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EXAMINING RELATIONS AMONG POSITIVE AND NEGATIVE METRICS OF PSYCHOLOGICAL FLEXIBILITY AND POSITIVE AND NEGATIVE OUTCOMES OF EXPOSURE TO TRAUMA

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by

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in the field of Psychology

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PTSD is a mental health condition that affects many people over the course of their life (National Comorbidity Survey, 2005), including veterans (Litz & Schlenger, 2009). However, many do not experience clinical levels of distress and some experience posttraumatic growth (PTG) resulting from such an event (Tedeschi, Park, & Calhoun, 1998). The Psychological Flexibility Model, of which Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 1999) is based, may help explain these phenomena. The purpose of this study was to examine these relationships utilizing a measure simultaneously assessing psychological flexibility and inflexibility. It was hypothesized that psychologically inflexible behaviors would predict PTSD symptom severity, while flexible behaviors would predict PTG. Furthermore, each of psychological inflexibility and flexibility would account for unique variance in PTSD symptom severity and PTG, respectively. Finally, the domains of ACT were examined to assess the strength each component has in the maintenance of these experiences. Results indicated that both psychological inflexibility and flexibility predicted PTSD symptoms and PTG, respectively, and each predicted unique variance in these experiences. Of the individual components, cognitive fusion, experiential avoidance, inaction, and lack of contact with the present moment all contributed to PTSD symptom severity, while values clarity, lack of contact with the present moment, and present moment awareness contributed to PTG. These results suggest the psychological flexibility model overall is consistent with the experience of PTSD symptoms and

the posttraumatic growth. Though further experimental methods are needed, the application of psychological flexibility through ACT could enhance PTSD treatments.
Keywords: acceptance and commitment therapy; psychological flexibility model; posttraumatic growth; posttraumatic stress disorder

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DEDICATION

I would like to dedicate this work to a number of people who supported me in this endeavor. I would like to start by recognizing my wife, without her none of this would be possible. Her support throughout this endeavor has been imperative to the success of both this project and my mental health. While I was locked away composing this manuscript, she ensured that we had a roof over our heads, food on the table, and the care and affection needed to sustain our family. I will forever be grateful for her compassion and patience.

Finally, none of this would be possible without those with whom I have served. To you, I owe my life and everything in it. We went to war as young boys and girls and were forced to grow up far too quickly. Plato said, “Only the dead have seen the end of war.” For many of the best this country has to offer, the war has not ended as they continue to struggle with the experiences they endured in the service of their country. I truly hope that my work in this area, can help end the war raging within for those who put a uniform on and marched toward the danger, not for their country but for each other.

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CHAPTER 1

INTRODUCTION

The experience of a traumatic event often leads to significant levels of distress, and in some cases this distress is intense and/or prolonged enough to merit a diagnosis of posttraumatic stress disorder (PTSD; Zlotnick et al., 2004). Of those exposed to a traumatic event, 9.7% of women and 3.6% of men go on to develop PTSD at some point in their lifetime (National Comorbidity Survey, 2005). For veterans, these statistics are much more concerning. According to the U.S. Department of Veterans Affairs, 10-18% of Iraq and Afghanistan veterans are diagnosed with PTSD (Litz & Schlenger, 2009). This means that of the 1.9 million service members who served in these conflicts (Institute of Medicine, 2010), between 190,000 and 342,000 veterans could experience symptoms severe enough to warrant a diagnosis of PTSD.

Most individuals who experience a traumatic event eventually recover from the experience (Monson, Resick, & Rizvi, 2014), and a subset of others not only recover but also experience personal growth as a result of experiencing the traumatic event (Davis & Nolen-Hoeksema, 2009). Known as posttraumatic growth (PTG; Calhoun & Tedeschi, 2014), one of the core components of this personal growth is clarity of one's personally held values (Janoff-Bulman, 2004) and cognitive changes to how one relates to their thoughts (Janoff-Bulman, 2006). There are five domains of PTG that these core components affect, including personal strength, how one relates to others, being able to perceive new possibilities post-trauma, having a new appreciation of life, and spiritual changes one may experience (Tedeschi & Calhoun, 1996). Tedeschi and McNally (2011) have further posited that PTG could be facilitated in individuals who endured a traumatic experience in their lives.

In addition to the aspects of PTG discussed above, one of the reinforcing aspects of

PTSD is avoidance of trauma-related reminders (Walser & Westrup, 2007), and such experiential avoidance could prevent the recovery from a traumatic experience. The Psychological Flexibility Model (Hayes, Barnes-Holmes, & Roche, 2001) provides a potential for the facilitation of resilience (Bryan, Ray-Sannerud, & Heron, 2015), and may also facilitate growth. The Psychological Flexibility Model is built upon two parallel hexagonal models: 1) flexible behavioral repertoires, known as the Hexaflex, and 2) inflexible behavioral repertoires, known as the Inflexahex (Hayes, Luoma, Bond, Masuda, & Lillis, 2006). In this context, psychological inflexibility is presented as the model of psychopathology of the Psychological Flexibility Model (Wilson, Hayes, Gregg, & Zettle, 2001).

Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 2011) is an empirically supported treatment for several mental health conditions that is based upon the Psychological Flexibility Model. The goal of ACT is to increase psychologically flexible behavioral repertoires, while also decreasing psychologically inflexible behaviors (Hayes et al., 1999). In the treatment of PTSD, ACT addresses mental illness symptoms with acceptance and mindfulness interventions, and promotes growth with values clarification and committed action interventions (Walser & Westrup, 2007). ACT has demonstrated some efficacy for individuals with PTSD symptoms (e.g., Twohig, 2008; Woidneck, Morrison, & Twohig, 2014). Additionally, two studies have found that psychological flexibility and inflexible behaviors predict unique variance in PTSD symptoms, beyond that of other predictors of PTSD (Meyer, Kotte, et al., 2019; Meyer, La Bash, et al., 2019), meaning that the Psychological Flexibility Model may provide a unique opportunity for change in someone suffering from PTSD symptoms. However, these two studies utilized the Acceptance and Action Questionnaire-II (AAQ-II; Bond et al., 2011), a measure developed as an assessment of psychological

inflexibility, that limits the ability to generalize these results to the full model.

A relatively new measure of flexibility and inflexibility that incorporates the entire Psychological Flexibility Model (Rolffs, Rogge, & Wilson, 2016) may provide insight into the potential relationship between an individual's negative or positive response to trauma experience and their psychological flexibility and inflexibility. The multidimensional psychological flexibility inventory (MPFI; Rolffs et al., 2016) is such a measure, as it was developed to account for limitations in the AAQ-II. The excellent psychometrics of this measure found by these authors have also been confirmed recently, in addition to confirming the structural model of the Psychological Flexibility Model (Seidler, Stone, Clark, Koran, & Drake, in press).

The purpose of the current study was to replicate and expand the findings of Meyer, La Bash, et al. (2019) by examining the unique variance of inflexibility in the context of several other predictors of PTSD symptom experience. Additionally, this study examined the association of psychological flexibility respective of other predictors of PTG, expanding upon the work of Meyer, Kotte, et al. (2019). Finally, it investigated the relationships of the individual components of both psychological flexibility and inflexibility and their relationship with the experience of PTG and PTSD, respectively. The next chapter will thoroughly discuss the extensive literature relative to each of these constructs.

CHAPTER 2

LITERATURE REVIEW

Posttraumatic Stress Disorder

PTSD is a is a psychological condition in which one endures long-term distress after experience with a traumatic experience. This distress can include reexperiencing of the event through memories and dreams, and in some cases as though they are reliving the event presently (Monson et al., 2014). Individuals often attempt to avoid reminders of the event, including reminders found in their environment. Cognitive and emotional disruptions can also occur, such that individuals can experience changes in their core beliefs about the world and feel detached or emotionally numb (Monson et al., 2014). Another common symptom is hyperarousal (Monson et al., 2014), where individuals typically experience hypersensitivity to sudden noises, extreme alertness to potential threats, sleep difficulties, and irritability.

Prevalence of PTSD

PTSD is a common outcome for individuals who are exposed to a traumatic event, experienced by approximately 1.6% of the population in a given year (Kessler et al., 2005). Lifetime PTSD rates for women based upon specific traumatic events include 32% of completed sexual assaults, 31% of other assaults, 39% of physical assaults, 22% for homicide of family or friend, 26% of any crime victimization, and 9% of non-crime related trauma (e.g., natural disasters/car accidents; Resnick, Kilpatrick, Dansky, Saunders, & Best, 1993). Following trauma exposure, 9.7 % of women and 3.6% of men develop PTSD at some point in their lifetime (National Comorbidity Survey, 2005). According to the U.S. Department of Veterans Affairs, 10-18% of Iraq and Afghanistan veterans are diagnosed with PTSD (Litz & Schlenger, 2009). Of the 1.9 million service members who have served in these two recent conflicts (Institute of

Medicine, 2010), between 190,000 and 342,000 veterans could experience PTSD symptoms severe enough for a diagnosis. A further analysis of current PTSD experienced by veterans of the wars in Iraq and Afghanistan resulted in 13.8% experiencing PTSD currently

Furthermore, many individuals report experiencing multiple traumatic events. According to Lehavot et al. (2018), veterans are more likely to report experiencing at least one traumatic event (female: 60.5%; male: 66.2%), while non-veterans experienced one or more traumatic events with less frequency (female: 49.9%; male: 47.8%). Alternatively, many veterans have been found to experience as many as three traumatic events in their lifetime, ranging from 57% (Dedert et al., 2009) to 77% (Clancy et al., 2006), with many of these experiences occurring in a combat zone (Clancy et al., 2006; Dedert et al., 2009). These statistics imply that a large proportion of those who experience a traumatic event do not in fact develop PTSD. There could be many reasons for this. Some individuals could have fewer risk factors (Possemato, McKenzie, McDevitt-Murphy, Williams, & Ouimette, 2014), greater social support (Laffaye, Cavella, Drescher, & Rosen, 2008; Seidler, 2014), have access and utilize resources to help cope with the trauma (Bowles et al., 2015), or are more resilient (Najera et al., 2017; Tsai, Harpaz-Rotem, Pietrzak, & Southwick, 2012). Another possibility as to why this large proportion of the population does not develop PTSD following a traumatic event is that they are more psychologically flexible (Bryan et al., 2015).

Historical Context of Trauma

The history of PTSD goes back as far as human beings have experienced traumatic events. Even in the earliest literary works in recorded history, one can observe what appears to be symptoms of PTSD (Pols & Oak, 2007). Furthermore, multiple medical professionals have written about distressing emotional experiences throughout history that today would be

considered clinically relevant under the current PTSD diagnosis criteria. This section will discuss the evolution of these explanations of how people react to traumatic events in their lives, starting with literary work from ancient Sumer and Greece, and evidence collected in the journal of someone who survived the Great London Fire. Additionally, medical explanations for the reactions to trauma will be discussed, from both combat and the industrial revolution. Finally, more contemporary explanations for these experiences will be examined, including descriptions from the wars of the 20th and 21st centuries, ending with the evolution of the Diagnostic and Statistical Manual for Mental Disorders (DSM).

The Epic of Gilgamesh. The first great work in human literature that has survived the sands of time, dating back to the third millennium BCE, is the Epic of Gilgamesh. In this account, both the experience of love and trauma are described, suggesting that both are fundamental human experiences (Crocq & Crocq, 2000). Gilgamesh, the protagonist in this story, was an adventurous hero of the ancient world who possessed great bravery (Kramer, 1963). Gilgamesh's saga is one that is strewn with great feats, but also describes horrific loss as well as the reactions he has concerning such loss. As would normally be expected, when Gilgamesh loses a close friend, he experienced great grief (Crocq & Crocq, 2000). As his grief subsided, he experienced significant panic that he, too, will die one day. This reaction could be one of the first representations of what would one day become the current understanding of PTSD (Taylor, 2006), but many have proposed that the story of Gilgamesh is too phenomenal to be about a single person (Kramer, 1963).

The Battle of Marathon. The ancient Greek historians were also quite versed in describing human experiences. Herodotus's description of the Battle of Marathon, written in 440 BCE (Herodotus, 1899) is an example of such expertise regarding traumatic experiences.

According to this Greek historian, a soldier fighting in this great battle suddenly succumbed to blindness, though he experienced no wounds to his physical body. When asked to describe what happened to him, his report indicated that a great soldier was standing over him on the battlefield with the intent of killing him. Instead of killing him, the enemy soldier killed another soldier nearby. The emotional experiences of fear and the witnessing of a comrade in his proximity losing his life appeared to have caused his loss of sight, which persisted for years (Crocq & Crocq, 2000). Herodotus also wrote of a later conflict in which Spartan soldiers exhibited signs of a negative traumatic reaction (Charvat, 2010). In this account, the Spartan king released his men from combat as a result of the exhaustion they experienced during the Battle of Thermopylae. Additionally, Homer described a similar instance in which traumatic experiences were at the root of significant distress following the experience of combat. As described in *The Iliad* (Homer, 800), Achilles suffers a multitude of losses and disappointments in the Trojan War in the 800s BCE, which had a lasting negative impact (Shay, 1991). Achilles withdrew from society, showed signs of emotional numbing, and experienced a negative worldview (Homer, 800), all possible symptoms of PTSD.

The Great Fire of London. In 1666, The Great Fire of London nearly destroyed the city (Hanson, 2002). While many have experienced distressing events throughout history, what sets this event apart is that one person, Samuel Pepys, recorded his experiences in a journal that survived the fire. This allowed for a retrospective examination of what he endured. According to Daly (1983), Pepys began recording his experiences at the onset of the fire and prior to the tragedy. Throughout the event and in its aftermath, Pepys suffered from difficulty sleeping, memory impairment, survivor's guilt, and distressing dreams regarding the experience. Overall, these symptoms lasted for about eight months. Daly (1983) assessed the descriptions recorded by

Pepys in his journal and concluded that Pepys would have likely met the diagnostic criteria for PTSD, based on the third edition of the Diagnostic and Statistical Manual for Mental Disorders (DSM-III; American Psychiatric Association, 1980), the standard of the time. Though the standard of PTSD has evolved over the past 38 years, it is possible that Pepys would still meet the diagnostic criteria of PTSD had the fire occurred in contemporary times.

The Napoleonic Wars. The reactions to traumatic events, such as combat exposure, began to be conceptualized as symptoms of a larger syndrome in the late 1600s. Johannes Hofer, a Swiss physician, called this group of characteristics "nostalgia," which included symptoms of despondency, continuous thoughts of home, insomnia, anxiety, heart palpitations, and decreased appetite (Charvat, 2010). These experiences could be interpreted as rumination, sleep difficulties, as well as the psychological and physiological symptoms of anxiety. Hofer's conceptualization of nostalgia was the first time that someone operationalized the symptoms of a traumatic reaction. French physicians took Hofer's conclusions and noted several factors in the activation of nostalgia, including cultural, social, environmental, and the final result of the battle (i.e., the victorious armies tended to suffer fewer casualties to mental illness than those that were defeated; Charvat, 2010). Another conceptualization that occurred at this time called "vent du boulet," translated roughly as "the fright of the wind of passing cannonballs," was based on the observation that distress would typically follow near misses of incoming artillery shells (Crocq & Crocq, 2000). The result of this development was the first operationally defined treatment for traumatic stress reactions (Roth, 1991), in which those that were afflicted were prescribed regular exercise, listening to music, and what was called "useful instruction" (Charvat, 2010). These early combat related conceptualizations and treatments set the stage for a more generalized application.

The Industrial Revolution. With the invention of and rise of the use of mechanical equipment, accidents also increased (Crocq & Crocq, 2000). As a result of these accidents, including those resulting from industrial manufacturing and carriage and railroad accidents, the conceptualization of traumatic stress responses continued to evolve. Prior to this time, the pervasive belief was that only those in combat suffered distress from traumatic experiences. However, a physician named Philippe Pinel observed in the late 1700s, though, that these experiences also manifested distress in those who had not served in military campaigns (Crocq & Crocq, 2000). Pinel (1813) documented these observations in a patient who experienced a carriage accident. This patient exhibited the symptoms of a depressed emotional state, social isolation, and recurring nightmares (Pinel, 1813). Behaviorally, the patient would even place a chair beside the left edge of his bed to stave off the fear of falling out of bed. Today, these experiences would translate as the PTSD symptoms of negative cognitions and mood and avoidance of emotional experiences. Survivors of railway accidents experienced similar signs of exposure to traumatic events (Jones & Wessely, 2007), and the physicians of that era struggled with the etiology of this syndrome. Erichsen (1867) first described the results of those afflicted with these types of injuries. Based on the medical model of the time, Hermann Oppenheim, one of Germany's leading neurologists, developed a theory that survivors of these horrific events suffered from microscopic lesions of the brain or spine (Crocq & Crocq, 2000). From this understanding, the term "railway spine" was born. Other physicians believed the symptoms were the result of what was known as "hysteria" (Hornung, 1986). Today, we know that both PTSD and physical injuries (i.e., "whiplash," which is consistent with railway spine) can result from such accidents.

The American Civil War. Many of the service members throughout the American Civil

War also suffered the effects of combat-related traumatic events. The indicators observed at this time included cardiac-related symptoms, similar to heart disease, though a physical examination would not reveal any physical abnormalities (DaCosta, 1871). Da Costa, a physician in the Civil War, observed that soldiers would experience pain in the left side of the chest, heart palpitations, breathing difficulty, and fatigue. This condition was also known as Da Costa's syndrome, which remains listed as a somatoform disorder in the International Classification of Diseases, currently in the 10th edition (ICD-10; World Health Organization, 2012). The symptoms that DaCosta identified are all characteristic of anxiety, and, coupled with the proximity to combat, may indicate a relationship to trauma.

20th Century wars. In the late 1910's, World War I broke out in Europe, with large numbers of military members suffering distress from combat experiences (Crocq & Crocq, 2000). The term used to describe the cluster of symptoms physicians observed was "shell shock," coined by soldiers on the battlefield themselves (Edgar, 2012). Individuals who experienced detonations of explosives without incurring a head wound would suffer from memory loss, difficulty concentrating, headaches, tinnitus (i.e., ringing in the ears), hypersensitivity to noise (i.e., possibly an exaggerated startle response), dizziness, and tremors (Jones, Fear, & Wessely, 2007). Often, these soldiers were accused of cowardice because no physical wounds could be identified (Edgar, 2012). Because the term "shell shock" coincided with a stigma attached to cowardice, the term "war neurosis" was adopted to better describe the underlying psychological aspects of this condition (Jones & Wessely, 2007). While the biomedical model was first used to explain these symptoms, only about 20% of those who experienced shell shock were proposed to suffer physical lesions (Jones & Wessely, 2007) consistent with railway spine. A significant contribution from World War I was the establishment of the forward treatment (i.e., near the

front lines) of psychological problems (Crocq & Crocq, 2000). This advancement in psychological treatment was successful at identifying and helping to alleviate traumatic stress responses, which helped service members recover and return to their duties.

To address the psychological problems faced by the armies in World War I, the U.S. Army began an assessment program with the goal of identifying those that would be vulnerable to war neurosis and subsequently limit their service in combat environments (Gade, 2018; Pols & Oak, 2007). The development of these assessments, led by Robert M. Yerkes, with the methodology suggested by Arthur S. Otis, is the foundation by which the U.S. military continues to screen potential recruits to enter the service (Gade, 2018). Unfortunately, the screening measures did not perform as expected during World War II, and high numbers of psychological casualties ensued (Pols & Oak, 2007). Military physicians and psychologists referred to these types of psychological combat injuries as combat or battle fatigue (Charvat, 2010; Jones & Wessely, 2007). With the high levels of collateral damage that were incurred during World War II, many civilians also showed signs of traumatic stress reactions (Crocq & Crocq, 2000).

During the war in Vietnam, psychological problems were relatively low when compared to other conflicts (Crocq & Crocq, 2000). The U.S. military was quick to implement forward treatment facilities during this conflict, known as combat stress control teams (Pols & Oak, 2007). This implementation, together with other measures, such as shortened deployments and frequent periods of rest and relaxation (Pols & Oak, 2007), could be a reason for the reduction in distress as a result of combat during the Vietnam War. The second edition of the DSM (DSM-II; American Psychiatric Association, 1968) was published during this time, though not much attention was paid to the effect of combat on the psychological health of service members serving in Vietnam due to the delayed symptom onset experienced by many veterans (Crocq &

Crocq, 2000). According to Jones and Wessely (2007), this delayed response to the combat experiences of veterans led to unofficial diagnoses known as "post-Vietnam syndrome" and "delayed stress syndrome," ultimately leading to the addition of PTSD in DSM-III (American Psychiatric Association, 1980).

The Evolution of PTSD in the DSM

As discussed above, the history of trauma reactions is steeped in deep history in both psychology and medicine. The history of PTSD is no different when it comes to the American Psychiatric Association's diagnostic taxonomy. The diagnoses in the first two editions of the DSM were descriptive as opposed to later versions that became more criterion based. The first edition of the DSM (American Psychiatric Association, 1952) did not include PTSD as it is known today, but did include a reference to reactions to a stressful event in the diagnosis of "gross stress reaction" (American Psychiatric Association, 1952, p. 40). Traumatic events were not specifically mentioned, though this edition of the DSM references the possibility of reactions to "overwhelming fear" (American Psychiatric Association, 1952, p. 40), including combat.

The first revision to the DSM (DSM-II; American Psychiatric Association, 1968) saw the removal of gross stress reaction as a diagnosis and reactions to traumatic events, such as combat, were included as a "transient situational disturbance" (1968, p. 48), relative to an adjustment reaction in adulthood. This edition referred to fear associated with combat experiences, which result in "trembling, running and hiding" (American Psychiatric Association, 1968, p. 49), making it significantly different from that of the first edition of the DSM. One could view this progression in the eventual acceptance of PTSD as a diagnosis endorsed by the American Psychiatric Association as a devolution.

PTSD, as we know it today, was first introduced into the diagnostic system with the third

edition of the DSM (DSM-III; American Psychiatric Association, 1980). This addition was the result of special interest groups and psychiatrists lobbying the APA to add the diagnosis in support of veterans who had served in Vietnam (Scott, 1990). Originally proposed as "post-Vietnam syndrome" and then "post-combat disorder," the final diagnostic description of PTSD was less specific to military veterans and allowed for those without military experience to be diagnosed. DSM-III described PTSD as comprising of reexperiencing symptoms, emotional numbing, and "a variety of autonomic, dysphoric, or cognitive symptoms" (American Psychiatric Association, 1980, p. 236) in response to a traumatic event defined to be "outside the range of usual human experience" (American Psychiatric Association, 1980, p. 236).

The diagnostic criterion according to this early form of the official diagnosis would form the foundation of PTSD for years. This edition required a stressor as a core precipitant for the symptoms reported, though what defined a stressor left much to interpretation. Also required were symptoms from three symptom clusters (American Psychiatric Association, 1980). The first cluster referenced reexperiencing the traumatic event through recurrent and intrusive memories, dreams, and what has become known as "flashbacks." The second cluster was relevant to emotional numbing marked by a diminished interest in one's activities, the feeling of detachment or distancing from other people, and limited affect. Finally, the third cluster listed symptoms that were not consistent with the prior two clusters of symptoms, and included symptoms ranging from hyperarousal and exaggerated startle response to survivor's guilt and severe avoidance (American Psychiatric Association, 1980).

The symptom structure for PTSD changed again with the revision of DSM-III (DSM-III-R; American Psychiatric Association, 1987). Though DSM-III-R maintained three diagnostic symptom clusters, the third cluster became more specific to hyperarousal symptoms. This

organization of symptoms would be the basis of the diagnostic criteria for PTSD for the next 26 years and three revisions of the DSM in DSM-III-R, DSM-IV, and DSM-IV-TR (American Psychiatric Association, 1987, 1994, 2000, respectively). These three clusters include re-experiencing the traumatic event through intrusive memories or "flashbacks," avoidance of reminders of the traumatic event or the experience of emotional numbing, and hyperarousal symptoms including exaggerated startle response and disturbance in one's sleep. A person who experienced at least one symptom from the listed re-experiencing cluster of symptoms, three from the avoidant and emotional numbing symptoms and two symptoms from the hyperarousal cluster would meet the minimum criteria for diagnosis. Finally, the evolution of PTSD continued to its current definition with the fifth edition of the DSM (DSM-5; American Psychiatric Association, 2013), which will be discussed in the next section.

Current definition of PTSD. Currently, PTSD is defined by the DSM-5 (American Psychiatric Association, 2013). With this edition, not only did the diagnostic criteria change significantly for the first time in decades, but the various reactions to trauma were also provided their own chapter to make distinct the differences between anxiety disorders and trauma- and stressor-related disorders (Wakefield, 2013). These changes stem from the continuing research done with traumatized populations, including military service members and veterans (Miller, Wolf, & Keane, 2014). The main changes included a significant revision of the traumatic event definition, the addition of three potential symptoms, and the reconceptualization and reorganization of the symptoms into four groups.

To be diagnosed with PTSD, first one must experience a traumatic event. DSM-5 outlines a traumatic event as personally experiencing an event or witnessing an event happen to someone, that threatens one's own or someone else's life or significant injury. One could also learn about a

traumatic event that occurred to a close family member or friend, or continued experience of aversive details of a traumatic event through one's job (American Psychiatric Association, 2013). The addition of the last potential stressor was in response to first responders who work with traumatized populations and begin to exhibit symptoms of PTSD themselves from that work (Wakefield, 2013). Another significant change to the definition of a traumatic event was the removal of the requirement that the experience involved the emotional responses of "intense fear, helplessness, and horror" (American Psychiatric Association, 2000, p. 467). This revision in the criteria was a result of research that found that the effect of these emotional responses was insignificant (e.g., Brewin, Lanius, Novac, Schnyder, & Galea, 2009; Karam et al., 2010; Lancaster, Melka, & Rodriguez, 2009).

In addition to the changes to how traumatic events were defined, the symptom structure of PTSD also evolved with DSM-5. The criteria changed from three symptom clusters to four, based on the empiricism of the time (Wakefield, 2013; Weathers, Marx, Friedman, & Schnurr, 2014). The first of the current diagnostic symptom clusters include symptoms relevant to re-experiencing the traumatic event, including intrusive memories and "flashbacks," requiring the endorsement of at least one of the symptoms (American Psychiatric Association, 2013). The second cluster, avoidance, includes the avoidance of memories, thoughts, or feelings associated with the traumatic experience and the avoidance of external reminders that provoke such memories, thoughts, or feelings, requiring at least one such symptom to be endorsed (American Psychiatric Association, 2013). The third symptom cluster includes seven potential symptoms consisting of negative alterations in cognition and mood concerning the traumatic event (American Psychiatric Association, 2013). In essence, this cluster includes the numbing symptoms from previous conceptualizations, in addition to the negative beliefs that are common

in PTSD (U.S. Department of Veterans Affairs, 2016). The negative alterations in cognitions and mood category of PTSD symptoms require at least two symptoms experienced (American Psychiatric Association, 2013). Finally, a unique category subsumes arousal and reactivity symptoms, including hypervigilance, irritability, exaggerated startle response, and sleep problems (American Psychiatric Association, 2013). This cluster of symptoms requires the experience of two or more symptoms to meet the diagnostic requirement.

A PTSD diagnosis also requires that at least 30 days have elapsed since the traumatic event. Any disturbance meeting all other PTSD diagnostic criteria other than the time interval of this criterion meets the criteria for acute stress disorder (American Psychiatric Association, 2013). The reason for this is because many reactions to a traumatic event are normal and most people recover naturally (King, King, Keane, Fairbank, & Adams, 1998; Monson, Resick, & Chard, 2016). The update of PTSD in DSM-5 also includes dissociative subtypes of PTSD, including depersonalization and derealization, as well as a specifier to indicate delayed expression. A delayed expression is when an individual does not experience clinically significant symptoms until after six months have elapsed since the traumatic event. Finally, DSM-5 also includes criteria in which children under the age of six can be diagnosed with PTSD (Friedman, 2013).

Predictors of PTSD

Many studies have examined the predictors and risk factors for PTSD since its inception, and two meta-analyses have summarized much of this literature. The first, Brewin, Andrews, & Valentine (2000), examined 14 separate risk factors across studies that investigated PTSD in both military and civilian samples. These researchers found three broad categories of risk factors across the literature. The first included factors such as gender, the age at which the traumatic

event occurred, and race in some populations. The second category of factors included education level, previous traumatic experiences, and general adversity experienced in childhood. The final category of factors included psychiatric history, childhood abuse, and family psychiatric history. Additionally, the largest risk factor for PTSD in the literature is military service (Brewin et al., 2000). In military samples, youth was noted as a significant risk factor ($\chi^2 = 1.77$, $p < .05$), as was low intelligence ($\chi^2 = 3.22$, $p < .01$), adverse childhood experiences ($\chi^2 = 8.30$, $p < .001$), the severity of the traumatic event ($\chi^2 = 19.43$, $p < .001$), and a lack of social support ($\chi^2 = 13.27$, $p < .001$). Alternatively, in civilian samples, a significant increased risk for PTSD was found based on gender ($\chi^2 = 2.59$, $p < .001$), youth ($\chi^2 = 3.32$, $p < .001$), reduced SES ($\chi^2 = 4.23$, $p < .001$), race ($\chi^2 = 2.32$, $p < .01$), previous traumatic experiences ($\chi^2 = 3.03$, $p < .01$), trauma severity ($\chi^2 = 2.44$, $p < .01$), and additional life stressors ($\chi^2 = 5.52$, $p < .01$).

The second meta-analysis, Ozer, Best, Lipsey, and Weiss (2003), included 476 studies of PTSD and reported on 68 that investigated seven predictors. In relation to prior trauma history, these researchers found a small, yet significant effect size (weighted average $r = .17$, 95% CI [0.11, 0.22]). Additionally, experiencing a prior traumatic event exhibited a stronger relationship to PTSD when the traumatic experience involved noncombat interpersonal violence (e.g., assault, sexual assault, or domestic violence; weighted $r = .27$) than when the traumatic event was related to combat experiences (weighted $r = .18$; $z = 3.02$, $p < .01$) or an accident (weighted $r = .12$; $z = 2.10$, $p < .05$).

In relation to having a history of prior adjustment problems, Ozer et al. (2003) found a small effect size (weighted average $r = .17$, 95% CI [0.10, 0.23]). Specifically, mental health treatment, pre-trauma emotional problems, pre-trauma anxiety or affective disorders, and antisocial personality disorder prior to serving in the military were all predictive of PTSD

symptoms. Depression was also a significant predictor of PTSD symptoms (weighted average r = .15; z = 3.78, p < .01). Finally, when compared to combat exposure (weighted r = .06), these adjustment problems exhibited increasingly strong associations with PTSD when the traumatic event involved noncombat interpersonal violence (weighted r = .31; z = 8.70, p < .01) or accident (weighted r = .28; z = 4.72, p < .01).

Family history of psychiatric conditions were also related to PTSD symptoms. Ozer et al. (2003) found a small effect size in the association between one's family history of mental illness and PTSD symptoms (weighted average r = .17, 95% CI [0.04, 0.29]). This relationship was stronger in those who experienced a noncombat interpersonal violent traumatic event (weighted r = .31) as opposed to combat exposure (weighted r = .12; z = 3.40, p < .01) or an accident (weighted r = .08; z = 3.00, p < .01).

Ozer et al. (2003) also examined the effect of perceived life threat on PTSD symptoms, finding a small to medium effect size (weighted average r = .26; 95% CI [0.18, 0.34]). Specifically, Ozer et al. (2003) found that the relationship between PTSD and a perceived threat to one's life was stronger the greater duration of time that had elapsed since the traumatic event. This was demonstrated between six months to three years (weighted r = .44) and one to six months (weighted r = .24; z = 2.23, p < .05) since the trauma occurred. Additionally, the association between the perception of life threat and PTSD symptoms was stronger when the traumatic event was noncombat interpersonal violence (weighted r = .36) than an accident (weighted r = .20; z = 2.44, p < .05).

Perceived post-trauma social support was also examined by Ozer et al. (2003), finding a small-to-medium effect size (weighted average r = -.28; 95% CI [-0.40, -0.15]) in the relationship with PTSD symptoms. This inverse relationship was noted the most influential in the

context of time since the traumatic event. Specifically, the effect of time was incremental, noting differences among when three or more years (weighted r = -.42), six months to three years (weighted r = -.16), and one to six months (weighted r = .01) had elapsed since the event occurred (z = 6.58, p <.01, greater than three years vs. six months to three years; z = 7.50, p <.01, three or more years vs. one to six months; six months to three years vs. one to six months, z = 2.64, p <.01). This finding is consistent with recent research examining social support as a protective factor of the development of PTSD symptoms (Seidler, 2014). In this study, it was observed that postdeployment social support from family, friends, and the community predicted decreased levels of PTSD symptom severity, of which social support from family significantly predicted unique variance in PTSD symptom experience.

Researchers have also examined personality as a risk factor for PTSD, though few have examined this construct in U.S. military service members and veterans. One of the earliest studies examining such effects investigated the effect of neuroticism on PTSD symptoms in Dutch soldiers following a four-month deployment to Iraq (Engelhard & Hout, 2007). These researchers administered a personality measure before the soldiers' deployment. Five months following the deployment, the soldiers also completed the personality measure again, in addition to both clinician-administered and self-report measures of PTSD. The results of this study indicated that neuroticism accounted for unique variance in PTSD symptoms in both the clinician-rated and self-report methods. Specifically, after adjusting for the effects of neuroticism, the magnitude of the severity of minor stressors reduced by 31% in relation to the clinician-rated PTSD symptoms, and the self-reported measure of PTSD reduced by 22%.

In another study examining the effects of personality on PTSD symptoms in Dutch military service members, Rademaker, Zuiden, Vermetten, and Geuze (2011) specifically

investigated the construct called Type D personality (Denollet, 2000). Researchers used several separate hierarchical regressions to assess the effects of personality before deployment on postdeployment PTSD symptoms. The results of these regression analyses indicated that Type D personality was not predictive of unique variance in PTSD symptoms. However, these results did indicate that predeployment negative affectivity did significantly, and independently, predict postdeployment PTSD symptom severity.

Additionally, in a meta-analysis examining personality traits relative to PTSD across studies published from 1980 to 2012, researchers noted that personality traits have both positive and negative relationships with the experience of PTSD (Jakšić, Brajković, Ivezić, Topić, & Jakovljević, 2012). Specifically, negative emotionality, neuroticism, harm avoidance, and trait anger and anxiety were all positively related to PTSD. These researchers also found that three personality-based subtypes of PTSD have been investigated, including internalizing, externalizing, and low pathology PTSD.

Additionally, researchers have examined the potential for personality based sub-types of PTSD. In one such study, Miller, Greif, and Smith (2003) sampled veterans from World War II, and the Korean and Vietnam wars. Using cluster analyses, a multivariate statistical method to identify natural groupings of cases in heterogeneous data and organize them into homogeneous subgroups, these researchers found differences between externalizing and internalizing clusters. The externalizing cluster reflected low constraint and harm avoidance coupled with high levels of alienation and aggression, in addition to histories in delinquency and increased levels of substance use problems. In contrast, the internalizing cluster was defined by lower levels of positive emotionality, alienation, and aggression, with increased constraints and greater levels of depressive symptoms. These results indicate that, concerning externalizing versus internalizing

traits, personality can affect the way individuals experience PTSD symptoms.

Posttraumatic Growth

Not everyone who experiences a stressful or traumatic event develops PTSD (Kessler et al., 1995). Some individuals experience distress initially, process the event, and return to a normal level of functioning (King et al., 1998). Others endure this distress and find it allows them to find personal growth as a result of the experience (Davis & Nolen-Hoeksema, 2009). Posttraumatic Growth (PTG) is the concept that one can find lasting value in their lives as a result of experiencing a stressful or traumatic event. Specifically, PTG is a positive psychological change that one experiences resulting from the struggle with extremely challenging life experiences (Tedeschi & Calhoun, 2004). Though this concept was not extensively researched methodically until the past two decades, it is not a new concept. It is possible that for as long as there have been traumatic experiences, people have experienced personal growth as a result of such events, as can be seen throughout literature and religion (Tedeschi et al., 1998). For example, the ancient Buddhist religion believes that the first noble truth is that there is suffering (de Silva, 1990), indicating that suffering is ubiquitous in life , thus growth is not possible without suffering (Calhoun & Tedeschi, 2014).

In more contemporary psychological science, Maslow, Dohrenwend, and Frankl all espoused the concept that suffering was a normal aspect of the human condition (Tedeschi & McNally, 2011). Furthermore, existential theorists posit that pain and suffering are inevitable, and that one leads a purposeful life through finding meaning through traumatic experiences (Werdel & Wicks, 2012). Where traditional psychology focuses on negative aspects of psychological experiences, PTG finds its foundation in positive psychology where the focus is on the strengths one has to cope with distressing experiences (Snyder & Lopez, 2009). By focusing

on this more eudemonic view of well-being, in contrast to the former hedonic view, a more comprehensive conceptualization of traumatic suffering can be captured (Medoza, 2015). Early researchers examining PTG studied the traumatic responses of persons suffering from bereavement, chronic illnesses, heart attacks, sexual assaults, and natural disasters (Tedeschi et al., 1998). The shift in focus to PTG in research increased exponentially from 2005 to 2011 (Medoza, 2015), increasing from 33 articles published in 2005 to 350 in 2011 (Werdel & Wicks, 2012). Of these publications, those that examined psychological flexibility with PTG were a minority, as were publications with a focus on the veteran population (Larner & Blow, 2011).

Posttraumatic Growth in Military Samples

Researchers have examined PTG in veterans of World War II, the Korean War, the Vietnam War, Desert Shield/Storm, and OIF/OEF eras. As evidenced earlier, traumatic experiences result in distress, and that distress can evolve into either PTSD or PTG, and PTG can evolve from the experience of PTSD, such that combat itself can shape the life narratives that promote the development of PTG (Tedeschi & McNally, 2011). Researchers have even postulated that PTG can be facilitated in military service members given the high risk they face as part of their duties (Tedeschi & McNally, 2011). To attempt this facilitation, the U.S. Army currently receives training in the Comprehensive Soldier Fitness program, which strives to reinforce and enhance a service member's psychological fitness before they experience combat (U.S. Department of the Army, 2014). Comprehensive Soldier Fitness is comprised of five dimensions of strength, including physical, emotional, social, spiritual, and familial. This program is consistent with the military family fitness model, which aims to enhance family fitness and resilience across the lifespan (Bowles et al., 2015). This section will examine PTG across the different eras of veterans in the 20th century and into the 21st century.

World War II and Korean War veterans. In one of the most comprehensive studies examining veterans' subjective combat experiences before, during, and after both the second World War and Korean War, Elder and Clipp (1989) found that those who served in heavy combat experienced the greatest distress. Veterans in this study were interviewed before combat (1939-1940), postwar (1945), mid-life (1970), and in later life (1985). Additionally, the veterans who had experienced heavy combat also reported feeling less helplessness and more resilient during both the prewar and postwar interview sessions. These same veterans also reported that their combat experiences helped them to develop coping skills, self-discipline, and a greater appreciation for life (Elder & Clipp, 1989). Furthermore, in a study of over 1,200 veterans from predominantly the World War II and Korean War eras found that negative experiences in response to combat-related trauma were not sufficient in describing all possible outcomes, including developing a sense of mastery, new coping resources, and positive affect experienced by some veterans (Aldwin, Levenson, & Spiro III, 1994). Finally, in a sample of former World War II and Korean War prisoners of war (POWs), researchers examined PTG using the PTGI (Tedeschi & Calhoun, 1996) and archival data (Erbes et al., 2005). The results of this research indicated that the veterans who suffer the most often perceive the greatest benefits of the traumatic events they experience. These researchers concluded that those who suffer the most are afforded the greatest opportunity for PTG to occur.

Vietnam veterans. In Vietnam, 70.1% of male veterans reported their experiences in the theater of operations as mostly positive (Tedeschi & McNally, 2011). According to the National Vietnam Veteran's Readjustment Study (Kulka et al., 1990a, 1990b), one of the largest and most comprehensive studies of Vietnam veterans, the majority of veterans successfully reintegrated into postwar lives and experienced few psychological problems. The psychological benefits of

combat, including self-improvement and successful coping, were positively associated with exposure to combat trauma in most cases (Fontana & Rosenheck, 1998). Of the worst experiences veterans endured in Vietnam, being captured and tortured by enemy forces ranked among the most extreme. One study that examined the long-term effects of such experiences by American POWs from the war in Vietnam found that 61% perceived their imprisonment as beneficial (Sledge, Boydstun, & Rabe, 1980). These veterans reported that being a POW resulted in positive changes to their self-concept, interpersonal relationships, and improved the way they value important parts of their life. Finally, Feder et al. (2008) found moderate PTG among POWs from the Vietnam War that experienced extreme hardship.

Desert Storm veterans. Concerning veterans of Operations Desert Shield and Desert Storm, only one study that has examined PTG (Maguen, Vogt, King, King, & Litz, 2006) was found in the literature. These researchers found that the most notable predictor of increased life appreciation was perceived life threat while in a combat zone. Essentially, those that faced the greatest risk were found to appreciate their day-to-day lives at increased levels. Furthermore, the best predictor of improved personal strength and interpersonal relationships was post-deployment social support (Maguen et al., 2006), which is a predictor of reduced levels of PTSD symptom severity (Seidler, 2014). Maguen et al. (2006) asserted that a strong social support network needs to be in place post-combat to reap the benefits of PTG.

Contemporary veterans. In the current generation of veterans, there has been an increased level of interest in researching PTG (Larner & Blow, 2011). In one such study examining factors that may increase PTG among OIF/OEF reservist and National Guard service members (Pietrzak et al., 2010), researchers found that 72% reported significant increases in at least one of the PTG factors (i.e., personal strength, relating to others, new possibilities,

appreciation of life, and spiritual change). Pietrzak et al. (2010) determined that perseverance had a positive association with PTG, as well as social support from the unit during deployment. Additionally, in a study of OIF/OEF amputees, researchers found that PTG moderated post-combat suicidality (Benetato, 2011). Benetato (2011) found PTG in moderate levels, as well as a positive correlation between PTG and both cognitive processing of the combat trauma and postdeployment social support in this sample. Finally, expanding on the work of Benetato (2011), researchers found that as PTG increased, suicidal ideation decreased (Bush, Skopp, McCann, & Luxton, 2011). These researchers asserted that PTG might be a protective factor against service members' perceptions regarding an inability to cope with stressors postdeployment.

In summary, the examination of PTG in veterans, though limited, has spanned each of the eras of conflict since the early 20th Century, and has been essential to understanding both their physical and emotional experiences. One of the constants that stand out in this subset of the literature on PTG is that growth stems from distress. In other words, those who suffer the most are the most likely to benefit from distressing or traumatic events. Additionally, postdeployment social support seems to be a necessary component for growth to occur. Because this population has not enjoyed the focus of these studies, it is imperative that future research, including the current study, examine this aspect of veterans' experiences.

Models of Posttraumatic Growth

There have been numerous models of PTG that have been proposed over the years, each attempting to explain why individuals undergo positive effects following some of the worst experiences in his or her life. Many of the models attempt to build on the founding model posited by Schaefer and Moos (1992). The purpose of this section is to review several of these

models as each has a unique aspect adding to the overall knowledge of the experience of growth following a traumatic event.

Life crises and personal growth model. Schaefer and Moos (1992) attempted to explain the construct of PTG, in which they stated that crises in life can be a catalyst for improved personal resources, developing new coping skills, and improved social resources. Because of the disruptions experienced following a traumatic event, people have to reevaluate their lives, including their relationships and values. Additionally, these researchers proposed that a person who undergoes a painful experience may be better able to comprehend and empathize with others experiencing similarly traumatic events.

According to this model, a person's characteristics and environment influence the way they interact with a personal crisis or traumatic event (see Figure 1). A person's environment (Panel I) included the context of one's life, such as their social support network and socioeconomic variables (e.g., financial stability). Personal characteristics (Panel II) are defined as sociodemographic attributes and personal resources available, including cognitive ability, health, self-efficacy, resiliency, motivation, and prior crisis experience (Medoza, 2015). Characteristics of the traumatic event itself (Panel III) were posited to predict growth as well. These included the severity, duration, and timing of the event. Lancaster, Klein, Nadia, Szabo, & Mogermann (2015) found that the degree to which the traumatic event challenged one's core beliefs was approximately equal in both predicting PTG and PTSD.

The combination of personal and environmental and traumatic event characteristics shapes the way a person responds or copes with the traumatic event (Panel IV). Schaefer and Moos (1992) categorized these coping responses into appraisal-focused, problem-focused, and

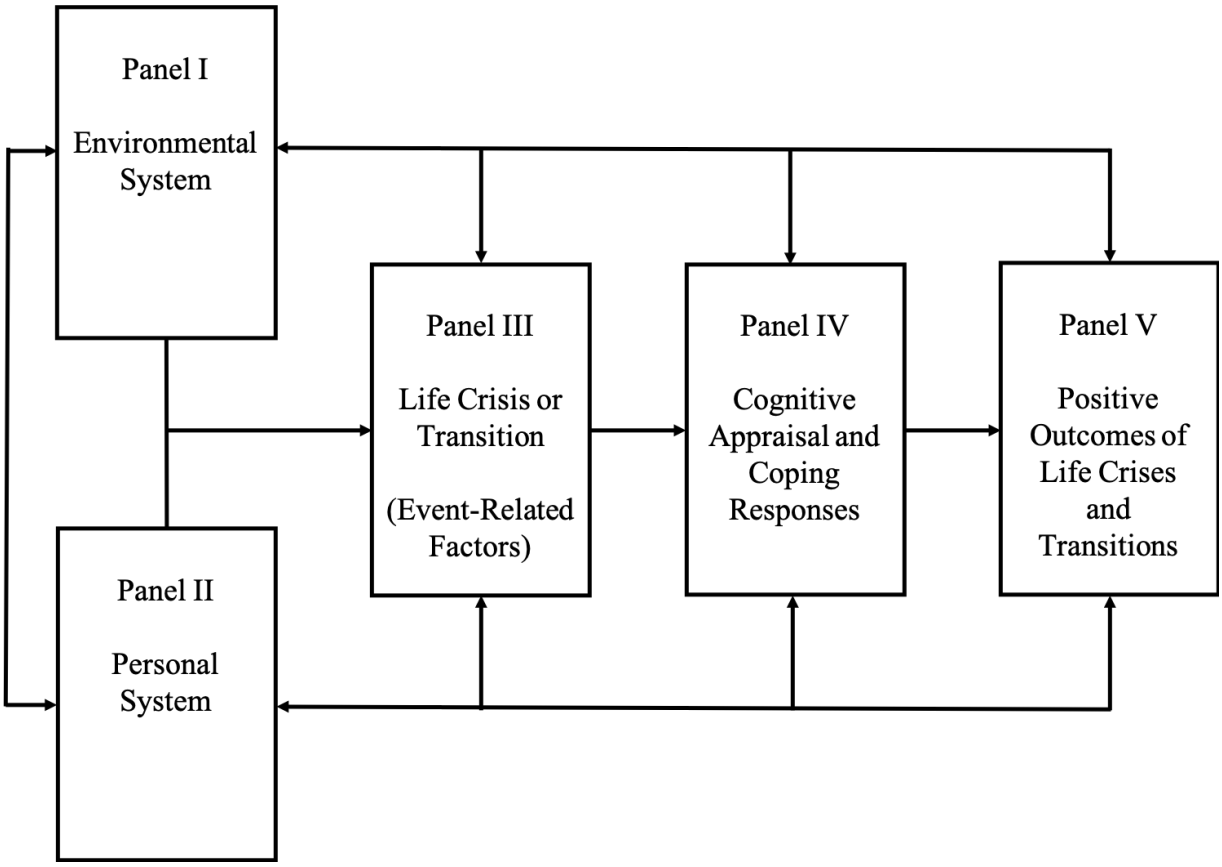

Figure 1. The Life Crises and Personal Growth Model. Adapted from "Life Crises and Personal Growth" by J. A. Schaefer and R. H. Moos, 1992, In B. N. Carpenter (Ed.), *Personal coping: Theory, research, and application*. Copyright 1992 by Praeger Publishers/Greenwood Publishing Group. Used with permission from the author (see Appendix J).

emotion-focused responses. Appraisal-focused responses revolved around identifying, interpreting, and understanding the event. Problem-focused responses concentrated on resolving the stressors through gaining information, taking action, and finding an alternative reward. Additionally, emotion-focused coping responses involved emotion regulation, the expression of anger, and the acceptance of the reality of the situation. Essentially, this aspect of the model put forth by Schaefer and Moos (1992) summarizes how individuals approach or avoid the traumatic event (Medoza, 2015).

Finally, the combination of each of the previous elements of the model shape the

potential positive outcomes (Panel V; Schaefer & Moos, 1992). According to these researchers, there are three main positive outcomes. The first is enhanced social resources, including better relationships and new or changed social support networks. Additionally, one can experience improved personal resources, such as assertiveness, empathy, maturity, cognitive and intellectual differentiation, and changes in one's values. Finally, one can experience increased levels of adaptive coping skills, including problem-solving, improved help-seeking behavior, and emotion regulation. To complete the model, each of the above areas have reciprocal relationships with one another, indicating that as experiences change, so will the attributes of the other elements.

Trauma and transformation model. Adapted from the model developed by Schaefer and Moos (1992), the trauma and transformation model was developed by Tedeschi and Calhoun (1995). This model included similar feedback loops as those of the Schaefer and Moos (1992) model. In the first stage of the trauma and transformation model, when a person experiences a particularly traumatic event, they develop a primary, mostly automatic, response that is ineffective (see Figure 2). As a result of the traumatic event, this response incorporates emotional, cognitive, and behavioral aspects. Specifically, the person believes the distress is not manageable, their core beliefs are challenged, and they fail to maintain control of the situation (Medoza, 2015).

The secondary response to the traumatic event is crucial to the development of growth following such an experience. The person must realize that the core beliefs that they hold are not realistic in a post-trauma reality, resulting in the person changing their goals and assumptions about the world (Tedeschi & Calhoun, 2004). This process occurs through rumination, which alongside intrusive thoughts, occur as part of the response to the trauma (Tedeschi & Calhoun, 2004). Specifically, Lancaster et al. (2015) found that deliberate rumination was strongly linked

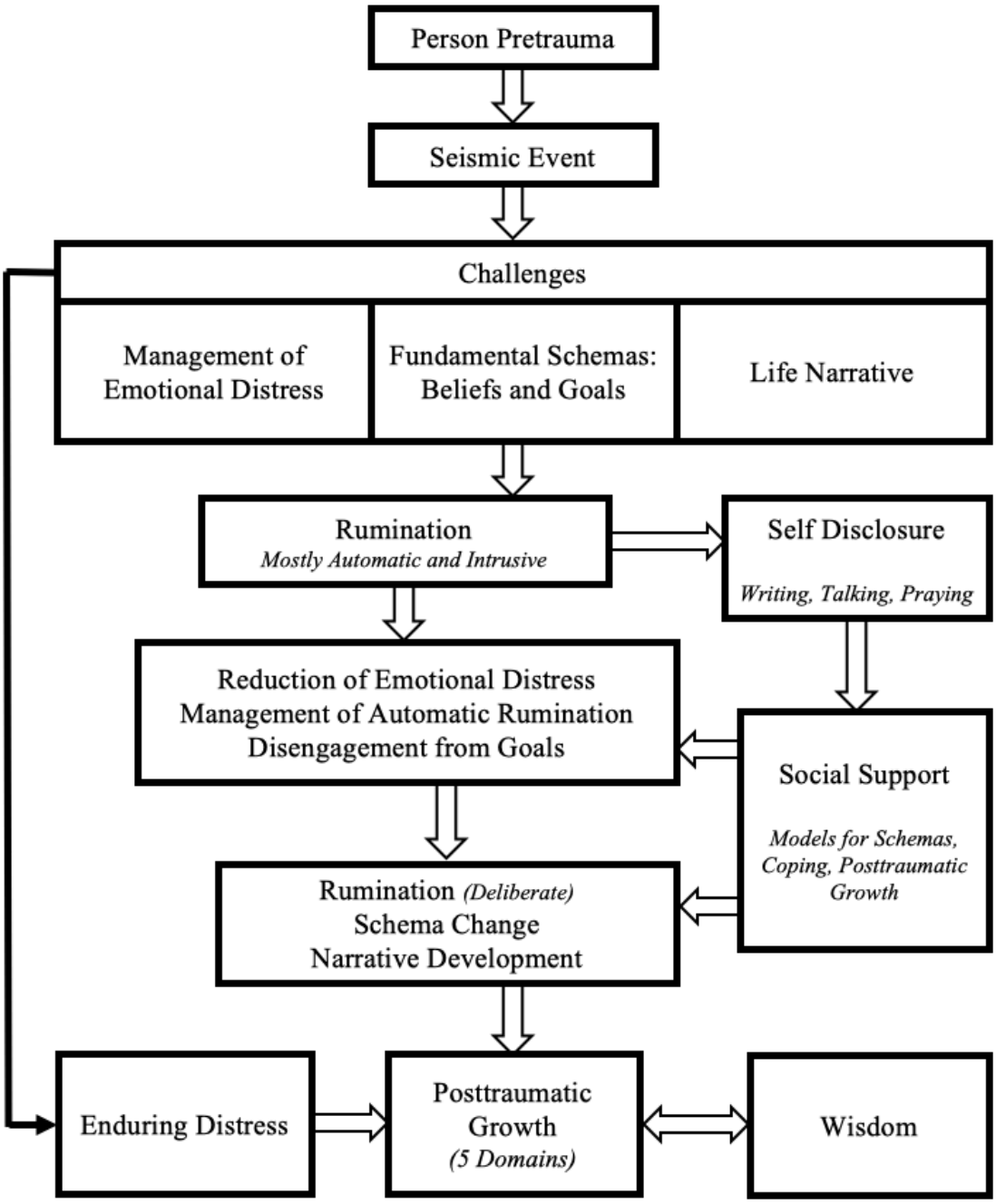

Figure 2. The Trauma and Transformation Model. Adapted from "Posttraumatic Growth: Conceptual Foundations and Empirical Evidence" by R. G. Tedeschi and L. G. Calhoun, 2004, *Psychological Inquiry*, 15, p. 7. Copyright 2004 by Lawrence Erlbaum Associates, Inc. Used with permission from the publisher (see Appendix K).

with PTG, while intrusive rumination was associated significantly with PTSD symptoms.

Furthermore, negative thoughts about oneself are linked to PTSD symptoms and exhibited no

relationship to PTG (Lancaster et al., 2015). According to O'Leary, Alday, and Ickovics (1998), when this secondary response occurs, a person is better equipped to accept the reality of a post-trauma world-view; the person revises their goals, constructs a new meaning regarding the event, and restructures core beliefs, leading to initial growth. Once this initial growth occurs, a person can begin trusting their personal strength and develop a new understanding for others (O'Leary et al., 1998). Additional growth is dependent upon internalizing the positive effects of the initial growth, meaning that affect is manageable, new core beliefs create a new meaning of the traumatic event, and new behavioral repertoires become effective (O'Leary et al., 1998). PTG does not take place until one has exhausted all of their former, and ill-equipped, coping behaviors, and developed new strategies (Tedeschi & Calhoun, 1995).

PTG is not a direct result of the traumatic experience, but rather it is the result of the struggle one faces in a post-trauma reality, which is the crucial determinant in the magnitude of growth experienced (Tedeschi & Calhoun, 1995). A person's core beliefs, which guide their actions, help gain an understanding of traumatic events and provide a sense of meaning and purpose in life, which is the determining factor as to whether one develops growth following a traumatic event (Medoza, 2015). A positive outcome is possible only when traumatic experiences allow a person to develop new psychological constructs leading to a more fulfilling life (Tedeschi et al., 1998). This supposition is consistent with a long history of beliefs about gaining strength through adversity. By facing adversity and overcoming it, one can develop a stronger self-concept that will affect their world-view (Davis & Nolen-Hoeksema, 2009). To best understand PTG, it can be considered the antithesis of PTSD, in which one experiences positive outcomes following the most distressing traumatic events, even in concert with distress (Tedeschi et al., 1998). This approach is consistent with both the life crises and personal growth

model (Schaefer & Moos, 1992) and with the concept that more flexible individuals will be able to adapt their core beliefs more successfully. Those individuals who experience high levels of distress and low levels of experiential avoidance show the greatest levels of PTG (Kashdan & Kane, 2011).

Domains of Posttraumatic Growth

According to Tedeschi and Calhoun (1995), there are several broad areas in one's life in which growth occurs following a traumatic event. Initially derived from qualitative research, these included changes in self-perception, one's philosophy of life, and in the way one experiences relationships with others. In the development of a measure of PTG, five specific factors were derived (Tedeschi & Calhoun, 1996). These factors included personal strength, relating to others, new possibilities, appreciation of life, and spiritual change.

Personal strength. Many individuals who experience a traumatic event find that their beliefs about the world change and they bear witness to their own vulnerability in the face of a dangerous and unpredictable world (Calhoun & Tedeschi, 2014). While some struggle with this concept, others perceive this experience as being tested and surviving despite great challenges, leading to individuals concluding that they were stronger than they initially believed (Calhoun & Tedeschi, 2014). These assertions imply that one may develop a stronger sense of self-esteem and efficacy following a traumatic event (Davis & Nolen-Hoeksema, 2009). These researchers propose that if one has low self-esteem and they successfully navigate a distressing experience, they will likely undergo a deeper appreciation and greater understanding for their own personal strength. By struggling with difficult and painful experiences, a person becomes stronger and learns more about their potential, which they were unaware of prior to the traumatic event (Janoff-Bulman, 2006). The personal strength domain reflects this increased self-reliance,

fortitude, and self-respect (Calhoun & Tedeschi, 2014).

Relating to others. As a result of coping with traumatic events, personal relationships can suffer (Calhoun & Tedeschi, 2014). Alternatively, the loss of some relationships may be as a result of changes in one's goals, which can result in a stronger connection to other people in general. This adjustment in relationships can lead to an increased sense of empathy and compassion for others who suffer difficult experiences. Thus, as a result of experiencing the distressing event, one can also develop positive changes in their relationships with others (Calhoun & Tedeschi, 2014). This position is evidenced in Tedeschi and Calhoun (1995), noting that individuals that gain a greater understanding of compassion also engage in altruism with increased frequency. Furthermore, individuals who experience these types of painful and distressing events experience a greater sense of intimacy, closeness, and perception of freedom to be oneself (Tedeschi & Calhoun, 1995).

New possibilities. When one experiences growth following a traumatic event, it can manifest as having a stronger perception of new opportunities in life (Calhoun & Tedeschi, 2014). The goals and values of a person that were important before a traumatic event are often not experienced with the same weight afterward. Consequently, new goals and values can be developed following such experiences, indicating a form of individual growth.

Appreciation of life. Related to the new possibilities domain, but yet distinct in its own right, individuals can develop a greater recognition of how valuable life is (Calhoun & Tedeschi, 2014). People experiencing growth in this domain tend to report significant changes in how they approach and experience their lives on a daily basis (Tedeschi & Calhoun, 2004). This change in perception includes recognizing an increased importance of the “little things” in life, such as spending time with their child, which one may have taken for granted before the distressing

event (Tedeschi & Calhoun, 2004). Additionally, the effect of recalling the traumatic event increases the sense that life is significant and purposeful (Davis & Nolen-Hoeksema, 2009), tying both the new possibilities and appreciation of life domains closely together.

Spiritual change. Existential questions arise out of enduring traumatic events, and for some, these are spiritual in nature (Tedeschi & Calhoun, 1995). Some experience clarity regarding other fundamental existential questions (Calhoun & Tedeschi, 2014). Specifically, while not everyone experiences spirituality in the same way or frequency, a strong tendency to question the purpose of one's existence is quite common (Tedeschi & Calhoun, 1995). Cultural aspects are highly influential as to how these effects are experienced (Tedeschi, Cann, Taku, Senol-Durak, & Calhoun, 2017). These researchers examined the spiritual change domain across three cultures with differing religious traditions (i.e., United States, Japan, and Turkey), finding that participants in Turkey, a highly religious culture, were likely to score higher in spiritual change, followed by the U.S. (moderate religiosity) and Japan (low religiosity). Even though a differing strength of religious beliefs was present, each of the cultures experienced some change in this domain.

Concepts Similar to Posttraumatic Growth

There are numerous critiques of PTG as a distinct construct (e.g., Gunty et al., 2011; Sumalla, Ochoa, & Blanco, 2009). Some have argued that positive changes can occur without the traumatic event as described by Tedeschi and Calhoun (1995), suggesting that the mere experience is less critical to the concept of growth (McMillen, 2004). This research cites positive changes in relationships when one shares personal experiences with, and depend on, others, as well as changes in goals as a result of the acquisition of new skills. Additionally, an alternative explanation of growth suggested three models of growth, including changes in self-

understanding as a product of suffering, changes in one's worldview and assumptions about the amount of control one has, and centering on making meaning from the source of suffering, reprioritizing, revaluing life, and spiritual change (Janoff-Bulman, 2004). While these arguments do have some merit, PTG focuses on the changes that do result from the traumatic experience, which is more specific than a generally positive change in one's life (Davis & Nolen-Hoeksema, 2009). This section will discuss the similar concepts of perceived benefit, resilience, and hardiness, each of which are related to, yet unique from, PTG.

Perception of benefit. Davis and Nolen-Hoeksema (2009) examine the concept of perceiving benefit relative to PTG. In their chapter, they advocate for greater specificity in the definition and measurement of PTG. They espouse the concept that PTG distinguishes itself from benefit perception. Benefits are common, yet transient, by-products of experiencing adversity, and can include similar domains as experienced in PTG, though not as pervasive in one's worldview. Such domains include improved social support and relationships, minor or transient changes in values and priorities, and the recognition of new opportunities in life (Davis & Nolen-Hoeksema, 2009). Therefore, the primary distinction between merely perceiving benefits of a distressing event and PTG is the duration and strength of the changes experienced. Simply, perceiving benefits is transitory and involves temporary changes while PTG is consistent with "significant sustained positive changes in major commitments and life goals" (Davis & Nolen-Hoeksema, 2009, p. 642). Furthermore, PTG requires active processing of the meaning of the painful experience, in addition to the time to set new goals and start progressing significantly toward those goals (Davis & Nolen-Hoeksema, 2009).

Resilience. Following adversity or hardship, including traumatic events in some cases, some people have the ability to return to their baseline functioning, or "bounce back" (Tedeschi

& Calhoun, 2004). While this is an essential aspect of responding to traumatic events, it is quite distinct from PTG. Resiliency is a valuable outcome of a traumatic experience because resilient individuals experience fewer occurrences of PTSD (Dunn, Uswatte, & Elliott, 2009). This distinction is a result of the mere definition of resiliency where an individual can experience an adverse event or trauma and still be able to return to pre-trauma functioning (Greene & Staal, 2017). Specifically, two criteria are needed to achieve a response to adversity that is considered resilient (Dunn et al., 2009). First, one must respond positively regarding psychosocial functioning. Second, the source of adversity must be threatening enough to reduce the chance of any positive outcomes occurring. Thus, resilient individuals can recover from their traumatic experiences and do well regardless of the adversity they faced in the event (Dunn et al., 2009). This concept is considerably different from PTG, as PTG requires the processing of the event and making long-lasting changes in one's life (Davis & Nolen-Hoeksema, 2009; Tedeschi & Calhoun, 1995). Furthermore, individuals that exhibit high resiliency tend to experience reduced levels of PTG (Tedeschi & McNally, 2011). When taken together, this evidence suggests that resilience and PTG are two distinct experiences.

Predictors of Posttraumatic Growth

Much of the research examining PTG has focused on determining attributes people possess that predict PTG, and of the possible predictors, several attributes have been found to predict PTG consistently. Individual characteristics such as age (e.g., Shuwiekh, Kira, & Ashby, 2018), ethnicity (Hijazi, Keith, & O'Brien, 2015), optimism (e.g., Davis, Nolan-Hoeksema, & Larson, 1998), openness to experiences and extraversion (e.g., Tedeschi & Calhoun, 2004) have all been shown to be predictors of the development of PTG. Additionally, environmental aspects, such as social support, as well as cognitive predictors including rumination, have all been

studied. The purpose of this section is to highlight and review these characteristics that consistently predict the development of PTG.

One such study examining the predictors of PTG investigated dimensions typically associated with recovery from traumatic experiences and peri-trauma characteristics (Wild & Paivio, 2004). Specifically, these researchers examined trauma recovery factors including psychological functioning, coping techniques, and emotion regulation. Concerning peri-trauma characteristics, the number and recency of the traumatic events and the average and maximal distress experienced were used to predict PTG. The results of this study indicated that as the number of traumatic events experienced increased, distress increased as well ($r = .20$, $p < .05$), commensurate with the literature (e.g., Brewin et al., 2000; Ozer et al., 2003). Furthermore, greater levels of PTG were associated with increased frequency of traumatic events experienced ($r = .23$, $p < .01$), the recency of the traumatic event ($r = -.16$, $p < .05$), and greater levels of distress when the trauma occurred ($r = .21$, $p < .01$). These findings are consistent with Tedeschi's model of PTG where increased levels of distress are likely to produce an increased opportunity to develop PTG (Tedeschi & Calhoun, 1995). Additionally, PTG exhibited a positive relationship with increased active coping ($r = .70$, $p < .01$), and subjective well-being ($r = .18$, $p < .05$). PTG also exhibited a positive correlation with emotional coping ($r = .53$, $p < .01$). Finally, in an examination of the individual domains of PTG, Wild and Paivio (2003) found that all of the PTG factors were related to higher distress at the time of the traumatic experience. These researchers found an association between each of the PTG factors relating to others, new possibilities, and personal strength individually with the increased frequency of traumatic experiences.

Relative to unique variance, Wild and Paivio (2003) found that active coping accounted

for the greatest amount of variance (22.2%), in addition to subjective well-being (4.6%). These researchers found that distress at the time of the trauma and emotional coping were not unique predictors of growth, despite significant correlations, which is consistent with the theory of PTG that growth only results from positive characteristics. Maximal distress regarding the traumatic event was also significantly predictive of PTG (4.6%). However, effective emotion regulation did not predict unique variance in PTG, contrary to these researchers' expectations.

In her dissertation, Medoza (2015) examined specific predictors of PTG in a veteran sample. Though this researcher did not examine total scores of PTG, she did examine the predictors of the individual domains of PTG using the PTGI. She found significant correlations between PTSD symptoms and relating to others (r = -.21, p < .01), new possibilities (r = .18, p < .01), personal strength (r = -.23, p < .01), and appreciation of life (r = -.13, p < .05). This finding further supports the concept that PTG can develop out of the experience of PTSD (Tedeschi & Calhoun, 2004). Additionally, Medoza (2015) found that postdeployment social support exhibited small to moderate associations with each of the domains of PTG (r = .20 to 0.42, p < .01).

This researcher further examined unique variance in the prediction of PTG (Medoza, 2015). PTSD symptom severity was a predictive factor of the relating to others domain of PTG while accounting for the variance from all other predictors in the analysis. Perceived social support from one's significant other was predictive of all of the domains of PTG except for spiritual change, while perceived social support from friends significantly predicted all of the domains, with the exception of appreciation of life. Concerning coping responses, the positive reinterpretation of the event significantly predicted the new possibilities, personal strength, and appreciation of life domains of PTG. Active coping responses accounted for significant variance

in both how participants relate to others and their appreciation of life, while denial coping accounted for unique variance in the relating to others and new possibilities domains. Finally, religious coping responses predicted unique variance in each of the relating to others, spiritual change, and appreciation of life domains of PTG. As can be seen in these analyses, each factor of PTG has its own unique set of predicting variables, including distress due to PTSD, sources of social support, and coping strategies.

In a study investigating an integrated model of PTG, Lancaster et al. (2015) examined the potential predictors of challenging core beliefs, the centrality of the traumatic event, post-trauma cognitions, and event-related rumination. These researchers found that challenging one's core beliefs had a significant total effect on both PTSD and PTG. They also found that intrusive rumination was predictive of PTSD symptom severity, while deliberate rumination predicted growth following the trauma. Both of these findings correspond with the theory of PTG, as deliberate considerations of the values one holds before the traumatic event is necessary for growth to take place (Davis & Nolen-Hoeksema, 2009). The centrality of the event was positively related to both PTSD symptom severity and PTG, indicating the interconnectedness of the symptomatology of PTSD with the potential for growth.

Additionally, personality traits have also been found to predict growth post-trauma (e.g., optimism; (Davis et al., 1998; Helgeson, Reynolds, & Tomich, 2006; Tedeschi & Calhoun, 1996); extraversion, openness to experience, and optimism; Tedeschi & Calhoun, 1996). Tedeschi and Calhoun (2004) discuss ways in which extraversion and openness to experience both influence PTG development. Specifically, extraversion was associated with all five factors of PTG, with a moderate correlation with the overall PTG experienced ($r = .29$, $p < .01$;Tedeschi & Calhoun, 1996). Openness to experience was associated with the new possibilities and

personal strength domain, culminating in a total PTGI score correlation in the small to moderate range ($r = .21$, $p < .01$). These researchers explain that these two personality traits likely influence the way positive emotions in adverse situations may be helpful in the processing of information leading to changes in core beliefs that result in PTG (Tedeschi & Calhoun, 2004). Additionally, these researchers found that optimism exhibited a small to moderate relationship with each of the domains of PTG (Tedeschi & Calhoun, 1996). They explain this finding relative to the idea that optimism is related to the way individuals make sense of the traumatic event (Tedeschi & Calhoun, 2004).

Finally, in a meta-analysis investigating personality traits concerning PTSD and PTG, Jakšić et al. (2012) found a negative association between each of the traits of extraversion, conscientiousness, self-directedness, a combination of high positive and low negative emotionality, hardiness, and optimism with PTSD. These researchers noted that these traits tended to have a positive relationship, where greater levels of these traits related to increased levels of PTG. The authors suggest that the results of their study not only identify personality-based protective factors of PTSD, but that this can also facilitate personal growth (Jakšić et al., 2012).

While PTSD symptoms are a common occurrence in individuals who experience a traumatic event, not everyone experiences substantial distress afterward (Kessler et al., 2005) and some who do experience distress do not endure chronic levels of PTSD symptoms (Zlotnick et al., 2004). While many differences exist between individuals with military experience and those without, there are also many similarities (Lehavot et al., 2018). Tedeschi and McNally (2011) have further posited that PTG could be facilitated in individuals who endured a traumatic experience in their lives. The importance of understanding why these individuals undergo these

psychological experiences cannot be understated and may lead to an alternative explanation to facilitate personal growth as opposed to developing distress. As discussed above, there are numerous reasons one may develop PTG. First, those who experience increased levels of distress as a result of a traumatic experience, in addition to reduced levels of experiential avoidance tend to exhibit the greatest levels of PTG (Kashdan & Kane, 2011). Additionally, a person's core beliefs, those beliefs that guide their actions, help gain an understanding of traumatic events, and provide a sense of meaning and purpose in life, is one of the determining factors into whether one develops PTG following a traumatic event of not (Medoza, 2015). Another way of conceptualizing their core beliefs is as a person's core values. As one gains more clarity in their values, PTG would likely increase. In this sense, PTG is possible only when the traumatic experience one endures allows them to develop new psychological constructs leading to a more fulfilling life (Tedeschi et al., 1998). Additionally, Active coping strategies, including taking direct action to resolve the trauma, seeking assistance, and positively reinterpreting the trauma, have predicted increased personal growth post-trauma (Wild & Paivio, 2004). Finally, having an openness to experience was associated with both the new possibilities and personal strength domains of PTG (Tedeschi & Calhoun, 2004). Given these attributes are malleable and can be changed, it would be reasonable to conclude that increasing these characteristics would thereby facilitate the development of PTG. In the next section, a model that incorporates each of these attributes will be discussed.

Psychological Flexibility Model

One paradigm that may help explain how the facilitation of growth may be developed could be the Psychological Flexibility Model. The Psychological Flexibility Model is depicted as an organization of six interrelated processes known colloquially as the Hexaflex (see Figure 3,

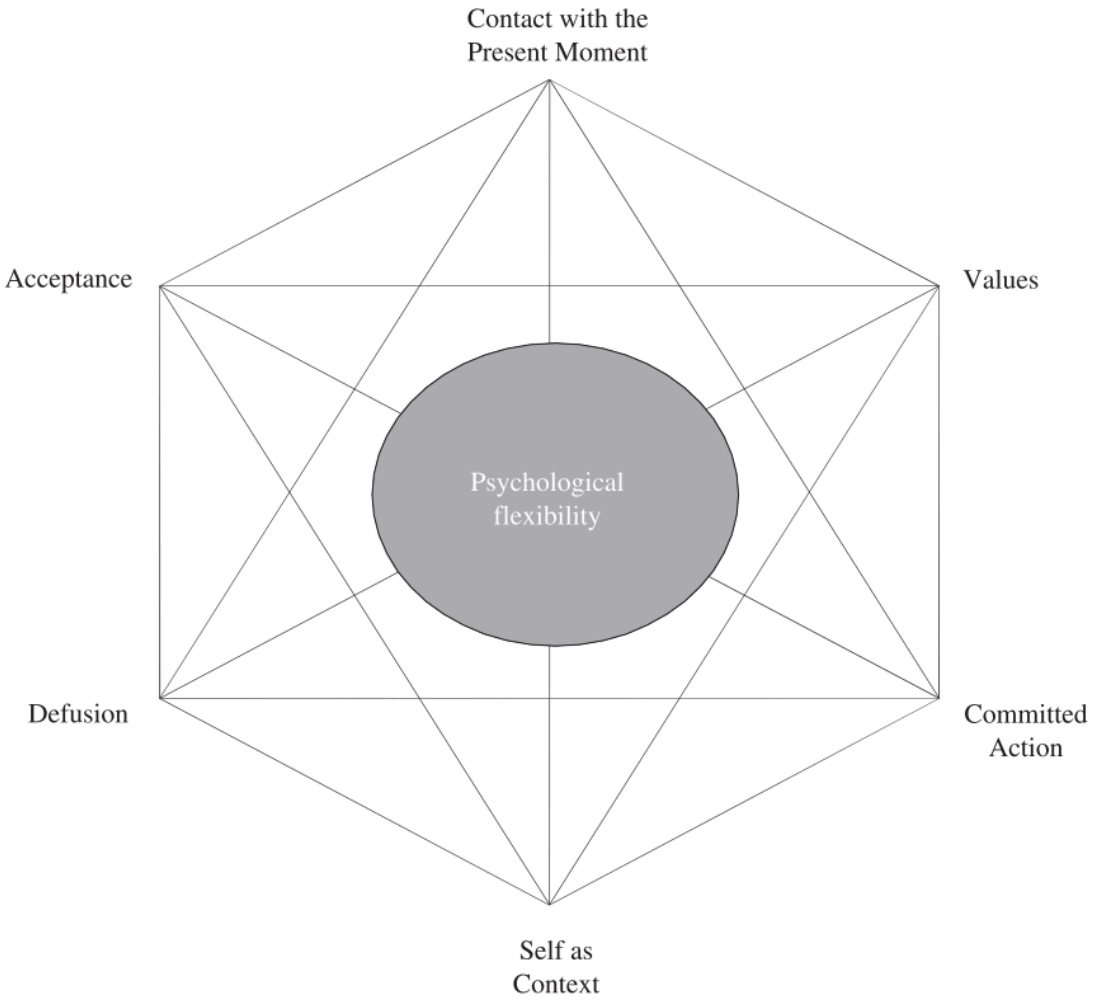

Figure 3. The Hexaflex Model of Psychological Flexibility. Adapted from "Acceptance and Commitment Therapy: Model, Processes, and Outcome" by S. C. Hayes, J. B. Luoma, F. W. Bond, A. Masuda, and J. Lillis, 2006, *Behavior Research and Therapy*, 44 p. 6.

Hayes et al., 2006). The inflexible counterpart to these processes, which represents a model of psychopathology consistent with the Psychological Flexibility Model (Wilson et al., 2001), is known as the Inflexahex (see Figure 4; Hayes et al., 2006). Psychological flexibility refers to several dynamic processes unfolding over the course of time. These processes are revealed by the ways a person: 1) adapts to shifting demands of situations, 2) changes in their mental resources, 3) changes in their perspective, and 4) balances their desires, needs, and life domains that are competing with one another (Kashdan & Rottenberg, 2010). The experience of flexibility

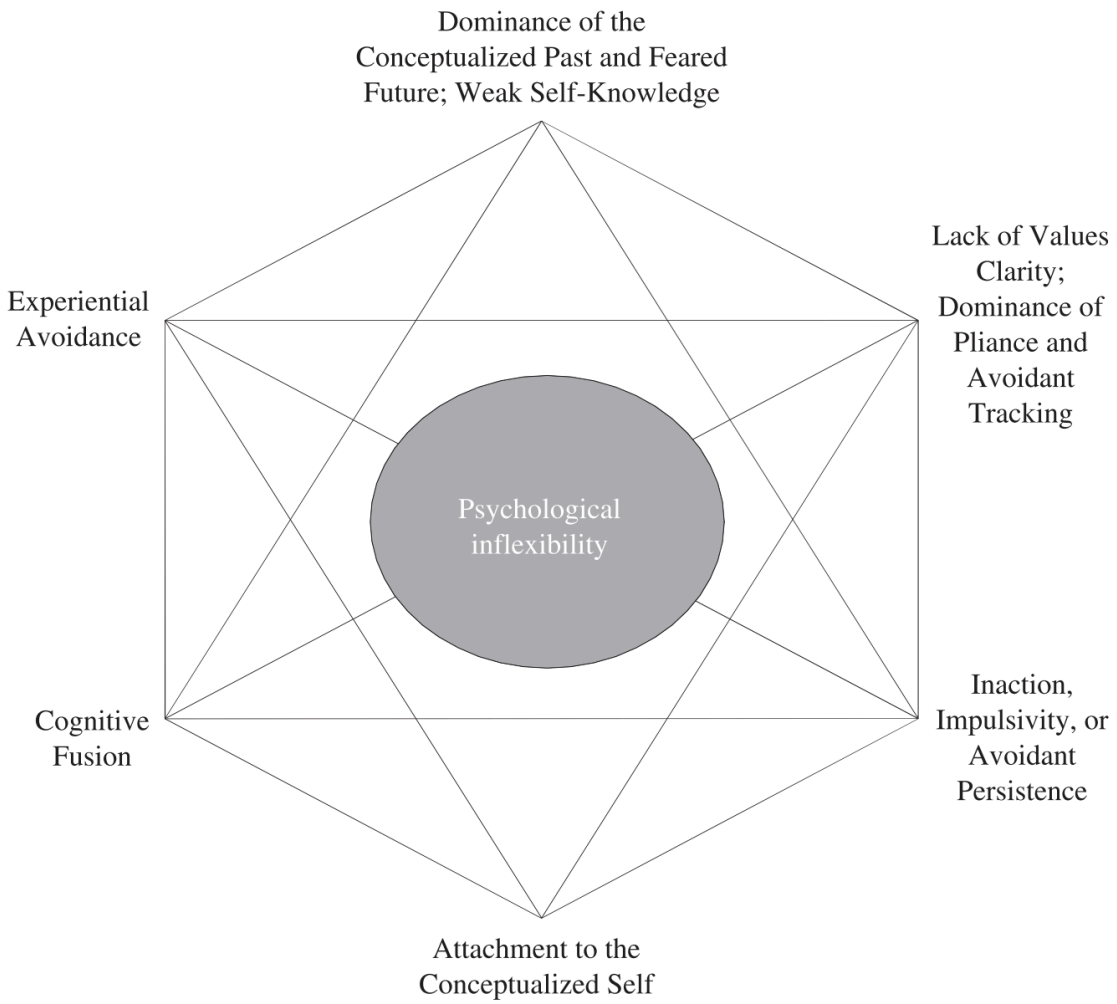

Figure 4. The Inflexahex Model of Psychopathology. Adapted from "Acceptance and Commitment Therapy: Model, Processes, and Outcome" by S. C. Hayes, J. B. Luoma, F. W. Bond, A. Masuda, and J. Lillis, 2006, *Behavior Research and Therapy*, 44 p. 6.

and inflexibility is context-dependent, meaning that an individual can be psychologically flexible in some areas of their life while simultaneously remaining inflexible in other contexts (Hayes et al., 2011).

The first component of the Hexaflex is present moment awareness, which refers to the ability to bring attention to one's current environment and to observe both internal and external experiences that are occurring here and now. The second component is cognitive defusion, which is a de-literalized, detached perspective on symbolic experiences such as memories and beliefs.

Next, self-as-context involves a cluster of perspective taking abilities to increase self-awareness, empathy, and potentially gain a sense of transcendence. Contact with one's values, the fourth flexible component, are personally chosen, deeply inspiring purposes of one's life. The last two components are acceptance and committed action. Acceptance is conceptualized as a curious willingness to understand personal experiences, such as unpleasant sensations, emotions, or memories. Finally, committed action is a behavioral expression of values consistent action.

The six Inflexahex components represent behaviors that contribute to psychological distress. They are not merely a lack of the qualities depicted in the six elements of the Hexaflex. For example, a lack of contact with the present moment is not just a limited ability to engage in present moment awareness, but rather is conceptualized as a preoccupation with one's memories, expectations, or imagination about events occurring in another place. In contrast to defusion, cognitive fusion is the rigid adherence to the literal meaning of one's thoughts and beliefs. Self-as-content, as opposed to context, entails narrow and constrained conceptualization about the self or others. Inflexibility concerning one's contact with values may be explained as a lack of contact with values and comprises of impoverished or incoherent repertoires relating to identifying one's deeply held convictions. The inflexible contrast of acceptance, experiential avoidance, is any action intended to prevent or minimize private experiences such as unpleasant emotions or memories. Finally, the inflexibility counterpart to committed action is inaction, including mindless impulsivity or persistent situational avoidance.

Acceptance and Commitment Therapy

Despite the plethora of research on the positive aspects of trauma, much of the research on PTSD treatment has continued to focus on symptom reduction. There are two frontline treatments of PTSD (American Psychological Association, 2017) that focus on reducing

suffering through the targeting of symptoms: Prolonged Exposure Therapy (PE; Foa & Kozak, 1986) and Cognitive Processing Therapy (CPT; Resick & Schnicke, 1992). While these are efficacious treatments addressing PTSD, military service members and veteran attrition rates for these treatments range from 9-39% (Steenkamp, Litz, Hoge, & Marmar, 2015). Furthermore, Watts et al. (2014) found that only 2% of veterans being treated with CPT or PE received an adequate dose of treatment, with most veterans only receiving five sessions, which is far below the recommended number of sessions (i.e., eight or more). Finally, in a recent review of these frontline treatments of PTSD, Steenkamp, Litz, & Marmar (2020) discussed findings from three recent RCTs that examined the effectiveness of PE and CPT, reporting that only 31% of veterans recovered or improved when utilizing these treatments, and approximately 60% of veterans continued to experience PTSD symptoms that met diagnostic criteria after treatment. Given these obstacles, researchers have recommended examining other treatment options (Shumaker, 2019).

One such treatment is Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 1999; Hayes et al., 2011). Founded on the Psychological Flexibility Model, ACT (Hayes, Strosahl, & Wilson, 1999; Hayes et al., 2011) is an evidence-based therapy that shares several components with other cognitive behavior therapies like Prolonged Exposure and Cognitive Processing Therapy. However, in contrast to the symptom reduction emphasis of PE and CPT, the purpose of ACT is to increase psychological flexibility and decrease psychological inflexibility resulting in an increase in life fulfillment. In basic terms, recipients of ACT are encouraged to learn and to integrate the Hexaflex skills into their life, as an alternative style of responding to psychological difficulties and challenges that in the past have likely been addressed with behaviors characterized by the Inflexahex. The results of the current study help to clarify the utility of ACT in the treatment of PTSD and facilitation of PTG.

Numerous studies have found empirical support for ACT, having been shown to be an efficacious treatment of numerous disorders, including chronic pain (McCracken & Morley, 2014), depression (Lang et al., 2017), anxiety (Forman, Herbert, Moitra, Yeomans, & Geller, 2007), and adjustment disorder (Wiggs & Drake, 2016). It is currently considered an evidence-based treatment for depression (Walser, Sears, Chartier, & Karlin, 2012) within the VA healthcare system. Additionally, protocols have been developed using ACT to treat PTSD in both individual (Walser & Westrup, 2007) and group (Settles, Morris, & Bratkovich, 2017) modalities.

Empirical support for ACT is not limited to RCTs. A recent meta-analysis of the six Hexaflex components examined the effect sizes across numerous presenting problems of participants (Levin, Hildebrandt, Lillis, & Hayes, 2012). This study found that, across all outcomes, the combined effect size was in the medium range for all components (Hedges' g = 0.44) and for targeted outcomes (Hedges' g = 0.68). Concerning specific components of ACT, each of the components exhibited a medium to large effect when targeting a specific outcome (Hedges' g = 0.46-0.81). Of these, the most significant effect size was found relative to acceptance (Hedges' g = 0.81), followed by defusion (Hedges' g = 0.77). They found the smallest effect sizes when all outcomes were targeted, ranging from small to large effect (Hedges' g = 0.22-0.74). The largest observed effect size based on a single component when targeting all outcomes was defusion (Hedges' g = 0.74), while the smallest was present moment awareness (Hedges' g = 0.22). Overall, researchers found the most significant effect size when mindfulness and values components were used in concert targeting specific outcomes (Hedges' g = 1.37). In summary, when used to target specific outcomes, such as PTSD symptoms, ACT has been shown to be an effective treatment. While some components seem to be more individually

impactful than others, all of the components exhibit more utility when focused on specific areas of suffering compared to a broader set of experiences.

Walser and Westrup (2007) recommended ACT as a treatment consistent with the avoidance model of PTSD, in which the focus of treatment is the experiential avoidance of emotional, cognitive, and physiological experiences. Because ACT focuses on experiential avoidance, an area in which people with PTSD specifically experience distress, this form of treatment is especially useful (Orsillo & Batten, 2005). Individuals with PTSD tend to avoid both physical reminders of the trauma, as well as the avoidance of distressing thoughts and emotions related to the trauma (Mulick, Landes, & Kanter, 2011). Researchers have completed several case studies examining the effectiveness of ACT in the treatment of PTSD. Orsillo and Batten (2005) examined this effect with a 51-year-old combat veteran, detailing each stage of treatment. These researchers found positive clinical results with the use of ACT, though they did not outline specific measures used in treatment.

Additionally, Batten and Hayes (2005) utilized an ACT-based approach with a 19-year-old female suffering from comorbid multiple substance use disorders and PTSD due to childhood sexual trauma. These researchers found that over 18 months of treatment, the client exhibited clinically significant improvement on all measures. In another case study, ACT was compared to cognitive behavior therapy (CBT) with a 43-year-old Caucasian female with chronic PTSD (Twohig, 2009). The client exhibited no improvement over the course of 20 sessions of CBT, but then followed up after a two-month interval with 21 sessions of ACT. The results of this study showed a significant reduction in measures of PTSD symptom severity, depression, anxiety, and increases in psychological flexibility over the course of treatment. However, trauma-related thoughts and beliefs showed minimal change until the end of treatment. The results of the current

study may clarify this finding, as it may require several components to be discussed prior to changes in trauma-related cognitions.

More recently, research examining the use of ACT in the treatment of PTSD has become more expansive. In a pilot study examining ACT for PTSD in both group and individual treatment modalities within two VAMCs, researchers found significant reductions in PTSD symptoms in both group and individual therapy formats (Wharton, Edwards, Juhasz, & Walser, 2019). Specifically, group based ACT treatments utilized a 90-minute, 12 session, protocol based on the work of Walser and Westrup (2007). Of those who completed the group treatment, significant decreases in PTSD symptoms were observed overall, $t(9) = 2.67$, $p = .026$, and 2/3 of veterans experienced clinically significant reductions in symptoms. Regarding specific symptom clusters, these researchers found significant reductions in avoidance symptoms, $t(8) = 2.92$, $p = .019$, but not hyperarousal or reexperiencing symptoms. This finding is consistent with the psychological flexibility model, such that ACT focuses on reducing experiential avoidance. By reducing experiential avoidance, participants likely became more aware of trauma related thoughts and memories, as well as hypervigilant behavior. Relative to individual treatment, these researchers found similar results where PTSD symptoms reduced significantly from pre-treatment to post-treatment, $t(8) = 2.39$, $p = .044$, and pre- to 3-month follow-up, $t(7) = 2.42$, $p = .046$. An examination of symptom cluster level, significant reductions were found in both avoidance symptoms, $t(7) = 3.40$, $p = .011$, and hyperarousal, $t(7) = 2.58$, $p = .036$, from pre-treatment to 3-month follow-up. This study highlights the promise that ACT is effective in the treatment of PTSD, despite not focusing on symptom reduction.

Psychological Flexibility and Trauma

Regarding the Psychological Flexibility Model and traumatic experiences, the literature

supports a relationship between experiential avoidance and PTSD (Kashdan, Morina, & Priebe, 2009). Specifically, these researchers found an association between each of PTSD, social anxiety disorder (SAD), and major depressive disorder (MDD), with increased levels of both experiential avoidance and psychological distress and reduced levels of quality of life in survivors from the Kosovo War. Further analysis indicated that experiential avoidance was a partial mediator of the effects of SAD and PTSD on survivors' quality of life. To understand the Psychological Flexibility Model concerning psychopathology, such as PTSD, one can apply the symptoms one experiences to the inflexible constructs. First, if one examines each of the symptom clusters in PTSD, a multitude of inflexible constructs may apply. For example, intrusive symptoms coincide with a lack of contact with the present moment and cognitive fusion, avoidance symptoms coincide with experiential avoidance, cognitive fusion, and lack of contact with the present moment, though little research has examined this area. As one drills deeper into individual symptoms, an individual may engage in several inflexible behaviors as well. For example, being "super alert," and watchful, or on guard coincides with a lack of contact with the present moment and cognitive fusion, loss of interest in activities that one used to enjoy coincides with a lack of willingness and committed action, as well as a lack of contact with values.

Psychologically flexible behavioral repertoires can be taught using ACT to increase levels of present moment awareness, defusion, self-as-context, contact with values, acceptance or willingness, and ultimately committed action (Villatte et al., 2016). Though few have researched this level of analysis regarding psychological flexibility constructs, one study examined mindfulness and experiential avoidance as predictors of avoidance symptoms of PTSD (Thompson & Waltz, 2010). Specifically, these symptoms include avoidance of thoughts, emotions, and physical sensations that remind the person of the traumatic experience, as well as

avoidance of external stimuli, such as situations, people, and places, that remind the person of the traumatic experience (American Psychiatric Association, 2013). These researchers, using the AAQ-II as a measure of experiential avoidance and the FFMQ as a measure of the facets of mindfulness, found that experiential avoidance was a significant predictor of trauma-related avoidance symptoms. This finding is consistent with an ACT consistent model of PTSD as an avoidance based syndrome (Walser & Westrup, 2007). Mindfulness also predicted avoidance symptoms (Thompson & Waltz, 2010). However, when examining the individual facets of mindfulness, the researchers observed that the greatest predictor of unique variance in avoidance symptoms was the nonjudgment of one's experiences. One can extend this research in the current study by examining each of the factors of psychological flexibility relative to PTSD symptom severity using a multidimensional measure.

In a recent study that examined the relationship between psychological inflexibility and PTSD symptom severity, Meyer, La Bash, et al. (2019) found that psychological inflexibility was predictive of PTSD symptom severity in a large sample of veterans. Conceptualizing psychological inflexibility using the Psychological Flexibility Model, these researchers extended the literature through examining this relationship in the context of established PTSD risk factors, such as military rank, the branch of service, trauma severity, perceived life threat, peritraumatic dissociation, and postdeployment social support. Using a hierarchical linear regression approach, researchers found that, after accounting for other risk factors, greater levels of psychological inflexibility predicted unique variance in the severity of PTSD symptoms at a one-year follow-up ($\Delta R^2 = .10$; $\beta = .41$; $p < .001$; $f^2 = .24$).

Additionally, these researchers examined the effect personality would have on psychological inflexibility concerning risk factors of PTSD (Meyer, La Bash, et al., 2019). They

found that when including personality traits as the second step in a hierarchical regression, after the other risk factors and before including psychological inflexibility in the model, psychological inflexibility still predicted unique variance in PTSD symptom severity ($\Delta R^2 = .05$; $\beta = .36$; $p < .001$; $f^2 = .11$). Finally, given the unique relationship between avoidance symptoms of PTSD (i.e., Criterion C; American Psychiatric Association, 2013) and the experiential avoidance aspect of psychological inflexibility, researchers examined this association in the context of other risk factors and personality factors. Meyer, La Bash, et al. (2019) found after conducting a hierarchical regression analysis that, even after accounting for all other risk factors (step 1) and personality traits and avoidance symptoms (step 2), psychological inflexibility (step 3) accounted for unique variance in the severity of PTSD symptoms ($\Delta R^2 = .04$; $\beta = .34$; $p < .001$; $f^2 = .12$).

Given that PTG is similar to resilience In a study examining the relationship between psychological flexibility and resilience (Davis & Nolen-Hoeksema, 2009), it is relevant to examine the relationship between this construct and psychological flexibility. In a study that did investigate this relationship in veterans, researchers examined unique variance in PTSD-related resilience accounted for by psychological flexibility (Meyer, Kotte, et al., 2019). Utilizing a hierarchical regression analysis, these researchers found that after accounting for psychopathology (i.e., PTSD and depressive symptoms) in step 1 and personality traits in step 2, psychological flexibility accounted for unique variance in resilience ($\Delta R^2 = .02$; $\beta = .26$; $p < .01$; $f^2 = .04$). The results of this study suggest that, although distinct difference exist between PTG and resilience (Davis & Nolen-Hoeksema, 2009), it is supported that psychological flexibility would predict unique variance in PTG as well.

Psychological flexibility also has an effect on resilience. In an examination of the effects of psychological flexibility on psychological distress in US Air Force service members,

researchers found that individuals with greater levels of psychological flexibility were less likely to experience PTSD, depression, and suicidal ideation (Bryan et al., 2015). Specifically, these researchers found that service members who exhibited greater levels of psychological flexibility reported less severe PTSD symptoms (β = -.04; *SE* = 0.011; *p* = .001) and depressive symptoms (β = -.05; *SE* = .009; *p* < .001) that those with decreased levels of psychological flexibility. Furthermore, greater psychological flexibility was associated with decreased risk of suicide (β = -.04; *SE* = 0.010; *p* < .001), which significantly moderated the effects of depression on suicidal ideation over time (β = .12; *SE* = 0.044; *p* = .008). The results of this study suggest that psychological flexibility can help to guard against emotional distress, buffering the effects of depression on suicide risk in military service members. Furthermore, in a study investigating the moderating effect of psychological flexibility between the centrality of the traumatic experience and PTG, researchers found a main effect of psychological flexibility predicting PTG (*B* = -8.42; *p* = .01), however, these researchers did not find an interaction between event centrality and psychological flexibility in the prediction of PTG (Boykin, Anyanwu, Calvin, & Orcutt, 2020). It is likely that, following a traumatic experience, psychological flexibility potentially facilitates PTG as it is also a factor that aids to increase resilience.

Measurement of Psychological Flexibility/Inflexibility

The assessment of the Psychological Flexibility Model has not been a simple task. In the past, researchers tended to measure each of the constructs of the Psychological Flexibility Model independently, even though the theoretical basis of the model proposes that these constructs are related, yet independent of one another (Rolffs et al., 2016). The reasoning for this approach was the result of a shift to focus on changes in each of the constructs as proposed mediators of clinical change (Wilson, Sandoz, Kitchens, & Roberts, 2010). The purpose of this section is to

highlight how researchers and clinicians assessed psychological flexibility and inflexibility in the past, and also to highlight a comprehensive and multidimensional assessment tool.

Acceptance and Action Questionnaire. The first measure of psychological flexibility, the Acceptance and Action Questionnaire (AAQ; Hayes et al., 2004) was initially developed to assess experiential avoidance (Hayes et al., 2004). Until recently, the AAQ, and the updated version (AAQ-II; Bond et al., 2011), were considered the primary measures of psychological flexibility (Wiggs & Drake, 2016). The AAQ was a brief questionnaire (i.e., 9 to 16 items) where respondents rated their experiences on a Likert-type scale, which was developed initially by ACT researchers and clinicians (Bond et al., 2011). As such, the items included in the final measure tended to focus on inflexible repertoires, as opposed to measuring those repertoires that are considered to be flexible. Though the AAQ was broadly reliable, and there were many versions adapted for special populations, the unidimensionality of the AAQ was limiting (Bond et al., 2011). Specifically, the internal consistency of this measure was merely satisfactory (α = .70), and test-retest reliability was in the moderate range (r = .64) over a four-month interval (Hayes et al., 2004). The problems with internal consistency resulted from respondents difficulty comprehending the items, leading to a revised, more psychometrically stable and sound, version (Bond et al., 2011).

The AAQ-II was developed to correct the limitations of the AAQ. To develop the item pool for the AAQ-II, 12 ACT researchers and clinicians from across Australia, Europe, and the U.S. created 49 items that represented the content of the Psychological Flexibility Model (Bond et al., 2011). These researchers then administered this 49-item measure to 26 postgraduate students and 18 members of the London community to provide feedback on individual items. They then administered the resulting 49-item measure to university students from the U.S. and

eliminated items that resulted in a small magnitude item-total correlation ($r < 0.30$). The subsequent measure contained 27 items, in which an exploratory factor analysis (EFA) was conducted resulting in a single factor solution consisting of seven items. In a follow-up study, Bond et al. (2011) administered the 49-item trial measure to both a university student sample and an outpatient clinical sample in the U.S., as well as a community sample in the U.K., and completed a confirmatory factor analysis (CFA) on the resulting data. These researchers specified a single factor solution, which fit the data well (normed $\chi^2 = 1.49$ to 1.98 across three samples, where the normed $\chi^2 < 3$ indicates good fit; Bollen, 1989).

In a third study, Bond et al. (2011) examined convergent validity of the AAQ-II. In the four samples described above, these researchers found a strong association between higher levels of psychological inflexibility with increased levels of depressive and anxiety symptoms, stress, and greater distress in psychological health. The AAQ-II was also highly associated with a measure of thought suppression, further increasing convergent validity (Bond et al., 2011). Additionally, the AAQ-II was not associated with social desirability, indicating that the measure would accurately measure inflexibility even when referencing potentially socially biasing topics. The final AAQ-II included seven items.

The AAQ-II has been administered to military veterans. Meyer, La Bash, et al. (2019) reported that the AAQ-II was associated with PTSD symptoms, as assessed with both the CAPS (Blake et al., 1995) and PCL-M (Weathers, Litz, Herman, Huska, & Keane, 1993), indicating strong associations between psychological inflexibility and distress from a traumatic experience. Using hierarchical regression analysis, these researchers examined the unique variance that was accounted for by the AAQ-II in PTSD symptoms. The results of these analyses indicated that psychological inflexibility accounted for 5% of the unique variance, after accounting for

personality, combat exposure, perceived threat, dissociation, life stress, and social support. This result was also reflected in the unique variance (12%) accounted for in the PCL.

Ultimately, the AAQ and AAQ-II have been highly versatile measures of psychological inflexibility. Overall, these assessment measures have been the most popular measures for this purpose. Though they were not designed to be used as diagnostic tools, specifically (Bond et al., 2011), they have been used as a way to clinically measure change in the treatment of mental health problems, including PTSD, when using ACT (Woidneck et al., 2014). In a further study, researchers observed a strong association between AAQ-II scores with items designed to measure distress as opposed to those designed to measure acceptance (Wolgast, 2014). Unfortunately, this measure was designed to measure inflexible constructs, as it was developed by clinicians working with those suffering mental health distress (Bond et al., 2011). This limitation restricts the ability to assess the positive aspects of the Psychological Flexibility Model. Furthermore, the AAQ has exhibited difficulty in discriminating from similar constructs, such as neuroticism (Lewis & Naugle, 2017). Finally, with the preponderance of items focused on the acceptance/experiential avoidance and defusion/fusion constructs, the AAQ-II may neglect the four other component pairs of the Psychological Flexibility Model (Francis, Dawson, & Golijani-Moghaddam, 2016).

Multidimensional Experiential Avoidance Questionnaire. The Multidimensional Experiential Avoidance Questionnaire (MEAQ; Gámez, Chmielewski, Kotov, Ruggero, & Watson, 2011) was developed to address the limitation regarding the discriminant validity of the AAQ-II. Researchers created an item pool of 170 items related to emotional avoidance that were grouped into 14 clusters (Gámez et al., 2011). These researchers then used a three-phase process to refine the item pool, in which the first phase used EFA procedures to verify the underlying

structure of the new measure. Items were refined throughout the process. The second phase focused on convergent and discriminant validity. This phase determined which items best described the full range of experiential avoidance, mapped onto psychopathology measures, and provided a distinction from personality traits, as well as a six-factor structure. This underlying structure reflected six unique areas of experiential avoidance that are distinct from the six factors of either psychological flexibility or inflexibility. The final phase examined the final 62-item MEAQ to determine item- and structural-level analyses and internal consistency. The MEAQ demonstrated good internal consistency (average $\alpha = 0.85$) and replicated the six-factor structure found in the second phase.

Many of the remaining measures of psychological flexibility focus on specific components within the model. Though there are a multitude of component measures, the remainder of this section will highlight a subset of the most common assessments used. Researchers designed one such measure, the Avoidance and Fusion Questionnaire (AFQ; Schmalz & Murrell, 2010), as a measure of experiential avoidance in adults. This measure was originally developed for applications with younger individuals (AFQ-Y; Greco, Lambert, & Baer, 2008) to address limitations in the AAQ-II (Bond et al., 2011). The AAQ-II did not address the avoidance of physical sensations, and the AFQ-Y had not yet been validated with an adult population (Schmalz & Murrell, 2010). These researchers sought to correct these limitations. In this study, the results indicated moderate to strong item-total correlations ($r = .48$ to 0.79) and good internal consistency reliability ($\alpha = .92$). Furthermore, the AFQ was associated with anxiety ($r = .53$, $p < .01$), stress ($r = .55$, $p < .01$), and depression ($r = .59$, $p < .01$), indicating moderate convergent validity. In relation to divergent validity, the AFQ exhibited a negative relationship with quality of life ($r = -.30$, $p < .01$). These results indicate that the AFQ was an

adequate measure of avoidance and cognitive fusion in adult populations. One limitation with this measure is that it does not assess each of the components of the Psychological Flexibility Model simultaneously, meaning that a clinician or researcher would be required to administer multiple measures to assess the full range of the 12 components.

Cognitive Fusion Questionnaire. The Cognitive Fusion Questionnaire (CFQ; Gillanders et al., 2014) is a seven-item component measure assessing the extent to which one experiences cognitive fusion. According to Gillanders et al. (2014), several constructs overlap with cognitive fusion (e.g., mindfulness, decentering, mentalization). While measures of these similar processes existed before the development of the CFQ, they were limited in their conceptualization relative to the cognitive fusion construct (Gillanders et al., 2014). These researchers found that the CFQ demonstrated excellent internal consistency, as well as good test-retest reliability. In contrast, the CFQ exhibited difficulty in discrimination validity; specifically, correlations with the AAQ-II indicated a strong association with experiential avoidance, restricting the ability to discern between these two distinct concepts. Though these constructs are interrelated, they are also conceptually (Hayes et al., 2006) and clinically (Villatte et al., 2016) different. Alternatively, concerning psychopathology, researchers found interaction effects between experiential avoidance, measured with the AAQ-II, and cognitive fusion, measured with the CFQ (Bardeen & Fergus, 2016). Specifically, in depression, anxiety, and posttraumatic stress, these researchers found that as experiential avoidance and cognitive fusion increased, psychological distress increased at differential rates, such that high experiential avoidance and high cognitive fusion exhibited highest rates of distress.

Valued Living Questionnaire. Another of the component measures within psychological flexibility is the Valued Living Questionnaire (VLQ; Wilson et al., 2010). The VLQ is a two-part

instrument designed specifically to measure the extent to which one lives in congruence with their values on a daily basis. The first component measures the importance of ten domains of living, while the second part measures the consistency in which one is in contact with the values indicated in part one. In a validation of this measure, these researchers found good to strong inter-item consistency (importance: $\alpha = 0.79$; consistency: $\alpha = 0.58$) for the first administration and second administration (importance: $\alpha = 0.83$; consistency: $\alpha = 0.60$) indicating moderate internal consistency. A composite score was created, which resulted in moderate to strong internal consistency as well (Time 1: $\alpha = 0.65$; Time 2: $\alpha = 0.74$), though considerable variability in item responses indicate that some domains were less consistent overall.

Five Facet Mindfulness Questionnaire. Another unidimensionally assessed dimension of psychological flexibility is mindfulness. Researchers developed the Five Facet Mindfulness Questionnaire (FFMQ; Baer, Smith, Hopkins, & Toney, 2006) for this purpose. These researchers examined the structure of mindfulness using five previously developed mindfulness measures. Factor analyses of the combined items from these five measures resulted in a five-factor model of mindfulness. These factors included describing, acting with awareness, nonjudging, nonreactivity, and observing. Baer et al. (2006) further evaluated the higher order structure of mindfulness using the FFMQ, finding that the five facets were significantly related to a higher order factor of mindfulness using a CFA approach. In a further examination of the FFMQ, researchers found evidence of convergent validity of this measure, but were unable to find support for discriminant validity (Goldberg et al., 2016). Specifically, they found that the facets of the FFMQ to moderately correlate with measures of psychological distress and well-being in a clinical sample undergoing mindfulness-based stress reduction (MBSR). Furthermore, as the MBSR treatment progressed, increases in the FFMQ facets increased at a comparable rate.

While this is promising as a mindfulness-based measure, its unidimensionality limits the use of this measure in psychological flexibility contexts, similarly to other component-based assessments.

In summary, while there have been a multitude of measures developed to assess many components of the Psychological Flexibility Model, there have been limitations to each. From inconsistent psychometrics, including convergent and divergent validity (Wilson et al., 2010), focusing on only negative aspects to psychological health (Bond et al., 2011), and being developed out of different conceptual backgrounds (Rolffs et al., 2016), these limitations have consequences in the assessment of psychological flexibility in a clinical setting. One of the most substantial limitations to the measures mentioned above is that none of them examine each of the psychological flexibility and inflexibility components simultaneously (Rolffs et al., 2016).

Multidimensional Psychological Flexibility Inventory. To correct the limitations of the measures above, Rolffs et al. (2016) developed the Multidimensional Psychological Flexibility Inventory (MPFI). These researchers determined that to fully assess all 12 dimensions of psychological flexibility and inflexibility, it would require the use of 22 different measures with a total of 296 items (Rolffs et al., 2016). In the name of parsimony, they developed a new self-report measure that incorporated aspects of each of these assessments. In the development of this questionnaire, these researchers administered 554 items pooled from the combination of other psychological flexibility measures to a combined sample of over 3,000 participants. In the first stage, they administered 494 possible items reflecting the 12 psychological flexibility/ inflexibility domains. They conducted an EFA on each of the 12 domains, in which these researchers eliminated items that failed to exhibit strong coefficients, resulting in 288 items. They then administered these items to a large sample in which the items were assessed using

item response theory (IRT) to determine the items that offered the most information. These researchers retained the five items from each domain that met this criterion, resulting in a 60-item measure. Finally, Rolffs et al. (2016) recommended the use of the two items from each of the 12 domains that provided the most information, according to the IRT analysis, as a short version of the MPFI. Further analysis of this assessment is ongoing (Seidler et al., in press).

Rolffs et al. (2016) then conducted an EFA using half of the sample on both the flexible and inflexible items to verify the underlying structure of the full 60-item MPFI. These results indicated a 12-factor solution in which each of the five-item subscales represented discrete factors that mapped onto the Hexaflex model suggesting that the MPFI was a multidimensional scale (Rolffs et al., 2016). They conducted an additional EFA on the other half of the sample in which they extracted a higher order two-factor solution, whereas both the six dimensions of flexibility and six dimensions of inflexibility formed discrete factors. To verify the results of the previous exploratory analyses, these researchers conducted a CFA using a separate sample that demonstrated that the 12 subscales loaded onto the two higher order factors. This assessment exhibited excellent fit indices (χ^2 (1697) = 4,617, root mean square error of approximation (RMSEA) = .040, comparative fit index (CFI) = .946, and standardized root mean square residual (SRMR) = .060).

The MPFI was psychometrically validated when developed. The global flexibility and inflexibility scales showed strong negative correlation (r = -.735), indicating that these factors share roughly 54% of their variance (Rolffs et al., 2016). These results suggest that they are distinct, yet related, constructs, consistent with the theoretical foundations of the Psychological Flexibility Model. The MPFI demonstrated excellent internal consistency, with Cronbach's α ranging from 0.96 to 0.97 for the flexibility composite and from 0.95 to 0.97 for the inflexibility

composite across gender, age, race/ethnicity, education level, and whether the respondent was in treatment or not (Rolffs et al., 2016). In a recent study, reliability estimates of the shortened version of the MPFI resulted in strong internal consistency (α = 0.91; Seidler et al., in press). Finally, the subscales exhibited only low to moderate correlations, in the directions one would expect to find, with all measures used to assess discriminant validity, including neuroticism, inattention to feelings, self-judgment, and rumination (Rolffs et al., 2016).

Though the assessment of the Psychological Flexibility Model has not been straightforward, each study has built upon the previous literature. This method of measure development has resulted in a reliable measure of the complete psychological flexibly model in the MPFI. Though the MPFI has strong psychometrics, and the original development was strongly reprehensive of the domains of psychological flexibility, future studies are further investigating this assessment in an attempt to verify the underlying structure of the Psychological Flexibility Model as assessed by the MPFI (Seidler et al., in press). Currently, the MPFI is the most comprehensive measure of the Psychological Flexibility Model, and it may provide a basis for exploring not just the potential relationship between PTSD and the various elements of psychological inflexibility, but also the potential relationship between PTG and psychological flexibility.

The Current Study

The purpose of the current study was to assess the relationships between the Psychological Flexibility Model, PTG, and PTSD. To accomplish this, the current study attempted to replicate and extend the findings of Meyer, La Bash, et al. (2019) in showing that psychological inflexibility was a predictor of PTSD, while accounting for other risk factors. This study also extended the findings of Meyer, Kotte, et al. (2019) through an examination of

psychological inflexibility relative to posttraumatic growth. Additionally, an investigation into the relationship between the constructs comprising both psychological flexibility and inflexibility and posttraumatic growth and PTSD was conducted, applying the theoretical foundations of psychological health after traumatic experiences (Kashdan & Rottenberg, 2010; Tedeschi & McNally, 2011). Finally, the current study extended the research of Thompson and Waltz (2010) by examining the individual domains of the Psychological Flexibility Model relative to posttraumatic stress and personal growth.

Hypotheses

The first hypothesis of the current study was the expectation that psychological flexibility would predict reduced levels of PTSD symptoms and psychological inflexibility would predict reduced levels of PTG in military service members and veterans. A negative relationship has been established between psychological flexibility and PTSD symptom severity (Dutra & Sadeh, 2018), and the current study aimed to validate that finding. Additionally, it has been suggested that psychological inflexibility should be inversely related to PTG (Kashdan & Rottenberg, 2010), though this has not been explicitly studied, a supposition supported by the theory (e.g., Tedeschi & Calhoun, 1995, 2004).

It was also hypothesized that the results of Meyer, La Bash, et al. (2019) would be replicated. These researchers found that psychological inflexibility predicted unique variance in PTSD symptoms, even when controlling for other risk factors. Thus, it was hypothesized in the current study that psychological inflexibility would continue to predict unique variance in PTSD symptom severity in military service members and veterans, after accounting for several other risk factors of PTSD. These other risk factors included sex, age, military rank, serving in the Army, combat exposure, perceived social support, personality traits, and avoidance.

Additionally, given the nature of the Psychological Flexibility Model in which experts consider flexibility a positive outcome (Kashdan & Rottenberg, 2010), as is PTG (Davis & Nolen-Hoeksema, 2009), it was expected that psychological flexibility would be a predictor of PTG in military service members and veterans. Meyer, Kotte, et al. (2019) found that psychological flexibility predicted trauma-related resilience, and this third hypothesis extends this finding to PTG, as well. More specifically, it is hypothesized in the current study that psychological flexibility will predict unique variance in PTG, after accounting for established predictors of growth. Such predictors include PTSD symptom severity, combat experiences, social support, and personality traits. The results of this hypothesis should synthesize and extend the literature regarding psychological flexibility and positive health outcomes (Kashdan & Rottenberg, 2010) and increasing personal growth in individuals who experience a traumatic event (Jakšić et al., 2012; Tedeschi & McNally, 2011).

It is expected that patterns will emerge in the relationships among the domains of the Psychological Flexibility Model, PTSD symptom clusters, and PTG. Therefore, it is hypothesized that inflexible domains will each exhibit predictive power relative to PTSD symptom severity. Though few studies have examined these effects specifically, these expectations would extend the research examining experiential avoidance and mindfulness as predictors of the avoidance symptom cluster of PTSD (Thompson & Waltz, 2010). Additionally, each of the flexible domains of the Psychological Flexibility Model will predict PTG. The current study will examine each of the psychological flexibility and inflexibility domains in comparison to PTG and PTSD symptoms using a multidimensional measure, an endeavor yet to be undertaken in the literature.

CHAPTER 3

METHOD

Participants

The participants in this study included veterans or current military service members recruited from a medium-sized Midwestern university as well as through veterans' social media pages (see recruitment procedure below). Inclusion criteria to participate included being a current or former U.S. military service member who was at least 18 years of age. An examination of the prior literature in relation to psychological flexibility and posttraumatic growth revealed effect sizes that were historically found to be in the moderate range ($f^2 = 0.11$; Meyer, La Bash, et al., 2019; $r = .35$, Kashdan & Kane, 2011; $r = .39$, Lancaster, Klein, Nadia, Szabo, & Mogerman, 2015). An a priori power analysis was conducted using a moderate effect size ($f^2 = 0.11$) utilizing G*Power 3.1 (Erdfelder, Faul, Buchner, & Lang, 2009), a computer program designed to conduct such analyses. The alpha level was kept at 0.0125 to control for family wise error using the Bonferroni correction (Howell, 2013). The results of this analysis indicated that a minimum of 174 participants would be an adequate sample size to achieve power equal to 80% to find a moderate effect size in a multiple regression analysis examining the predictability of post-traumatic growth from the six psychologically flexible components. Understanding that some data participants provide may be unusable, the addition of 20% of the necessary participants were added to the total sample size to limit the effects of attrition. These results indicated that a final sample size of 208 participants was required.

The participants in this study were veterans and current military service members. The initial recruitment included 607 potential participants. Of this number, approximately 1.3% ($n = 8$) were ineligible to participate (i.e., reported a lack of military service), 9.4% ($n = 57$) failed to

Table 1

Demographics from the Current Study and 2018 Military Population Census.

Category		Current Study	2018 Military Census
Gender			
	Male	73.3% (*n* = 195)	82.1%
	Female	25.9% (*n* = 69)	17.9%
Ethnicity			
	White, non-Hispanic	81.6% (*n* = 217)	70.8%
	Hispanic or Latino/Latina	4.5% (*n* = 12)	14.9%
	Black or African American	3.0% (*n* = 8)	16.8%
	Native American or Alaskan Native	1.5% (*n* = 4)	1.0%
	Asian	1.1% (*n* = 3)	4.4%
	Multiracial or Other	8.3% (*n* = 22)	7.0%‡
Education			
	High School Diploma or GED	3.0% (*n* = 8)	66.0%†
	Some College	28.2% (*n* = 75)	
	Associates Degree	18.0% (*n* = 48)	8.4%
	Bachelor's Degree	27.1% (*n* = 72)	14.7%
	Master's Degree	16.2% (*n* = 43)	8.2%††
	Doctoral Degree	7.5% (*n* = 20)	
Rank			
	Enlisted	85.7% (*n* = 228)	82.8%
	Officer	12.8% (*n* = 34)	17.2%
	Warrant Officer	1.1% (*n* = 3)	
Deployment Experience			
	Deployed	70.7% (*n* = 188)	NR
	Never Deployed	29.3% (*n* = 78)	NR
Age		*n* = 266	
	Mean	43.10	
	SD	13.08	

Note. NR: Not Reported; ‡: All other reported ethnicities in the military; †: Includes GED, high school diploma, and some college; ††: Includes both Masters and Doctoral degrees. 2018 Military Census figures adapted from Office of the Deputy Assistant Secretary of Defense. (2018). 2018 Demographics Profile of the Military Community. Retrieved from https://download.militaryonesource.mil/12038/MOS/Reports/2018-demographics-report.pdf

give informed consent and 238 participants (39.2%) withdrew from the study prematurely, which left a sample of 304 participants who completed the study. Of these individuals, 15 failed to attend to the surveys as measured by the "attention check" items and 23 participants (7.3%) were observed to have greater than 5% of their data missing or grossly incomplete measures and were

excluded from the study.

The final sample (n = 266) was comprised of 25.9% female (n = 69), 73.3% male (n = 195), and included two participants (0.9%) who reported identifying as non-binary. Both officers (n = 37, 13.9%) and enlisted (n = 228, 85.7%) service members were represented. This sample further comprised of European American (n = 217, 81.6%), Hispanic or Latino/a (n = 12, 4.5%), African American (n = 8, 3.0%), Native American (n = 4, 1.5%), Asian American (n = 3, 1.1%), and multiracial or ethnic backgrounds outside of these categories (n = 22, 8.3%). Participants were 43.10 years old on average (SD = 13.08), ranging from 20 to 77 years old, and 70.3% (n = 187) were not currently enrolled in a college or university. The median annual income participants reported was $60,000 to $74,999. Additionally, 86% of U.S. states were represented in the sample. The demographics of the current sample, as well as a comparison of the current sample compared to that of the U.S. military population (Office of the Deputy Assistant Secretary of Defense, 2018) can be seen in Table 1.

Measures

Outcome Variables

PTSD Checklist for DSM-5 (PCL-5; Weathers et al., 2013). The PCL-5 is a 20-item measure that assesses each of the symptoms of PTSD according to DSM-5, including intrusive thoughts and memories, avoidance, negative alterations in cognition and mood, and arousal symptoms. This measure can be used as a proxy to assess the presence of PTSD with the utilization of a method to assess criterion A (i.e., the traumatic event). Respondents, for each item, indicate the frequency in which they experienced a specific symptom within the past month. Respondents rate each item on a five-point Likert-type scale that ranges from 0 = *not at all* to 4 = *extremely*, and total scores range from 0, indicating no presence of PTSD symptoms, to

80, indicative of severe PTSD symptom severity. Total scores greater than 32 are indicative of a positive screen of PTSD. Studies have found the internal consistency of the PCL-5 to be excellent (α = .94; Blevins, Weathers, Witte, & Davis, 2012; α = .95; Contractor, Armour, Wang, Forbes, & Elhai, 2015). Additionally, this instrument has had good construct validity, exhibiting moderate to strong correlations (*r*'s = .66 and .76) with the PTSD symptom severity score of the Clinician-Administered PTSD Scale for DSM-5 (CAPS-5; Frank W. Weathers, Blake, et al., 2013a), and the Clinician-Administered PTSD Scale for DSM-IV (CAPS; Blake et al., 1995), respectively (Weathers et al., 2018). For the current study, the internal consistency of the PCL-5 was in the excellent range (α = .97), and participants reported an average score of 27.22 (*SD* = 21.89).

Posttraumatic Growth Inventory (PTGI-X; Tedeschi & Calhoun, 1996; Tedeschi et al., 2017). The PTGI is a 21-item measure designed to assess positive outcomes one may experience following the experience of a stressful or traumatic event. Items are rated using a five-point Likert-type scale ranging from 0 = *I did not experience this change as a result of my crisis* to 5 = *I experienced this change to a very great degree as a result of my crisis*. Total scores range from 0, indicative of a lack of change due to the stressful event, to 105, indicating strong changes due to the stressful event. Alternatively, higher scores are interpreted as increased levels of growth post-trauma (Tedeschi et al., 2017). The PTGI incorporates five subscales that coincide with the five constructs of posttraumatic growth: 1) relating to others, 2) new possibilities, 3) personal strength, 4) spiritual change, and 5) appreciation of life.

This measure was found to be psychometrically sound, demonstrating an excellent internal consistency, with Cronbach's α's of .90 (Tedeschi & Calhoun, 1996) and .94 (Lancaster et al., 2015). Furthermore, the internal consistency for each of the subscales ranged from α's of

.67 to .85, with the lowest consistency exhibited by the Appreciation of Life subscale and the greatest consistency shared by the Relating to Others and Spiritual Change subscales (Tedeschi & Calhoun, 1996). These researchers also found test-retest reliability acceptable (r = .71) over a two-month interval.

The PTGI was updated to expand the spiritual change subscale with the addition of four additional items, resulting in a 25-item measure. This updated measure (PTGI-X; Tedeschi et al., 2017) demonstrated similar psychometric characteristics as the original measure but was better able to identify growth through spiritual or existential experiences. The internal consistency for this revised version was found to be excellent (α = .97) in U.S. samples, as well as in samples from Turkey and Japan (α = .96 and .95, respectively). The internal consistency of the PTGI-X in the current study was in the excellent range (α = .96), and participants reported an average score of 47.53 (SD = 31.34).

Predictor Variables

The Big Five Inventory (BFI; John, Donahue, & Kentle, 1991). The BFI is a 44-item brief self-report measure of the five-factor model (FFM) of personality (Costa & McCrae, 1992). The BFI assesses each of the five constructs of personality: extraversion, agreeableness, conscientiousness, neuroticism, and openness. Each item is a phrase describing the characteristics of personality and respondents rate each item on a five-point Likert-type scale ranging from 1 = *disagree strongly* to 5 = *agree strongly* to indicate the strength to which the characteristic applies to them. Each of the five personality trait subscales can be totaled for a subscale score in which higher scores indicate a stronger endorsement of the trait. The BFI has exhibited strong internal consistency, test-retest reliability, and convergent and divergent validity for both the overall BFI and each of the subscales (John & Srivastava, 1999). Furthermore, in a

military sample, the internal consistencies of the subscales were found to be adequate (Caska & Renshaw, 2013). The internal consistency of the BFI domains were in the acceptable to good ranges (α = .77 to .84).

Combat Experiences Scale (CES; Vogt, Smith, King, & King, 2012). The CES is a 17-item assessment of the exposure to warfare experiences (e.g., firing a weapon, being fired upon, witnessing injury and death, etc.). It is a part of the Deployment Risk and Resilience Inventory (DRRI-2; Vogt et al., 2012), which is a battery of measures that assesses key psychosocial risks and resiliency characteristics within the military and veteran population and is designed to be used in its entirety or single measures individually. Each item of the CES is rated on a four-point Likert-type scale ranging from 1 = *never* to 4 = *many times*, resulting in total scores indicating an increased level of combat exposure. The CES is psychometrically sound, achieving a moderate criterion validity (r = .45, p < .05; Vogt et al., 2013) when compared to the PCL-M (Weathers et al., 1993), and has consistently exhibited excellent internal consistency (α = .91 to .96; Seidler, 2016; Vogt et al., 2013). The internal consistency of the CES in the current study was in the excellent range (α = .94).

Multidimensional Psychological Flexibility Inventory (MPFI; Rolffs et al., 2016). The MPFI is a 60-item inventory of items designed to assess the six psychological flexibility constructs (i.e., present moment awareness, defusion, self-as-context, acceptance, values, and committed action) and the six psychological inflexibility constructs (i.e., lack of contact with the present moment, fusion, self-as-content, experiential avoidance, lack of contact with values, and inaction). Participants rate the items using a six-point Likert-type scale ranging from 1 = *Never true* to 6 = *Always true* based on the past two weeks. Index scores for both psychological flexibility and inflexibility have been validated, as well as subscale scores for each of the 12

constructs. As discussed earlier, psychometric research on the MPFI is supportive of a multidimensionally reliable and valid measure of psychological flexibility (see Chapter 1 for more information). The internal consistency of the MPFI in the current study was in the excellent range (α = .89) overall. The internal consistency scores for both the psychological flexibility and inflexibility scales were in the excellent range (α = 0.97). The internal consistency of the 12 MPFI subscales were in the good to excellent ranges (α = .88 to .96).

Postdeployment Social Support Scale (PDSSS; Vogt et al, 2012). Also a part of the DRRI-2, the PDSSS is a measure of the social support one perceives following their military deployment. The PDSSS, specifically, is a 10-item measure that assesses the extent that respondents perceive emotional support and instrumental assistance from friends, family, and the community following deployment. Respondents rate each item on a five-point Likert-type scale that ranges from 1 = *strongly disagree* to 5 = *strongly agree*, and a total score is derived by summing each of the item responses. Scores then range from 15 to 75, in which a greater total score is indicative of greater perception of social support. The PDSSS is an internally consistent measure (α = .90-.92; Seidler, 2016; Vogt et al., 2013) with moderate criterion validity (r = -.46, p < .05; Vogt et al., 2013) when compared to the PCL-M (Weathers et al., 1993). The internal consistency of the PDSSS in the current study was in the good range (α = .87).

Unit Social Support Scale (USSS; Vogt et al., 2012). Another measure incorporated within the umbrella of the DRRI-2, the USSS is a 12-item measure of the amount of assistance and encouragement one perceives from the military in general, unit leaders, and other unit members while deployed to a combat zone. Respondents rate each item on a five-point Likert-type scale that ranges from 1 = *strongly disagree* to 5 = *strongly agree*. Items are summed for a total score, where higher scores indicate greater levels of perceived social support from the

military. The psychometric properties of this measure are strong, including internal consistency (α = .93 - .96; Seidler, 2016; Vogt et al., 2013). Criterion validity was modest (r = -.27, p < .05) in comparison with the PCL-M (Weathers et al., 1993). The internal consistency of the USSS in the current study was in the excellent range (α = .95).

Demographics and Military Service Questionnaire (see Appendix A)

Participants completed a survey of basic demographics questions including age, gender, ethnicity, and education level. These items included open-ended questions (e.g., date of birth) and closed-ended questions with an option to include additional information if the options available did not adequately describe the participant's background (i.e., sex and ethnicity). As a means of assessing social economic status (SES), an item regarding the highest level of education of respondents' maternal parent/guardian was included. There is a strong association between maternal education level and a child's health, academic achievement, and the ability to attain employment, thus making this variable an adequate measure of SES (Bradley & Corwyn, 2002; Dubow, Boxer, & Huesmann, 2009; Racine & Joyce, 2007; Suizzo & Stapleton, 2007).

Given that some individuals have been known to portray themselves as having served in the military when they truly did not serve (Weisz, 2016), additional items included in the demographics questionnaire consisted of items developed to assess participants' military service. These items included questions relating to information about participants' pay grade and military job (i.e., Military Occupational Specialty [MOS], Air Force Specialty Code [AFSC], and Navy Enlisted Classification [NEC]). These acronyms were not explained as those who served in the military would understand what these terms referred to and serve as an additional screening instrument indicating whether the participant truly served in the military. Items also included questions relating to deployment information, such as the location of deployment and

experiences of combat (e.g., improvised explosive device [IED] detonation) and combat-related events (e.g., seeing dead civilians or enemy combatants).

Procedure

Participant Recruitment

Military service members and veterans were recruited through coordination with the university veterans' services office and through social media posts. Regarding participant recruitment through the university veterans' service office, the email addresses of these veterans was requested, and individualized emails were sent to each veteran requesting their assistance with this project (see Appendix B). Following a three-day interval, a reminder email was sent to the participants who had not completed the survey or had not opted out of the study (see Appendix C). One week later, a third contact was made to remind individuals of the research participation request (see Appendix D). A final request was sent to the participants approximately 90 days following the beginning of the study (see Appendix E). This procedure has been shown to increase participation rates by applying the social exchange theory (Bierstedt & Blau, 1964; Homans, 1974). As recommended by Dillman et al. (2014), emails were sent in the morning hours as this is the most likely time that participants will respond. Three aspects of survey research are required to maximize participation (Dillman et al., 2014). These include increasing the benefits of survey participation, decreasing the costs of participation, and establishing trust.

The benefits of participation include the potential of the current research study to help other veterans in need. The culture within the military that is experienced by veterans and military service members embodies the mantra that they "will never leave a fallen comrade" (U.S. Department of the Army, 2012). Additionally, participants were entered in a drawing for

one $50 Amazon gift cards per 50 participants that was emailed to the winners at the conclusion of the study. The highest cost of participation is the length of the survey (Dillman et al., 2014). Thus, the length of the overall survey was kept to a minimum number of items, with a total estimated duration to complete the survey limited to 30-40 minutes to decrease the costs of participation.

Furthermore, complex items and difficulty participating also contribute to the cost of participation (Dillman et al., 2014). Items were reviewed to ensure they were easy to understand, and the survey was administered online to limit these participation costs. Finally, possibly the most significant contributor to participation reluctance is trust (Dillman et al., 2014). The option to confirm the authenticity of the survey was offered in the email invitation to gain the trust of potential participants. Additionally, the researcher, being a veteran and military service member, introduced himself as such, as well as including the official logo of the sponsoring university in the email invitation. Modeling participant recruitment after an example from Dillman et al. (2014), in which multiple invitations were sent to prospective participants, these researchers were able to achieve a 20% response rate. The response rate of the current study was 17.29% of the veterans invited by email responded, while 64.03% of respondent participants successfully completed the study.

Additionally, social media was used to recruit participants. Study invitations were posted on veterans' Facebook pages periodically over the course of ten months (e.g., *U.S. Army NCOs Past and Present*, *Veterans Well-Being Community*, *Mission Roll Call*, and *Iraq and Afghanistan Veterans of America*), averaging approximately once per month (see Appendix F). For each period of recruitment through social media, the mean number of responses was 42.45 (*SD* = 50.31) with one outlier observed where the August recruitment period resulted in 189 responses.

Of the total responses to social media invitations, 39.40% (n = 182) of respondent participants successfully completed the study.

Data Collection

Individuals recruited through the university were provided a hyperlink to the study as part of the email invitation, in addition to a unique code they were to enter to ensure an individual did not participate more than once. The hyperlink directed their default internet browser to the Qualtrics website, where the survey was administered. Qualtrics is a U.S. based web-based software company who meets the "Safe-Harbor" requirements for data protection in both the U.S. and European Union (Qualtics, 2014), and is currently undergoing FedRAMP authorization, the "gold standard" of internet security compliance (Qualtrics, 2018). Participants were presented with an informed consent (see Appendix G) that was required to proceed with the study. Of the total respondents to the study invitation, 9.07% did not proceed beyond the informed consent. The battery of measures took an average of approximately 43.13 minutes to complete, once 31 outliers were accounted for. The order in which participants completed the measures was randomized. The settings in Qualtrics were set such that identifying information was not be collected, including the users' IP address. All data was collected, transferred, and stored digitally utilizing the Internet, and data was secured by utilizing Transport Layered Security (TLS) protocol. This protocol is designed for Internet-based communication security. Following the completion of the study, participants received an email extending gratitude for helping with this project (see Appendix H). Each participant was presented with a short debriefing document following completion of the study outlining the purpose of the study (see Appendix I).

Data Analytic Plan

Preliminary Analyses

Data were screened and cleaned before carrying out any of the main analyses. The dataset was examined for missing data, outliers, and potential patterns. Data cleaning, comprised of inspecting the data accuracy during importation from Qualtrics, and recoding of reverse coded variables was conducted. Outliers were identified, and transformations were conducted to ensure the main analyses are representative of the population as recommended by Tabachnick and Fidell (2013). In cases where the patterns of missing data were found to be missing at random (MAR), and less than 5% of the participant's responses to items were missing from any individual measure, missing values were imputed the hot deck imputation (Myers, 2011). This approach has been shown to be an effective method of reconciling missing data (Andridge & Little, 2010). Where a participant's responses were missing at a rate greater than 5% of the total items on a particular measure, that measure of the participant's data was excluded from any analysis conducted. Bivariate correlations were obtained between demographic variables and baseline measures to determine any potential moderators.

Main Analyses

Hypothesis 1: It was hypothesized that, in a sample of military service members and veterans, psychological flexibility would demonstrate an inverse relationship with PTSD symptom severity and a positive relationship with PTG. Furthermore, it was hypothesized that psychological inflexibility would exhibit a negative relationship with the strength of PTG reported by participants and a positive relationship with PTSD symptom severity. Bivariate correlation analyses were conducted in which the relationships among the psychological flexibility scale score and the psychological inflexibility scale score of the MPFI were used to

predict the total PCL-5 score (i.e., PTSD symptom severity) and the total PTGI score (i.e., PTG).

Hypothesis 2: It was hypothesized in the current study that psychological inflexibility would predict unique variance in PTSD symptom severity in military service members and veterans after accounting for other risk factors of PTSD, including participants' age when the traumatic experience occurred, measured within the demographics questionnaire and criterion A questionnaire of the PCL-5. Additional risk factors include combat exposure (using the CES), perceived social support (from the unit using the USSS, and postdeployment social support measured with the PDSSS), and personality traits (measured with the BFI). To assess this relationship, multiple regression analysis was carried out for the entire sample to compare three hierarchical linear models, where model one included only participants' sex and rank, model two added the five subscale total scores from the BFI (i.e., individual personality traits), and age when the event occurred, and model three added the psychological inflexibility scale score from the MPFI. To account for predictors of PTSD in the subsample that has deployed, a second hierarchical multiple linear regression analysis was conducted to compare model one with two other nested models: a model with sex, rank, the five subscale total scores from the BFI (i.e., individual personality traits), age when the event occurred, the total CES score (i.e., combat exposure), and the total scores from the USSS and PDSSS (i.e., unit and postdeployment social support), and a model that included all 10 variables plus the psychological inflexibility scale score from the MPFI.

Hypothesis 3: The third hypothesis of the current study was that psychological flexibility would predict unique variance in PTG, after accounting for other predictors of PTG. Such predictors include age, PTSD symptom severity (as measured with the PCL-5), combat experiences (measured using the CES), social support (unit social support measured with the

USSS and postdeployment measured using the PDSSS), and personality traits (measured with the BFI). To assess this relationship, multiple regression analysis was carried out for the entire sample to compare three hierarchical linear models where model one included only participants' ages and total score from the PCL-5 (i.e., PTSD symptom severity) as predictors, model two added the five subscale scores of the BFI (i.e., individual personality traits), and model three further added the psychological flexibility scale score from the MPFI. Similar to approaches used in the second hypothesis, another hierarchical multiple linear regression analysis was carried out using the sample subset of deployed participants in which total scores from the USSS and PDSSS (i.e., social support), the CES (i.e., exposure to combat experiences), in addition to participants' ages and PCL-5 scores (i.e., PTSD symptom severity) were included in model one, the five subscale scores of the BFI (i.e., individual personality traits) were added in model two, and the psychological flexibility scale score from the MPFI were added in model three.

Hypothesis 4: It was expected that each of the psychological flexibility domains would emerge as a significant predictor of PTG, while the domains of psychological inflexibility would each predict PTSD symptom severity. Bivariate correlation among these domains were obtained. Furthermore, because the approaches of relating specific components of psychological flexibility to either PTSD or PTG has not been explored in the literature, a stepwise regression analysis approach was selected to explore these relationships. Specifically, this stepwise regression analysis was designed such that the 12 flexible and inflexible components measured with the MPFI would predict the total score of the PCL-5 (i.e., PTSD symptom severity). In the use of a stepwise regression, the statistical criteria used to determine whether a variable was included in the model was probability of F was less than or equal to .050, while the criteria for removal of a variable from the model was a probability of F greater or equal to .100. Furthermore, a second

stepwise multiple regression analysis was used such that the 12 Psychological Flexibility Model components measured with the MPFI would predict total PTGI-X scores (i.e., strength of reported PTG).

CHAPTER 4

RESULTS

Preliminary Analyses

No significant outliers were identified, and no transformations were required to ensure the main analyses were representative of the population as recommended by Tabachnick and Fidell (2013). When conducting the missing data analysis, it was observed that 22 (7.3%) participants were missing greater than 5% of data for multiple measures and were removed from future analysis. Of the missing data were found to be missing at random (MAR) and less than 5% of any participant's responses to items were missing from any individual measure (n = 4 across four measures), missing values were imputed using hot deck imputation (Myers, 2011). Bivariate correlations were obtained between demographic variables and baseline measures resulting in identifying small relationships (r < .2; Cohen, 1992). Specifically, age exhibited a small relationship with psychological flexibility and inflexibility, race exhibited a small relationship with PTG, and income demonstrated a small relationship with psychological inflexibility and PTSD symptom severity (see Table 2). Given the nature of the small associations observed, it is unlikely that any of these variables serve as a moderator.

Main Hypotheses

Hypothesis 1: Bivariate correlation analyses were conducted examining the relationships among the psychological flexibility scale score of the MPFI, the psychological inflexibility scale of the MPFI, the total PCL-5 score (i.e., PTSD symptom severity), and the total PTGI-X score (i.e., PTG). Each pair of variables were plotted and linear relationships appeared to be present. See Table 2 for the bivariate correlation results.

A significant linear relationship between the flexibility scale of the MPFI and the total

Table 2

Descriptive Statistics and Bivariate Correlation Analyses among Demographic and Outcome Variables (n = 266).

	M (*SD*)	1	2	3	4	5	6	7	8
1) PTSD Symptom Severity	27.22 (21.89)	-							
2) PTGIX Posttraumatic Growth score	47.53 (31.34)	.15*	-						
3) MPFI Flexible subscale score	2.54 (0.57)	.07	.44***	-					
4) MPFI Inflexible subscale score	2.03 (1.03)	.68***	.03	.14*	-				
5) Age (n = 260)	43.10 (13.08)	-.08	.04	.09	-.20**	-			
6) Sex	-	-.07	-.06	-.10	-.13*	.19**	-		
7) Ethnicity	-	-.01	-.15*	-.11	-.05	.12	.06	-	
8) Income (n = 264)	-	-.19**	-.001	-.05	-.22*	.26**†	.02	.02	-

Note. Correlations conducted assessing both ends of the distribution (2-tailed). * $p < .05$. ** $p < .01$. *** $p < .001$. † n = 258.

PCL-5 score was not observed (r = .07, p = .240), nor was a linear relationship between the total inflexibility scale of the MPFI and the total PTGI-X (r = .03, p = .690) observed. Alternatively, the flexibility scale score of the MPFI and the total PTGI-X score were positively associated (r = .44, $p < .001$). According to (Cohen, 1992), this finding falls within the range of a medium effect size (i.e., r = .3 to .5). The strongest linear relationship found was observed between the total PCL-5 score and the inflexibility scale of the MPFI (r = .68, $p < .001$), of which Cohen (1992) considers a strong relationship (i.e., $r > .5$). These results suggest that this hypothesis was partially supported. Additionally, the relationships between total PCL-5 scores and total PTGI-X scores were examined, finding a small (i.e., $r < .3$; Cohen, 1992) positive association (r = .15, p = .017). Finally, the association between psychological flexibility and inflexibility scale scores of the MPFI exhibited a small positive linear relationship (r = .14, p = .026).

Table 3

Hierarchical Regression Analysis Predicting PTSD Symptom Severity with Predictor Variables in a Sample of Veterans (n = 243).

Model and predictor variable	*B*	*SE*	β	Adj R^2	ΔR^2	*F*	ΔF
Model 1				-.003	.005	0.62	0.62
Sex	-3.43	3.17	-.07				
Rank	-0.49	2.10	-.02				
Model 2				.31	.32	14.21***	18.65***
Sex	-1.53	2.78	-.03				
Rank	2.59	1.80	.08				
Extraversion	1.03	1.68	.04				
Agreeableness	-1.37	2.11	-.04				
Conscientiousness	1.11	2.13	.03				
Neuroticism	14.93	1.81	.56***				
Openness	-0.50	2.12	-.01				
Age when Trauma Occurred	-0.19	0.13	-.09				
Model 3				.49	.18	26.76***	83.81***
Sex	1.87	2.41	.04				
Rank	1.99	1.54	.06				
Extraversion	1.51	1.44	.06				
Agreeableness	-0.24	1.81	-.01				
Conscientiousness	2.15	1.81	.06				
Neuroticism	7.42	1.75	.28***				
Openness	0.49	1.82	.01				
Age when Trauma Occurred	-0.03	0.11	-.01				
Psychological Inflexibility	11.79	1.27	.55***				

Note. *** $p < .001$.

Hypothesis 2: To assess the relationships hypothesized in the second prediction, a hierarchical multiple linear regression analysis was utilized (see Table 3). Preliminary analyses conducted indicated no violations of normality, linearity, multicollinearity, or homoscedasticity assumptions. Multivariate outliers were removed from the sample ($n = 1$) and individuals who did not report details of their traumatic event (e.g., their age at the time of the trauma) were removed from the current analysis ($n = 23$), resulting in a final sample size of 242 participants. Participants' military rank and sex were included in model one, accounting for 0.5% of the

Table 4

Hierarchical Regression Analysis Predicting PTSD Symptom Severity with Predictor Variables in a Sample of Deployed Veterans (*n* = 97).

Model and predictor variable	*B*	*SE*	β	Adj R^2	ΔR^2	*F*	ΔF
Model 1				-.016	.01	0.26	0.26
Sex	-2.88	5.18	-.06				
Rank	-1.54	3.54	-.05				
Model 2				.53	.58	10.52***	12.73***
Sex	-8.08	3.82	-.16				
Rank	2.39	2.58	.07				
Extraversion	0.19	2.29	.01				
Agreeableness	-3.00	2.93	-.10				
Conscientiousness	-2.01	2.87	-.06				
Neuroticism	12.18	2.39	.48***				
Openness	-1.59	2.92	-.05				
Age when Trauma Occurred	-0.25	0.18	-.10				
Unit Social Support	0.11	0.15	-.06				
Postdeployment Social Support	-0.12	0.22	.04				
Combat Experiences	0.77	0.12	.50***				
Model 3				.66	.12	16.39***	34.40***
Sex	-6.16	3.24	-.12				
Rank	2.87	2.18	.09				
Extraversion	1.30	1.94	.05				
Agreeableness	-4.39	2.49	-.14				
Conscientiousness	-1.49	2.42	.04				
Neuroticism	5.43	2.33	.21*				
Openness	-1.52	2.46	-.04				
Age when Trauma Occurred	-0.13	0.15	-.05				
Unit Social Support	0.15	0.13	.08				
Postdeployment Social Support	0.31	0.20	.11				
Combat Experiences	0.61	0.12	.39***				
Psychological Inflexibility	11.14	1.90	.52***				

Note. * $p < .05$. *** $p < .001$.

variance in PTSD symptom severity. Following the inclusion of the five subscale scores from the BFI (i.e., individual personality traits) and age when the event occurred in model two, the total variance explained by the model as a whole was 30.5%, $F(8, 233) = 14.21$, $p < .001$. When the psychological inflexibility scale score from the MPFI was included in model three, the total variance explained by the complete model was 49%, $F(9, 232) = 26.76$, $p < .001$. The addition of psychological inflexibility explained an additional 18.1% of the variance in PTSD symptom severity, after controlling for the predictors established in the literature, *R* squared change = 0.18, *F* change (1, 232) = 85.81, $p < .001$, adjusted $R^2 = .49$. In the final model, neuroticism ($\beta = .28$, $p < .001$) and psychological inflexibility ($\beta = .55$, $p < .001$) significantly contributed to the model.

To assess a greater number of predictors of PTSD, a second hierarchical multiple linear regression was utilized in a subsample of participants who deployed at least once with complete measures ($n = 97$; see Table 4). In this multiple regression model, military rank and sex were included in model one, accounting for 0.6% of the variance in PTSD symptom severity. The five components of personality (i.e., the five subscale scores from the BFI), age when the event occurred, unit social support (i.e., USSS total score), postdeployment social support (i.e., PDSSS total score), and combat experiences (i.e., CES total score) were added in model two, and the total variance explained by this model was 52.7%, $F(11, 83) = 10.52$, $p < .001$. When the psychological inflexibility scale score from the MPFI was also included in model three, the total variance explained by the complete model was 66.3%, $F(12, 82) = 16.39$, $p < .001$, adjusted $R^2 = .66$. The addition of psychological inflexibility explained an additional 12.3% of the variance in PTSD symptom severity, after controlling for the predictors established in the literature, *R* squared change = .12, *F* change (1, 82) = 34.40, $p < .001$. In the final model, neuroticism ($\beta = .21$, $p = .022$), combat experiences ($\beta = .39$, $p < .001$), and psychological inflexibility

Table 5

Hierarchical Regression Analysis Predicting Posttraumatic Growth with Predictor Variables in a Sample of Veterans (n = 260).

Model and predictor variable	*B*	*SE*	β	Adj R^2	ΔR^2	*F*	ΔF
Model 1				.02	.02	3.21*	3.21*
PTSD Symptom Severity	0.22	0.09	.15*				
Age	0.13	0.15	.05				
Model 2				.15	.15	7.71***	9.30***
PTSD Symptom Severity	0.48	0.10	.34***				
Age	-0.01	0.14	-.004				
Extraversion	5.15	2.58	.13*				
Agreeableness	5.52	3.10	.12				
Conscientiousness	3.70	3.22	.08				
Neuroticism	-7.10	3.04	-.19*				
Openness	6.85	3.21	.14*				
Model 3				.24	.09	11.11***	28.93***
PTSD Symptom Severity	0.33	0.10	.23***				
Age	-0.01	0.13	-.01				
Extraversion	5.38	2.45	.14*				
Agreeableness	2.86	2.98	.06				
Conscientiousness	0.67	3.10	.01				
Neuroticism	-4.25	2.93	-.11				
Openness	3.75	3.10	.07				
Psychological Flexibility	18.15	3.37	.33***				

Note. * $p < .05$. *** $p < .001$.

(β = .52, $p < .001$) contributed significantly to the prediction of PTSD symptom severity.

Hypothesis 3: To assess the relationships predicted in the third hypothesis, a hierarchical multiple linear regression analysis was conducted including the predictors of age, PTSD symptom severity, combat experiences, social support, and the five main personality traits (see Table 5). Preliminary analyses conducted indicated no violations of normality, linearity, multicollinearity, or homoscedasticity. No outliers were identified. Six participants did not report their current age, and were removed from the analysis, resulting in a final sample size of 260. In model one, participants' ages and the total scores from the PCL-5 (i.e., PTSD symptom severity)

Table 6

Hierarchical Regression Analysis Predicting Posttraumatic Growth with Predictor Variables in a Deployed Sample of Veterans (n = 96).

Model and predictor variable	*B*	*SE*	β	Adj R^2	ΔR^2	*F*	ΔF
Model 1				.14	.19	4.20**	4.20**
PTSD Symptom Severity	0.09	0.16	-.06				
Unit Social Support	0.30	0.27	.12				
Postdeployment Social Support	1.00	0.41	.25*				
Combat Experiences	0.70	0.24	.32**				
Age	-0.05	0.26	-.02				
Model 2				.15	.05	2.71**	1.18
PTSD Symptom Severity	0.20	0.20	.14				
Unit Social Support	0.21	0.29	.08				
Postdeployment Social Support	0.81	0.42	.21†				
Combat Experiences	0.55	0.26	.25*				
Age	-0.03	0.26	-.01				
Extraversion	5.61	4.32	.15				
Agreeableness	4.33	5.27	.10				
Conscientiousness	-1.23	5.40	-.03				
Neuroticism	-0.91	5.17	-.03				
Openness	4.43	5.37	.09				
Model 3				.21	.06	3.31***	7.30**
PTSD Symptom Severity	0.05	0.20	.04				
Unit Social Support	0.20	0.28	.08				
Postdeployment Social Support	0.52	0.42	.14				
Combat Experiences	0.53	0.26	.24*				
Age	-0.06	0.25	-.02				
Extraversion	6.83	4.20	.18				
Agreeableness	2.35	5.14	.05				
Conscientiousness	-3.29	5.27	-.07				
Neuroticism	1.17	5.05	.03				
Openness	1.77	5.27	.04				
Psychological Flexibility	16.03	5.93	.29**				

Note. * $p < .05$. ** $p < .01$. *** $p < .001$. † approached significance at $p = .058$.

accounted for 1.7% of the total variance in PTG (i.e., PTGI-X total score). When the five subscale scores of the BFI (i.e., individual personality traits) were included in model two, the

total variance explained by the model as a whole was 15.3%, $F(7, 252) = 7.71$, $p < .001$. Upon addition of the psychological flexibility scale score from the MPFI inserted in model three, the total variance explained by the complete model was 23.8%, $F(8, 251) = 11.11$, $p < .001$, adjusted $R^2 = .24$. The addition of psychological inflexibility explained an additional 8.5% of the variance in PTSD symptom severity, after controlling for the predictors established in the literature, *R* squared change = .09, *F* change (1, 251) = 28.93, $p < .001$. Of the predictors in the final model, psychological flexibility ($\beta = .33$, $p < .001$), extroversion ($\beta = .14$, $p = .029$), and PTSD symptom severity ($\beta = .23$, $p = .001$) were statistically significant.

Similar to the second hypothesis, a second hierarchical multiple linear regression was utilized in a subsample of participants who deployed at least once with complete measures ($n = 96$; see Table 6) to assess a greater number of predictors of PTG. In this multiple regression model, age, unit social support (i.e., USSS total score), postdeployment social support (i.e., PDSSS total score), and combat experiences (i.e., CES total score), and PTSD symptom severity (i.e., the total score of the PCL-5) were included in model one, accounting for 14.4% of the variance in PTG. The five components of personality (i.e., the five subscale scores from the BFI) were included in model two, and the total variance explained by the model was 15.2%, $F(10, 85) = 2.71$, $p = .006$. When the psychological flexibility scale score from the MPFI was included in model three, the total variance explained by the complete model was 21.1%, $F(11, 84) = 3.31$, $p = .001$, adjusted $R^2 = .21$. The addition of psychological inflexibility explained an additional 6.1% of the variance in PTSD symptom severity, after controlling for the predictors established in the literature, *R* squared change = .06, *F* change (1, 84) = 7.30, $p = .008$. In the final model, psychological flexibility ($\beta = .29$, $p = .008$), and combat experiences were statistically significant ($\beta = .24$, $p = .042$), with the latter achieving the next greatest beta value.

Table 7

Bivariate Correlation Analyses among Outcome Variables and Psychological Flexibility Model Components (*n* = 266).

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1) PTSD Symptom Severity	-													
2) Posttraumatic Growth	.15*	-												
3) Present Moment Awareness	-.16*	.34***	-											
4) Defusion	-.36***	.30***	.56***	-										
5) Self-as-Context	-.24***	.36***	.61***	.80***	-									
6) Acceptance	-.17**	.24***	.65***	.56***	.54***	-								
7) Values	-.33***	.39***	.60***	.72***	.76***	.49***	-							
8) Committed Action	-.27***	.30***	.50***	.63***	.69***	.42***	.85***	-						
9) Lack of Contact with the Present Moment	.54***	.03	-.33***	-.33***	-.29***	-.27***	-.37***	-.31***	-					
10) Fusion	.66***	-.07	-.22***	-.50***	-.38***	-.28***	-.43***	-.40***	.56***	-				
11) Self-as-Content	.56***	.01	-.21***	-.41***	-.32***	-.30***	-.39***	-.36***	.49***	.76***	-			
12) Experiential Avoidance	.44***	.15*	-.05	-.10	-.07	-.22***	-.08	-.06	.39***	.36***	.42***	-		
13) Lack of Contact with Values	.55***	-.08	-.24***	-.37***	-.35***	-.22***	-.57***	-.50***	.57***	.64***	.54***	.30***	-	
14) Inaction	.61***	-.09	-.23***	-.45***	-.41***	-.21**	-.52***	-.50***	.58***	.76***	.58***	.31***	.80***	-

Note. Correlations conducted assessing both ends of the distribution (2-tailed). * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Hypothesis 4: To explore the relationships among the domains of the psychological flexibility model, bivariate correlation coefficients among the psychological flexible and inflexible components with PTSD symptom severity and PTG were obtained. Additionally, to identify the strongest predictors of both PTSD and PTG, two stepwise multiple regression analyses were completed in which the 12 flexible and inflexible components measured with the MPFI will predict the total score of the PCL-5 (i.e., PTSD symptom severity), and the total PTGI scores (i.e., strength of reported PTG), respectfully.

The results of the bivariate correlation among the total scores of the PCL-5, PTGI-X, and subscale scores of the MPFI (i.e., component scores of the Psychological Flexibility Model) indicated that each of the components, both flexible and inflexible, significantly predicted PTSD symptoms severity (see Table 7). Specifically, each of the flexible components exhibited a small to medium negative association with PTSD symptom severity, while inflexible components exhibited a medium to strong positive relationship with the severity of PTSD symptoms. Alternatively, only flexible components were associated with PTG, with the exception of experiential avoidance. Specifically, the flexible domains exhibited small to medium positive associations with PTG, while experiential avoidance exhibited a small positive association with the magnitude of personal growth experienced.

In the first stepwise regression, the 12 components of the Psychological Flexibility Model were entered into a model predicting the magnitude of PTSD experienced (see Table 8). Preliminary analyses conducted indicated no violations of normality, linearity, multicollinearity, or homoscedasticity assumptions and no outliers were detected. Of the components, cognitive fusion statistically accounted for 43.3% of the variance in PTSD symptom severity and was included in the model, $F(1, 264) = 203.40$, $p < .001$. Furthermore, the addition of experiential

Table 8

Stepwise Regression Analysis Predicting PTSD Symptom Severity with Psychological Flexibility Model Components in a Sample of Veterans (n = 266).

Model and predictor variable	*B*	*SE*	β	Adj R^2	ΔR^2	*F*	ΔF
Model 1				.43	.44	203.40***	203.40***
Fusion	10.33	0.72	.66***				
Model 2				.48	.05	121.49***	22.79***
Fusion	9.04	0.75	.58***				
Experiential Avoidance	4.10	0.86	.23***				
Model 3				.50	.03	89.52***	13.78***
Fusion	6.17	1.06	.39***				
Experiential Avoidance	3.91	0.84	.22***				
Inaction	4.10	1.11	.25***				
Model 4				.51	.01	70.19***	6.54*
Fusion	5.66	1.07	.36***				
Experiential Avoidance	3.39	0.57	.19***				
Inaction	3.28	1.14	.20**				
Loss of Contact with the Present Moment	2.51	0.98	.14*				

Note. * $p < .05$. ** $p < .01$. *** $p < .001$.

avoidance statistically accounted for 3% of the unique variance in PTSD, and was included in the second model, $F(2, 263) = 121.49$, $p < .001$, adjusted $R^2 = .48$. A third model was statistically derived, in which inaction was added to statistically predict PTSD symptom severity, accounting for a total of 50.1% of the variance, $F(3, 262) = 89.52$, $p < .001$. The final statistically derived model added having a lack of contact with the present moment, accounting for 1% of the unique variance in the severity of PTSD symptoms, $F(4, 261) = 70.19$, $p < .001$, adjusted $R^2 = .51$. In the final model, cognitive fusion (β = .36, $p < .001$), experiential avoidance (β = .19, $p = .001$), and inaction (β = .20, $p = .004$), and lack of contact with the present moment (β = .14, $p = .011$), resulted with the greatest predictive value of PTSD symptom severity.

In the second multiple regression, the 12 components of the Psychological Flexibility Model were entered into a model predicting PTG (see Table 9). Preliminary analyses conducted

Table 9

Stepwise Regression Analysis Predicting Posttraumatic Growth with Psychological Flexibility Model Components in a Sample of Veterans (n = 266).

Step and predictor variable	*B*	*SE*	β	Adj R^2	ΔR^2	*F*	ΔF
Step 1				.15	.15	47.68***	47.68***
Values	10.61	1.54	.39***				
Step 2				.18	.03	30.05***	10.68**
Values	12.55	1.62	.46***				
Lack of Contact with the Present Moment	4.91	1.50	.20**				
Step 3				.20	.03	25.52***	8.69**
Values	9.52	1.90	.35***				
Lack of Contact with the Present Moment	5.59	1.50	.22***				
Present Moment Awareness	5.63	1.91	.20**				

Note. ** $p < .01$. *** $p < .001$.

indicated no violations of normality, linearity, multicollinearity, or homoscedasticity. Of the components, values statistically accounted for 15.0% of the variance in PTG and was included in the model, $F(1, 264) = 47.68$, $p < .001$. Furthermore, the addition of lack of contact with the present moment statistically accounted for 3% of the unique variance in PTG, and was included in the second model, $F(2, 263) = 30.05$, $p < .001$, adjusted $R^2 = .18$. Finally, the addition of present moment awareness statistically accounted for another 3% of the unique variance in PTG, and was included in the third model, $F(3, 262) = 23.52$, $p < .001$, adjusted $R^2 = .20$. In the final model, values (β = .35, $p < .001$), lack of contact with the present moment, (β = .22, $p < .001$) and present moment awareness (β = .20, $p = .003$) components exhibited the greatest predictive value of PTG.

CHAPTER 5

DISCUSSION

This study was designed to examine the effects of psychologically flexible and inflexible behavioral repertoires on both positive and negative aspects of trauma experience, including PTG and PTSD symptom severity, respectively. The first hypothesis examined overall relationships among psychological flexibility and inflexibility, PTG, and PTSD symptom severity, where inflexible behaviors were expected to have an inverse relationship PTG and a positive relationship with PTSD symptom severity. Additionally, flexible behavioral repertoires were expected to have an inverse relationship with PTSD symptom experience, as well as a positive association with PTG. This hypothesis was partially supported, finding a strong positive relationship between psychological inflexibility and PTSD symptom severity, and a moderate positive association between psychological flexibility and PTG. However, the relationship between psychological flexibility and PTSD, as well as that between psychological inflexibility and PTG, were not statistically significant.

This result is important because it shows that although knowing a veteran's inflexibility score provides some insight into their experience of PTSD symptoms, it does not provide clinicians with reliable information about any degree of personal growth experienced as a result of that traumatic experience. In similar fashion, having information about a veteran's flexible behavioral repertoires does provide some information about the personal growth they have experienced, although it does not provide predictable information about their level of symptoms. This pattern of findings may offer clinicians useful information for treatment; a patient with an elevated inflexibility score is more likely to have either more severe or more frequent PTSD symptoms, while a veteran with an elevated flexibility score is more likely to have experienced

an increase in personal growth as a result of their struggle with the traumatic event. Because the MPFI is a comprehensive measure of both flexible and inflexible behavior, it allows for this insight into not only a veteran's distress as would be measured with a symptom screener or the AAQ-II, but also their strengths. A clinician would be able to then utilize these strengths while developing more flexible behavioral repertoires in treatment. These results may also be a product of military service, such that the structured environment of the military creates a situation in which concrete, black and white, cognition teaches veterans that they should be able to control their thoughts and emotions as opposed to accepting them.

Additionally, a small positive relationship was observed between psychological flexibility and inflexibility. This is a counterintuitive finding, in the sense that higher flexibility scores predict higher inflexibility scores, and it conflicts with the moderate negative correlation reported by Rolffs et al. (2016). It is not clear why these results are so different; perhaps veteran trauma survivors exhibit flexible and inflexible behaviors differently. Specifically, it is possible that when a veteran experiences a triggering event, an event that reminds the individual of the traumatic event, they may engage in inflexible behaviors when they would normally engage in flexible behaviors under any other circumstances. In any case, it appears that the basis for viewing flexibility and inflexibility as separate, distinguishable repertoires rather than complimentary repertoires reflecting opposing ends of a continuum is further supported by the current findings.

Similarly, a small positive association was observed between PTSD symptom severity and PTG, supporting the underlying theory espoused by Tedeschi and Calhoun (1995) that posits that the development of PTG depends on the amount of distress one experiences. Thus, the amount of trauma-related distress experienced by participants was predictive of the amount of

personal growth they also experienced. While PTG does not directly result from the experience of a traumatic event, it does result from the consequences of one's struggle with that traumatic experience (Tedeschi & Calhoun, 1995). Tedeschi et al. (1998) asserted that growth was only possible when the distress suffered as a result of a traumatic experience was severe enough to allow a person to reconsider and develop new beliefs and ways of thinking that leads to more fulfilling life experiences. Specifically, this point where the trauma related distress is strong enough that a person considers changing their beliefs could differ for each individual. In other words, those with high distress tolerance may offset those with low distress tolerance. This relationship could be explored in future research; however, it was not the focus of the current study.

The second hypothesis examined whether psychological inflexibility would predict unique variance in PTSD symptom severity in military service members and veterans after accounting for other known risk factors for PTSD. This hypothesis was fully supported in both the full sample as well as the subset of deployed members which allowed for the inclusion of additional factors, namely social support and combat experience. Specifically, psychologically inflexible behavioral repertoires accounted for 18% of the variance in the total sample, and 12% of the variance in the deployed subset of the sample. This finding shows that psychological inflexibility predicts a unique portion of the variance that other risk factors did not account for. This is significant as this finding replicates that of Meyer, La Bash, et al. (2019). Furthermore, these results expand upon the findings of Meyer, La Bash, et al. (2019) by examining psychological inflexibility utilizing a more comprehensive, and arguably more valid, measure of inflexibility.

In addition to accounting for unique variance in PTSD symptom severity, the inclusion of

psychological inflexibility reduced the effect of neuroticism by approximately half in both the full sample and the deployed subset. Psychological inflexibility also decreased the effect of combat experiences when added to the model using the deployed subset. This could indicate that when targeting psychologically inflexible behavior in treatment, it is possible that both neuroticism and combat experiences have less effect on the experience of PTSD symptoms. Specifically, by targeting psychological inflexibility through the use of ACT, the person may also experience less neurotic behavior (e.g., worry, anxiety, and hypervigilance) as well as focus less on past stressful experiences related to combat, however, this relationship could not be explored with the cross-sectional approach utilized in the current study. While historically, the focus of ACT has been to reduce inflexible behavior and increase flexible behavior, perhaps it would be worth considering becoming aware of ways one is inflexible and gain more understanding of whether that behavior is helpful or unhelpful.

Further expanding upon the literature, the examination of the relationship of psychological flexibility relative to PTG in the third hypothesis was also supported. As predicted, psychological flexibility accounted for 9% of unique variance in the overall sample and 6% in the deployed subset that included social support and combat experiences as predictors, as well. This finding was unique to the literature as no other study has examined the relationship between PTG and psychological flexibility, although these results are consistent with the results of Meyer, Kotte, et al. (2019) who found that psychological flexibility predicted trauma-related resilience.

Additionally, in the overall sample, extraversion also predicted PTG, which is consistent with the literature (Tedeschi & Calhoun, 1996). Specifically, extroverted individuals are less likely to avoid situations that may be stressful and more likely to engage with their social support

networks (Tedeschi & Calhoun, 1996). When psychological flexibility was added to the model, both neuroticism and openness to experience were no longer significant predictors of PTSD symptoms. Of note, in the deployed subset when social support and combat experiences were included as predictors, PTSD symptom severity was not a significant predictor of PTG. From a treatment perspective on the predictors of PTG, psychological flexibility may be able to facilitate such personal growth following a traumatic event. This is consistent with the literature, as psychological flexibility includes important aspects of PTG, such as values clarity, experiencing the present moment, and seeing oneself as larger than that of a single experience. Additionally, in comparing psychological flexibility to other predictors of PTG, changing behavior is much easier than changing personality traits, making psychological flexibility a much more pragmatic treatment target.

Finally, the fourth hypothesis analyzed all twelve of the individual components of the Psychological Flexibility Model in relation to both PTSD symptom experience and PTG. Of the components, cognitive fusion, experiential avoidance, inaction, and lack of contact with the present moment were all significant predictors of PTSD symptom severity. Alternatively, values clarity, lack of contact with the present moment, and present moment awareness were significant predictors of PTG. These findings provide partial support for the hypothesis that all twelve components would predict symptoms and growth. While several of the psychologically inflexible components predicted PTSD symptoms, not all inflexible components predicted PTSD symptom severity. Furthermore, PTG was not predicted by each of the flexible components and was also predicted by an inflexible component. It should be noted that stepwise regression analyses rely solely on statistical criteria, and the final model is typically cross validated. Given the sample size in the current study, this was not feasible and still maintain the necessary power and

additional data needs to be collected to validate the final models.

While not all of the psychological inflexible or flexible components significantly predicted PTSD and PTG, respectively, it is important to examine those that were significant predictors and the implications of such. First, the inflexible behaviors that significantly predicted PTSD are all consistent with typical post-trauma reactions. Specifically, cognitive fusion may stem from beliefs one holds regarding the traumatic event, such as believing the world is a dangerous place, that no one is trustworthy, or that one is damaged because of their trauma. Experiential avoidance, or the avoidance of uncomfortable or distressing internal experiences, such as thoughts, memories, emotions that are related to the traumatic event, is a hallmark symptom of PTSD. Such common experiences are intrusive thoughts or memories of the traumatic experience and distressing emotions such as anger, guilt, and shame. Inaction is a failure to engage in values driven behavior, and someone who experiences PTSD may be so focused on their symptoms, past experiences, or future worries that they no longer engage in what is truly important to them. Finally, a lack of contact with the present moment is consistent with reactions to trauma as people tend to ruminate about what they should have or should not have done at the time of the event and focus on future worries regarding safety and security.

Although symptom reduction is not a primary goal of ACT, it can be a second-order effect of engaging in a values-consistent life. By targeting these areas in treatment and making efforts to reduce these inflexible behaviors, perhaps treatment could have the greatest impact on the experience of PTSD symptoms and increase life fulfillment and trauma recovery more effectively. Furthermore, instead of simply attending to the reduction of psychologically inflexible repertoires in treatment, but also attending to how the individual responds to introducing the psychologically flexible counterparts to these components may provide insight

into the individual's recovery.

Regarding PTG, the three significant predictors from the psychological flexibility model also are consistent with the literature. To develop personal growth following a traumatic event, the event must be significant enough to challenge previously held beliefs and values (Davis & Nolen-Hoeksema, 2009). This would be observed in values clarity where the experience of a traumatic event may provide a kind of incentive for developing depth and conviction about one's values. Additionally, a lack of contact with the present moment, while intuitively seems to counter the development of PTG, this may be indicative of deliberate rumination found in the Trauma and Transformation Model of PTG (Tedeschi & Calhoun, 2004). In order to challenge pre-trauma beliefs and values, one must deliberately think about the effect the trauma has had on their life. Conceivably this may be beneficial even though it seems characteristic of a focus away from the present sensory environment. However, present moment awareness was also a significant predictor of PTG, which supports that two different forms of attention, deliberate rumination and attending to the present moment, are at play here. For PTG to develop, one may need to have awareness of their internal experiences, to include thoughts and emotions in order to develop an appreciation of life and new possibilities that are available post-trauma.

It was proposed that PTG could be promoted in individuals, specifically in military service members and veterans (Tedeschi & McNally, 2011). This facilitation could be a product of increasing psychological flexibility and decreasing inflexibility, though it is unclear whether inflexibility is a precursor to psychopathology or a result of trauma (Kashdan & Rottenberg, 2010). What is understood is that those who engage in psychologically flexible behaviors also exhibit less distress in psychopathology (Kashdan & Rottenberg, 2010). As discussed above, the goal of ACT is to increase psychologically flexible repertoires, while decreasing inflexible

behaviors. It is possible that this increase in flexible behavioral repertoires could increase one's likelihood in developing growth following a traumatic event.

The results of this study mostly support this assertion. So, while a certain amount of distress is necessary to develop personal growth, focusing on specific areas in ACT may facilitate such growth. First, facilitation of values clarity will help one to see what is important to them post-trauma. This is important as what is important to a person will likely change in the event of a traumatic experience and people in general tend not to be specific in the identification of their values. Furthermore, present moment awareness may be more nuanced than previously believed in regard to PTG. Specifically, if deliberate rumination is important to developing growth, focusing solely on present moment experiences may be an obstacle to PTG. Whereas allowing for deliberate rumination in the context of being aware of those thoughts in the moment may have the desired outcome of growth. Overall, it would seem as though a majority of rumination in the current sample was not focused on values clarity, as evidenced by the medium negative association between values and having a lack of contact with the present moment (r = -.37, p <.001). However, the measure of having a lack of present moment awareness does not explicitly focus on the reason for such behavior, meaning that it does not adequately account for worry (typically associated with anxiety) or automatic or intrusive rumination (typically associated with depression), let alone deliberate rumination (attributed with PTG). As such, more specificity would be needed to assess the reasons why having a lack of present moment awareness predicted PTG in the current sample.

The implications of this study on clinical applications suggest that ACT potentially offers a way to facilitate personal growth. Between the findings of Meyer, Kotte, et al. (2019) that psychological flexibility predicts unique variance in trauma-related resilience, and that of the

current study where psychological flexibility predicted unique variance in PTG, the evidence for facilitation of PTG is strengthened. Provided the results of the current study found that values clarity, lack of contact with the present moment, and present moment awareness all predicted growth, by focusing on these domains, it is possible that one could increase the likelihood of experiencing posttraumatic growth. While there is some evidence that other trauma-focused treatments (i.e., PE) facilitate an increase in PTG (Hagenaars & van Minnen, 2010), given the other obstacles observed with frontline PTSD treatments (i.e., attrition and non-response), utilizing the psychological flexibility model may be more appealing. Additionally, ACT may offer benefits to other evidence based psychotherapies (EBPs) for PTSD, such as PE and CPT. It was observed that cognitive fusion, avoidance, inaction, and lack of contact with the present moment predicted PTSD in the current study. It may be important for clinicians to use ACT interventions such as defusion, acceptance or willingness, committed action, and present moment awareness to increase flexible behaviors in the treatment of PTSD. Alternatively, clinicians could incorporate these aspects into current EBPs. However, these assertions would certainly need further examination to understand any causal relationships, if they exist.

Limitations and Future Directions

Despite the best efforts of researchers, research projects each have their limitations, and this study is no different. Methodological limitations to this study limit the implications that can be made. These limitations include cross-sectional methodology, internet-based data collection, utilization of a subclinical sample, and the lack of a Criterion A assessment. The focus of this section is to examine each of these limitations and ways future investigations can expand the findings of the current study.

The first limitation to discuss is the adoption of a cross-sectional design. This limits the

ability to make causal inferences regarding the data. The relationships found in this study are a first step in the examination of the psychological flexibility model and are a foundation in which further research using an experimental method could be used. Using an internet-based convenience sample is another area that could be improved in future investigations. This approach was selected as it was the best approach given the resources available to reach the population of interest. Another consideration is that of a sample with more advanced education than that of the population. This could result in inconsistencies between the sample and the population that reflect different approaches to both trauma related distress and personal growth relative to flexible behaviors. Specifically, individuals with less formal education are at greater risk of developing PTSD (Brewin et al., 2000), thus the increased education level of the sample likely reduced the likelihood of distress experienced by the current sample. Looking forward, researchers might recruit directly from military and veteran organizations, including the Veterans Administration.

Furthermore, attrition rates were high, however, the attrition rates of the current study resembled other methodologically similar studies (Dillman et al., 2014). Another limitation of the current study is the utilization of a subclinical sample in the assessment of a clinical experience. It is acknowledged that there is a possibility that the results of this study may not generalize to a clinical sample. Given the internet-based methods used, an accurate assessment of clinical presentations was not feasible. In a different setting where veterans and military service members are available, a clinical assessment using a structured interview to verify specific traumatic events and symptom presentations in the diagnosis of PTSD could be achieved. Furthermore, the purpose of this study was to examine the full range of experiences, from fully functional to dysfunctional presentations. Thus, the utilization of a non-clinical sample was more

appropriate for the research question being investigated; a clinical sample may have restricted the range of experiences and limited the ability to detect the relationships that were hypothesized.

Finally, another limitation included the assessment of Criterion A of PTSD (American Psychiatric Association, 2013), or lack thereof in the current study. Criterion A is the requirement to experience a specific event that meets criteria of a traumatic experience. This includes experiencing, witnessing, or learning about such an event experienced by a close family member or friend, or being repeatedly exposed to trauma stories as part of one's job in relation to PTSD (American Psychiatric Association, 2013). There is a great amount of debate over the requirement of Criterion A for PTSD (Holmes, Facemire, & Da Fonseca, 2016; Kubany, Ralston, & Hill, 2010; O'Donnell, Creamer, McFarlane, Silove, & Bryant, 2010), and some feel that the definition provided by DSM-5 is too restrictive, meaning that individuals can experience events that do not meet the threshold of criterion A and still experience symptoms similar to PTSD (Briere & Scott, 2006). This likely results in individuals not getting treated for the traumatic stress reaction. Additionally, the definition of a traumatic event was recently changed with the update to DSM-5 due to research examining the emotional component of trauma exposure (Brewin et al., 2009). Furthermore, recent research examining the symptom severity relative to different traumatic experiences found that, although different symptom patterns are exhibited by individuals, differences in PTSD symptom severity did not significantly differ between those who had experienced a Criterion A event and those who had not (Franklin, Raines, & Hurlocker, 2019). This suggests that the results of the current study would likely remain consistent had Criterion A been assessed.

Summary and Conclusion

In summary, the efficacy of using ACT in the treatment of PTSD is as of yet uncertain (American Psychological Association, 2017). However, the results of the current study suggest that self-reported markers of psychological inflexibility are consistent with PTSD symptom severity and that markers of psychological flexibility are consistent with post-traumatic growth among individuals with a trauma history. The results of the current study replicated previous findings that psychological inflexible behavioral repertoires predict unique variance in PTSD symptom presentation (Meyer, La Bash, et al., 2019). As an extension to the work of these researchers, the current study extended their findings through an examination of psychological flexibility predicting unique variance in PTG beyond other predictors. This coincides with the work of Meyer, Kotte, et al. (2019) who found that psychological flexibility predicted PTSD-related resilience beyond other predictors.

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APPENDIX A

DEMOGRAPHICS AND MILITARY SERVICE QUESTIONNAIRE

1) Have you ever served in the military?
   - o Yes
   - o No
   - o Unsure

For the responses of "No" and "Unsure," skip to the end of the survey.

2) What year did you join the military? *(YYYY)*

   _____

3) Are you currently serving in the military?
   - o Yes
   - o No

For the response of "No," skip to Question 5.

4) What year did you join the military? *(YYYY)*

   _____

5) What branches of the military have you served in?
   (Select all that apply)
   - □ Air Force
   - □ Army
   - □ Coast Guard
   - □ Navy
   - □ Marine Corps

6) What components have you served in?
   (Select all that apply)
   - □ Active Duty
   - □ Reserve
   - □ National Guard

7) What was the highest pay grade you achieved?
   (i.e., E-4, E-8, O-2, O-4, etc.)

   _____

8) What was your job (i.e., MOS, AFSC, NEC)?
   (Please list each if you held more than one)

   _____

9) Have you been deployed?
   - o Yes
   - o No

For the response of "No," skip to Question 18.

10) How many times were you deployed to a combat zone?
(Indicate the number of times you deployed with a numerical value)

_____

11) What duties did you perform on your deployments?

_____
_____

12) To which combat zone were you deployed?
(Select all that apply)
   - ☐ Iraq
   - ☐ Afghanistan
   - ☐ Syria
   - ☐ Other *(Please specify)*

_____

13) In what year did you return from your last deployment? *(YYYY)*

_____

14) Did you experience a combat event?
(i.e., IED, direct fire, indirect fire)
   - o Yes
   - o No

For the response of "No," skip to Question 16.

15) Which type of combat event did you experience?

	Yes	**No**	**Unsure**
IED	o	o	o
Direct Fire	o	o	o
Indirect Fire	o	o	o
Other: *(Please indicate what combat-related event)* _____	o	o	o

16) Did you experience a combat-related event?
(e.g., civilians or enemy combatants killed, destroyed homes or infrastructure, etc.)
   - o Yes
   - o No

For the response of "No," skip to Question 18.

17) Which type of combat-related event did you experience?

	Yes	No	Unsure
Civilians killed	o	o	o
Enemy combatants killed	o	o	o
Destroyed homes	o	o	o
Destroyed infrastructure	o	o	o
Other: *(Please indicate what combat-related event)* _____	o	o	o

18) What is your date of birth?
(format: MM/DD/YYYY)

_____

19) What is your sex?
- o Female
- o Male
- o Other *(Please specify)*: _____

20) Which state do you currently call home? _____

21) Last year, what was your total family income from all sources, before taxes?
- o Less than $10,000
- o $10,000 to $19,999
- o $20,000 to $29,999
- o $30,000 to $39,999
- o $40,000 to $49,999
- o $50,000 to $59,000
- o $60,000 to $74,999
- o $75,000 to $99,999
- o $100,000 to $149,999
- o $150,000 or more

22) Are you in college?
- o Yes
- o No

23) What is your current education level?
- o High school diploma or GED
- o Some College but no degree
- o Associate Degree
- o Bachelor's Degree
- o Master's Degree
- o Doctoral Degree or its equivalent *(e.g., DDS, JD, MD, PhD)*

24) Which of the following groups best describes your ethnicity?
(Select all that apply)

- ☐ American Indian/Alaskan Native
- ☐ Asian
- ☐ Black or African American
- ☐ Hispanic or Latino/Latina
- ☐ Native Hawaiian or another Pacific Islander
- ☐ White, non-Hispanic
- ☐ Other *(Please specify)*: _____

25) What is your mother's (or female guardian's) highest level of education *(i.e., highest degree she completed)*?

- o Less than High School
- o GED
- o High School Diploma
- o Some College but no degree
- o Associate Degree
- o Bachelor's Degree
- o Master's Degree
- o Doctoral Degree or its equivalent *(e.g., DDS, JD, MD, PhD)*
- o Do not know
- o Not applicable

26) What is your father's (or male guardian's) highest level of education *(i.e., highest degree he completed)*?

- o Less than High School
- o GED
- o High School Diploma
- o Some College but no degree
- o Associate Degree
- o Bachelor's Degree
- o Master's Degree
- o Doctoral Degree or its equivalent *(e.g., DDS, JD, MD, PhD)*
- o Do not know
- o Not applicable

APPENDIX B

FIRST CONTACT EMAIL INVITATION CORRESPONDENCE

From: Dustin Seidler <dustin.seidler@siu.edu>
Sent: <Date and Time Email Sent>
To: <Insert Participant's Email>
Subject: Research Request: Veterans Mental Health Study

Dear <Insert Participant's Name>,

I am contacting you to ask for your help in an important study that I am conducting with current and former military service members. You are part of a random sample of veterans at SIU that has been chosen to complete a questionnaire about your experiences. Your email address was provided by the Office of Military Services. I am especially interested in how your experiences in the military has affected your well-being.

This is a short survey and should not take more than about 30 minutes to complete. To begin the survey, simply click on this link:

<Insert Survey Link>

And then type in the following access code:

Access Code: <Insert Unique Access Code>

I am also a veteran, and I have been working throughout my doctoral studies to better understand mental health aspects of serving in combat operations. To show appreciation for your participation, you will be entered in a drawing to receive a $50 Amazon gift card.

Your participation in this survey is completely voluntary and all of your responses will be kept confidential. If you come to a question you prefer not to answer, you are welcomed to skip it and go on to the next, though completing the survey in full will be the most useful in understanding your experiences.

If you do not want to participate in this survey and do not want to receive any further invitations please click the following link: <Opt Out>

If you do not respond to this survey or return the opt-out message, you will be contacted again with this request three times during the next six weeks. Should you have any questions or comments, please contact me at dustin.seidler@siu.edu.

I very much appreciate your help with this project. Thank you for participating in this study! It is only through the help of individuals like you that the mental health concerns of veterans can be better understood and addressed.

Sincerely,

Dustin A. Seidler, M.A.
Doctoral Candidate, Clinical Psychology
Department of Psychology
Southern Illinois University - Carbondale
Email: dustin.seidler@siu.edu

This project has been reviewed and approved by the SIUC Human Subjects Committee. Questions concerning your rights as a participant in this research may be addressed to the Committee Chairperson, Office of Sponsored Projects Administration, Southern Illinois University, Carbondale, IL 62901-4709. Phone (618) 453-4533. E-mail siuhsc@siu.edu

APPENDIX C

SECOND CONTACT EMAIL REMINDER CORRESPONDENCE

From: Dustin Seidler <dustin.seidler@siu.edu>
Sent: <Date and Time Email Sent>
To: <Insert Participant's Email>
Subject: Research Request: Veterans Mental Health Study

Dear <Insert Participant's Name>,

Earlier this week I sent you an email, provided by the Office of Military Services, asking for your help in an important study of current and former military service members to learn about some of the aspects of your life and experiences in the military.

I hope that by providing you with a link to the survey website will make it easier for you to respond. To begin this short survey, simply click on this link:

<Insert Survey Link>

And then type in the following access code: <Insert Unique Access Code>

Your responses to this survey are very important and will be greatly helpful to gaining a better understanding of the problems military service members and veterans face upon returning from deployments. As a veteran, I have striven to continue my service through gaining a better understanding of what veteran's endure upon returning from deployment, and I'm hoping you will continue to serve other veterans like you by completing this survey.

Your response is completely voluntary and I appreciate your considering my request.

Sincerely,

Dustin A. Seidler, M.A.
Doctoral Candidate, Clinical Psychology
Department of Psychology
Southern Illinois University - Carbondale
Email: dustin.seidler@siu.edu

This project has been reviewed and approved by the SIUC Human Subjects Committee. Questions concerning your rights as a participant in this research may be addressed to the Committee Chairperson, Office of Sponsored Projects Administration, Southern Illinois University, Carbondale, IL 62901-4709. Phone (618) 453-4533. E-mail siuhsc@siu.edu

APPENDIX D

THIRD CONTACT EMAIL REMINDER CORRESPONDENCE

From: Dustin Seidler <dustin.seidler@siu.edu>
Sent: <Date and Time Email Sent>
To: <Insert Participant's Email>
Subject: Help us Understand Veterans' Mental Health: Research Request

Dear <Insert Participant's Name>,

Recently, I sent you an email asking you to complete a survey about how veteran's experiences affect their mental health. If you have already completed this survey, I would like to thank you very much. I truly appreciate your help.

If you have not completed the questionnaire yet, I'd like to encourage you to do so. I believe it should only take about 20-30 minutes to complete. Simply click the link below and use your access code to begin answering questions.

<Insert Survey Link>.
Access Code: <Insert Unique Access Code>

As a fellow veteran, I understand that every veteran's experiences differ and that has an effect on their thoughts and emotions. For the results of this study to be useful, it is very important that I hear from veterans with a great variety of experiences. This will ensure that I can accurately identify the factors that influence veterans' mental health, overall, and help the greatest number of fellow veterans.

Thanks so much for considering my request. Should you have any questions about participating in this study, you may contact Chad Drake, the supervisor of this study, at chad.drake@siu.edu.

Sincerely,

Dustin A. Seidler, M.A.
Doctoral Candidate, Clinical Psychology
Department of Psychology
Southern Illinois University - Carbondale
Email: dustin.seidler@siu.edu

This project has been reviewed and approved by the SIUC Human Subjects Committee. Questions concerning your rights as a participant in this research may be addressed to the Committee Chairperson, Office of Sponsored Projects Administration, Southern Illinois University, Carbondale, IL 62901-4709. Phone (618) 453-4533. E-mail siuhsc@siu.edu

APPENDIX E

FINAL CONTACT EMAIL REMINDER CORRESPONDENCE

From: Dustin Seidler <dustin.seidler@siu.edu>
Sent: <Date and Time Email Sent>
To: <Insert Participant's Email>
Subject: Last Chance to Help us Understand Veterans' Mental Health: Research Request

Dear <Insert Participant's Name>,

Earlier this month, I sent you an email requesting your participation in a study of veteran's experiences and how they affect their mental health. The study is almost over, and I plan to start analyzing the results of this study next week. Therefore, I wanted to follow-up one last time to provide you with every opportunity to share your experiences with me. I hope that the results will be useful to understanding how veterans' experiences affect their mental health, potentially identifying ways to improve veteran's mental health.

Just click the link below and enter your personal access code listed below to be logged onto the website.

<Insert Survey Link>
Access Code: <Insert Unique Access Code>

Thank you again for considering my request. I know that your time is limited, so I truly appreciate your help.

Sincerely,

Dustin A. Seidler, M.A.
Doctoral Candidate, Clinical Psychology
Department of Psychology
Southern Illinois University - Carbondale
Email: dustin.seidler@siu.edu

This project has been reviewed and approved by the SIUC Human Subjects Committee. Questions concerning your rights as a participant in this research may be addressed to the Committee Chairperson, Office of Sponsored Projects Administration, Southern Illinois University, Carbondale, IL 62901-4709. Phone (618) 453-4533. E-mail siuhsc@siu.edu

APPENDIX F

APPRECIATION EMAIL CORRESPONDENCE

From: Dustin Seidler <dustin.seidler@siu.edu>
Sent: <Date and Time Email Sent>
To: <Insert Participant's Email>
Subject: Thank You for Helping to Understand Veterans' Experiences

Dear <Insert Participant's Name>,

I received your response to the study that I am conducting and wanted to take a moment to personally thank you for your participation. With your help, I hope to gain a better understanding of how veterans' experiences affect their mental health. If you would like a summary of the findings of this study, please send me an email at dustin.seidler@siu.edu, and I would be happy to share this with you. Take comfort in knowing that you were instrumental in the success of this study. I truly appreciate your help.

Sincerely,

Dustin A. Seidler, M.A.
Doctoral Candidate, Clinical Psychology
Department of Psychology
Southern Illinois University - Carbondale
Email: dustin.seidler@siu.edu

This project has been reviewed and approved by the SIUC Human Subjects Committee. Questions concerning your rights as a participant in this research may be addressed to the Committee Chairperson, Office of Sponsored Projects Administration, Southern Illinois University, Carbondale, IL 62901-4709. Phone (618) 453-4533. E-mail siuhsc@siu.edu

APPENDIX G

SOCIAL MEDIA POST INVITATION CORRESPONDENCE

I am a 3x Iraq veteran and I'm working on my doctorate to become a clinical psychologist. This project is examining veterans' experiences during and after their service. Please help me and the many veterans suffering out by completing my survey. The overview is listed below:

There are many who want to bring awareness to Veterans' mental health, including the 22 pushups a day to bring awareness for the 22 Veteran suicides that happen each day. Here is an opportunity to actually help us better understand the mental health struggles that many veterans experience – and it will only take about 30 minutes of your day. Bringing awareness to these issues is essential, but the first step is helping to answer the questions. I am a 3-time veteran of the war in Iraq and am currently doing research investigating the effects of military life on veterans' mental health as a part of my doctoral dissertation, and I cannot do it without your help. Just select the link below to help me find answers to these very important questions, and for your trouble you may receive a $50 Amazon gift card.

<Insert Survey Link>

Your participation in this survey is completely voluntary and all of your responses will be kept confidential. You must be 18 years old or older to participate. I very much appreciate your help with this project. It is only through the help of individuals like you that the mental health concerns of veterans can be better understood and addressed. If you see how this study will be useful to veterans, please share this on your page with veterans you know.

Should you have any questions or comments, please contact me at dustin.seidler@siu.edu or Dr. Chad Drake, the supervisor of this study, at chad.drake@siu.edu.

This project has been reviewed and approved by the SIUC Human Subjects Committee. Questions concerning your rights as a participant in this research may be addressed to the Committee Chairperson, Office of Sponsored Projects Administration, Southern Illinois University, Carbondale, IL 62901-4709. Phone (618) 453-4533. E-mail: siuhsc@siu.edu

APPENDIX H

INFORMED CONSENT

This is a brief study being conducted by Dustin Seidler, a graduate student in the Psychology Department at Southern Illinois University-Carbondale, to gather information on how people differ from one another in terms of their experiences and how these experiences affect their mental health.

Your participation in this study is completely voluntary and you may stop participating at any time by simply closing your browser window. If you choose to participate in the study, completing the questionnaires will only take approximately 30 minutes of your time.

You will be entered in a drawing to receive a $50 Amazon gift card as compensation for completing all of the surveys. One gift card will be awarded to one out of every 50 participants. You may exit the survey at any time, but you need to complete the entire set of surveys in order to receive this compensation.

To participate in this study, you must be a current military service member or a veteran, who has deployed in support of combat operations. All of your responses will be kept confidential within reasonable limits. Your data will be identified only by a participant number. This number will not be associated with your name or other identifying information. Only those faculty and graduate students directly involved with this project will have access to the data you provide. We will take all reasonable steps to protect your identity.

If you have any questions about this study, or how your information may be used, please contact:

Dustin A. Seidler, M.A.
Doctoral Candidate, Clinical Psychology
Department of Psychology
Southern Illinois University
Carbondale, IL 62901-6502
dustin.seidler@siu.edu

Chad E. Drake, Ph.D.
Associate Professor of Psychology
Department of Psychology
Southern Illinois University
Carbondale, IL 62901-6502
chad.drake@siu.edu

Thank you for taking the time to participate in this research.

I have read the above consent form and any questions I may have were answered to my satisfaction. By entering my Personal Access Code below and selecting the “arrow” button below, I agree to participate in this study and realize I may withdraw at any time without prejudice by closing my web browser.

This project has been reviewed and approved by the SIUC Human Subjects Committee. Questions concerning your rights as a participant in this research may be addressed to the Committee Chairperson, Office of Sponsored Projects Administration, Southern Illinois University, Carbondale, IL 62901-4709. Phone (618) 453-4533. E-mail siuhsc@siu.edu

Please enter your Personal Access Code from email invitation you received below.

APPENDIX I

DEBRIEFING FORM

Veteran's Well-Being Study
Fall 2018
Principal Investigator: Dustin A. Seidler, M.A.

Psychology is a science that attempts to understand and explain why people think, feel, and act the way they do. This is often accomplished using surveys like the ones you just completed. The survey asked you many questions about different ways you may sometimes feel, different attitudes you may have, and different behaviors or activities you may sometimes engage in. By looking for similarities in responses across people, psychological researchers can begin to understand the possible connections and relationships between peoples' attitudes, beliefs, and characteristic ways of acting or feeling. This allows researchers to develop new theories and hypotheses that can be tested in future research.

In psychological research, it is also sometimes necessary and helpful to study people with specific characteristics more closely. The study you just participated in is looking at a number of different concepts affecting the military and veteran population. Recently, research has noted that service members who are more psychologically flexible suffered less distress than those who were more psychologically inflexible. Psychological flexibility is defined as the ability to accept the emotional experiences, without avoidance, while still being able to pursue the goals one has even while undergoing distressing thoughts and emotions.

Sometimes, following the experience of distressing events, some people undergo personal growth rather than continued distress. This growth is typically experienced in the way they perceive their personal strength, how they relate to others, being able to see new possibilities and appreciation of life, and spiritual or existential change. This project hopes to investigate this phenomenon more closely. Such close study of these types of experiences allow psychologists to better understand the reasons why people behave the way they do under different circumstances.

Thank you for participating in this research study. If you have any further questions, or would like a summary of the results of this study, please contact Dustin Seidler in the Southern Illinois University - Carbondale Psychology Department at dustin.seidler@siu.edu or his Research Advisor, Dr. Chad Drake, at chad.drake@siu.edu.

This project has been reviewed and approved by the SIUC Human Subjects Committee. Questions concerning your rights as a participant in this research may be addressed to the Committee Chairperson, Office of Sponsored Projects Administration, Southern Illinois University, Carbondale, IL 62901-4709. Phone (618) 453-4533. E-mail siuhsc@siu.edu

APPENDIX J

PERMISSION TO REPRINT THE LIFE CRISES AND PERSONAL GROWTH MODEL

From: Rudolf H. Moos rmoos@stanford.edu
Subject: RE: Request: Life Crises and Personal Growth Model
Date: May 18, 2020 at 6:53:51 PM
To: Seidler, Dustin A dustin.seidler@siu.edu

[EXTERNAL EMAIL ALERT]: Verify sender before opening links or attachments.

Dustin Seidler,

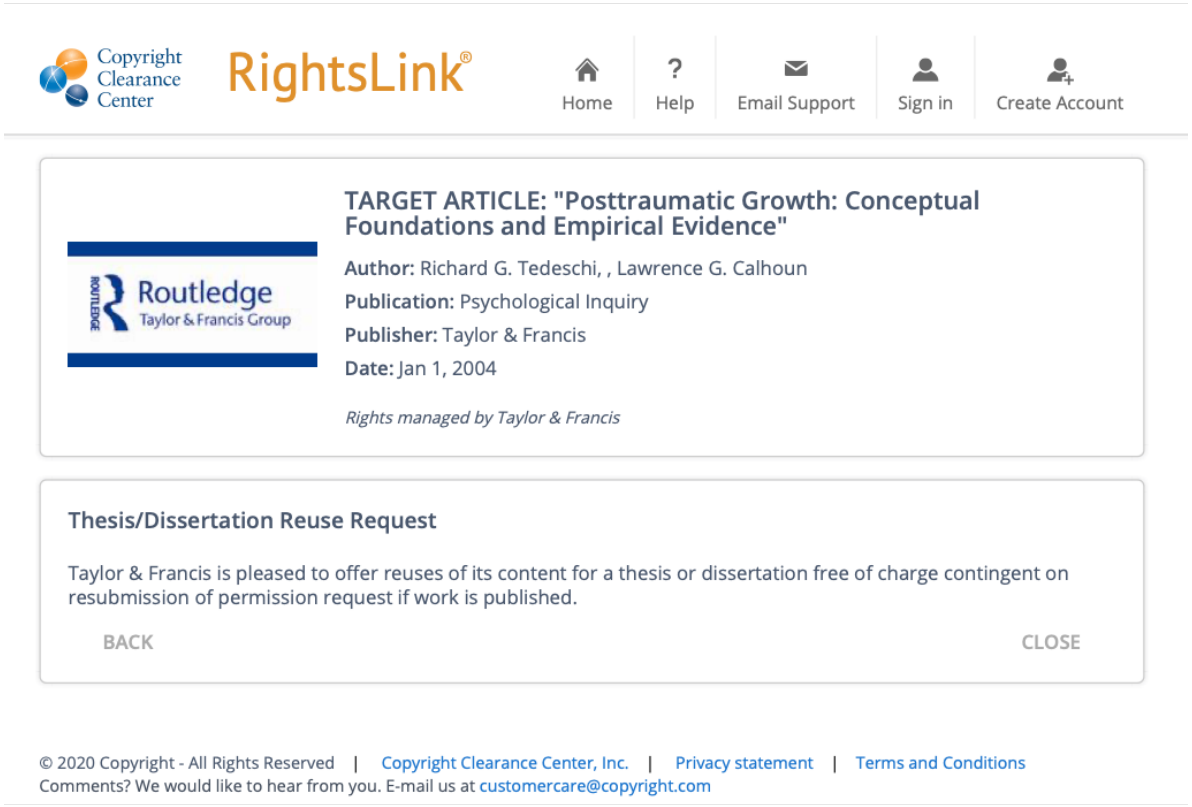
I am pleased to give you permission to include the figure depicting the Life Crises and Personal Growth Model in your dissertation.

Good luck with your work.

Rudolf Moos, Ph.D.,
Professor Emeritus
Department of Psychiatry and Behavioral Sciences
Stanford University School of Medicine
Palo Alto, California

APPENDIX K

PERMISSION TO REPRINT THE TRAUMA AND TRANSFORMATION MODEL



VITA

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Dustin A. Seidler

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Bachelor of Arts, Psychology, May 2014

Southern Illinois University Carbondale
Master of Arts in Psychology, December 2016

Special Honors and Awards:

- Graduate Student Research Award Nominee, Southeast Psychological Association – Annual Meeting, 2020
- Outstanding Graduate Teaching Assistant Nominee, College of Liberal Arts – Southern Illinois University-Carbondale, 2018
- Career Development Award, Graduate and Professional Student Council – Southern Illinois University-Carbondale, 2017
- Honors Graduate, Department of Psychology – George Mason University, 2014
- Outstanding Community/Campus Leader Award, Honorable Mention – George Mason University, 2014

Dissertation Paper Title:

Examining Relations among Positive and Negative Metrics of Psychological Flexibility and Positive and Negative Outcomes of Exposure to Trauma

Major Professor: Chad E. Drake, Ph.D.

Publications:

Seidler, D. A., Stone, B., Clark, B. E., Koran, J., & Drake, C. E. (in press). Evaluating the factor structure of the Multidimensional Psychological Flexibility Inventory: An independent replication and extension. *Journal of Contextual Behavioral Science*.

Najera, E., Landoll, R., Swisher, S., Bartone, P. T., …, Seidler, D. A., & Bowles, S. V. (2017). Stress and resilience in military married couples. In S. V. Barlow & P. T. Bartone (Eds.), *Military Psychology: Clinical and Organizational Practice*. (pp. 157-175). New York, NY: Springer.

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