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# The Impact of Trauma Experience, Adverse Early Circumstances and Unit Cohesion on Posttraumatic Growth in Active Duty Service Members

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The Impact of Trauma Experience, Adverse Early Circumstances and Unit Cohesion on  
Posttraumatic Growth in Active Duty Service Members

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A dissertation submitted in partial fulfillment

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In

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347 words

### Abstract

Active duty service members are regularly exposed to highly traumatic events. Commonly, individuals exposed to trauma experience positive changes as a result of the trauma they experienced. The likelihood of these changes occurring can be positively or negatively influenced by characteristics of the event itself, the biopsychosocial history of the service member, and the availability of internal and external coping resources. The present study aimed to evaluate how threat to life during a traumatic event influences posttraumatic growth using a sample of active duty service members ( $N = 818$ ). Participant's ranged in age from 19 to 54 ( $M = 26.5$ ) and were predominantly male (97.7%) and Caucasian (66.8%). The military rank of participants ranged from E-1 to O-6 with the average rank falling between E-5 and E-6, and participants reported being deployed an average of 1.89 times. This sample consisted of archival data collected by the United States Army as part of the Post Deployment Health Reassessment. In addition to examining the effect of threat to life on posttraumatic growth, the present study also evaluated the moderating effects of adverse childhood experiences and unit cohesion. These moderators were included in order to provide better understanding of mechanisms which facilitate or hinder posttraumatic growth, and to identify targets for intervention. Results indicated that threat to life ( $b = 1.72, t [804] = 1.98, p = .048$ ), and unit cohesion ( $b = .415, t [804] = 5.26, p < .001$ ) both significantly predict posttraumatic growth, and that adverse childhood experiences may decrease the strength of the relationship between threat to life and posttraumatic growth. This moderation effect approached, but fell short, of significance ( $b = -.65, t [804] = -1.62, p = .095$ ). The moderating effect of unit cohesion was not significant ( $b = .012, t [804] = .342, p = .732$ ). These results emphasize the importance of assessing for pre-military

factors which may increase service member vulnerability, intervening to increase adaptive coping skills of service members, assessing and taking steps to strengthen unit relationships, and developing policy and strategy which allow units to stay together pre and post deployment.

## Chapter I: Introduction

The purpose of this study is to examine how adverse childhood experiences moderate the relationship between traumatic exposure and posttraumatic growth in a sample of United States service members exposed to combat trauma. Additionally, this study will investigate how unit cohesion moderates the influence of these adverse childhood experiences on posttraumatic growth. Posttraumatic growth represents positive inter and intrapersonal changes which an individual may experience following trauma, and which exceed previous levels of development (PTG; Tedeschi & Calhoun, 1996). Much time has been spent researching the negative consequences of trauma, and scientists and philosophers have recognized the existence of negative mental health reactions to traumatic events dating back to ancient Greece. Perhaps equally common in historical texts however are sentiments about positive changes which occur as a result of trauma exposure (Tedeschi & Calhoun, 1995). Interestingly, these positive outcomes have received much less attention in empirical research. Consequently, therapeutic modalities intended to facilitate recovery following trauma are often centered on the idea of moving an individual from a place of psychological distress back to baseline, rather than working to promote growth. By focusing on promoting growth in treatment, the quality of life of service members may be improved even as they continue to suffer from symptoms of posttraumatic stress (Martz, Livneh, Southwick, & Pietrzak, 2018; Tsai, El-Gabalawy, Sledge, Southwick, & Pietrzak, 2015).

Recent research, however, indicates that trauma survivors can hope for more than just a return to baseline. Studies of active duty and veteran military populations, cancer survivors, traumatized children, and victims of natural disasters have recognized that for certain individuals, surviving a traumatic experience can result in psychosocial benefits (Tedeschi &

Calhoun, 2004). Over the last twenty-five years, there has been a push for a greater understanding of growth following trauma and the factors that predict this growth or alter the magnitude in which it occurs. Spearheading much of this research, Tedeschi & Calhoun (1996), coined the term posttraumatic growth, which describes the strengthening of self-perception, interpersonal relationships, and philosophy in life that occurs in response to surviving traumatic events. This strengthening does not merely represent a return to baseline after psychological functioning has been compromised by trauma, but rather attaining previously unfamiliar levels of positive development.

Exposure to traumatic events and the resulting cognitive processes are said to be the catalysts for growth (Tedeschi & Calhoun, 2004). However, not everyone who is exposed to trauma experiences growth, and individuals often have different reactions to the same traumatic events. Nearly everyone experiences some psychological discomfort in response to trauma, however the degree and longevity of this distress varies from person to person. Individuals who are particularly resilient often maintain a relatively healthy level of functioning despite being exposed to traumatic events (Bonanno, 2005). For others, who experience a more significant initial reaction to trauma, three outcomes are possible: recovery to baseline functioning, pathology, and posttraumatic growth (PTG). PTG can occur in concert with either normal recovery or pathology, provided the individual was significantly distressed by the events, at least initially (Tedeschi & Calhoun, 2004).

In working to increase understanding of factors which produce growth, much of the research has focused on characteristics of the traumatic exposure itself, such as the severity as indicated by traumatic stress symptoms following the incident, or the number of events experienced. However, the body of research on the relationship between severity of traumatic



exposure and growth provides conflicting conclusions (e.g., McLean et al., 2013; Morris & Shakespeare-Finch, 2011). PTG research in arenas outside the military has examined the impact of specific types of stressors on PTG as well as the compounding effect of multiple types, and made significant contributions to the literature (Armstrong, Shakespeare-Finch, & Shochet, 2014; Chopko, 2010; Shakespeare-Finch & Armstrong, 2010). As such, it is important to continue this strategy in examining PTG in combat exposed samples by focusing on aspects of the event outside of severity, that is, the degree to which a soldier's life is threatened during the traumatic event itself.

Aside from differences in PTG, which may be the result of the event itself, previous experiences an individual has had may also impact his or her capacity for growth. One such experience may be childhood exposure to adverse life events, which may subsequently compromise an individual's capacity to engage in the cognitive, emotional, and relational processes required for growth. For the purposes of this study, adverse life events will consist of childhood experiences which are considered adverse, and cover a broad range of verbal, emotional, physical, and sexual abuse that a soldier may have witnessed or experienced first-hand prior to the age of 18. These experiences also include neglect, exposure to substance use, and family separation. A study investigating the prevalence of adverse childhood experiences (ACEs) in the family history of service members revealed that in the post-draft era, service members endorsed significantly more adverse childhood experiences than civilians, though this relationship is less significant in female service members (Blosnich, Dichter, Cerulli, Batten, & Bossarte, 2014). In addition, the wide body of research on the impact of adverse childhood experiences has established these experiences as significant predictors for maladaptive life outcomes such as psychiatric disorder, suicide, heart disease, and substance use (Felitti et al.,

1998). What remains unknown, however, is the influence that these experiences might have on a soldier's capacity to experience positive outcomes following trauma. Though not yet explored, research points to adverse childhood experiences having a negative impact on growth. Tedeschi and Calhoun (2004) assert that emotional and relational processing is required for growth. However, research has found that ACEs predict significant disruptions in attachment, which plays a role in the development of each of these processes (Van der Kolk, 2005), with downstream effects producing decreased ability to understand and regulate emotions as well as an increase in the likelihood of interpersonal conflict (Dvir, Ford, Hill, & Frazier, 2014). If there is a negative impact of ACEs on PTG, and ACEs are more common in service members than the general population, then how is PTG still occurring with relative frequency in military populations? One possibility is that another variable is mitigating the negative impact of ACEs on PTG.

Development of strong social connections has been shown as an effective way to mediate the effect of adverse childhood experiences on future physical/psychological health and relationships (Dube, Felitti, & Rishi, 2013). Additionally, social factors such as support, connectedness, and a sense of community have been common targets for research into predictors of PTG (e.g., Schmidt, Blank, Bellizzi, & Park, 2012). In an active duty military context, especially during deployment, a soldier's unit is often the source of such support and sense of membership. In this context the soldier is separated from family and friends, and thus spends all waking hours, including holidays, with members of his or her unit. Unit cohesion has been the target of one study that focused on its ability to predict PTG, and significant results were found (Mitchell, Gallaway, Millikan, & Bell, 2013). However, the strength of this relationship was much smaller than anticipated, which suggests that unit cohesion promotes PTG through an

interaction with other variables. If unit cohesion is indeed protecting against the detrimental effect of ACEs on growth, and ACEs have this effect due to a disruption of cognitive processes typically developed through secure attachments, then one explanation for the protective effect of unit cohesion is that these close relationships are healing attachment wounds through a corrective emotional experience.

While significant efforts have been made to understand the etiology of posttraumatic growth, relatively few studies have been dedicated to the specific factors associated with posttraumatic growth in active duty service members. Studies have been conducted with military veteran samples, however in these studies, significant time may have elapsed between the traumatic event and data collection, and veterans in such samples do not have to contend with stressors unique to life on active duty. These confounds compromise the generalizability of this research to active duty populations. This study will attempt to address some of these confounds by assessing PTG using a sample of active duty service members, who are less than 6 months removed from the deployment during which their traumatic event occurred. As such, time elapsed since the event will be minimized, and the impact of possibly unique active duty stressors will be captured. By evaluating how the negative impact of ACEs on PTG is moderated by unit cohesion in an active duty sample, this study will contribute to the research by increasing our understanding of mechanisms which hinder and promote positive outcomes following combat related traumas.

## Chapter II: Literature Review

### Responding to Trauma: Growth Through Adversity

**Operationalizing Posttraumatic Growth.** Until recently, little research had been done on the positive outcomes of surviving a traumatic event; however, as the positive psychology movement (Seligman & Csikszentmihalyi, 2000) continues to build momentum, more and more research focuses on positive outcomes as well as psychopathology. Starting in the late 20<sup>th</sup> century, Tedeschi and Calhoun formalized research into positive outcomes of trauma and coined the term posttraumatic growth (PTG; 1996). PTG encapsulates the idea that outside of trauma being diffused by resilience, or resulting in an acute or pathological stress response, there is a third possible outcome which can occur in concert with, or separate from, pathology. This third outcome is the possibility for positive bio-psycho-social-spiritual consequences following trauma exposure, in which an individual experiences growth and strengthening in various arenas of his or her life. It is important to note that PTG is not necessarily an alternative to PTSD, as many studies report the co-occurrence of these two responses to trauma. For instance, a recent study on Operation Enduring Freedom and Operation Iraqi Freedom (OEF/OIF) veterans found that PTSD symptoms and PTG were reported simultaneously, with moderate levels of PTSD predicting the largest degree of growth (Mattson, James, & Engdahl, 2018). Even though individuals who endorse PTG also frequently endorse symptoms of PTSD, these individuals also report greater quality of life, better mental functioning, and better general health than their counterparts who endorse PTSD and no PTG (Martz, Livneh, Southwick, & Pietrzak, 2018; Tsai, El-Gabalaway, Sledge, Southwick, & Pietrzak, 2015). Thus, while PTG does not prevent PTSD, it does reduce suffering and it may present as renewed appreciation of life, new possibilities, enhanced personal

strength, improved relationships with others, or spiritual change (Taku, Cann, Calhoun, & Tedeschi, 2008).

Renewed appreciation for life is seen in individuals who have recognized: a shift in their priorities following a traumatic event, renewed or increased sense of their own value, and/or new-found appreciation for life. The new possibilities category of posttraumatic growth is significantly elevated when individuals have developed new interests or a new life path and have recognized the opportunity for a greater purpose following traumatic exposure. This category also includes a recognition of new opportunities and a willingness to make significant lifestyle changes. Growth in terms of enhanced personal strength involves an increase in self-efficacy following a traumatic event and represents individuals who recognize an increased ability to rely on themselves, to handle demanding situations, a capacity to accept outcomes, and a more positive perception of their own strength. Improved relationships with others involve a recognition of an increased willingness to count on and open-up to others, an increase in the amount of compassion one feels for others and holding others in higher esteem in general. Finally, individuals who recognize spiritual growth report a better understanding of their own spirituality, and a strengthening of faith (Tedeschi & Calhoun, 1996).

**Posttraumatic Growth Across Populations.** Evidence for the occurrence of posttraumatic growth has been examined across many populations and types of traumatic experiences. Traumatic experiences related to the physical health of self or a family member have been a common target for PTG research, consistently providing evidence for PTG in this context. In a longitudinal study of breast cancer survivors, for example, women reported significant levels of posttraumatic growth following a battle with cancer, and these reports of growth maintained or increased for at least 18 months following the first report of PTG

(Danahauer et al., 2015). PTG has also been demonstrated as a possible reaction for exposure to natural disaster. Researchers examining PTG in adult survivors of the Wenchuan earthquake found that one year following the incident, 51% of individuals reported PTG (Jin, Xu, Liu, & Liu, 2014). Outside of healthcare and natural disaster, some of the most commonly studied traumas are those related to wartime and terror exposures. In one study, 2,999 Israeli youth who had been exposed to terror related incidents were assessed for posttraumatic stress reactions as well as PTG (Laufer & Solomon, 2006). Although, 41 percent reported posttraumatic stress symptoms, 75 percent reported experiencing growth following the trauma (2006). This relationship between domestic terror exposure and PTG has been seen in several studies across the globe, with incidences of PTG being reported by survivors of the September 11<sup>th</sup>, 2001 terror attacks in the United States as well (Linley, Joseph, Cooper, Harris, & Meyer, 2003). In considering the implications of posttraumatic growth research for working with military populations, however, it is important to look at research that has focused specifically on individuals who have been actively involved in combat. This is because there are unique variables at play for active participants exposed to the trauma of war, compared to individuals who experience trauma because of health challenges, natural disasters, or bystander exposure. For example, individuals who are actively involved in conflict are continually living in an unsafe environment and have the added stress of being separated from family (Rosner & Powell, 2006).

***Posttraumatic growth in the military.*** The study of PTG in combat veterans started to gain significant momentum as veterans of the Vietnam war began seeking healthcare services in increasing numbers. One study of US military veterans who were prisoners of war during the Vietnam conflict provided evidence for the occurrence of sustained posttraumatic growth in military combatants despite the military specific stressors mentioned earlier, and the prolonged

nature of this type of traumatic experience (Feder et al., 2008). Additionally, pilots who flew in the Vietnam war and were captured reported psychological benefits from the ordeal including positive personality change, increased self-confidence, and a reorganization of values to appreciate things that were truly important (Sledge, Boydston, & Rabe, 1980). Reports of PTG related to military combat are not isolated to Vietnam however. A study with a national sample of veterans from conflicts ranging from World War II to the present conflicts in Iraq and Afghanistan found that 50% of the total sample reported PTG and 70% of those with PTSD reported PTG (Tsai et al., 2015). Reports of PTG have also been found in studies specifically focused on modern conflicts. Veterans of the first gulf war for example endorsed a small to moderate degree of growth across the five categories, with appreciation of life being endorsed the most strongly, falling between a moderate and great degree of growth (Maguen, Vogt, King, King, Litz, 2006). Similar reports have even been made in reference to OIF/OEF, the ongoing conflict the US has in the Middle East. Veterans of these conflicts, who sustained a combat related amputation, reported growth across new possibilities, personal strength, appreciation of life, and relating to others, though very little spiritual change was endorsed (Benetato, 2011). It is important to establish the occurrence of growth across conflicts, because as time passes and technology evolves, the nature of traumatic events service members are exposed to changes as well. For example, improvised explosive devices, which were not predominantly used until the early 2000s, are now said to be responsible for half of the United States military casualties sustained during the current conflict (Ursano et al., 2017). With much of the research on Veterans and PTG occurring many years after the traumatic events occurred, time is a significant confound. Unfortunately, there has been very little research on PTG with active duty samples to allow for analysis of the impact of time on perspectives of growth. The active duty research that

has been conducted has established that soldiers deployed to both Iraq and Afghanistan endorse factors of PTG across all five domains (Lee, Luxton, Reger, Gahm, 2010). Additionally, a recent study of Air Force Medical personnel who served in OEF and/or OIF, found that individuals exposed to combat and healthcare stress simultaneously also experienced growth (McLean et al., 2013).

**Critiquing PTG: Genuine Growth or Merely Resilience?** A common critique of posttraumatic growth is that it is really an expression of resilience. Resilience is indicated when, following a trauma, an individual experiences relatively mild psychological consequences, and recovers from these quickly (Bonanno, 2005). Following recovery, the individual then maintains a healthy trajectory. Resilience has been found to be a common response to trauma, with some researchers positing that it is the most common (2005) one. Tedeschi and Calhoun (2004) assert that PTG is a considerably different construct; rather than representing an activation of previously held traits or skills, it represents a change in functioning to levels that had not been realized prior to the trauma exposure. In addition, studies on both former prisoners of war, and Israeli adolescents exposed to wartime traumas have demonstrated that resilience and PTG are not only distinct variables, but are also inversely related (Zerach, Solomon, Cohen, & Ein-Dor, 2013; Levine, Laufer, Stein, Hamama-Raz, & Solomon, 2009). This supports a previous theory from Calhoun & Tedeschi (1998) that to experience PTG, an individual must be negatively impacted by the traumatic exposure; the negative reaction to trauma triggers the cognitive processes leading to PTG. Resilience actually appears to have a buffering effect on the impact of trauma, making PTG less likely. Whether or not the relationship between resilience and PTG is negative, however, may be dependent on temporal construction. Tedeschi (2011) suggests that there is likely a positive relationship between PTG and resilience; however, it is the



experience of growth which leads to increased resilience to future traumas, rather than the other way around. If PTG indeed increases resilience to future traumas, in addition to positively impacting quality of life as mentioned earlier, the importance of an increased understanding of the processes and conditions which promote PTG is clear. Such an understanding begins with an examination of theories on the inter and intrapersonal processes behind the development of PTG.

**Intra and Interpersonal Processes of PTG.** A modern approach to understanding the process of posttraumatic growth has involved a combination of information processing and social cognitive theories of the human response to trauma. The utilization of social-cognitive theories to understand PTG is anchored in the idea that exposure to traumatic events can result in a shattering of individual assumptions which are used as a reference point for understanding the world as well as one's place in it (Janoff-Bulman, 2010; Lindstrom, Cann, Calhoun, & Tedeschi, 2013; Tedeschi & Calhoun, 2004). These assumptions are commonly referred to as core beliefs (Janoff-Bulman, 2010). Whether an individual then experiences a pathological reaction, growth-oriented reaction, or some combination of both following trauma is determined by the social and cognitive techniques they utilize in reconstructing these core beliefs. This reconstruction happens through automatic and deliberate inter and intrapersonal processes such as rumination, affective expression, and social referencing (Resick, 2001; Calhoun & Tedeschi, 2006). It has been suggested that greater degrees of core belief disruption are correlated with greater degrees of growth. (Tedeschi & Calhoun, 2004) and that this breaking down of beliefs, which then requires reconstruction, is the catalyst for growth (2004). Recent research on core beliefs has supported this theory, with several studies indicating that individuals who report the most growth also report the most significant disruption to their belief system following trauma (Lindstrom, Cann, Calhoun, & Tedeschi, 2013; Taku, Cann, Tedeschi, & Calhoun, 2015). This apparent need

for the reconstruction of core beliefs in order to produce growth has led researchers to examine cognitive processes which facilitate such reconstruction. A prominent target in this research has been rumination, which has been defined as recurrent thoughts regarding one's own psychological distress and the related implications (Nolen-Hoeksema, 1991).

***Rumination.*** Intrusive rumination is a common symptom of the traumatic stress reaction, and in the case of PTSD is an indication that an individual's understanding of the trauma may not be fully formed (Taku, Calhoun, Cann, & Tedeschi, 2008). Recently however, researchers have been examining the difference between intrusive and deliberate rumination, with deliberate rumination representing a more intentional process through which an individual attempts to synthesize information necessary for the understanding of the traumatic event (Stockton, Hunt, & Joseph, 2011). While intrusive rumination has been implicated in the development of PTSD, it also appears to precede and motivate deliberate rumination (Brooks, Graham-Hevan, Lowe & Robinson, 2017). Studies on the relationship between deliberate rumination and PTG have produced mixed results, with some studies finding a direct link between deliberate rumination and PTG (Taku, Cann, Tedeschi, & Calhoun, 2009), and others finding no direct relationship (Brooks et al., 2017). This discrepancy indicates that the link between rumination and PTG appears to be affected by the quality of the rumination and the environment within which it occurs. Two aspects which have been found to have an influence on rumination as well as the likelihood of growth are affect regulation and support and input from others. Indeed, Tedeschi & Calhoun (2006) have suggested that affect regulation and the response of social referencing groups to trauma and associated disclosures influence the likelihood of an individual forming positive perceptions regarding the comprehensibility, manageability, and meaningfulness of the event.

*Affect regulation and social referencing.* Affect regulation is important for growth because when an individual who has been exposed to trauma feels overwhelmed by his or her lack of understanding of, or the severity of emotions, the tendency is to avoid the processing of traumatic events (Horowitz, 1986). This suggests that individuals who have difficulty regulating emotions will be less likely to engage in deliberate rumination, and thus less likely to experience PTG. One aspect of affect regulation often involves disclosure of emotions to others, and how others respond, influences whether an individual can regulate his or her emotions and continue to process, or conversely, becomes overwhelmed and avoids (Tedeschi & Calhoun, 2006). It is through this process that supportive relationships also have an impact on the likelihood that the cognitive processing necessary for growth will occur. Should the individual's emotional disclosures be met with similar interpretations or validation in some form by supportive others, the individual will not only be more likely to engage in further processing but will also be more willing to incorporate the perspective of others as he or she makes sense of the event (2006). While willingness to engage in social referencing doesn't guarantee growth due to the possibility of negative conceptualizations offered by others, there is an increased likelihood that the individual will be exposed to positive appraisals regarding the comprehensibility, manageability, and meaningfulness of the event, which may result in the reconstruction of a more adaptive core belief.

Considering the strong influence of social-cognitive processes on the development of PTG, it is important to focus on factors which help or hinder these processes to understand the development of PTG in combat deployed service members. Prior research has attempted to focus on the role of the traumatic event itself in promoting growth, however results have thus far been mixed. As such, further efforts are needed to provide clarity.

**PTG and Traumatic Exposure: A complex relationship**

**Prevalence of Trauma and Response Variability.** Lifetime exposure to at least one traumatic event is exceedingly common world-wide, with a large-scale study of individuals from 24 different countries finding that 70% of the sample of nearly 70,000 people reported at least one traumatic event (Benjet et al., 2016). The United States is certainly no exception, with one large sample study finding that 89.7% of participants endorsed experiencing at least one event which met DSM-5 Criterion A (Kilpatrick et al., 2013), delineating which events classify as “traumatic” and are thus eligible for consideration in a diagnosis of posttraumatic stress disorder (PTSD; American Psychiatric Association, 2013). Events qualify as being “traumatic” if they involve, directly experiencing or witnessing actual or threatened death, serious injury, or sexual violence, learning that these events have happened to a close family member or friend, or being repeatedly exposed to these events, as with first responders (APA, 2013). The United States military, who have been actively involved in violent conflict for most of the twentieth, and the entire twenty-first century, are a common target of trauma research. Much of the focus on United States service members has been on the impact of combat exposure, which has been shown to uniquely predict poor mental health (Donoho, Bonanno, Porter, Kearney, & Powell, 2017). However, exposure to trauma predicts a variety of reactions, from resilience, to disorder, to growth, or some combination of the three.

Many studies have attempted to understand this variability through an examination of trauma severity, assessing either the severity of traumatic stress symptoms or subjective ratings of exposure severity as in the Combat Exposure Scale (Keane et al., 1989). However, this research paints an unclear picture. On the one hand, the relationship between trauma severity and growth has been found to be linear, with greater severity predicting greater growth (Aldwin,

Levenson, & Sprio, 1994; Feder et al., 2008; Jin, Xu, & Liu, 2014; Tedeschi & Calhoun, 1996). On the other hand, this relationship has been shown to be curvilinear, with the highest levels of growth attained at moderate levels of severity (Fontana & Rosenheck, 1998; McLean et al., 2013; Solomon & Dekel, 2007), while several studies found no relationship at all (Powell et al., 2003; Maguen et al., 2006). Although there is a consensus that traumatic exposure is essential for significant growth, analysis of the severity of traumatic exposure does not appear to capture the intricacies of this relationship. One possible explanation may be that PTG is only related to trauma severity up to a certain point, after which other characteristics of the event have a greater influence on the magnitude of PTG. Essentially once an event is “traumatic enough” to produce growth, other factors determine the phenotype. Additionally, while it has been established that an individual must experience psychological distress to experience significant PTG, it has not been established that this distress must persist over a long period of time. Measuring psychological distress after a significant amount of time has passed, and then using this data to predict PTG, may fail to capture the influence of acute distress on PTG. As such, rather than predicting PTG from posttraumatic stress symptoms, this study will control for those symptoms and instead examine the influence of other traumatic event characteristics. This approach will facilitate an examination of PTG across service members who either experienced an acute or chronic stress reaction, and provide new information about the relationship between exposure and PTG.

### **Alternative Approaches to Understanding Traumatic Exposure and PTG.**

In populations outside of the military, researchers have had success contributing to the understanding of PTG by examining the impact of different traumatic experiences on PTG. One of the initial studies to examine these differences focused simply on the relationship between type of trauma and posttraumatic growth. In examining survivors of sexual abuse, motor vehicle

accidents, and bereavement, researchers found that PTG did in fact differ across types of traumata, with those experiencing bereavement reporting the most growth (Shakespeare-Finch, & Armstrong, 2010). This is consistent with the research on the relationship between exposure and PTSD, which has found that certain types of events are more likely to produce pathological responses than others, interpersonal violence and combat exposure being the most usual (Kilpatrick et al., 2013).

***Threat to life.*** One theory as to why the magnitude of PTG is influenced by the type of trauma is that certain traumatic experiences pose a greater threat to life than others, based on physical proximity to an event or emotional proximity to those effected, with greater threat to life producing greater growth (Mystakidou et al., 2007; Thornton, 2002; Vieselmeyer, Holguin, & Mezulis, 2017; Zoellner & Maercker, 2006). For example, in a study of police officers, being involved in a duty related shooting, an event predicated by life-threatening action by the perpetrator was most predictive of posttraumatic growth (Chopko, 2010). In a follow-up study, the same principle investigator found that PTG differed as a function of whether an officer was directly or indirectly exposed to trauma, with direct exposure producing greater growth (Chopko, Palmieri, & Adams, 2018). Further, in a recent study which, among other things, examined the impact of physical and emotional proximity to a school shooting, individuals with higher proximity scores produced higher PTG scores as well (2017). Although each of these examples involves violent traumas, this association also holds true for other types of trauma. For example, in a study of parents of children with severe illnesses, researchers found that parents of children with cancer, reported more PTG than parents of children with type 1 diabetes, a less life-threatening condition. This indicates that greater PTG is also predicted by medical conditions which pose a greater threat to life (Hungerbuehler, Vollrath, & Landolt, 2011).

Efforts to understand the effect of diverse types of traumatic events on PTG attained by service members present unique challenges. Primarily, these challenges stem from the fact that combat deployed service members endorse a high number of events in which they are exposed to death. Additionally, due to the sample for this study being gathered from archival data, analysis of PTG is limited to those who have endorsed at least one of the following: seeing the bodies of dead soldiers or civilians, personally witnessing someone being killed, becoming wounded or injured, and killing others in combat. As such, an attempt to compare combat deployed soldiers who had been exposed to death against those who have not would likely result in limited variance. Therefore, this study will operationalize traumatic exposure by examining the influence of the degree to which a soldier's own life was threatened. Specifically, it would be interesting to examine the differential effect of the following on PTG (from low to high degree of threat): seeing the bodies of dead soldiers or civilians, personally witnessing someone being killed, killing others in combat, and becoming wounded or injured. Based on the aforementioned research, it seems that individuals reporting a greater threat will also endorse greater PTG.

As individuals come face to face with these traumatic events, the cognitive strategies they use to make sense of and cope with the exposure are going to be dependent on assumptions and skills they developed earlier in life (Janoff-Bulman, 1989). As such, it makes sense to examine the impact of these early life events on cognitive processes which have been found to promote growth following trauma.

### **The Moderating Effect of ACEs on PTG**

**Adverse Childhood Experiences: Definition and Prevalence.** Dating back to the development of attachment theory, psychologists have long been aware of the potential negative impacts that adverse events in childhood can have on adult functioning (Bowlby, 1969).

However, until the mid-nineties, very little research had been done to determine the frequency with which these events were occurring, and the concrete ways in which these events were impacting physical and psychological health in adults. In response to this lack of research, the Centers for Disease Control and Kaiser Permanente began collecting data from patients in Southern California who utilized the Kaiser HMO. Researchers developed a questionnaire to assess for adverse childhood experiences across several categories: emotional, physical, and sexual abuse, violence against mother, living with substance abusers, living with someone who was mentally ill or suicidal, and being separated from a family member due to imprisonment or divorce (ACE; Felitti et al., 1998). Initial analysis of the data collected from 9,508 middle-class adults revealed that over half of the sample reported at least one adverse childhood experience, with one fourth reporting events across multiple categories. Further, a greater number of adverse events experienced in childhood was found to be related to increased risk for substance use, depression, suicide attempts, cancer, and liver disease among other health risks (1998). These results prompted a call to action from former CDC director and President/Co-Founder of The Task force for Global Health, Dr. W.H. Foege (1998), encouraging researchers and providers alike to focus on the assessment and impact of these childhood experiences. Since then, research into the impact of these events on more specific populations and health outcomes has been consistently pursued. In delineating the history of research on adverse childhood experiences it is important to note that rather than breaking down the health correlates of each distinct category of events, ACEs will be referred to in terms of quantity rather than category. The reason for this is that over a decade of research has realized that the consequences of ACEs are similar across categories, and the variation in these consequences is better explained by the number of events to



which an individual has been exposed (Felitti & Anda, 2010). Unique exceptions to this rule will be noted.

**Aces and maladaptive consequences.** Congruent with traumatic exposure research, nearly all the research on ACEs has been related to negative physical, psychological, and social consequences. Consistently throughout this research, exposure to adverse experiences in childhood has been linked to significant negative effects which persist into adulthood. ACEs have certainly been linked to physical health consequences such as cancer, liver disease, obesity, and broken bones (Felitti et al., 1998), but for the purposes of this study the focus will specifically be on psychological and relational consequences of these experiences. From the first published study onward, ACEs have been linked to maladaptive mental health outcomes in the general population. In an effort to gain a general understanding of this relationship, researchers began by examining how the number of ACEs an individual was exposed to, impacted the likelihood of their endorsing general mental health distress as adults. This study found that 34% of the sample endorsed at least one adverse event, supporting previous evidence of the commonality of these occurrences. Within this 34%, evidence was found for a dose-response relationship between the number of adverse events and psychological wellness, with a greater number of events predicting greater distress (Edwards, Holden, Felitti, & Anda, 2003). While this finding is important and significant for the initial recognition of the negative psychological impact of adverse events in childhood, it provides no information about the nature of this distress. As research has progressed however, the link between ACEs and specific psychiatric disorders and maladaptive health behaviors have been examined. This research has led to the conclusion that in the general population, adverse experiences in childhood are related to depressive symptoms in adults of all ages; with high school seniors who reported ACEs

endorsing more depressive symptoms (Schilling, Aseltine, & Gore, 2007), and several studies with adult samples reporting the same findings (Kalmakis, & Chandler, 2015). ACEs remain a significant predictor of psychopathology of increasing severity as well, with support found for a link to mood disorders and posttraumatic stress disorder (Lu, Mueser, Rosenberg, & Jankowski, 2008), and hallucinations (Felitti, & Anda, 2010).

*Maladaptive consequences in the military.* One diverse group which warrants further examination in relation to the impact of adverse childhood experiences is the United States military. Service members are at risk for many of the adverse impacts which have been associated with ACEs simply due to the nature of working in a high-risk environment. Fifty-seven percent of veterans of the most recent military conflicts (OEF/OIF/OND) who have registered for healthcare in the veteran's affairs system were given at least a provisional diagnosis of mental illness, with 55% of those being PTSD, 45% being depressive disorders, and 43% being other anxiety disorders (US Department of Veterans Affairs, 2012). A popular notion is that individuals join the military to get away from less than ideal pre-military family environments, but is it possible that these early environments are contributing to the prevalence of mental illness in the military? Consistent with research previously mentioned on civilian samples, it seems that ACEs render service members more susceptible to mental illness. In a study examining post-deployment marines who had returned from Afghanistan, researchers found that those who had been diagnosed with PTSD were more likely to have endorsed one or more ACEs and been exposed to childhood neglect (physical and emotional), emotional abuse, and domestic violence. Those with two or more ACEs were significantly more likely to have a PTSD diagnosis than those with none (LeardMann, Smith, & Ryan, 2010). Additionally, in a study of Canadian armed forces personnel, researchers found that many of the links between

ACEs and mood disorders found in civilian samples hold true for service members. Results displayed significant links between adverse childhood experiences and mood or anxiety disorders, even when controlling for deployment related combat exposures (Sareen et al., 2013). Another consistent correlate of ACEs throughout the literature is the link between these experiences and suicidal ideation or attempts. Suicidal behaviors in active duty and veteran service members have received a great deal of attention in recent research due to the high prevalence, with a Department of Veterans Affairs study (2016) reporting that 20 veterans commit suicide per day in the United States. It appears that ACEs may account for some of this risk, as several studies have found that ACEs uniquely predict suicidal thoughts and attempts in service members (Carroll, Currier, McCormick & Drescher, 2017; Skopp, Luxton, Bush, & Sirotnin, 2011). The link between ACEs and adverse health outcomes in service members is quite clear, with service members reporting higher numbers of ACEs than the civilian population, service members diagnosed with mental illness commonly reporting these experiences in childhood, and the power of ACEs to uniquely predict health risk behaviors. However, little research exists on the impact of these experiences on a service member's capacity for growth.

**ACEs as a moderator of PTG.** As indicated in the previous sections on PTG and trauma exposure, posttraumatic stress and posttraumatic growth often occur in concert with one another, with increasing levels of traumatic stress predicting increasing PTG, at least to a certain point. This link may lead researchers to assume that prior life experiences, which have been implicated in the development of PTSD, would similarly be implicated in the likelihood of responding to trauma with growth. It seems however that making this assumption would be a mistake. This is due to the disruptive effects of adverse childhood experiences on the cognitive processes associated with growth. Evidence suggests that adverse childhood experiences are detrimental to

an individual's ability to successfully engage in these processes, and thus the more accurate assumption is that increased exposure to ACEs will result in decreased PTG.

*ACEs, attachment, and growth-oriented cognitive processing.* Attachment theory posits that experiences in childhood foster the development of internal working models, which then impact how we regulate our emotions, process stimuli, and behave in relationship with one another (Bowlby, 1969). These internal working models “are assumed to represent the primary cognitive underpinnings of adult core beliefs related to self and others” (Dozois, Frewen, & Covin, 2006, p.178). As mentioned in the earlier section, these are the very beliefs which are shattered by trauma, and through the rebuilding of which growth can be attained. However, for these beliefs to be rebuilt into an adaptive and growth-oriented form, the individual must be willing to engage in cognitive processing of the event and have success in doing so (Tedeschi & Calhoun, 2006). As exposure to adverse childhood experiences increases, the likelihood of an individual being willing or able to engage in these processes decreases. This is due to these adverse experiences being linked to the development of insecure internal working models (Mickelson, Kessler, & Shaver, 1997), which in turn predict increased avoidance and decreased affect regulation (Crawford et al., 2007). In a well-powered study of adults across the united states, Mickelson, Kessler, & Shaver (1997) found that experiencing abuse or neglect, parental substance use, parental psychopathology, parental divorce, or financial insecurity was correlated with insecure attachment in adulthood. Further, one study examined links between ACEs and the Adult Attachment Interview (George, Kaplan, & Main, 1996), finding that increased ACEs predict an increased likelihood of adult reports of attachment being classified as unresolved and disorganized (Murphy et al., 2014).

In relation to traumatic events in adulthood, Shaver & Mikulincer (2002) propose that individual's attachment style informs how they monitor and appraise the availability of attachment figures, and how this appraisal informs the individual's response to the event. Whereas securely attached individuals are willing to rely on others, elicit support, and can recognize and regulate emotions, individuals with more insecure working models have been consistently found to have difficulty regulating emotions, and are more likely to avoid processing traumatic events or seeking support (e.g., Cloitre, Stovall-McClough, Zorbas, & Charuvastra, 2008; Marganska, Gallagher, & Miranda, 2013; Mikulincer, Florian, & Weller, 1993). Though research on adult attachment style and posttraumatic growth has been minimal, one study on political prisoners found that securely attached individuals were more likely to attain growth following torture, whereas insecurely attached individuals were more likely to experience negative emotions (Salo, Quota, Punamaki, 2005).

At this point it is important to address the decision to examine the impact of ACEs on PTG rather than examining the impact of attachment security. Ultimately, this decision was dictated by the nature of the sample. Because this study is focused on a group of service members who have already been exposed to combat trauma, there is not an opportunity to measure attachment prior to trauma exposure. Without a pre-trauma measure of attachment security, it would be impossible to tell if post-trauma attachment security was consistent with pre-trauma levels or if it had been impacted by trauma, military experiences, or other confounding factors as has been demonstrated in previous research. For example, a study investigating self-reported attachment security in former prisoners of war (ex-POWs), found that ex-POWs reported increasing symptoms of attachment avoidance and attachment anxiety from time 1 to time 2, while a veteran control group's attachment security remained stable (Solomon,

Dekel, & Mikulincer, 2008). By measuring ACEs, the potential confounding effect of this change is avoided. This is because rather than having to self-interpret and report current functioning, and there being the potential for traumatic events to have impacted this interpretation, a measurement of ACEs asks the service member to affirm or deny exposure to past events, requiring no interpretation. By eliminating the need for self-interpretation, the potential confounding effects of combat trauma are circumvented. Additionally, while research on the validity of retrospective reports of ACEs has found error rates at a level of clinical significance, these errors are more likely the result of false negatives rather than false positives (Hardt & Rutter, 2004). As such, measuring ACEs allows for an accurate to conservative assessment of exposure to events which may have compromised attachment security, protecting against any overestimation of significant effects in the model.

While adult attachment security cannot be inferred simply based on self-reports of adverse childhood experiences, assessing for these experiences can provide insight regarding whether aspects of successful cognitive processing typically learned through attachment have been compromised. For example, in a large meta-analysis of studies investigating the relationship between adverse experiences in childhood and emotion regulation difficulties, Dvir, Ford, Hill and Frazier (2014), determined that there was convincing evidence to support a negative effect of adverse childhood experiences on understanding and regulating emotions. ACEs have also been implicated in the utilization of maladaptive emotion regulation strategies such as substance use, non-suicidal self-injury (Baiden, Stewart, & Fallon, 2017), and emotional eating (Michopoulos et al., 2015). One of the most common correlates of ACEs has been substance use, with greater exposure to adverse events leading to increased use of alcohol, tobacco, and other substances (Dube et al., 2003; 2001; Felitti, 1998). Excessive use of alcohol

is a significant problem facing members and veterans of the armed forces (Hunsaker & Bush, 2018). Ten percent of veterans of the wars in Iraq and Afghanistan who sought treatment at a Veterans Affairs facility were diagnosed with alcohol use disorders; while 12-15% of Operation Iraqi Freedom veterans self-report problematic alcohol use post-deployment (2018; Seal et al., 2011; Milliken et al., 2007). Awareness of these rates is particularly important when examining response to military trauma, because alcohol use has been linked to difficulty recovering from posttraumatic stress disorder, and has a negative impact on PTG (Schumm, 2012; Milam, 2004). Social processes are also highly involved in our ability to regulate emotion (Bowlby, 1969), and as mentioned earlier, this influence has not been lost on PTG theorists. Unfortunately, adverse childhood experiences decrease effective use of social relationships, further promoting the deleterious effect of ACEs on the development of PTG. This negative effect on relationships even appears to start at a biological level, with ACEs being linked to chronically low levels of neuropeptides which are correlated with prosocial factors. Heim et al., (2009) found that women with a history of child abuse had significantly lower levels of oxytocin than women without such adversity. Oxytocin has a significant impact on social affiliation, attachment, social support, and trust (2009).

It seems that research supports the idea that being exposed to adverse experiences in childhood may decrease the ability and willingness of an adult to engage in the deliberate rumination, affective expression, and social referencing required for growth. This is due to decreased ability to identify and regulate emotions, and decreased ability and willingness to seek support through personal disclosure and social referencing. As such, individuals who endorse a high number of ACEs will likely report low amounts of growth following trauma, as the processes which facilitate growth-oriented perspectives regarding the events comprehensibility,

manageability, and meaningfulness do not occur. However, the majority of research which supports these conclusions has been conducted on civilians across the lifespan, making it difficult to generalize these conclusions to service members. One study on ACEs had a large enough portion of service members in their sample to be able to compare the prevalence of ACEs in service members to those of civilians. These researchers found that service members were more than twice as likely to report ACEs than their civilian counterparts, but only in the post-draft era (Blosnich, Dichter, Cerulli, Batten, & Bossarte, 2014). These results certainly underscore the importance of investigating the impact of ACEs on PTG in combat exposed service members, but they also illustrate an interesting phenomenon. The research delineated above suggests that ACEs undermine an individual's ability to develop PTG, and as such if service members are reporting high numbers of ACEs one would expect that rates of PTG would low in this population. However, multiple studies have found a high prevalence of PTG in service members (Tsai et al., 2015). This contradiction indicates that military specific factors may be mitigating the negative effects of adverse childhood experiences, allowing soldiers to grow following trauma.

***Volunteering for service in search of support.*** There is a popular notion that service members join the military to get away from environments that are less than ideal. This idea is supported by the fact that the study which found higher rates of ACEs in service members than civilians, also found that this relationship only held true in the post-draft era (Blosnich et al., 2014). So rather than service members as a whole reporting increased ACEs over the general population, it is those who volunteered for service who report higher ACEs. It seems possible then, that joining the military is an opportunity for such individuals to seek the positive and supportive experiences in service, that they were denied as children. If high numbers of service



members are volunteering for military service to find the support and security they were denied in childhood, it is relevant to the field to examine the impact of succeeding versus failing in this pursuit. Further it would be interesting to determine whether finding such supportive relationships in the military, characterized by mutual trust, provides a corrective emotional experience for the service member and overrides the negative effects of ACEs on the development of PTG.

When a soldier is deployed, he or she is separated from many sources of social support common to civilians and must rely on the unit for the safety and comfort characteristic of supportive relationships. As such, in examining the possible protective effect of newly developed supportive relationships on factors which would otherwise inhibit PTG, it makes sense to focus on combat deployed service member's self-reported ratings of unit cohesion.

### **The Buffering Effect of Unit Cohesion**

**Introduction and definition.** The support of others in the aftermath of a trauma can promote growth in that a traumatized individual can share their conceptualization of the event with supportive others, who can then provide additional or corrective information facilitating the formation of an accurate and adaptive narrative. Tedeschi and Calhoun (2004) posit that perhaps the most effective support comes from individuals who have had similar experiences to the trauma survivor, and thus provide a unique understanding and foundation from which to provide perspective. Trauma survivors are often more willing to accept advice from individuals with these similar experiences (Tedeschi & Calhoun, 1993). For active duty military, particularly when they are deployed and traumatic events occur, their unit is the most immediately available source of social support. Further, with the additional benefit of shared experiences, soldiers are likely to lean on members of their unit following a traumatic experience. As a result, instead of

focusing on the role of social support in general in fostering PTG in active duty populations, it is relevant and important to focus on the unique contribution of unit cohesion, and other factors which may influence the strength of this relationship.

Blurred lines between social support and unit cohesion as distinct constructs can be seen with even a surface level understanding of each, but these blurred lines remain apparent in research as well. In conducting a literature review, it became clear that unit social support and unit cohesion are used interchangeably in research on military populations. In fact, many studies which have examined unit cohesion in the past have measured it using the Unit Social Support subscale of the Deployment Risk and Resilience Inventory (King, King & Vogt, 2003), (e.g., Brailey, Vasterling, Proctor, Constans, & Friedman, 2007). This current study will not attempt to separate these terms; however, it is important to recognize how these terms are used interchangeably in the literature. For the sake of respecting the unique dynamics of supportive relationships during deployment, namely the increased reliance due to threats of safety, the term Unit Cohesion will be used as an all-encompassing term to describe the construct and associated evidence delineated below.

Though significant efforts have been made to study the impact of unit cohesion, the importance of unit cohesion warrants and requires continued exploration. In writing about the importance of unit cohesion, as well as its similarities to social support, Manning (1994) states that there is no civilian analogue for unit cohesion, in that although it is largely the same thing as social support, the importance of this support in the military is much greater than it is in the civilian world, and this importance cannot be overstated. In search of further practical support for the theoretical importance of cohesion, Manning & Fullerton (1988) conducted a study of special forces units in the military. These units are among the most cohesive and long standing and are

thus an excellent source of information about the positive effects of unit cohesion. The investigators found that soldiers in these units did report greater physical and psychological well-being, as well as greater job and career satisfaction than soldiers in non-specialized units. Further, ratings of social support and satisfaction with unit were the most predictive of well-being (1988). These results punctuate the importance of unit cohesion as a construct, and provide further justification for its continued study, particularly with increased research interest across the field of psychology in positive rather than pathological outcomes.

In furthering the research on unit cohesion in relation to PTG and as an analog for social support in active duty military samples, it is first important to establish a clear definition. Perhaps most clearly described by former Chief of Staff Edward Meyer, unit cohesion is “the bonding together of soldiers in such a way as to sustain their will and commitment to each other, the unit, and mission accomplishment, despite combat or mission stress” (as cited in Manning, 1994, p.4). This definition of cohesion presents three important concepts. Horizontal bonding (cohesion with peers), vertical bonding (cohesion with higher and lower ranks), and commitment (Manning, 1994). In looking at unit cohesion’s influence on stress and performance, Griffith & Vaitkus (1999) note that cohesion is “an intersubjective dynamic, characterized by the strength of supportive ties among unit members” (p.38). As research into unit cohesion has continued to progress over the last several decades, the need for a standard model of cohesion has arisen because of some discrepancies in the operationalization of the construct.

Responding to this need, Siebold (2007) elucidates a standard model of military unit cohesion, which consists of four systemic bonding components: Peer (horizontal), leader (vertical), organizational, and institutional. Bonding is used to refer to affective and instrumental aspects of the cohesive relationship. These four components then make up primary and

secondary unit cohesion, with primary cohesion referring to cohesion which exists between peers and leaders, and secondary referring to organizational and institutional cohesion. Organizational cohesion refers to the bonding that occurs between a soldier and the next highest organization unit (i.e., battalion), and institutional cohesion refers to the soldier's relationship with the military as a whole. For the purposes of this study, Siebold's definition will be adopted as the operational definition, because the four bonding components most closely align with the Unit Support measure on the Deployment Risk and Resilience Inventory (DRRI; King, King, & Vogt, 2003), which is the measure included in the data set being utilized for this study. As mentioned earlier, the DRRI is commonly used in military psychology research to measure unit cohesion.

**Correlates of Unit Cohesion.** In addition to a standardized definition of military unit cohesion, equally important to understanding the construct is an understanding of factors which are beneficial or detrimental to cohesion. Given the environmental stressors and organizational hierarchy which are unique factors at play within military unit relationships, as well as the fact that death is a likely consequence of dysfunction, variables which influence unit cohesion are somewhat different than what would be expected in civilian dyadic or group relationships. Perhaps the most unique of these variables would be the joint experiencing of a stressful event, such as those commonly occurring during deployment. Patterns of relating required between members of a unit in those moments have been suggested to be strong catalysts for cohesion (Bartone & Adler, 1999; Manning, 1991). Playing a significant role in determining whether stressful events enhance or erode unit cohesion, is the reaction of the unit's leadership. In their study of the longitudinal trajectory of unit cohesion in an army medical task force, Bartone & Adler (1999), found that as commissioned and noncommissioned officers demonstrated competence in their role, as well as dedication to the well-being of their soldiers across the

duration of the deployment, unit cohesion increased. At the beginning and end of deployment, effective leadership which fosters unit cohesion, also involves taking actions to strengthen and increase soldier's access to family supports. Family related stressors have a negative impact on unit cohesion across the deployment timeline, but efforts can be made by effective leaders to minimize these effects (1999). Time spent together is also a factor which influences unit cohesion, as over time individual soldiers begin to identify themselves as members of the unit (Manning, 1991). Finally, core to the development of unit cohesion is trust; not only a soldier trusting that members of his or her unit have the skills necessary to execute the mission, but also that these individuals will act in the face of danger, taking steps to accomplish the mission and protect the unit. It is further important that this trust exists horizontally across fellow soldiers, and vertically between soldiers and unit leadership (Hamilton, 2010; Siebold, 2007). These variables which have been theorized and demonstrated as predictors of unit cohesion are largely modifiable through various multi-systemic interventions. As a result, unit cohesion has remained a significant focus of military psychology research across decades.

**Protective effects of Unit Cohesion.** Much of the research on unit cohesion as an independent variable however, has been related to the development of military policy, particularly in relation to the impact of multiple deployments and of separating units once they return stateside. Within this research, unit cohesion has been demonstrated to be a protective buffer against many maladaptive health outcomes in soldiers. Spiegel (1944), who was one of the first to study unit cohesion, with much of his work occurring during World War II, was quoted as saying, "Here was a critical, vulnerable, and, to be precise, an influenceable component that often decided whether or not a man would be overwhelmed by his fear, anxiety, or fatigue. Here was a factor that often decided whether or not the man became a psychiatric casualty" (p. 384).

Research has since revealed that this use of the word casualty was not merely an artistic choice. Indeed, some of the most compelling research on unit cohesion has been the examination of the relationship between unit cohesion and suicide. For example, in a study of 1,663 recently deployed soldiers of the OEF/OIF wars, found that combat exposure was significantly and positively related to suicidal ideation, and that unit cohesion was significantly negatively related to suicidal ideation. This indicates that unit cohesion operates as a protective factor for suicidal ideation at all levels of combat exposure (Mitchell, Gallaway, Millikan, & Bell, 2012).

Additionally, particularly relevant for this current study, is that unit cohesion also functions as a protective buffer against previous life experiences which would have otherwise greatly increased risk for suicidal ideation (Skopp, Luxton, Bush, Sirotnin, 2011). Positive effects of unit cohesion have been shown to stretch far beyond decreasing suicidal ideation however, with impacts seen across a diverse range of negative psychological reactions to combat exposure. One study of Marines who had recently returned from Iraq following a 7-month combat deployment found support for unit cohesion as protective against the development of posttraumatic stress and depression.

**Unit Cohesion as an indicator of Corrective Emotional Experience.** There has been a great deal of research on the ability of unit cohesion to function as a protective factor for negative mental and physical health outcomes. However, little is known about the impact of unit cohesion on the likelihood of positive responses to traumatic exposure. One attempt to examine the ability of unit cohesion to promote posttraumatic growth did return significant results, though this relationship was much weaker than expected. Mitchell, Gallaway, Millikan, & Bell (2013) examined posttraumatic growth in a large sample of recently deployed soldiers, and found that combat exposure, unit cohesion, minority status, and lower enlisted rank were all significant

predictors of greater PTG. However, considering the close relationship between unit cohesion and social support, and the fact that social support has often been demonstrated as a strong predictor of PTG, researchers were surprised by the relatively low explanatory power of unit cohesion in their model. They suggested that despite soldiers serving in cohesive units, other factors may be influencing the extent to which they benefited from this support. As such, the role of unit cohesion in promoting PTG is still unclear. One possibility is that rather than having a direct impact on PTG, unit cohesion is making up for/protecting against factors which hinder the development of growth.

Even though service members report a high rate of adverse childhood experiences, which have been shown to have detrimental effects on cognitive processes typically developed through secure attachment, and required for PTG, high rates of PTG are still reported in military research (Tsai et al., 2015). As such, it seems that these downstream effects of negative attachment experiences are being counteracted by experiences in the military, thus allowing service members with high ACEs to be able to regulate emotion, rely on others for support, and engage in the deliberate cognitive processing necessary to develop growth-oriented conceptualizations of traumatic events. In their theory of growth through adversity, Joseph & Linley (2005) posit that following a traumatic event, an individual will be able to experience growth through a positive accommodation process so long as that individual's social environment is supportive. In a vacuum, many combat deployed service members have come from social environments that are not supportive, reducing the likelihood of growth following trauma. However, joining the military provides an opportunity for those with a history of adverse experiences to join a new family, which may or may not provide the social support required for posttraumatic growth. Research on the positive correlation between adverse childhood experiences and psychological

disorders has demonstrated that the development of supportive social relationships reduces the ability of prior stressful life events to predict PTSD following subsequent trauma (Murphy et al., 2014; Dube, Felitti, & Rishi, 2013). It is theoretically plausible therefore, that these same supportive relationships would reduce the strength of the possible negative correlation between ACEs and PTG. One explanation for the process by which this protective effect occurs, is that members of the unit function as significant attachment figures who provide a corrective emotional experience, which overwrites previous maladaptive relational and regulatory patterns the soldier has developed due to ACEs. In turn, the soldier develops a willingness and ability to rely on supportive others for healthy cognitive processing and emotion regulation following traumatic events, resulting in an increased capacity for growth. Research into the impact of ACEs on negative outcomes provides some support for this theory, finding that high unit cohesion seemed to eliminate or reduce the negative effects of prior life experiences (Brailey et al., 2007).

One of the most intuitive parallels between attachment figures in childhood and relationships which promote unit cohesion is the relationship between the soldier and unit leadership. Indeed, several studies have examined the enactment of attachment related dynamics between leadership and subordinates, positing that leadership figures can form a secure attachment relationship with followers, and promote experiences which may be corrective for previously disruptive attachment related events (Popper & Mayseless, 2003). This corrective emotional experience which occurs between soldiers and effective leadership, may have explanatory power in investigating the occurrence of PTG in soldiers despite a high rate of adverse childhood experiences. As we know from the attachment literature, trust in attachment figures is one of the strongest predictors of attachment security (Cassidy, 1994), and trust is



developed through how the attachment figure responds to the target individual's fear. Ainsworth, Blehar, Walters, and Wall's seminal work on the strange situation (1978), demonstrated that infants will respond to fear related stimuli with increases in attachment related behavior.

Effective responses to the child by the attachment figure lead to increased trust and security. The individual not only learns to trust that others will help him or her through difficult situations, but also that they can trust their own reactions as valid (Van der Kolk, 2005). The downstream effect of increased trust and security is an increased willingness to embrace vulnerability associated with sharing personal experience and accepting support from others.

For combat deployed adults, there are frequent opportunities to look to unit leadership for support and safety. Initially, individuals who have had prior life experiences that compromised their attachment security would be most likely to avoid seeking support in these challenging times (Mikulincer, Florian, & Weller, 1993). However, as leaders establish efficacy in executing their job as well as demonstrate a care for and willingness to commit to the well-being of their soldiers, trust in leadership increases (Hamilton, 2010). This style of leadership, called *transformational leadership* (Burns, 1978) has been found to promote self-actualization, morality, concern for the well-being of others, empowerment (efficacy, confidence, self-worth, etc.), and unit cohesion (Burns, 2003; Bass, Avolio, Jung, & Berson, 2003). As such, the more a soldier with high ACEs is exposed to leaders who engage in trust promoting behaviors, the more evidence they have to go against maladaptive internal working models developed in their youth, and learn that others can be trusted as sources of safety and emotional support.

Although leadership figures within the unit present the most intrinsic analog for a single attachment figure who has the power to have a corrective effect on the adverse consequences of childhood events, peers in the unit promote this process as well. As delineated by Siebold (2007)

and Hamilton (2010). Soldiers must be able to rely on peers within the unit to have the skills necessary to protect other members of the unit, as well as a willingness to do so. When this trust exists, it further solidifies the corrective experience for the soldier of being around individuals who can be relied upon for protection. As a result, soldiers may be more likely to share their experiences with leadership and peers within the unit, as well as ask for support when needed. Military leaders and unit peers in turn have an opportunity to provide support as well as a growth-oriented interpretation of traumatic events, which can be integrated into an individual's narrative of the event. This increases the likelihood that soldiers will see events as formative rather than detrimental (Bartone, 2006; Tedeschi & Calhoun, 1993). Through exposure to highly cohesive units, consisting of effective leaders and supportive peers, it seems that individuals who would have otherwise been motivated to avoid the cognitive processing required for growth would be more likely to engage in this processing. As a result, rather than avoiding memories of the event and the associated thoughts and emotions, service members engage in the emotion regulation, support seeking, and social reference necessary to see the event as comprehensible, manageable, and meaningful, allowing for its integration into reconstructed core beliefs that are growth-oriented.

### **Synthesis: Inroads to understanding PTG**

Current events do not presage a decrease in military action, therefore it is of vital importance to further the research on posttraumatic growth in active duty military populations. While the development of PTG does not necessarily indicate an absence of PTSD, pursuing a greater understanding of factors which promote PTG is worthwhile due to its protective effects against suicide (Bush, Skopp, McCann, & Luxton 2011), and promotion of quality of life, mental

functioning, and general health (Martz, Livneh, Southwick, & Pietrzak, 2018; Tsai, El-Gabalaway, Sledge, Southwick, & Pietrzak, 2015).

The occurrence of posttraumatic growth, has been empirically demonstrated in military samples regardless of conflict, dating all the way back to World War II. Despite the vast amount of evidence for its existence however, there are many shortcomings in the current body of research. First, much of the research on posttraumatic growth in military populations has been conducted on veteran rather than active duty samples. While this provides a significant insight as to the occurrence of PTG, the impact of time since traumatic event is a significant confound. As such, we know very little about whether posttraumatic growth occurs close in time to the traumatic event in military samples, or if this cognitive process occurs after some time has passed. Further, the relationship between PTG and traumatic exposure in military samples remains unclear, with some studies finding positive relationships between trauma severity and PTG while others have found a curvilinear relationship or no relationship at all. Additionally, utilizing measures of posttraumatic stress to predict PTG several months or years after the traumatic event, may fail to capture the development of PTG in individuals who had an acute stress reaction, but did not experience persistent symptoms of distress. These individuals have experienced the distress necessary to promote the cognitive processes associated with PTG but may not endorse this distress months and years down the road. Rather than predicting PTG from severity of traumatic exposure, greater insight may come from examining the nature of stressors, as has been done with non-military studies (e.g., Chopko, Palmieri, & Adams, 2018; Vieselmeyer, Holguin, & Mezulis, 2017), specifically, the degree to which a soldier's life is threatened during the traumatic event. The minimal amount of research that does exist indicates that as threat to life increases, PTG increases as well. However, this possibility has not yet been

examined with a military sample. These shortcomings indicate the importance of examining active duty service members to further evaluate the impact of trauma exposure on PTG and provide insight regarding the influence of time on PTG reporting. Additionally, little is known regarding how prior life experiences may impact a soldier's capacity for PTG.

Adverse childhood experiences have been found to be more prevalent in the history of service members than in the general population. Given this, understanding the detrimental effects of these experiences are important. Research has established that ACEs increase the likelihood of maladaptive psychological outcomes and behaviors following trauma, however little is known about how these experiences may alter a service member's capacity to experience posttraumatic growth. Inferences regarding this relationship can be made by examining the impact of ACEs on processes which promote growth, such as an ability to identify and regulate emotions, engage in deliberate cognitive processing of the event, and seek and utilize supportive others. ACEs have been shown to reduce an individual's capacity to successfully utilize these strategies, possibly due to the impact of ACEs on attachment security. Secure attachment processes allow children to develop these regulatory strategies, however ACEs seem to disrupt this development. Theoretically then, it seems that soldiers exposed to trauma who report high levels of adverse childhood experiences would be less likely to report posttraumatic growth due to a decreased willingness or ability to engage in the necessary cognitive processes. Given the lack of research on the impact of ACEs on PTG, and the high frequency with which they occur in service members, there is a necessity for further research on the moderating effect of ACEs on the relationship between trauma exposure and posttraumatic growth.

If ACEs have a similarly detrimental impact on PTG as they do on psychological distress, it begs the question of how PTG is still consistently being reported in studies on service

members, despite high rates of ACEs (Tsai et al., 2015). One possible explanation is that other military specific factors protect against the negative impact of ACEs on PTG. Because ACEs have been demonstrated to be detrimental to attachment processes which develop the skills necessary to attain PTG following trauma, it makes sense to examine factors which may be repairing this damage. There is some evidence to suggest that factors related to social support promote the development of PTG, however the research on this impact has been mixed (Jia, Liu, Ying, Lin, 2017; Nenova et al., 2013). This may indicate that rather than impacting PTG directly, factors related to social support are mitigating the negative effects of ACEs. In order to do this however, the social support a soldier receives must in some way be repairing attachment insecurities which undermine growth promoting processes. Modern attachment research has indicated that adults are able to form attachment relationships with a variety of individuals including peers and leadership. The most likely targets for this type of relationship in the military are peers and leadership within a soldier's unit, due to considerable time spent together during deployment and a need to rely on one another for safety and support.

As leadership and peers within the unit demonstrate a willingness and ability to value, protect, and support the service member, that individual has increasing amounts of disconfirming evidence for insecure internal working models developed due to ACEs. Therefore, it is plausible that as these processes continue over the eight to twelve months of deployment, attachment insecurities begin to heal, and the service member becomes more willing and able to trust others and engage in the social and emotional processing necessary to experience growth. Each of these attachment related factors which may promote a service member's ability to grow following trauma are included in a measure of unit cohesion, with insecurely attached individuals producing low scores. Therefore, unit cohesion seems an appropriate way to examine the

possibility that social processes within the unit are counteracting the negative effects of ACEs. If this is indeed the case, then individuals reporting high ACEs and low cohesion will report low PTG, and individuals reporting high ACEs and high cohesion will report high PTG. As unit cohesion is seen as a modifiable factor in the military, demonstrating the ability of unit cohesion to promote growth by mitigating the negative impact of ACEs would provide clinicians and military strategists with further means and motivation to promote PTG in combat deployed service members.

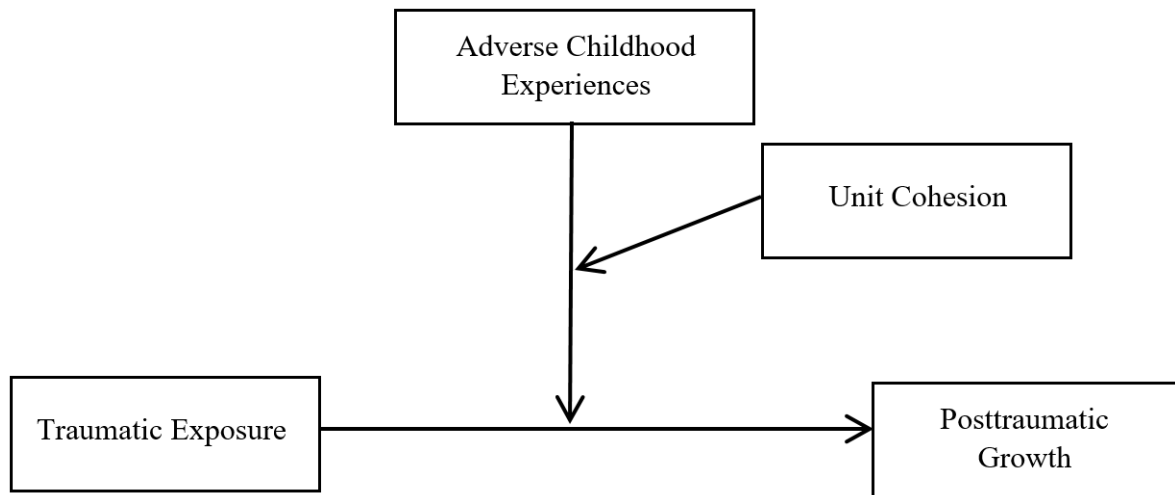
It seems that utilizing ACEs and unit cohesion as an analog for the disruption and healing of attachment security is a stretch. However, when thought about in more of a clinical sense, it is not a stretch at all. In clinical work, psychologists and other mental health professionals have diagnostic labels for certain conditions. These labels are important for documentation and compensation processes; however, they have limited practical utility. In practice, mental health professionals are not treating/responding to diagnoses, they are treating symptoms associated with the diagnoses. For example, psychologists don't treat "PTSD", but rather use techniques to address hypervigilance, avoidance, or maladaptive cognitions. They also look at antecedent events to determine targets for treatment. Applying this mindset to the relationship between ACEs, attachment, and unit cohesion, we can see the justification for ACEs and Unit Cohesion as analogues for attachment health. The aforementioned research (e.g., Heim et al., 2009) has provided evidence that ACEs disrupt processes related to attachment, and produce symptoms associated with disruptions in attachment security such as decreased trust, social affiliation, and emotion regulation. As such, by measuring ACEs we can make a pretrauma estimate about the likelihood that attachment processes have been disrupted, and symptoms such as difficulty regulation emotions, trusting others, or seeking social support may have been present prior to

joining the military. Unit cohesion on the other hand, is characterized by relationships built on trust and social support (Griffith & Vaitkus, 1999). As such, it is a viable variable to measure the potential healing effects of military relationships, and how those effects may impact growth. Given the impact of ACEs on trust and support seeking and social referencing, necessary aspects of unit cohesion, we can assume that individuals with high ACEs will endorse low ratings of unit cohesion. However, if individuals with high ACEs endorse high unit cohesion, this means that military relationships have counteracted the negative impact of adverse childhood events, providing a corrective emotional experience. Strictly measuring attachment would not allow us to draw these conclusions, because without a pre-trauma assessment of attachment, we could not account for the modifying effect of trauma on attachment security. As such, it would be difficult to tell if the traumatic event or other factors were the cause of any reported changes. Looking at ACEs and Unit Cohesion instead of directly measuring attachment security, is not a stretch. Rather it is an informed scientific decision which allows for the examination of the possibility that military relationships can provide a corrective emotional experience, while avoiding the potential confounding influence of trauma.

### **The Present Study**

In response to the lack of knowledge regarding factors which facilitate and/or hinder posttraumatic growth in active duty service members deployed to combat, this study will attempt to add to the research by examining the influence of the degree to which a soldier's life is threatened during a traumatic event on posttraumatic growth following trauma, and how that effect is magnified or minimized by the interaction between adverse childhood experiences and unit cohesion. The first hypothesis of this study is that the more an individual's life is threatened during a traumatic event the greater the amount of PTG he or she will report. The second

hypothesis is that adverse childhood experiences will moderate the relationship between traumatic exposure and growth, with increasing levels of adverse childhood experiences producing decreased growth across all levels of life threat. The third hypothesis is that self-reported unit cohesion, will moderate the effect of adverse childhood experiences on the relationship between trauma exposure and growth. More specifically, elevated levels of unit cohesion will predict increased PTG across all levels of ACEs, with individuals reporting high rates of ACEs and high unit cohesion reporting the greatest amount of PTG. To reduce confounding influences of potentially related variables I will control for: gender, rank, race, age, number of deployments, and PTSD symptoms.



*Figure 1.* Conceptual, diagrammatic model of hypothesized relationships.



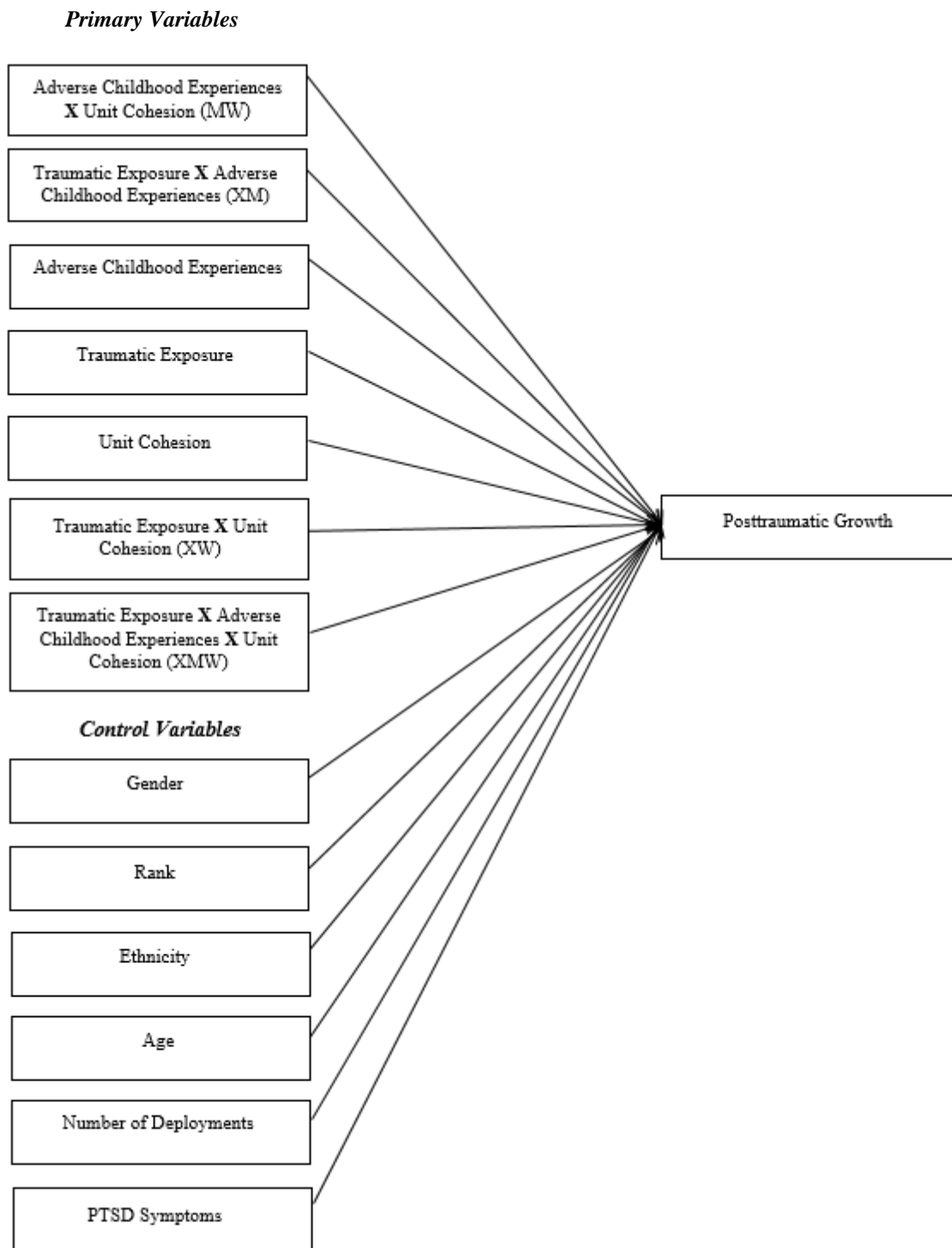


Figure 2. Statistical, diagrammatic model of hypothesized relationships (using primary variable) and potential confounding variables (i.e., control variables).

### Chapter III: Method

#### Participants

**Determining sample size.** G\*Power version 3.1 (Faul, Erdfelder, Buchner, & Lang, 2009) was utilized to determine the necessary sample size to obtain a power of .95. Power was set to .95 instead of the traditional .80 due to the large sample in this study. It was determined that to obtain power of .95 with a moderate effect size of  $f^2 = .15$ , the required  $N$  is 189. In reviewing previous research on predictors of posttraumatic growth, studies which did report effect sizes typically found small to moderate effects for significant predictors (Prati & Pietrantonio, 2009).

**Recruitment eligibility and sample characteristics.** The sample from this study was derived from an archival data set. The initial data collection resulted in a sample of 2,413 service members who were part of the United States Army at the time of collection. For the current study sample, soldiers were only included if they completed the Posttraumatic Growth Inventory, Adverse Childhood Events, and Unit Social Support scales. It was not necessary to include additional exclusion criteria for trauma exposure, because the PTGI was only given to soldiers who endorsed being exposed to traumatic experiences (i.e., being wounded during combat, witnessing someone being killed, seeing bodies, or killing others). Given those exclusion criteria, the total sample for the present study was  $N = 838$ .

**Consent and confidentiality.** Due to the data for this study coming from a larger archival data set, no additional procedures were required to obtain consent and protect confidentiality. The data set was already de-identified once it reached the hands of the researcher, and there was no need to retrospectively contact any study participants. The Madigan

Army Medical Center Institutional Review Board approved the use of the de-identified data for the original and future analyses.

### **Procedure**

Per Army regulations, all soldiers returning from deployment are given the Post-Deployment Health Reassessment (PDHRA) between 90 and 180 days following their return to United States soil. The archival data used in this study was collected as part of that required screening. The soldiers completed the screening at Schofield Barracks, Hawaii following their return from Iraq, and the median time since deployment was 4 months.

### **Measures**

**Participant Demographic characteristics.** Participant demographics were collected as part of the larger original survey. Demographic questions spanned both personal and occupational aspects. Personal demographic questions utilized in this study gathered information regarding gender (binary), ethnicity, marital status, parental status, and level of education. Occupational demographics utilized in this study included, pay grade, branch of service, number, length, and location of deployments (last 5 years), duty status, and occupational specialty.

**Posttraumatic Growth.** The PTG-I is a 21-item questionnaire, intended for adults, which measures positive responses to traumatic exposure (PTG-I; Tedeschi & Calhoun, 1996). The PTG-I was originally developed so that researchers could standardize the evaluation of positive reactions to trauma which had been demonstrated in previous research. The PTG-I assesses PTG across 5 domains: New possibilities (5 items), Relating to Others (7 items), Personal Strength (4 Items), Spiritual Change (2 items), and Appreciation of Life (3 Items), each representing distinct aspects of perceived growth following trauma. New possibilities represent a recognition of new life trajectories and opportunities. Relating to others represents increased

strength and valuing of relationships. Personal strength represents an increased feeling of self-efficacy. Spiritual change represents a strengthening or greater understanding of spiritual or religious faith. Appreciation for life represents increased recognition of the value of an individual's own life and each day in general, as well as a shift in priorities. For each question, the respondents are asked to rate each prompt in terms of the degree to which they have experienced this type of change as a result of the crisis or disaster they were exposed to. Respondents rate each item using a 6-point Likert scale ranging from 0 (*I did not experience this change as a result of my crisis*), and 5 (*I experienced this change to a very great degree as a result of my crisis*). Example items include: "I changed my priorities about what is important in life" (appreciation of life), "I more clearly see that I can count on people in times of trouble" (relating to others), "new opportunities are available which wouldn't have been otherwise" (new possibilities), "I have a better understanding of spiritual matters" (spiritual change), and "I have a greater feeling of self-reliance" (personal strength).

The development of the PTG-I involved the researchers first creating 34 items which were thought to be representative of three aspects of growth demonstrated in previous literature: perceived changes in self, sense of relationships with others, and changed philosophy of life (Tedeschi & Calhoun, 1996). The psychometric properties of this original 34 item scale were then assessed using a 604-person sample of students of a large university in the United States who endorse experiencing a significant negative life event in the last 5 years. A principle components analysis was then utilized to determine the factor loadings of these 34 items. Results indicated six factors that met the eigenvalue greater than 1 criterion, with 5 of these factors being theoretically interpretable. Thus, the researchers retained the 21 items associated with the 5-factor model and conducted a second principle component analysis with a varimax rotation. This

analysis produced 5 factors identical to those found in the first analysis and accounted for 62% of the variance. Proportion of variance accounted for by each factor was as follows: New possibilities (16%), Relating to Others (17%), Personal Strength (11%), Spiritual Change (9%), and Appreciation of Life (9%). Internal consistency of the entire 21 item scale was reported at  $\alpha = .90$ . Broken down by factor the internal consistency was New possibilities ( $\alpha = .84$ ), Relating to Others ( $\alpha = .85$ ), Personal Strength ( $\alpha = .72$ ), Spiritual Change ( $\alpha = .85$ ), and Appreciation of Life ( $\alpha = .67$ ) (1996). Test-retest reliability was  $r = .71$ . More recent analysis which set out to test the validity of the PTG-I for use with service members who had served in Iraq and Afghanistan found support for both the 5-factor model, and higher-order 5-factor model having adequate fit to validate use of this measure and either scoring format when studying military populations (Lee, Luxton, Reger, & Gahm, 2010).

For the current study, participants were asked to respond to each prompt in the PTG-I according to the degree of change they had experienced as a result of combat experiences. Individual responses on the PTG-I were summed to produce a total score for magnitude of posttraumatic growth following trauma. Scored in this way, scores can range from 0 to 105, with higher scores indicating greater degrees of growth. In the present study, the alpha coefficient was .95.

**Traumatic Exposure.** Traumatic exposure was measured using a set of questions intended to capture experiences of those deployed to combat. These four questions were presented as follows: “During combat operations did you become wounded or injured?”. “During combat operations did you personally witness anyone being killed?”, “During combat operations did you see the bodies of dead soldiers or civilians?”, and “During combat operations did you kill others in combat (or have reason to believe others were killed as a result of your actions)?”.

The four questions utilized were assigned values, from least to most threatening, based on findings from previous research. First, research has found that reactions to trauma are strongest as physical and emotional proximity to the event increases (Vieselmeier, Holguin, & Mezulis, 2017). This supports ranking traumatic event types based first on proximity. Additionally, research indicates that reactions to trauma increase in strength as exposure becomes less vicarious and more direct (Chopko, Palmieri, & Adams, 2018), and as medical conditions provide a more significant threat to life (Hungerbuehler, Vollrath, & Landolt, 2011). This supports ranking the traumatic events from vicarious to active and from least to most direct threat to personal life. Based on this evidence, traumatic events were ranked from least to most threatening according to personal proximity to the event, the active versus passive nature of exposure, and from least to most direct threat. This resulted in the following order from least to most threatening: (1) seeing dead bodies (2) personally witnessing someone being killed (3) killing others in combat (4) becoming wounded or injured.

In instances where individuals endorsed more than one experience, they were given the highest event value of those they endorsed.

**Adverse Life Events in Childhood.** To assess for exposure to adverse life events in childhood, the Adverse Childhood Events measure was used (ACE; Felitti et al., 1998). The ACE was originally developed as part of a large cohort study in the mid-nineties which set out to examine the health impact of adverse childhood experiences. Questions on the ACE were pulled from several pre-existing and well validated sources. Questions used to identify instances of emotional and physical abuse were taken from the Conflict Tactics Scale (CTS; Straus, 1979), and consisted of items such as “Did a parent or other adult in the household often or very often swear at you, insult you, put you down, or humiliate you? OR Act in a way that made you afraid

that you might be physically hurt?”. Questions used to identify instances of sexual abuse were adapted from Wyatt (1985) and included items such as, “Did an adult or person at least 5 years older than you ever touch or fondle you or have you touch their body part in a sexual way? OR Attempt or actually have oral, anal, or vaginal intercourse with you?”. Questions to assess for the presence of substance use in the childhood home were drawn from Schoenborn (1995). Other items included in the scale were, “Was a household member depressed or mentally ill, or did a household member attempt suicide?”, “Were your parents ever separated or divorced?”, and “Did a household member go to prison?”. In its original form, response scales ranged from dichotomous: *yes/no* to Likert: *never to very often*. Though little research has been done on the validity of the ACE questionnaire, one study did examine the validity of retrospective reports of adverse childhood events using the ACE questionnaire. The study found that though there is a significant error rate in retrospective reporting of adverse events in childhood, this error rate is due to a substantial rate of false negatives, with false positives being rare (Hardt & Rutter, 2004). This suggests that if anything, the ACE questionnaire underestimate the prevalence of ACEs in the lives of respondents. The researchers further cautioned other researchers from relying on individuals detailed description of events or endorsement of experiences that are less concretely defined (2004). These concerns are valid, but do not apply to the present study, as participants were not asked to describe events and the prompts involve concretely defined scenarios.

For the purposes of the study which originally generated this data set, questions were combined/modified to shorten the survey and allow for dichotomous scoring of all items. Participants were asked to respond with “yes” or “no” to each prompt, which was preceded by the statement “While you were growing up, during the first 18 years of life:”. As such, the measure utilized in this study consisted of 10 items, which assessed whether an individual was

exposed to adverse events prior to the age of 18, in each of the following categories: psychological abuse, physical abuse, sexual abuse, neglect, abuse of mother, divorce, mental illness, substance use, and member of the household going to prison. Each category is represented by one question except for neglect which is represented by two. Formatted in this way, a response of “yes” indicates an endorsement of exposure to a particular category of adverse childhood event. Scoring is done by totaling all “yes” responses with a possible range of 0 to 9 (neglect being endorsed by a “yes” response to either question). Higher scores indicate exposure to a higher number of categories of ACEs. The author of the present study is aware of the psychometric limitations associated with artificially dichotomizing polychotomized variables, as well as manipulating the structure of questionnaires, and these limitations will be addressed in the discussion. In the present study, the alpha coefficient was .77.

**Unit Cohesion.** Unit cohesion was measured using the Deployment Risk and Resilience Inventory (DRRI; King, King, & Vogt, 2003). The DRRI is a large battery which can be used to evaluate any combination of 14 separate risk and resilience factors relevant to soldiers who have deployed. For the purposes of this study, respondents were given 12 questions which comprise the Unit Social Support subscale of the DRRI. The Unit Social Support Subscale evaluates a soldier’s perception of social support and cohesion in reference to the military, leadership, and fellow unit members. Soldiers are asked to respond to each prompt in reference to their experience during deployment. Example items include: “The commanding officers in my unit are supportive of my efforts”, “I could go to most people in my unit for help when I have a personal problem”, “Members of my unit understand me”, and “My unit is like a family to me”. Soldiers respond to these prompts on a 5-point Likert scale ranging from 0 to 4, with 0 indicating *Strongly Disagree*, and 4 indicating *Strongly agree*.



Development of the DRRRI began with the researchers generating operational definitions for each of the 14 risk and resilience factors they wanted to measure. These definitions were then refined through a series of focus groups during which veterans of the Gulf War discussed their most important war zone experiences, guided through each of the risk and resilience factors by a moderator. This qualitative data was then used to refine the original operational definitions. Items for each scale were then created based on previous research as well as focus group data, with a particular focus on using the same language utilized by soldiers in the focus groups. At the end of this process each scale had roughly 25 items. These items were then evaluated by subject matter experts for validity, specificity, and clarity, and the researchers integrated this feedback in determining which items to reword or eliminate. Finally, items were evaluated for readability, appropriateness of response options, face validity, neutrality, “double-barreldness”, and variance in response options, before being once again reviewed by service members (King, King, & Vogt, 2003).

Psychometric validation of the DRRRI began when the scales were administered by phone to 357 veterans, and items with skewed distributions or low correlations were eliminated. This resulted in each scale being reduced to between 15 and 20 items. The newly updated scales were then administered to 495 more veterans in paper format to determine the internal consistency of each scale. 11 of the 14 scales, including unit social support, were found to have an internal consistency of  $\alpha = .85$  or higher. Finally, a third study was conducted to demonstrate the construct validity of each scale. The Deployment Social Support scale was found to be significantly negatively correlated with PTSD, Depression, and Anxiety, and significantly positively correlated with Satisfaction with Life and Mental Health Functional Status (King, King, & Vogt, 2003).

For the current study, the Unit Social Support scale was used as a measure of Unit Cohesion. As mentioned in the literature review in chapter 1, social support and unit cohesion are often used interchangeably. Indeed, in the manual for the Unit Social Support Scale, King et al., (2003) state that scores are indicative of the degree to which soldiers feel supported by, and cohesive with, peers and leadership in the unit as well as with the army as a whole. Further, this is not the first study to utilize the Unit Social Support scale as a measure of Unit Cohesion with a military sample (Jones et al., 2012). Scoring the Unit Social Support Scale is accomplished by totaling the responses to all 12 items, for a possible score ranging from 12 to 60. Higher scores are indicative of higher cohesion. In the present study, the alpha coefficient was .93.

### **Analyses**

To test the hypothesized model, I used Hayes' (2018) PROCESS Macro version 3.3 in SPSS 25 to estimate the effects using 10,000 bootstrapped samples. PROCESS produces coefficient and standard error estimates for each predictor and interaction term and allows for the overall model to be represented by a single regression coefficient. Necessary mean-centering of continuous predictors and corrections for heteroskedasticity are taken care of by the macro as well. Exposure severity scores were derived by assigning a point value (1-4) to each type of traumatic exposure based on severity, then providing each participant a score based on the most severe stressor they endorsed. Posttraumatic growth scores were obtained by totaling all items on the Posttraumatic Growth Inventory. Adverse childhood experiences scores were obtained by totaling the number of types of adverse experiences endorsed by the service member. Scores for unit cohesion were obtained by summing the total of all the service member's responses to the questions from the Unit Social Support Scale. To test my first hypothesis, I examined the simple regression of exposure severity on posttraumatic growth. To test the second hypothesis, I

examined the moderating effect of adverse childhood experiences on posttraumatic growth. To test the third hypothesis, I explored the combined moderation effect of unit cohesion and adverse childhood experiences on the relationship between exposure severity and posttraumatic growth. Further, the relationships between primary study variables were examined while controlling for the following variables due to their potential confounding influence on the analysis: gender, rank, ethnicity, age, number of deployments, and PTSD symptoms. The potential moderating effects of Adverse Childhood Experiences and Unit Cohesion on the predictive relationship between Trauma Exposure and Posttraumatic Growth were analyzed using PROCESS Model 3. Simple slopes of significant interactions were evaluated at one standard deviation below the mean of the moderator variables, at the mean of the moderator variables, and one standard deviation above the mean of the moderator variables. The Johnson-Neyman procedure was used to identify trends in the statistically significant moderation effects.

## Chapter IV: Results

### Data Preparation and Analyses of Assumptions

The data were screened for missingness and violation of assumptions prior to analysis. One case was found to be missing data for the entire PTGI and one case was found to be missing data for the entire ACE measure. These cases were deleted. There was also missing data on Ethnicity for 5 participants (.06% of the sample) and on Paygrade for 7 participants (.06% of the sample). Ethnicity and Paygrade were modeled as covariates in the regression analyses and, as a result, cases with missing data were removed from the analysis. Outlier analysis evaluated for violation of linearity, normality, independence and homogeneity assumptions prior to analyzing the regression model. Outliers were identified via the Mahalanobis, Cook's, and Levene's statistics. Six participants had scores that exceeded cutoffs on two of the three outlier statistics. As a result, these cases were deleted from the analysis. Though the analysis could have been run with and without these cases, the present sample provided more than adequate power for the model, so there was no reason to introduce potential confounds by allowing these outliers to remain in the data set. Following deletion of cases for missingness and outlier values, the final sample for analysis was 818 participants.

### Preliminary Analysis

Prior to running the analysis, descriptive statistics and bivariate correlations were calculated to evaluate the utility of including each variable in the final analysis. All primary study variables and covariates were determined to be appropriate for further analysis. Prior to moving on to analyses specific to the hypotheses of the present study, it is worth noting the mean values for PTG and ACEs in the sample for the present study. Regarding PTG, the average amount of PTG reported by the 818 participants included in the study was  $M = 44.93$ . Regarding

ACEs, the average number of ACE categories endorsed by service members in this sample was  $M = 2.09$ , and twenty-five percent of the sample endorsed experiencing 4 or more categories of ACEs. This frequency of adverse childhood experiences is considerable higher than that of the general population, in which greater than fifty percent of individuals report having experienced 1 or fewer aces and only sixteen percent of people report having experienced 4 or more (Merrick, Ford, Ports, & Guinn (2018). This is consistent with previous findings that service members tend to have been exposed to more ACEs than the general population (Blosnich et al., 2014). Further information regarding descriptive statistics are displayed in Table 1 and bivariate correlations are displayed in Table 2.

Table 1

*Descriptive Statistics*

Variable	<i>M</i>	<i>SD</i>	<i>Range</i>
1. Exposure	1.89	1.03	1-4
2. Unit Cohesion	27.98	11.31	0-48
3. Adverse Childhood Experiences	2.09	2.14	0-9
4. Posttraumatic Growth	44.93	24.77	0-105
5. Gender	.02	.15	0-1
6. Rank	5.45	2.61	1-24
7. Ethnicity	5.71	1.20	1-8
8. Age	26.50	5.21	19-54
9. Number of Deployments	1.89	1.23	1-11
10. PC-PTSD	.50	1.07	0-4

Table 2.  
*Bivariate Correlations Among all Study Variables*

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Expo.	--									
2. UC	-.06	--								
3. ACE	.057	.170**	--							
4. PTG	.090**	.138**	-.055	--						
5. Gend.	.132**	.035	.046	-.030	--					
6. Rank	.008	.230**	-.124**	.141**	.045	--				
7. Ethn.	-.005	-.036	.076*	.146**	.003	-.025	--			
8. Age	.076*	.071*	-.037	-.062	.064	.424**	.130**	--		
9. Dep.	.158**	.070*	.022	.052	.012	.141**	-.086*	.330**	--	
10. PTS	.248**	.232**	.201**	.039	-.02	.106**	.035	-.008	.07*	--

Note. Expo = Exposure Severity; UC = Unit Cohesion; ACE = Adverse Childhood Experiences; PTG = Posttraumatic Growth; Gend. = Gender; Ethn. = Ethnicity; Dep = Number of Deployments; PTS = Posttraumatic Stress Symptoms. \* $p < .05$ , \*\* $p < .01$

**Moderation Analysis**

The overall model for Posttraumatic Growth was statistically significant:  $F(13, 804) = 6.61, p < .001, R^2 = .10$ . For individuals who were exposed to traumatic events during deployment, the degree to which their life was threatened (labeled exposure severity) was a significant predictor of their self-reported PTG ( $b = 1.72, t [804] = 1.98, p = .048$ ). Adverse childhood experiences were not a significant predictor of PTG ( $b = -.60, t [804] = -1.47, p = .142$ ). The interaction between exposure severity and adverse childhood experiences approached significance ( $b = -.65, t [804] = -1.62, p = .095$ ). Unit cohesion was a significant predictor of PTG ( $b = .415, t [804] = 5.26, p < .001$ ). The interaction between unit cohesion and adverse

childhood experiences was not significant ( $b = .012$ ,  $t [804] = .342$ ,  $p = .732$ ). The combined interaction between exposure severity, adverse childhood experiences, and unit cohesion accounted for .0022% of the variance in PTG and was not found to be statistically significant ( $F [1, 804] = 1.96$ ,  $p = .162$ ). Further results of the moderation analysis are provided in Table 3; a graphical depiction of the interaction is provided in Figures 3, 4, and 5.

Table 3.

*Results of Moderation Analysis on the Outcome Variable Posttraumatic Growth*

Predictor	$\beta$	p	95% CI	
Exposure Severity	1.72	.048	.014	3.433
Adverse Childhood Experiences	-.60	.142	-1.408	.202
Unit Cohesion	.415	.000	.260	.569
Exposure Severity x Adverse Childhood Experiences	-.645	.095	-1.402	.112
Exposure Severity x Unit Cohesion	-.026	.716	-.166	.114
Adverse Childhood Experiences x Unit Cohesion	.012	.732	-.055	.078
Exposure Severity x ACEs x Unit Cohesion	-.043	.162	-.103	.017

*Notes.* Age, Rank, Gender, Ethnicity, Number of Deployments, and PTSD Symptoms were controlled for in this analysis.

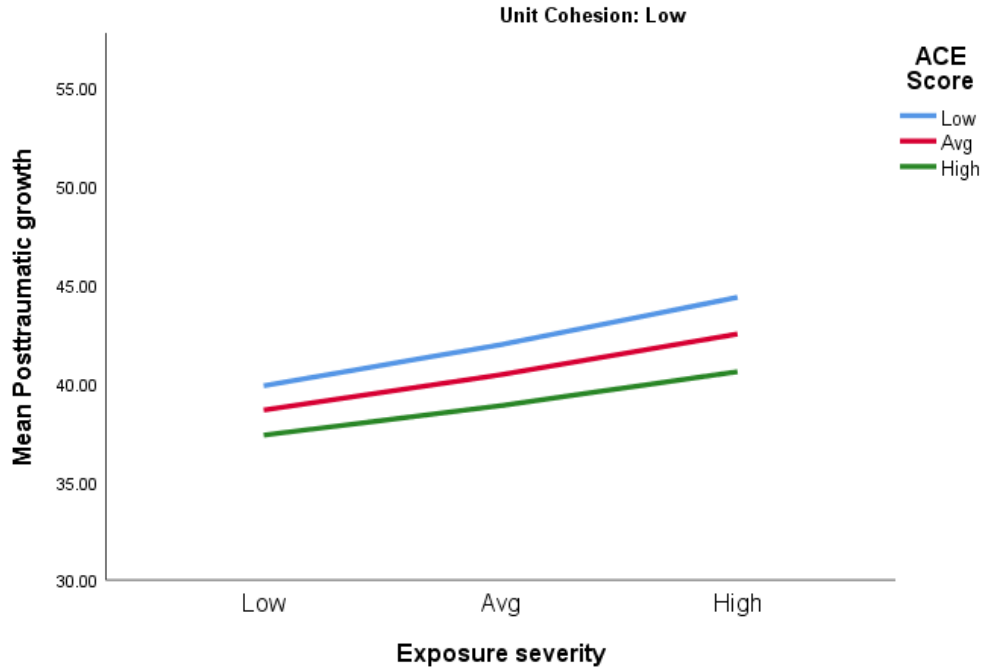


Figure 3. Moderating effect of ACEs and exposure severity on PTG at low unit cohesion.

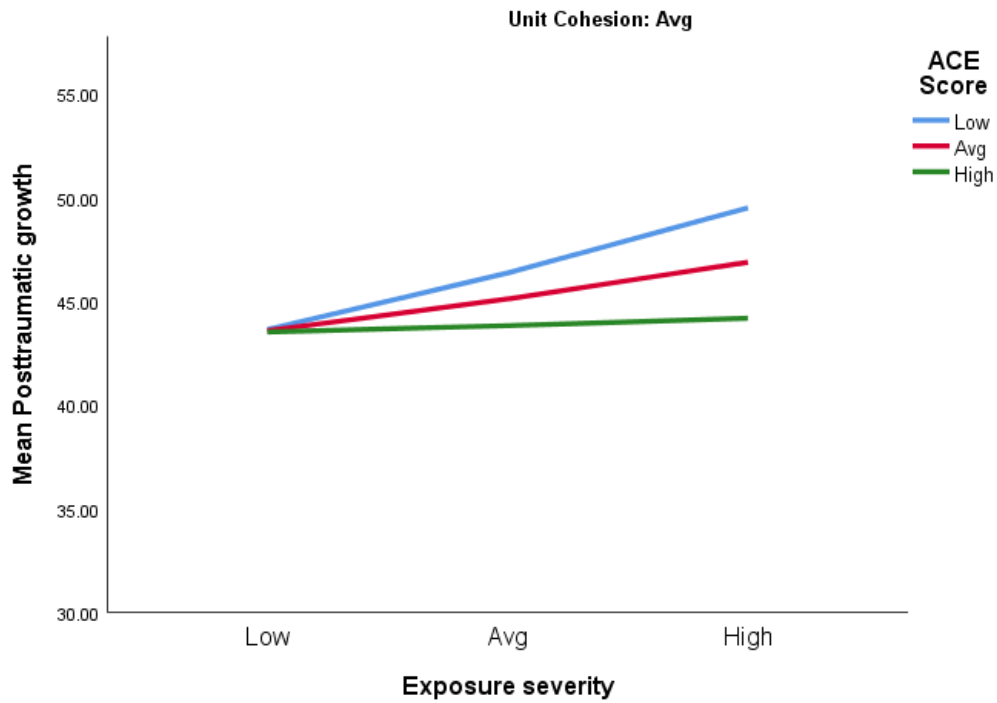


Figure 4. Moderating effect of ACEs and exposure severity on PTG at average unit cohesion.



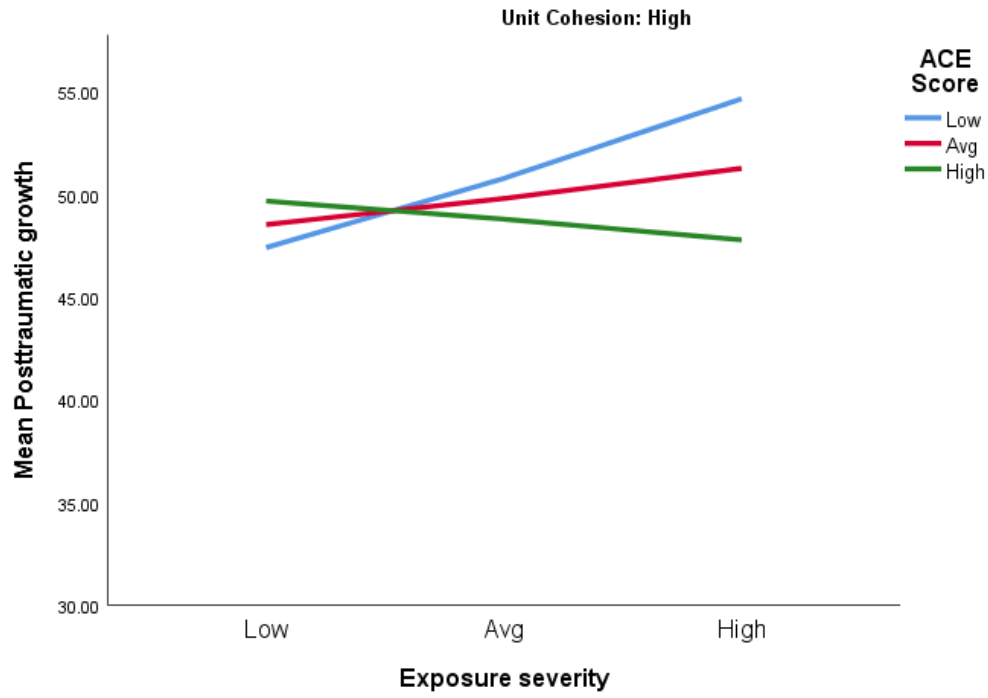


Figure 5. Moderating effect of ACEs and exposure severity on PTG at high unit cohesion.

## Chapter V: Discussion

The initial hypotheses of the present study were partially supported. The first hypothesis was supported in that as the severity of a traumatic event increased (operationalized as the degree to which a person's life is threatened) so too did the amount of posttraumatic growth reported. The second hypothesis was partially supported, in that adverse childhood experiences did appear to decrease the strength of the relationship between exposure severity and posttraumatic growth, however this effect fell just short of significance ( $p = .095$ ). The third hypothesis was not supported in that unit cohesion did not moderate the effect of adverse childhood experiences on the relationship between exposure severity and posttraumatic growth. Although the three-way interaction between exposure severity, adverse childhood experiences, and unit cohesion was not found to be a significant predictor of posttraumatic growth, the overall model including covariates was significant, and accounted for ten percent of the variance in PTG. Within this model, both exposure severity and unit cohesion were found to be significant predictors. In the next section, I will explore possible explanations for the results including those arising from the current body of research, and those arising from issues related to the methodology of the present study.

### Interpretation of Findings

**Predicting posttraumatic growth.** Results of this study suggest that childhood, peritraumatic, and posttraumatic factors each have a role in predicting the amount of PTG a trauma-exposed service member will report. Specifically, analysis showed that the degree to which a stressor threatens the life of the service member and the degree of cohesion a service member feels within their unit each significantly predict the amount of PTG they report.

The finding that greater threat to life produced more PTG is consistent with previous research on the relationship between trauma severity and PTG. Studies have examined peritraumatic factors across medical, academic, and law enforcement settings and found that higher rates of PTG are reported by those who experience the most severe stressors. Specifically, PTG has been found to rise with increased physical or emotional closeness to traumatic events (Vieselmeier, Holguin, & Mezulis, 2017), increased level of direct involvement in a traumatic event (Chopko, Palmieri, & Adams, 2018), and increased severity of medical conditions (Hungerbuehler, Vollrath, & Landolt, 2011). In the present study, PTG reported by service members fell along a similar continuum. The least growth was reported by individuals who had been exposed to dead bodies but had not been present when a person was killed, had not killed another person, and had not themselves been injured. The traumatic event endorsed by this group was the least life threatening of the four, the most indirect, and the least proximal. Slightly more growth was reported by those who had seen someone killed but had not killed another person or been injured during deployment, followed by those who had killed another person but had not been injured during deployment. The most PTG was reported by those who had been wounded or injured, the stressor which was the most proximal, direct, and life threatening. One possible explanation for this finding is that traumatic events which involve a high degree of threat to life, result in the greatest degree of core-belief disruption, in turn requiring a high degree of reconstruction. Subsequent to the event, other factors predict whether that reconstruction produces growth-oriented core-beliefs, maladaptive core-beliefs, or a combination of the two.

It was hypothesized that one factor which would inhibit the development of PTG was adverse childhood experiences. Surprisingly however, adverse experiences in childhood were not found to be a significant standalone predictor of PTG. This result is unexpected because of the

links between adverse childhood experiences, attachment, and the development of the intra- and interpersonal coping skills necessary for developing PTG following trauma in adulthood.

Specifically, it was hypothesized that ACEs would negatively impact PTG because they have been found to predict the development of insecure attachment, the downstream effects of which lead adults to avoid the adaptive coping responses necessary for PTG such as social referencing and deliberate rumination (Cloitre, Stovall-McClough, Zorbas, & Charuvastra, 2008; Marganska, Gallagher, & Miranda, 2013; Mikulincer, Florian, & Weller, 1993). One previous study even found a direct link between attachment security and PTG, though this study focused on political prisoners and not soldiers (Salo, Gupta, Punamaki, 2005). Given the research linking ACEs, development of emotion regulation capacity, and adverse psychological outcomes, it seems likely that the present study failed to find ACEs to be a significant predictor of PTG due to methodological limitations. It is also possible that the vulnerabilities associated with ACEs do not impact PTG directly; rather their effect is modified by other variables including contemporary stressors and protective factors. While ACEs were not found to be a significant predictor of PTG in the present study, the predictive power of unit cohesion did turn out to be significant.

The finding that unit cohesion was a significant predictor of PTG in this study is consistent with previous research on the relationship between unit cohesion and PTG in service members (Mitchell, Gallaway, Millikan, & Bell, 2013). Social-cognitive models have long touted the importance of social factors in the post-traumatic response, with researchers suggesting that as individuals attempt to reconstruct their beliefs about themselves and the world, the development of growth-oriented beliefs is aided by social referencing (Tedeschi & Calhoun, 1996; Resick, 2001). Social-referencing allows the affected individual to develop a more

accurate and growth-oriented narrative of the traumatic event, and individuals are most likely to engage in this interpersonal process with individuals they trust who have had similar experiences (Tedeschi & Calhoun, 2006). It may be that service members who report higher rates of Unit Cohesion achieve higher rates of growth because the trust and support which are characteristic of highly cohesive units foster service Member's willingness to engage available social support networks. It is likely that service members who report high unit cohesion do so because they have accumulated experiences in which other members of the unit, and unit leadership have demonstrated efficacy in caring for that specific soldier or supporting the unit as a whole (Bartone & Adler, 1999). Witnessing this pattern may increase the soldier's belief that unit relationships are an acceptable and effective place to seek support, thus increasing opportunities for approaches to emotion-focused coping that facilitate growth. Specifically, those who report high unit cohesion may report higher growth because they utilize unit relationships to regulate strong emotions so that they can approach rather than avoid processing the traumatic event. The affect regulation and perspective taking in turn aides adaptive deliberate rumination, which subsequently produces a higher degree of growth-oriented beliefs.

**The interaction of recent trauma and past adverse experiences.** Despite not being a significant predictor of PTG on their own, when ACEs were examined as part of a multiplicative effect along with exposure severity, the results approached significance ( $p = .095$ ). Though falling short of the standard for significance, this suggests the possibility that ACEs do in fact moderate the relationship between threat to life and PTG under certain circumstances. Though likely a small effect, ACEs seem to decrease the strength of the relationship between threat to life and PTG, and this effect becomes stronger as unit cohesion increases. At high levels of unit

cohesion, the effect of ACEs was strong enough to change the slope of the relationship between threat to life and PTG from positive to negative.

The general ability of ACEs to decrease the strength of the relationship between threat to life and PTG is consistent with past research on childhood experiences and traumatic response. Specifically, adverse childhood experiences have been linked to the development of insecure internal working models. Children with insecure internal working models have been shown to display compromised capacity for affect regulation and increased avoidance behaviors (Mickelson, Kessler, & Shaver, 1997; Crawford et al., 2007). Though developed in childhood, internal working models have long been theorized as building blocks for adult behavior (Dozois, Frewen, & Covin, 2006). Research on adult's response to trauma has supported this theory, as adults who developed insecure internal working models as kids have been found to have difficulty regulating their emotions and to avoid processing traumatic events (Cloitre, Stovall-McClough, Zorbas, & Charuvastra, 2008; Marganska, Gallagher, & Miranda, 2013; Mikulincer, Florian, & Weller, 1993). These consequences of insecure internal working models lie in direct contrast to the processes which researchers have posited as being necessary for growth, namely affect regulation and deliberate rumination (Tedeschi & Calhoun, 2006). It seems that resulting from adverse experiences in childhood, service members with high ACEs are less equipped to develop growth-oriented beliefs following traumatic events due to decreased emotion regulation capacity and increased propensity for avoidance. As demands for affect regulation and processing increase with the severity of the stressor, the deleterious effect of ACEs becomes more prevalent.

Considering the size of the sample and relatively high levels of ACEs reported by participants, it is surprising that the impact of ACEs was not found to be more significant. One

possible explanation is the manner in which data on ACEs was collected. The ACE questionnaire was designed to capture the number of different types of events a child experienced, however it does not provide information regarding the number of times each type of adverse event may have occurred. Additionally, while there is significant variability across the ACE questionnaire in terms of the severity of the adverse events, this variability is not factored in to the scoring. Because of this, one individual receiving a score of “2” may have endorsed being exposed to a parental divorce and having a family member with a substance use problem, while another individual who received the same score may have experienced repeated physical and sexual abuse. It is also likely that time represents a significant confound when attempting to utilize childhood experiences to predict adult responses to trauma. During the years between adverse childhood experiences and deployment trauma, it is likely that service members had other significant relationships and life experiences which influenced their adult capacity to regulate emotion and achieve growth following trauma. Given these limitations, it is possible that the ACE questionnaire only provided a partial picture of the pre-military trauma attachment experiences of participants. This narrow view of pre-military attachment experiences may have resulted in too much variability within, rather than between levels of the moderator, compromising the strength and significance of the moderation effect.

### **Clinical Applications**

Despite failing to find significance for the combined moderation effect of ACEs and unit cohesion on the relationship between threat to life and PTG, the present study indicates the viability of several avenues for promoting PTG in service members. First, soldiers who view their units as cohesive report greater levels of growth; likely due to increased feelings of trust and support within the units. This finding in concert with previous studies, further emphasizes

the utility of efforts to promote unit cohesion, as it appears to be a reliable predictor of service Member well-being post-deployment. As such, unit leadership would be well served by attending to relational dynamics within the unit and making efforts to address any fractures that exist between members. Further, it would be beneficial for those in charge of military strategy and policy to make efforts to keep units together during and after deployment unless their separation is necessary for readiness. Should a service member be separated from one unit to deploy with another, it cannot be guaranteed that the new unit will offer the same support as the old, and thus the soldier may be more vulnerable on deployment than they were with their previous unit. Of course, at times, unit to unit transfers are necessary due to re-classification, personnel need, or deployment readiness standards. In instances where transfers are unavoidable, transferring service members would benefit substantially from deliberate efforts by unit leadership to establish trusting and supportive relationships.

In addition to this study finding support for continued efforts to promote unit cohesion, the results also indicate the importance of considering premilitary factors when assessing a soldier's potential for healthy post-deployment adjustment. Specifically, it seems that ACEs influence the positive effect of unit cohesion at high levels of trauma severity, which means that without intervention, individuals who report higher ACEs will have a harder time forming growth-oriented beliefs, even when they feel supported by their unit. For mental health professionals, the present study suggests the importance of assessing for adverse childhood experiences as a marker for potential difficulty coping with future traumas. Should a service member report elevated ACEs at intake, a possible worthy target for intervention would be to address the likely presence of compromised emotion regulation and cognitive processing capacity. If these deficits are addressed pre-deployment, this may increase the likelihood of PTG



specifically and effective coping in general should the service member experience trauma in the future.

### **Limitations and Directions for Future Research**

The present study included several limitations related to data collection, measurement, and statistical analysis which necessitate that the findings be interpreted with caution. The field would benefit from future research which seeks to address these methodological limitations. First, the data for the present study was collected at one time point. As such, relationships between variables should not be interpreted as causal. The single-time point nature of data collection begs the most consideration in terms of findings related to the relationship between unit cohesion and posttraumatic growth. Specifically, although unit cohesion was hypothesized to be a variable which promotes PTG, Unit Cohesion and PTG were measured at the same time. As changes in *relating to others* is a factor of PTG, it is possible that Unit Cohesion scores may have changed following the trauma because of the PTG process. Future studies should attempt to parse out the temporal nature of this relationship by measuring PTG and unit cohesion before and after deployment.

An additional limitation related to the measurement of study variables was the modification to the original ACEs questionnaire. As mentioned in the measures section, the ACEs questionnaire was modified to shorten the length of the measure. Researchers involved in initial data collection were careful to insure all the initial ACE questions were included in this new format, and all ACE categories were reflected. During this process several questions which previously had 3 response options (Never/Once/More than Once), were altered to have only a “yes” and a “no” option. As 4 of the 5 questions in the original format were scored “yes” if either “once” or “more than once” were selected, the alteration had no effect on scoring for these

questions. For one question regarding emotional abuse however, only “more than once” would have counted as an endorsement of the category. As such, in the present study individuals who experienced emotional abuse only once would have received a positive score for that category, whereas in the original ACE study they would not. While the impact of such a small difference is likely minimal, comparisons to other ACE data should be made with caution considering these modifications.

Finally, this study is also limited by the restricted range of the independent variable. Data on traumatic exposure was collected in such a way that it was not possible to account for the frequency of traumatic events, nor for the wide variety of possible traumas that exist in nature. In the present study, it was only possible to analyze relationships between study variables within a sample of service members who had been exposed to a narrow range of traumas. Specifically, the PTG-I was only administered to service members who had seen dead bodies, seen someone killed, killed another person, or been wounded/injured. As such, it was not possible to study the occurrence of PTG in service members who were exposed to other types of trauma (e.g., interpersonal violence, sexual violence, the death of a close friend or relative, etc.). This significantly limits the generalizability of the present study. It is possible that this lack of variability in the independent variable was a primary reason that some hypothesized relationships were not found to be significant.

Given the methodological issues in the present study, the field would benefit from future studies which seek to examine the interaction of childhood and contemporary experiences in the development of PTG with samples containing more variance. Specifically, it would be beneficial to replicate this model after altering the method in which data on traumatic exposure and ACEs are collected. Capturing more variability in ACEs by accounting for the frequency of events, and

more variability in exposure data by including experiences with sexual assault and frequency of stressors may allow for future researchers to find significant interaction effects in this analysis.

## **Conclusion**

With military conflict continuing to be an ever-present aspect of life in the twenty-first century, prevalence of traumatic exposure in the lives of active duty service members shows no signs of decreasing. As such, efforts to understand and work towards methods to produce positive psychological outcomes following such events are of utmost importance to the field of psychology. Social-cognitive theories of posttraumatic-growth suggest that significant trauma precipitates the destruction of previously held core-beliefs, and growth occurs when these beliefs are reconstructed in an adaptive way. This process is aided by an individual's ability to effectively manage the emotional sequelae of trauma while restructuring their understanding of themselves, others, and the world considering the event. In an effort to examine factors which may influence the likelihood of PTG following trauma, the present study sought to examine the role of childhood, peri-traumatic, and posttraumatic factors in PTG development among active duty service members. The degree to which a traumatic event was life threatening and ratings of unit cohesion were found to be predictive of PTG. Specifically when events were more life threatening greater PTG was reported, and greater PTG was reported by those who reported high cohesion within their units. There was some evidence to suggest that adverse events in childhood decreased the strength of the relationship between threat to life and PTG, however more research which accounts for the limitations of this study is needed. The results emphasize the importance of fostering unit relationships characterized by trust and support, as well as the importance of considering the influence of childhood experiences on a service member's response to traumatic events. They also suggest the possible clinical utility of preemptive interventions done by health

care providers to bolster the adaptive coping skills of those exposed to adverse childhood experiences. Future research into PTG in active duty service members should aim to address the limitations of this study associated with its cross-sectional nature and limited variability in traumatic events.

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