

DOES PERSONAL GROWTH OCCUR FOLLOWING A DEPLOYMENT? A  
LONGITUDINAL EXAMINATION OF NATIONAL GUARD SOLDIERS AND PARTNERS  
THROUGH THE LENS OF POSTTRAUMATIC GROWTH

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## **ABSTRACT**

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Soldiers and their families are at risk for negative outcomes resulting from military deployment. In particular, National Guard soldiers and their families experience unique deployment challenges. On top of dealing with the consequences of combat-related trauma, they must also navigate multiple transitions between military and civilian life. Despite these obstacles, some soldiers report positive outcomes and personal growth due to deployment, a phenomenon most commonly referred to in the literature as posttraumatic growth (PTG). The current studies explored PTG in National Guard soldiers and their partners longitudinally, with the goals of validating reports of PTG in soldiers and exploring how PTG in soldiers and their partners may be related. Data were collected from National Guard soldiers and their partners at pre-deployment, reintegration, one year post-deployment and two years post-deployment. Informed by PTG theory, three domains were measured (perceived ability to handle stress, social support seeking, and purpose in life) at each of the four time points, with increases in these domains indicating PTG. Repeated measures latent profile analyses (RMLCA) and dyadic latent change score models were fit to the data to explore PTG. The results of the two studies indicate that PTG occurs for some soldiers, and that in specific domains PTG among partners is related. Findings emphasize the value of making efforts to facilitate PTG in soldiers, and where applicable, to take a systemic approach which involves partners.

This dissertation is dedicated to those who believed in me even when I did not believe in myself. To my parents who taught me the importance of integrity and to value the amount of hard work you can accomplish at the last minute. To my children, for their encouraging words, even when they might not have understood how much they meant to me. To Adrian, for giving me the chance to grow. And most of all, to Steph, who saw more in me than just a cement headed hockey player. Thank you.

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## CHAPTER 1: AN INTRODUCTION TO POSTTRAUMATIC GROWTH IN SOLDIERS, THEORETICAL UNDERPINNINGS, AND THE CURRENT STUDIES

### **Research Problem**

Since the attacks on the United States on September 11<sup>th</sup>, more than 2.6 million military service members have deployed as part of Operation Enduring Freedom, Operation Iraqi Freedom, and Operation New Dawn (Institute of Medicine, 2014). This era of deployments to Afghanistan and Iraq were unique in comparison to others for multiple reasons. These operations involved deployments which were longer and more frequent, meaning multiple deployments were required of many military personnel, and often with a short reprieve between deployments (IOM, 2010). The requirement of more troops meant a greater reliance on service members from the National Guard and Reserves, who comprised 44% of troops deploying for these operations (IOM, 2010). This has translated to high strain being placed on National Guard service members and families, a population that already faces unique challenges when compared to active duty soldiers (IOM, 2010). National Guard soldiers, or “citizen warriors,” have a distinct deployment experience, and consequently unique challenges at reintegration (Gorman, Blow, Ames, & Reid, 2011; Werber, Schaefer, Osilla, et al., 2013). Unlike active duty soldiers, whose employment remains in place with the military after returning home, those in the National Guard must return to the civilian workforce. This dispersal of National Guard soldiers to their respective places of civilian employment and living likewise means that they experience less contact, and thereby less support, from their unit peers than do active duty soldiers. Adding to these potentially challenging circumstances, National Guard soldiers are also at risk for experiencing barriers to quality mental healthcare in the post-deployment period. This may occur due to a lack of services

in their area (particularly in rural locations), the pervasive stigma in the military regarding mental health treatment, or concerns of how it could negatively impact their standing in the military (Valenstein et al., 2014).

Extensive research has documented the adverse outcomes that soldiers experience related to deployment. Soldiers demonstrate impairment in their physical health, mental health, social and role functioning, relationship functioning and family life, spirituality, as well as financial well-being (Sherman, Larsen, & Borden, 2015). Among these domains impacted by deployment, mental health problems are particularly predictive of future struggles (Sherman et al., 2015). Posttraumatic stress disorder (PTSD) is estimated to affect 10-17% of service members who have served combat deployments and is associated with detrimental outcomes such as higher risk of suicide and emotional distance in intimate relationships (Allen, Rhoades, Stanley, & Markman, 2010; Pietrzak et al., 2010; Sundin, Fear, Iversen, et al., 2010). Among Operation Enduring Freedom and Operation Iraqi Freedom (OEF/OIF) veterans, nearly one-fifth are estimated to suffer from depression (Lane, Hourani, Bray, & Williams, 2012; Seal, Metzler, & Gima, et al., 2009), and nearly one-third report hazardous drinking shortly after return from deployment (Blow, Gorman, Ganoczy, et al., 2013).

During the post-deployment period, National Guard members are estimated to experience similar levels of mental health difficulties as active duty soldiers (Blow et al., 2013; Gorman, Blow, Ames, & Reed, 2011). One study reported that following deployment, nearly 40% of National Guard soldiers presented with at least one of the following mental health problems: hazardous alcohol use, depression, PTSD, or suicidal ideation (Gorman et al., 2011). Reserve component soldiers may even be at greater risk than active-duty soldiers in certain areas, as one study showed, reservists who had been deployed had higher rates of suicidal ideation and

attempts than their active-duty counterparts (Lane et al., 2012). This risk for mental health challenges, combined with barriers to receiving quality mental health care, is particularly concerning for National Guard soldiers' well-being.

Partners of soldiers are unavoidably affected by deployment as well. As 39% of National Guard soldiers are married (Department of Defense, 2016), the soldier-partner relationship, as well as the well-being of NG partners, requires ongoing study. The quality of the intimate relationship between soldiers and partners can suffer as a result of deployment-related challenges. Soldier PTSD symptoms are linked with lower marital satisfaction and higher levels of negative communication, as well as higher divorce rates (Allen et al., 2010; Cook et al., 2004; Levin, Greene, & Solomon, 2016). In addition to relational problems, military partners are at greater risk for mental health difficulties (Blow et al., 2013; Gorman et al., 2011; Steenkamp, Corry, Qian et al., 2018). A study using data from the Millennium Cohort Family Study reported that among partners of soldiers who had deployed to the Middle East, over one-third met criteria for at least one psychiatric condition, with a partner's experience of combat specifically relating to higher anxiety, insomnia, and somatization (Steenkamp, Corry, Qian et al., 2018). Compared to National Guard members, their partners may experience comparable mental health symptoms, with one report estimating that as many as one-third of NG spouses experience clinical levels of depression, anxiety, or posttraumatic stress (Blow, Gorman, Ganoczy, et al., 2013; Gorman et al., 2011).

Despite the evidence for deployment-related adversity, many soldiers and their partners demonstrate positive outcomes (Dickstein, Suvak, Litz & Adler, 2010). Many studies have explored qualities that enable soldiers and their families to be resilient, or in other words, resistant to negative outcomes, in the time following deployment (e.g. Meredith, Sherbourne,

Gaillot, et al., 2011). More recently, other studies have explored posttraumatic growth (PTG), which differs relative to resilience, in that it asserts that soldiers not only return to normative functioning following deployment, but may in fact experience personal growth in certain areas of their lives as a result of struggling with the challenges of trauma.

Recent reports indicate that a moderate level of PTG in military soldiers is common, occurring in as many as 70% of combat veterans in at least one area (Hijazi, Keith, & O'Brien, 2015; Mark, Stevelink, Choi, & Fear, 2018; Pietrzak et al., 2010; Tsai, Gabalawy & Sledge et al., 2015). Additionally, some researchers assert that the encouragement of PTG could be an effective alternative to treating posttraumatic stress symptoms, and could therefore help improve overall well-being (Mark et al., 2018; Morgan, Desmarais, Mitchell, et al., 2017). This makes the study of PTG in military populations timely and meaningful. However, the study of PTG in military populations remains relatively understudied, particularly regarding National Guard soldiers and their partners. Additionally, the majority of PTG studies on military populations is cross-sectional in nature, which limits the understanding that can be gained about the interaction among soldiers and their partners.

## **Posttraumatic Growth Theoretical Underpinnings**

### **Origins of Posttraumatic Growth**

Traumatic experiences can drastically impact the lives of individuals, couples and families. There is extensive research demonstrating the negative impacts of such traumatic events. However, there is also evidence for the opposite: namely, that for some, there are benefits that result from trauma. As many as 70% of trauma survivors report undergoing positive change in at least one area of their life (Linley & Joseph, 2004).

This idea of growth emerging from struggle can be found historically as far back as thousands of years ago in various cultures, such as the ancient Hebrews and Greeks (Tedeschi & Calhoun, 1995). A variety of religions likewise teach of the potential for suffering to transform the individual, including certain Hindu, Buddhist, Muslim, and Christian teachings (Tedeschi & Calhoun, 1995).

In modern times, psychologists and scientists proposed similar ideas, and began exploring the concept that personal growth and meaning can result from otherwise tragic events (Frankl, 1963; Maslow, 1970). Rather than solely studying those who are unwell, psychologist Abraham Maslow (1970) emphasized the importance of researching “people who are actually healthy” and exploring the resilience of human nature (p. 270). More recently, positive psychology introduced the idea that individuals and communities have the innate potential to thrive regardless of life’s challenges (Seligman & Csikszentmihalyi, 2000).

In the 1990s psychologists began examining the phenomenon of personal growth resulting from traumatic events. Qualitative studies documented reports of individuals experiencing positive personal changes from a variety of traumatic events, including rape, bereavement, cancer, heart attacks, natural disasters, and military combat, among others (Tedeschi & Calhoun, 1996). After reviewing literature on personal growth due to life crises, researchers began identifying trends in reported positive outcomes and variables associated with them (Schaefer and Moos, 1992). Conceptual models of how this growth occurs also started to emerge. Janoff-Bulman (1992) proposed that trauma can shatter an individual’s basic schemas of self and the world, but that over time, these schemas can be restructured in a way that makes sense of the trauma and that can fortify the individual in preparation for future trauma.

Building off of this conceptual model of trauma and considering the positive outcomes reported in trauma literature, two scales were developed in 1996, each with the goal of quantifying these reports of trauma-related growth. Park, Cohen, and Murch (1996) presented the Stress-related Growth Scale (SRGS), which was followed shortly after by Tedeschi and Calhoun's (1996) Posttraumatic Growth Inventory (PTGI). Since then, the study of posttraumatic growth, as it was termed by Tedeschi and Calhoun (1996), has received increasingly more attention.

### **Tedeschi and Calhoun's Model of Posttraumatic Growth**

The predominant framework in the PTG literature is Tedeschi and Calhoun's, which describes the phenomenon of PTG using an earthquake metaphor (Calhoun & Tedeschi, 1998; Calhoun & Tedeschi, 2004). The metaphor posits that the process of PTG is initiated within an individual when the experience of a traumatic event shatters one's core beliefs and assumptions about the world, and thereby causes a crisis (Janoff-Bulman, 1997). Although trauma typically causes psychological distress, the trauma alone cannot bring about growth. If the crisis is likened to the earthquake, emotional and cognitive processing are akin to the rebuilding process. Just as buildings can be restructured in a way that will make them more earthquake-resistant in the future, an individual's view of self and the world can be rebuilt in a way that will provide protection against future trauma through greater resilience.

This process of rebuilding requires effort on the individual's part, and is theorized to occur by multiple processes. One of the major processes which facilitates growth is deliberate rumination about the event, during which one takes time to consider why the event occurred. Connected with rumination is the process of meaning-making (Tedeschi & Calhoun, 2004). People desire meaning in their experiences, and as they find it, it enables them to cope with

trauma (Frankl, 1992). Self-disclosure to empathic individuals who provide social support may facilitate this rumination process, and thereby help survivors develop new narratives surrounding their traumatic experiences (Tedeschi & Calhoun, 2004). It is important, however, to note that even with perceived growth in certain areas, the individual does not typically view the traumatic event as desirable. Rather, PTG can be viewed as positive outcomes derived from a negative experience (Tedeschi & Calhoun, 2004). Tedeschi and Calhoun (1996) originally identified three main areas of change that had been reported following trauma: 1) perception of self, 2) relationships with others, and 3) philosophy of life.

**Perception of self.** The domain of perception of self includes a variety of areas in which change can occur. When describing the domain of perception of self, Tedeschi and Calhoun (1996) cited individuals reporting changes in their emotional growth, experience about life, feelings of strength and self-assurance, self-reliance, and competence with facing challenges assertively. In their later conceptualizations of PTG, Tedeschi and Calhoun (2004) described the paradox of increased ability to handle crises with a greater sense of one's own vulnerability. Other researchers have since asserted that additional aspects of self-perception should be considered, including self-esteem and self-mastery (Mangelsdorf et al., 2019). Thus, the domain of perception of self is broad when it comes to trauma, and can be conceived in a variety of ways depending on the context of the trauma, population, and other factors.

**Relationships with others.** When originally describing the domain of sense of relationship with others, Tedeschi and Calhoun (1996) detailed a variety of potential outcomes. Broadly, these outcomes included closer and deeper family relationships, a greater appreciation for loved ones, and more willingness to self-disclose and accept help (Tedeschi & Calhoun, 1996). Other aspects of these changes in relationships include experiencing greater compassion



for others in similar circumstances and learning which relationships are genuine (Tedeschi & Calhoun, 2004). Tedeschi and Calhoun (1996) also touched on the idea that the types of outcomes in this domain may be trauma-specific. To illustrate, they provided the example of a study of women who were survivors of rape, those women reported experiencing growth in their ability to protect themselves from abuse in their relationships (Veronen & Kilpatrick, 1983). Similar to the perception of self domain, it is important to consider the context of the trauma and the population involved when exploring the ways in which growth may occur.

**Philosophy of life.** Changes in one's philosophy of life have been characterized as new ways in which an individual views the world or his/her life. Aspects of this PTG domain, as originally cited by Tedeschi and Calhoun (1996), include an increased appreciation for one's existence, a better perspective on life, changed priorities, a desire to live life more fully, stronger spiritual beliefs, and a greater sense of meaning or purpose in life. Further, survivors of trauma may express feeling lucky to be alive, and may find joy in previously unremarkable parts of daily life (Tedeschi & Calhoun, 2004).

With these three areas of growth as the foundation of PTG, Tedeschi and Calhoun (1996) set out to develop a scale for measuring PTG. After examining literature containing reports of growth following trauma, they compiled a list of 34 items which represented areas of growth reported in the literature. After conducting a study in which trauma survivors responded to these 34 items, 21 of the items were distinguished into five factors using principle components analysis. These 21 items became the PTGI, and were grouped into the following five domains: 1) relating to others, 2) new possibilities, 3) personal strength, 4) spiritual change, and 5) appreciation of life. The new possibilities domain originally was encapsulated by the perception

of self domain, and the spiritual change and appreciation of life domains were originally included in the philosophy of life domain.

Since the development of the PTGI, Tedeschi and Calhoun's theory of PTG, and the PTGI itself, have significantly impacted the way PTG is studied and understood. To illustrate, the PTGI is currently the predominant scale used in the measurement of PTG. Although Tedeschi and Calhoun laid the foundation for PTG theory, others have sought to address certain critiques of the PTGI (which are detailed in Chapter 2). Frazier and colleagues (2009) introduced a domain-based approach to measuring PTG as part of an effort to measure "actual" rather than "perceived" PTG. In their study, they selected specific domains (relationship quality, presence of meaning, life satisfaction, gratitude, and religiosity-spirituality) intended to reflect the domains of the PTGI and PTG literature. These five domains were measured pre- and post-trauma, and an increase in any of these areas over time was considered to be indicative of PTG. The current study was modeled after this longitudinal, domain-based approach, and is described below.

### **Purpose Statement**

Given the lack of longitudinal studies on PTG in National Guard soldiers and their partners, the purpose of these studies is to measure PTG in U.S. National Guard soldiers who have recently experienced a deployment and their partners over time using a domain-based approach. I was specifically interested in identifying significant predictors of PTG in National Guard soldiers and exploring whether or not soldiers and their partners may influence one another's PTG. To do so, data analyses were performed on longitudinal data which were collected from National Guard soldiers and their partners at the following four time points: pre-deployment, reintegration, one year, and two years post-deployment. The first study measures PTG using scores from three PTG-related domains assessed pre-and post-deployment. These

domains include perceived ability to handle stress, social support seeking, and purpose in life. Perceived ability to handle stress, which reflects the perception of self domain of PTG, as described by Tedeschi and Calhoun (2004), was measured using soldier and partner responses on the Perceived Stress Scale-4 (PSS-4; Cohen & Williams, 1988). Support-seeking, which represents the relationship with others domain of PTG, was measured using responses from the Using Emotional Support and Using Instrumental Support subscales of the Brief COPE (Carver, 1997). Participant responses on the Life Engagement Test (Scheier, Wrosch, Baum, et al., 2006) were used to indicate their purpose in life, which falls under the philosophy of life domain of PTG. Positive change in each of these domains over time was considered indicative of PTG. The second study examines whether PTG domain scores of one partner can predict the other partner's future PTG domain scores.

### **Research Questions and Hypotheses**

**Study 1.** The first study explored whether or not certain variables significantly predict PTG in National Guard soldiers. As such, the first research question is as follows: Are a soldier's levels of optimism, social support, PTSD symptoms, and avoidant coping at reintegration associated with PTG post-deployment?

Based on existing PTG literature (which is discussed in-depth in Chapter 2), hypotheses for study 1 were as follows: 1) Higher levels of soldier optimism at reintegration will be associated with soldiers who experience PTG post-deployment; 2) Higher levels of soldier-reported social support at reintegration will be associated with soldiers who experience PTG post-deployment; 3) Higher levels of PTSD symptoms at reintegration will be associated with soldiers who experience PTG post-deployment; and 4) Higher levels of soldier avoidant coping at reintegration will be associated with soldiers who experience PTG post-deployment.

**Study 2.** The second study explored the following research question: In a military couple, can one partner's level of PTG predict their partner's level of PTG at a future time point? Or in other words, do partners in a military relationship influence one another's PTG? Additionally, is PTG in either partner predictive of better relationship outcomes for both partners?

Based on previous reports that PTG among partners is related (Moore, Gamblin, & Geller, 2011), hypotheses for this examination of PTG in military couples were as follows: 1) Higher levels of soldier scores on PTG domains at reintegration would predict higher partner scores on PTG domains at one-year and two-year post-deployment; 2) higher partner PTG domain scores at reintegration would predict higher soldier PTG domain scores at one-year and two-year post-deployment; 3) higher soldier PTG domain scores at one-year post-deployment would predict higher partner PTG domain scores at two years post-deployment; 4) higher partner PTG domain scores at one-year post-deployment would predict higher soldier PTG domain scores at two years post-deployment; and 5) higher post-deployment PTG domain scores would predict better relationship adjustment at two years post-deployment for both soldier and partner.

### **Rationale**

The two current studies involve examining PTG in National Guard soldiers and their romantic partners over time. As I discuss in greater depth below, this was done by measuring PTG-related domains (constructs that represent specific dimensions of PTG) by comparing scores collected at pre- and post-deployment time points. Below I provide a rationale for this measurement approach.

### **PTG in the Military Population**

These studies expanded the discussion on PTG in the military, a subject which has received relatively little attention despite the recent rapid increase in PTG research among other

populations. Soldiers are at-risk for a variety of combat-related traumatic events, including in addition to the combat itself, traumatic brain injury, amputation, bereavement, and being held as a prisoner of war. A particularly unique type of trauma associated with combat is the requirement for soldiers to kill or commit other atrocities if necessary. Soldiers who kill others in combat, particularly innocent civilians, have demonstrated the highest levels of PTSD (Maguen, Metzler, Litz, et al., 2009). In addition to the traumatic events experienced during deployment, upon returning home soldiers also face other stress-inducing events such as re-establishing family roles, regaining intimacy with their partner, and for NG soldiers, readjusting to civilian life and securing employment once again (Gorman et al., 2011). Given the serious nature of these challenges and the toll they can take on some soldiers, literature on soldiers and deployment has predominantly examined deployment-related pathology, especially PTSD. However, multiple studies report veterans describing positive outcomes from their combat experiences, and soldiers have therefore been posited as an important population in which to examine PTG (Tedeschi, 2011). Despite this fact, military populations remain underrepresented in the PTG literature. Instead, most of the study of PTG has been focused on subjects who are undergraduate students or cancer patients (Morgan, Desmarais, Mitchell & Simons-Rudolph, 2017). Men also tend to be underrepresented in the PTG literature (Mangelsdorf et al., 2019), making the study of NG soldiers (who are predominantly male) an important contribution to this area of research.

Soldiers and their experience with deployment offer a distinct context for the study of PTG. Combat-related trauma is unique compared to other commonly-studied sources of trauma in that service members voluntarily expose themselves to traumatic experiences. This means that soldiers can be assessed prior to the traumatic event, an approach is difficult to achieve with the study of other types of trauma. Additionally, in their experience of trauma, service members may

not only be the victim, but also the perpetrator, as they are expected to kill and commit other actions which may conflict with their own moral code. This presents a unique relationship to trauma which deserves to be explored.

Although there has been an increase in the study of PTG in military in recent years, there are few studies that specifically examine NG soldiers. Some PTG studies of military samples include a composite of veterans who served in a variety of wars and at varying levels of combat (e.g., Hijazi et al., 2015), while others use exclusively active-duty soldiers (e.g., Mitchell, Gallaway, Millikan, et al., 2013). As the deployment experiences of NG soldiers, and also their challenges, are distinct in comparison to active-duty soldiers, it is important to study them independently.

Despite their high risk for deployment-related psychopathology (Blow et al., 2013; Gorman et al., 2011), partners of NG soldiers are likewise underrepresented in the PTG literature on military populations. The concept of secondary traumatization posits that a partner may experience vicarious traumatization due to their partner's traumatic event (Figley, 1983; Salston & Figley, 2003). Secondary PTG, on the other hand, has received little attention in the literature, particularly in the military context. As military partners play an important role in soldiers' navigation of the deployment process, they are essential to include in the study of PTG related to deployment.

### **Longitudinal Study Design**

Beyond the contribution that these studies make to the literature on PTG in National Guard soldiers and their partners, they offer a more objective approach to studying PTG. The two major critiques of the current methods for measuring PTG include relying on retrospective self-report of change and taking a cross-sectional approach. The vast majority of PTG studies use

the Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996). Of the studies on PTG that have been conducted with military populations since 2001, all have used either the PTGI or one of its variations (Mark et al., 2018). Despite its common use, critics of the PTGI assert that it is flawed due to its retrospective nature (Jaywickreme et al., 2014). They argue that asking an individual to report their extent of personal growth due to a specific event is overly complex and subjective, and therefore is not an accurate estimate of genuine growth (Frazier et al., 2009; McFarland & Alvaro, 2000; Nolen-Hoeksema & Davis, 2004; Tennen & Affleck, 2002). In addition, the use of the PTGI has typically been in cross-sectional study designs which fail to establish a pre-trauma baseline for comparison, which presents another measurement concern (Ford et al., 2008).

In summary, the advantage of the current studies is the longitudinal, domain-based approach to measuring PTG. As Lerner and Blow (2011) discussed, the use of a military population for longitudinal study of PTG is ideal, as it allows for pre-trauma data collection. Although Frazier and colleagues (2009) executed a domain-based approach to measuring PTG over time, this approach has yet to be used in a military population. Therefore, these studies offer a needed longitudinal approach to the examination of PTG in National Guard soldiers and partners which the literature currently lacks.

## CHAPTER 2: LITERATURE REVIEW OF POSTTRAUMATIC GROWTH IN THE MILITARY AND IN COUPLES, AND A DISCUSSION OF PTG MEASUREMENT, DOMAINS, AND PREDICTORS

In order to provide a foundation for the hypotheses detailed in Chapter 1, this chapter will first define the construct of PTG and closely-related constructs. Next, I will review the existing literature on PTG, specifically regarding military populations and couples. Then I will outline the flaws related to the construct itself and its measurement, and in response will describe my operationalization of PTG and my proposed approach to measuring it. Finally, I will provide a review of the literature on each of the three variables I have selected as PTG domains (perceived ability to handle stress, social support seeking, and purpose in life), followed by the variables I examined as PTG predictors (optimism, social support, combat exposure, PTSD symptoms, and avoidant coping).

### **Posttraumatic Growth and Similar Constructs Defined**

Posttraumatic Growth (PTG) has been defined as the “subjective experience of positive psychological change reported by an individual as a result of the struggle with highly challenging life circumstances” (Tedeschi & Calhoun, p. 12, 1996). Later studies have added understanding to PTG’s definition, including the idea that PTG is a “cluster of benefits that result from a complex combination of cognitive, emotional, and social processes (Tedeschi & Blevins, p. 373, 2015). However, there remains confusion about the PTG construct and how it is different or similar to other constructs pertaining to recovery from trauma. In order to more fully understand PTG, it is helpful to understand what it is not. There are other similar existing constructs which are important to distinguish from PTG.



## **Resilience**

One closely-related construct is resilience. Resilience has been described in the literature as the ability to return to normal functioning shortly following trauma with the relative absence of negative symptoms (Lepore & Revenson, 2006). In the case of resilience, the individual returns to the original state without the shattering of world assumptions and associated distress, an important component in the development of PTG (Tedeschi & Calhoun, 2004). Thus, individuals who demonstrate greater resilience to a traumatic event exhibit less distress but also less growth, compared to those who experience PTG. In contrast, those who exhibit PTG experience a level of growth that surpasses expected outcomes post trauma (Luhmann, Orth, Specht, Kandler & Lucas, 2014).

## **Benefit Finding**

Another closely related construct is that of benefit finding, which has been defined as the experience of positive changes in the context of a stressful experience (Tennen & Affleck, 2002). Renshaw and Campbell (2017) distinguish benefit finding from PTG by noting that benefit finding is a broader construct which applies generally to stressful events, while PTG in its purest definition applies specifically to traumatic experiences. It is important to recognize, however, that the criteria for determining an event to be “traumatic” are somewhat subjective, and that PTG literature uses the terms “trauma,” “crisis,” and “highly stressful events” interchangeably (Tedeschi & Calhoun, 2004).

In summary, PTG is currently conceptualized as the perception of personal growth in response to the shattering of life assumptions following a traumatic event. Although it is not the automatic result of trauma, PTG may occur in individuals who actively seek new understanding and meaning as they “rebuild” following the event. This growth process is complex, and may

occur in a variety of areas, which according to Tedeschi and Calhoun (1996) include perception of self, relationships with others, and philosophy of life. Although the report of PTG does not reflect that a traumatic event was desirable, it indicates the potential for something beneficial to result from an otherwise negative experience.

### **Posttraumatic Growth in Soldiers**

Recent reports indicate that a moderate level of PTG in military soldiers may be common (Hijazi, Keith, & O'Brien, 2015; Mark, Stevelink, Choi, & Fear, 2018; Pietrzak et al., 2010; Tsai, Gabalawy & Sledge et al., 2015). Multiple studies show that as many as 70% of combat veterans experience moderate levels of PTG in at least one domain (Hijazi et al., 2015; Pietrzak et al., 2010). Despite these reports of the PTG being a common occurrence among soldiers, there is relatively little PTG literature on military populations. A significant proportion of PTG literature in military populations focuses on its association with PTSD. This subject will be discussed later in the PTG predictors section. Only one study to date has explored a longitudinal measurement approach of PTG in military samples, and although the design was longitudinal, analyses did not include any pre-trauma data. This study found that among combat veterans, PTG levels have varying trajectories over time (Tsai & Pietrzak, 2016). Reporting a challenge to core beliefs, rumination, and a perception of moral wrongdoing, along with engaging in reading, have each been associated with higher levels of PTG in soldiers (Hijazi et al., 2015; Morgan et al., 2017; Tsai & Pietrzak, 2016). Ethnic minorities also demonstrate higher levels of PTG than Caucasians among military populations (Gallaway, Millikan & Bell, 2011; Kaler, Erbes, Tedeschi, et al., 2011; Mitchell, Gallaway, Millikan, et al., 2013). PTG in combat veterans has been significantly linked with higher life satisfaction and lower risk for suicidal ideation (Bush, Skopp, McCann, et al., 2011; Gallaway, Millikan, & Bell, 2011). Consequently, some

researchers assert that the encouragement of PTG could be an effective alternative to treating posttraumatic stress symptoms, and could therefore help improve overall well-being (Mark et al., 2018; Morgan, Desmarais, Mitchell, et al., 2017). This makes the study of PTG in military populations timely and meaningful, although it is currently limited by little focus on longitudinal methods.

### **Posttraumatic Growth in Military Couples**

Study of PTG in soldiers would be incomplete without addressing how it relates to their partner and romantic relationship. Combat-related trauma is linked not only to negative outcomes in soldiers, but also worse relational well-being in couples (Knobloch & Theiss, 2011; Nelson Goff et al., 2007). Additionally, military couples face other serious relational challenges following deployment, including renegotiating their roles and reestablishing intimacy at reintegration.

Although resilience has been identified and studied in military couples, only a handful of studies have been done to date on PTG or related constructs (e.g., benefit finding, meaning, etc.) in military couples. A study of Vietnam veterans showed that those who had more positive views of their experiences in war were more likely to still be married (Dohrenwend et al., 2004). Another study which focused on prisoners of war (POWs) demonstrated that spouses of POWs reported higher benefit finding than military spouses of non-POWs (Dekel, 2007). The meaning that military spouses attribute to deployment was a significant predictor of higher marital satisfaction in both spouses and service members (Bergmann et al., 2014). Similarly, deployment-related benefit finding in wives of service members was positively associated with increases in service member marital satisfaction during the post-deployment period (Renshaw & Campbell, 2017). Another study demonstrated that after a four-day retreat, veterans and their

partners reported increased relationship adjustment and perceptions of PTG (Monk et al., 2017). Thus, although deployment puts couples at risk for negative relational outcomes, there is also the opportunity for growth. As discussed, there is evidence that a partner's perception of deployment-related growth or positive outcomes may be linked to increased marital satisfaction within military couples (Bergmann et al., 2014; Renshaw & Campbell, 2017). This makes the study of PTG within military couples meaningful and important to examine. Although these handful of studies provide a starting point for studying PTG in military couples, there remains a significant gap in the literature regarding if and how members of military couples influence each other's PTG.

### **Theoretical Approaches for Understanding PTG in Couples**

There is theoretical and empirical evidence that romantic partners have an influence on each other in their experiences of and reactions to stress (Bodenmann, 1997). Trauma impacts not only the individual, but can also, in a sense, "infect" the romantic partner, even if the partner has not experienced the trauma directly (Salston & Figley, 2003). This may occur as the trauma survivor shares the details of their experience, and their partner consequently feels distress upon learning what their loved one endured. This phenomenon of one partner's experience of stress impacting the other is known by multiple terms in the literature, including secondary traumatic stress, secondary traumatization, and vicarious traumatization (Arzi et al., 2000; Lev-Wiesel & Amir, 2001). The partner "infected" by stress, then in turn, may respond negatively to the trauma survivor, creating a cycle of distress that can be detrimental to couple functioning and exacerbate trauma responses (Allen et al., 2010; Arzi et al., 2000; Nelson Goff & Smith, 2005; Oseland, Gallus, & Nelson Goff, 2016).

On the contrary, the systemic transactional model posits that as couples engage in supportive behavior in response to stress, they are able to cope together and experience better couple outcomes (Bodenmann, 1997). Multiple studies have concluded that PTG, like distress, may be contagious within couples (Canevello et al., 2016; Manne et al., 2004). This phenomenon has been observed in varying contexts, from couples experiencing national disasters to those navigating cancer (Canevello et al., 2016; Manne et al., 2004). The concept of “contagious” PTG in couples is supported by other reports of one person’s PTG influencing another’s. For example, trauma survivors have demonstrated higher PTG when they have had contact with a PTG role model, someone who experienced similar challenges but who reported perceived benefits (Cobb et al., 2006; Weiss, 2004b). Therefore, when considered together, secondary traumatization and the systemic transactional model support the idea that PTG in one partner may influence PTG in the other.

### **Posttraumatic Growth in Non-Military Couples**

Although there are few existing studies of PTG in military couples, there is a growing body of literature on couples in other populations. Specifically, much of the couple PTG literature focusing on couples dealing with cancer (Zwahlen et al., 2010), and particularly breast cancer survivors and their partners (Gesselman et al., 2017; Hagedoorn et al., 2008; Lee et al., 2017; Manne et al., 2004; Moore et al., 2011). Below is a discussion of studies which have been done to-date on PTG in non-military couples, including some of the limitations of this existing literature.

### **Individual and Couple Variables Linked to PTG in Couples**

Perhaps the most common approach in the study of PTG in couples has been to identify personal and couple qualities which predict partner PTG. Qualities related to closeness and

emotional support in couples are highly correlated with PTG in couples. In the time following a traumatic experience, marital intimacy coincides with PTG (Hagedoorn et al., 2008; Moore et al., 2011). Emotional processing is also closely tied to PTG among couples, with higher partner emotional expressiveness predicting higher PTG in cancer patients (Manne et al., 2004). Another study examining the mutual occurrence of PTG in cancer survivors and their partners indicated that couples reacted as an emotional system, rather than as individuals (Hagedoorn et al., 2008). Further emphasizing the role of emotional connection in PTG, cancer survivors who reported more partner support experienced greater PTG (Weiss, 2004b). Although causal relationships cannot be established, the case for a link between a couple's emotional connection and their experience of PTG is well documented.

Partner role and gender are other qualities that have been explored in connection with PTG. Much of the literature on PTG in couples has focused on cancer survivors and their partners, with the understanding that despite facing the same challenge together, they have distinctions in their experiences. In a study of cancer patients and their partners, although both partners experienced PTG, patients demonstrated higher PTG than partners (Zwahlen et al., 2010). The same study reported that female partners experienced higher PTG than their male partners (Zwahlen et al., 2010), a finding which is supported by other literature in which women demonstrate significantly higher levels of growth than men in general (Jeon et al., 2017; Tedeschi & Calhoun, 1996). Studies of military couples have also reported that the spouse's scores on PTG-related constructs such as benefit finding and meaning making were more influential than service member's when it comes to predicting relationship outcomes (Bergmann et al., 2014; Renshaw & Campbell, 2017). These studies highlight the notion that although

partners are connected in their experience of PTG, there may be distinctions in how and to what extent they experience growth.

### **Actor PTG Predicting Partner PTG in Couples**

Recent studies have also begun exploring the phenomenon of actor PTG predicting partner PTG among couples (Büchi et al., 2009; Canevello et al., 2016; Weiss, 2004a). Greater PTG in the wife has been shown to predict greater PTG in the husband among breast cancer survivors and their husbands, as well as couples who experienced the loss of a premature baby (Büchi et al., 2009; Weiss, 2004a). In seeking to understand the mechanism of how one partner's PTG may influence the other's, some have begun exploring possible mediating factors between actor and partner PTG (Canevello et al., 2016). Canevello and colleagues (2016) argued that PTG may be "contagious" among partners through the mediating process of interpersonal responsiveness, where perceived responsiveness is defined as the perception of being understood, valued, and supported by one's partner. They identified that actor PTG predicts actor responsiveness, which then predicts partner's perceived actor responsiveness, which in turn predicts partner PTG (Canevello et al., 2016). It is important to note that these explorations of PTG in couples utilized the PTGI or similar measures. As such, a PTG domain-based measurement approach is warranted in order to test whether or not PTG among partners is related.

### **Longitudinal Study of PTG in Couples**

The majority of studies have examined PTG in couples cross-sectionally, with only a few taking a longitudinal approach. Manne and colleagues (2004) found that PTG increased for both cancer survivors and their partners in the one and a half years following diagnosis. Likewise, PTG was correlated in cancer patients and their partners at 6 and 12 months following diagnosis

(Kunzler et al., 2014). Although these studies indicate that PTG in couples may be linked over time, data were only collected following the traumatic event. No studies to date have measured PTG in couples from a longitudinal approach which includes both pre- and post-trauma data.

Thus, although several studies have begun exploring PTG in couples, few of these have included military soldiers and their partners. Additionally, there is a paucity of longitudinal study of PTG in military couples. This study aimed to fill these research gaps, while also seeking to address some critiques that the PTG and its predominant scale, the PTGI, have received. These critiques will be discussed below, and will be followed by the current study's approach for addressing them.

### **Critique of the Posttraumatic Growth Construct**

Despite the body of evidence in support of PTG and its measurement, there remain unanswered questions regarding the construct itself. One of the major criticisms of the PTG construct is that it may be more complex than Tedeschi and Calhoun originally conceived. Maercker and Zoellner (2004) proposed the Janus Face Model of Self-perceived Growth as a more accurate representation of the nuances of PTG. In this model, they propose that PTG contains two components, which may be conceived of as two sides of the same coin: one side being constructive and self-transcending as described by Tedeschi and Calhoun (2004), and the other side being self-deceptive and illusory. Although genuine positive change may occur in some individuals, Maercker and Zoellner (2004) assert that in some circumstances, the report of growth in response to trauma may be attributed more to wishful thinking and denial than actual change. This idea was built off of the previously conceived term positive illusion, which Taylor and Brown (1994) used to describe the observed phenomenon of people responding to trauma with positively distorted beliefs in an effort to adapt. The presence of this illusory thinking does



not necessarily negate the potential for actual growth to occur. In the case where it coincides with active coping efforts, real growth may result as the self-transforming component grows and the illusory component dissipates. However, in the event where positive illusions regarding trauma are combined with cognitive avoidance, there may be negative adjustment rather than growth (Maercker & Zoellner, 2004).

This concern is evidenced in the PTG literature by questions of whether PTG actually relates to better well-being. If one's perception of growth is in fact illusory, rather than constructive, some assert that it will be associated with greater distress, rather than well-being (Boals & Schuler, 2018). A meta-analysis of 77 studies involving PTG and mental health outcomes reported that PTG (as measured using the PTGI) was not significantly associated with distress, anxiety, or quality of life (Helgeson, Reynolds, & Tomich, 2006), and another study found PTG to be linked to greater distress (Frazier, Tennen, Gavian, et al., 2009). As such, PTG, and particularly the accuracy of its measurement using the PTGI, have been called into question.

### **Critique of Posttraumatic Growth Measurement Using the PTGI**

#### **Retrospective Perception of Change**

Perhaps the largest criticism of the measurement of PTG using the PTGI is its requirement for individuals to retrospectively evaluate themselves. Some researchers are dubious that individuals can accurately assess their own change over time (Frazier et al., 2009). The PTGI's retrospective nature requires individuals to perform a complicated task, which some say makes it less credible (Nolen-Hoeksema & Davis, 2004). The PTGI specifically requires individuals to 1) assess their current standing on a given domain, 2) assess their previous standing on that domain, 3) compare the current and previous standing responses, 4) assess how

much change had occurred, and 5) decide to what degree their perceived change was related to the traumatic event (Frazier et al., 2009).

Concern over the validity of the PTGI has led to attempts, in recent years, to remove retrospection from the process of assessing PTG. Two approaches have been taken to estimate “actual PTG,” each of which involve pre- and post-trauma assessment (Frazier et al., 2009). The first approach involves measuring PTG by assessing pre- and post-trauma on five measures which correspond to each of the five domains in the PTGI (i.e. relationship quality, meaning in life, life satisfaction, gratitude, and religiosity-spirituality) (Frazier et al., 2009). The second approach involved the development of a “current standing” version of the PTGI (C-PTGI), which asked participants to respond based on how they have felt in the last 2 weeks (i.e. “I have appreciated each day”), rather than how they have felt following the trauma, as is in the PTGI. This C-PTGI was administered both pre- and post-trauma. For both the C-PTGI approach and the PTG domains approach of estimating actual PTG, actual PTG was not correlated with perceived PTG (the score provided by the PTGI). These findings imply that the PTGI may not be an accurate measure of real growth, but rather an indicator of one’s subjective perception of his/her growth (Frazier et al., 2009). The PTGI short form has also been converted to the current standing version (C-PTGI-SF) and used in a military population to estimate actual growth (Kaur et al., 2017). Results showed that the C-PTGI-SF succeeded in measuring psychological well-being cross-sectionally, and also allowed for objective longitudinal assessment of PTG across two or more time points (Kaur et al., 2017). Although the use of a “current standing” version of the PTGI appears to be an objective approach to PTG measurement, to date it has only been used in the two studies discussed.

In addition to the issue of the complexity involved with this trauma-related retrospection, the possibility of individuals overestimating their growth as an illusory coping strategy is a cause of scrutiny of the PTGI (Zoellner & Maercker, 2006). In a phenomenon which has been termed downward temporal comparison, an individual may cast a more negative perception on their pre-trauma self as a means of creating a positive outcome from trauma (Helgeson, Reynolds, & Tomich, 2006; McFarland & Alvaro, 2000). This puts measurement using the PTGI at risk for over-estimation of actual growth.

Further, individuals may over-report their growth when completing the PTGI due to its suggestive nature. Rather than allowing individuals to report their trauma-related changes on a complete spectrum, ranging from negative to positive, the PTGI only inquires about positive change. As a result, reports of growth may not be completely genuine or accurate, as individuals may feel pressured to respond in a way that is more socially favorable or expected. Nordstrand and colleagues (2017) recognized this flaw in the PTGI, and consequently created a bi-directional scale for measuring posttraumatic change. Despite this recently proposed measurement approach, the PTGI remains the current predominant scale for PTG measurement.

### **Timing of PTG Assessment Relative to Trauma**

Another issue with PTG assessment is the timing at which PTG is measured relative to the occurrence of the traumatic event. There is currently very little research that attempts to assess PTG both before and after the traumatic event. Due to the cost of conducting extensive longitudinal studies and the unpredictability of traumatic life events, many studies resort to the use of cross-sectional designs and convenience samples (Mangelsdorf, Eid, & Luhmann, 2019). However, as PTG is conceived as both a process and an outcome (Tedeschi & Calhoun, 2004), the study of it only from a cross-sectional fails to capture the big picture. Also, much of the

current literature assesses for PTG months to years after the trauma has happened, operating under the assumption that PTG occurs as the result of rumination on the event after-the-fact. However, it has been argued that growth may actually begin occurring during or shortly after the experience of trauma (Manne et al., 2004).

For this reason, PTG assessment should ideally begin concurrently, or soon after the traumatic experience. Scholars have called for more longitudinal studies of PTG, both in order to avoid the bias of positive illusion (Jayawickreme & Blackie, 2014; Occhipinti et al., 2015), and to learn more about its dynamic nature and varying trajectories (Tsai et al., 2017). Lerner and Blow (2011) specifically called for the study of deployment-related PTG in soldiers. They asserted that deployment serves as an ideal type of trauma for the study of PTG, in that it can be anticipated and a pre-trauma baseline can be established. Overall the research on PTG could benefit from a more in-depth, longitudinal approach to the timing with which PTG is studied.

### **Neglecting other Psychological and Psychosocial Areas as Domains of Growth**

A final concern with the current predominant approach to PTG measurement is that it should not be limited to the domains outlined in the PTGI. The picture of what growth looks like following a traumatic event is influenced by a variety of factors, including the type of trauma and cultural ideas regarding growth (Mangelsdorf et al., 2019; Pals & McAdams, 2004). It is therefore limiting to suggest that a complete understanding of PTG can be gained by measuring only the five domains contained in the PTGI. Mangelsdorf and colleagues (2019) called for a broader conceptualization of PTG after conducting an in-depth meta-analysis of PTG literature. They, along with others, called for the addition of other psychological domains in the measurement of PTG, including self-esteem and mastery, self-confidence, self-awareness, interpersonal involvement, and social adaptability (Mangelsdorf et al., 2019; Nordstrand et al.,

2017). The importance of measuring trauma-specific domains has also been highlighted. For example, survivors of cancer and other serious illnesses reported gaining a new awareness of their bodies due to their health struggles (Hefferon, Grealy, & Mutrie, 2009). As the trauma related to combat veterans is unique, the measurement of growth related to deployment should not be limited only to the five domains presented by the PTGI.

To summarize, although use of the PTGI has provided the foundation for the study of PTG, it is not without flaws. The PTGI has been criticized as overly complex, suggestive, and too narrow in its scope of domains measured. Additionally, it tends to be used cross-sectionally, rather than longitudinally. This study seeks to add to the understanding of PTG that has been achieved to this point by using the approach described below.

### **An Alternative Approach to Posttraumatic Growth Measurement**

In an effort to measure PTG in a more objective manner, this study takes a longitudinal domain-based approach, as was conceived and conducted by Frazier and colleagues in 2009. Frazier and colleagues (2009) measured PTG-related domains pre- and post-trauma in an effort to measure “actual”, rather than perceived, PTG. (It is important to note, however, that this study was a convenience sample of undergraduate students who had collectively experienced a variety of types of trauma.) The measurement of PTG domains across a traumatic event is a longitudinal approach which allows for the detection of growth without requiring participants to directly report it. It also allows for the selection of PTG domains pertinent to the sample, rather than being limited only to those included in the PTGI. As outlined by Tedeschi and Calhoun (1996), the original three areas of PTG include one’s 1) perception of self, 2) relationships with others, and 3) philosophy of life, or view of the world. This study seeks to measure growth from each of these three areas in order to capture the PTG construct as originally theorized by Tedeschi and

Calhoun (1996). In order to do so, a domain reflective of each of these three areas was measured pre- and post-deployment. Below is a brief description of each of these areas of PTG (i.e. perception of self, relationships with others, and philosophy of life), followed by a description of the PTG domain that was used to represent each area. This includes discussion of how each PTG domain is an accurate reflection of its specific area of PTG, and how it relates to reports of PTG in the literature.

### **Measuring Perception of Self**

Perception of self, as an area of PTG, encompasses many dimensions. As described in Chapter 1, Tedeschi and Calhoun's conceptualization of perception of self includes aspects such as life experience, personal strength, self-assurance, self-reliance, vulnerability, and the ability to handle crises (Tedeschi & Calhoun, 1996; 2004). For this study I measured perceived ability to handle stress as a reflection of participants' growth in their self-perception. Perceived ability to handle stress has been addressed in the literature through a variety of constructs, including self-efficacy, belief in self, personal control, and personal strength. The perception of one's ability to effectively face adversity is pertinent to the lives of deploying soldiers and their families. They are at risk for experiencing ongoing adversity in addition to the current deployment, such as reintegration challenges for themselves and their family, as well as possible future deployments. Confidence in one's ability to face stress is a relevant quality to assess in order to determine if growth is truly occurring.

**Perceived ability to handle stress as a PTG domain.** In order to assess change in a soldier's self-perception, changes in perceived ability to handle stress were measured. According to Lazarus and Folkman's (1984) Theory of Cognitive Appraisal (1984), a model of psychological stress and coping, the impact of an objective stressor is to some extent related to

an individual's subjective perspective of that stressor. From this perspective, it is the level to which one appraises a situation as stressful, rather than the objective stressfulness, that determines how one responds. One's appraisal of stress is related to one's perceived coping resources. When the appraisal of a situation is that it is highly stressful, this is an indication that the individual perceives the demands of the situation to be beyond his/her own abilities to cope (Lazarus, 1977; Lazarus & Folkman, 1984). When taken in this light, the construct of perceived stress can be considered to be a reflection of one's own ability to cope with stressful situations. This makes perceived ability to handle stress an ideal construct to measure over time in response to trauma in order to determine PTG related to one's self-perception.

The connection between perceived ability to handle stress and PTG has been examined in a handful of studies. In a variety of populations, including high school students and cancer survivors, perceived ability to handle stress and PTG have been shown to have a positive relationship (Arpawong, Louise, Rohrbach, et al., 2016; Bussel & Naus, 2010; Diaz, Aldridge-Gerry, & Spiegel, 2014; Love & Sabiston, 2011). In a study of Chinese American breast cancer survivors, Yeung and Lu (2018) explored the relationships between social support, perceived ability to handle stress, and PTG. They reported that perceived ability to handle stress was positively associated with both social support and PTG. Further, they found that perceived ability to handle stress mediated the relationship between social support and PTG (Yeung & Lu, 2018). These findings lend credence to Lazarus and Folkman's (1984) theory that greater perceived resources (i.e. social support) can improve one's perception of their ability to handle stress. Consequently, this increased sense of one's ability translates to greater PTG. To date, perceived ability to handle stress does not appear to have been examined over time, nor in connection with PTG, in a military population.

***Self-efficacy.*** The construct of perceived ability to handle stress is closely related to self-efficacy. As coined by Bandura (1977) in his social cognitive theory, self-efficacy refers to an individual's beliefs about his/her ability to impact the events in his/her life. It indicates a belief in one's ability to master challenging demands and mirrors the sense of being able to exert control over one's environment (Bandura, 1977). As such, it can be an important influence in reactions to stress and the quality of coping in threatening situations (Bandura, 1997).

Contemporary developments of Bandura's social cognitive theory assert that beliefs about one's own abilities are instrumental in allowing an individual to overcome trauma-related challenges (Benight & Bandura, 2004). This idea is reflected in trauma literature, as the presence of self-efficacy has been predictive of several positive mental outcomes. Among trauma survivors, self-efficacy has been related to lower frequency and severity of PTSD, and has predicted lower PTSD symptom severity at future time points (Benda & House, 2003; Kia-Keating & Ellis, 2007). Self-efficacy has also been associated with lower levels of distress, depressive feelings, and anxiety in survivors of trauma (Benight, Swift, Sanger, et al., 1999; Kia-Keating & Ellis, 2007). Self-efficacy has been shown to be beneficial for combat veterans as post-deployment coping self-efficacy (a soldier's perception of his/her ability to cope with reintegration demands) predicted lower depressive symptom severity and decreased symptoms of PTSD (LaRocca, Scogin, Hilgeman, et al., 2018). Self-efficacy has likewise been related to PTG, with multiple studies reporting a positive association (Jurisova, 2016; Mystakidou, Parpa, Tsilika, et al., 2015). In one study, cancer patients' self-efficacy beliefs were positively correlated with their levels of PTG (Mystakidou, et al., 2015).

In summary, the perceived ability to handle stress captures an important area for possible growth regarding one's self-perception. An increase in this construct in the wake of a traumatic



event reflects an individual's greater belief in his/her ability to successfully manage life's challenges, which makes it a useful indicator for measuring PTG.

### **Measuring Relationships with Others**

Similar to the perception of self area of PTG, Tedeschi and Calhoun (1996) conceived the relationship with others area as being multi-faceted. As discussed in Chapter 1, one of the aspects that characterized PTG was an increase in willingness to turn to others for help and support (Tedeschi & Calhoun, 1996). In order to examine change in soldiers' relationships with others, the construct of social support seeking was measured.

**Social support seeking as a PTG domain.** In social science literature, reaching out to others in times of adversity is known as social support seeking, and has been conceptualized as a dimension of coping (Amirkham & Greaves, 2003; Carver, 1997). The term social support seeking encapsulates both instrumental support seeking, which involves seeking advice, help, or information, and emotional support seeking, which refers to seeking sympathy, understanding, and moral support (Carver, Scheier, & Weintraub, 1989). The act of seeking social support is a good reflection of one's relationships with others because it indicates a willingness to allow others to help bear the burden of adversity. To illustrate, in a qualitative study, partners of deployed soldiers described the value of seeking emotional support from their partner, family, friends, and support groups. One partner explained that soliciting emotional support required her to "get over that feeling of not wanting to bother people or not having to ask for help, because [she needed] help" (p. 257, Rossetto, 2015). This example highlights how the act of seeking social support reflects an individual's recognition that it is acceptable to turn to others for help in times of adversity. Seeking social support has also been positively associated with problem solving as a coping strategy (Daniels et al., 2013). As PTG has been conceived as both a process

and an outcome, it stands to reason that this coping strategy could be both a facilitator and an indicator of personal growth in response to trauma.

Social support seeking following a traumatic event has been positively associated with PTG in a variety of populations, including undergraduate students, paramedics, and incarcerated prisoners (Jurisova, 2006; McMillen, Smith, & Fischer, 1997; Vanhooren, Leijssen, & Dezutter, 2018). Among women who were recently widowed, those who sought support from family and friends reported higher levels of appreciation for life and overall personal growth (Recksiedler, Loter, Klaas, et al., 2018).

In an effort to explain the connection between social support seeking and PTG, some researchers suggest that seeking emotional support facilitates self-disclosure regarding traumatic events (Hill, 2016; Litman, 2006). Self-disclosure, or the act of discussing trauma-related thoughts and feelings with someone, is an important component of the reconstruction process following the shattering of beliefs caused by trauma. Indeed, Tedeschi and Calhoun (2004) assert that the level of PTG which can be achieved may be influenced by an individual's willingness to self-disclose. By processing the traumatic experience with supportive others, an individual is aided in creating meaning and understanding, and thereby positive change in response to the trauma (Calhoun, Cann, & Tedeschi, 2010; Tedeschi & Calhoun, 2004). Regarding combat veterans specifically, Tedeschi and McNally (2011) discuss how the disclosure of deployment experiences may enable them to create a trauma narrative. Among OEF/OIF veterans, their urge to discuss their traumatic experiences at six months post-deployment was shown to be the main predictor of PTG (Currier, Lisman, Harris, et al., 2013). According to this study, the veterans' willingness to talk about their deployment-related trauma was directly related to the extent to which they were able to cognitively process that trauma (Currier et al., 2013). Further, by

reaching out to others, survivors may have opportunities to desensitize to negative feelings, establish closer relationships, and recognize their own personal strength (Manne, Ostroff, Winkel, et al., 2004). Although social support seeking and self-disclosure are distinct constructs, the purported connection between the two adds understanding to the process by which seeking support from others can both lead to, and be indicative of, personal growth.

The social support seeking construct embodies a willingness to reach out to others in a time of need, whether for advice or emotional support. It indicates the understanding that in times of trial, greater strength can be achieved by relying to an extent on others, rather than solely on one's self. An increase in social support seeking over time among soldiers in response to deployment could indicate an altered perspective of one's relationships with others, and therefore, demonstrate the occurrence of PTG.

### **Measuring Philosophy of Life**

Tedeschi and Calhoun's (1996) third conceived area of PTG is philosophy of life. Philosophy of life includes one's perception of one's purpose in life (Tedeschi & Calhoun, 1996). In this study, the philosophy of life aspect of PTG was accounted for by examining purpose in life in soldiers.

**Purpose in life as a PTG domain.** Purpose in life has been defined as one's perception of having long-term goals, direction, and meaning in past and present life (Kim, Sun, Park, et al., 2013; McKnight & Kashdan, 2009). Further, one's sense of purpose in life has also been conceptualized as a psychosocial resource which can help individuals respond more positively to challenging circumstances (Burrow, Hill, & Sumner, 2016; Fogelman & Canli, 2015). Consequently, the subject of purpose has been widely studied in stress and trauma literature. Purpose in life is associated with better physical and mental health, including less chronic illness,

reduced cortisol reactivity and output, as well as lower levels of perceived stress and negative affect (Fogelman & Canli, 2015; Hill, Sin, Turiano et al., 2018; Kim et al., 2013; Lindfors & Lundberg, 2002; Scheier et al., 2006). More specifically, purpose in life has been shown to moderate the relationship between daily stressors and well-being (Hill, Sin, Turiano, et al., 2018). Resilience and social support are also positively associated with purpose in life (Musich, Wang, Kraemer et al., 2018; Nygren, Alex, Jonsen et al., 2005).

Having a sense of purpose in life is likewise beneficial in the lives of soldiers. Soldiers who report greater purpose or meaning in life display tend to display more resilience (Isaac, Mota, Tsai, et al., 2017), including fewer suicidal behaviors, less distress, and better functioning at work, in recreation, and in their interpersonal relationships (Bryan, Elder, McNaughton-Cassill et al., 2013; Kachadourian, Lorig, Tsai, et al., 2019) As such, some regard purpose in life to be a protective psychosocial characteristic for soldiers (Kachadourian et al., 2019; Straus, Norman, Haller et al., 2019). Bryan and colleagues (2013) suggest that promoting meaning in life among combat veterans may help reduce their risk for maladaptive coping behaviors (i.e. suicide-related behaviors, substance abuse, etc.).

Purpose/meaning in life is also related to PTG. In the aftermath of terrorist attacks, college students demonstrated a positive association between meaning in life and PTG (Steger, Frazier, & Zacchanini, 2008). Triplett and colleagues (2012) developed a path model which showed that higher PTG predicted more meaning in life among undergraduate students who had experienced a traumatic event. Among veterans, purpose in life has been positively associated with PTG (Tsai, El-Gabalawy, & Sledge, et al., 2015; Tsai & Pietrzak, 2016). When examined longitudinally, purpose in life positively predicted the sustainment or increase in PTG levels two years later in U.S. veterans (Tsai & Pietrzak, 2016). Linley and Joseph (2011) reported that the

presence of meaning was positively associated with PTG, but that the search for meaning was associated with more negative change. These findings help shed light on how the process of undergoing PTG can be marked by increased distress, although it may ultimately culminate in personal growth.

To summarize, purpose in life is a construct aimed at measuring one's current sense of direction, meaning, or value in their life. Greater purpose in life is associated with better health outcomes in soldiers and is correlated with more PTG. Purpose in life is a good reflection of one aspect of one's philosophy of life, and therefore can be measured over time as a measure of PTG.

### **Exploring Predictors of Posttraumatic Growth**

Thus far I have established a foundation for measuring PTG in soldiers using a domain-based approach. Along with measuring PTG, I explored four variables as potential predictors of PTG. These variables include optimism, social support, PTSD symptoms, and avoidant coping. Below is a discussion of each variable, including how it is defined and its pertinence to PTG in soldiers.

#### **Optimism**

Dispositional optimism, or simply, optimism, was conceptualized by Scheier and Carver (1985) as a stable personality characteristic regarding the way a person approaches the world. Specifically, it refers to one's tendency to anticipate either good or bad outcomes in the future (Scheier & Carver, 1985). Optimism has frequently been examined in literature as a predictor of resilience in response to adversity (e.g. Segovia, Moore, & Linnville et al., 2012). Tedeschi and Calhoun (2004) clearly distinguish optimism from PTG, conceptualizing optimism as an enduring trait involving positive expectations for the future, as opposed to PTG which has a quality of transformational change. Despite this distinction, Tedeschi and Calhoun (2004) posit

that optimism is a trait that may enable individuals to develop PTG. Specifically, they explain that optimists may be more effective at cognitively processing traumatic events, which may facilitate personal growth (Tedeschi & Calhoun, 2004). This perspective makes the consideration of optimism pertinent in the study of PTG.

Many studies of PTG in varying contexts confirm this theory of the connection between PTG and optimism. Optimism is positively associated with PTG in a variety of situations including natural disasters and cancer (Bozo, Gundogdu, & Buyukasik-Colak, 2009; Buyukasik-Colak, Gundogdu-Akturk, & Bozo, 2012; Martinez, Reyes, & Solar, 2014). One report of cancer patients explained that greater optimism encouraged the use of problem-focused coping strategies, which consequently fostered the development of PTG (Buyukasik-Colak et al., 2012). Although optimism is commonly linked with PTG in the literature, to date no studies were found which examine it as a predictor of PTG in combat veterans. Optimism is, however, a relevant trait to study in soldiers, as it has been linked to less suicidal ideation in military personnel (Bryan, Ray-Sannerud, Morrow, & Neysa, 2013). For study 1, it was hypothesized that greater optimism would be associated with higher levels of PTG in soldiers.

### **Social Support**

Social support is one of the most impactful variables on both resilience and PTG (Grills-Tauechel, Littleton, & Axsom, 2011; Hall, Hobfoll, Canetti, et al., 2010; Tedeschi & Calhoun, 2004). It is typically classified into two types: instrumental and emotional. Instrumental social support refers to tangible goods or services, while emotional support indicates gestures intended to provide comfort to an individual experiencing stress, depression, anxiety, uncertainty, or hopelessness (Finfgeld-Connett, 2005). It may be provided by an intimate partner, family member, friends, co-workers, support groups, health care providers, or other members of a

community (Connerty & Knott, 2013; Heppner et al., 2009). It is important to distinguish social support from the previously discussed social support seeking. Social support is conceptualized as an individual's perception of available social resources, whereas social support seeking indicates the extent to which an individual takes action to utilize their social resources. Social support has been identified as a predictor of PTG in multiple populations, including survivors of natural disasters, cancer, HIV, and infertility (Sim et al., 2015; Yeung & Lu, 2018; Zeligman, Varney, Grad, & Huffstead, 2016). It is particularly important in the study of how to encourage PTG, as qualitative research has identified it as one of the primary modifiable factors in promoting PTG (Connerty & Knott, 2013).

PTG theory provides some explanation for the link between social support and PTG. Tedeschi and Calhoun (2004) posit that social support may promote the development of PTG by enabling a trauma victim to reconstruct their narrative regarding the event and find meaning. Joseph and Linley (2005) add to this idea by specifically asserting that growth following a traumatic event is more likely to occur in a social context which encourages autonomy, competence, and relatedness. However, a key to the efficacy of social support in contributing to PTG is that the survivor views it to be meaningful, rather than simply just available (Tedeschi & Calhoun, 2004). Trauma survivors whose disclosure was received with encouragement and mutual disclosure have demonstrated lower distress and higher PTG (Taku, Tedeschi, Cann, et al., 2009), whereas those who reported low quality of social support exhibited higher posttraumatic stress symptoms (Belsher, Ruzek, Bongar, et al., 2012). More specifically, Belsher and colleagues (2012) reported that the relationship between social constraints (i.e. situations which leave trauma survivors feeling unsupported) and greater posttraumatic stress is mediated by negative posttraumatic cognitions. These findings are supported by Lepore's (2001) social-

cognitive processing model, which theorizes that discussing thoughts and feelings related to trauma with others who are supportive can enable recovery. According to this model, quality social support facilitates the re-establishment of a sense of self-worth and safety, allows for the processing of trauma-related memories, and is a source of both emotional and instrumental support (Lepore, 2001). When disclosure is not well-received, the recovery process may be hindered and distress may be maintained (Lepore, 2001).

Social support is particularly beneficial to soldiers, as it can reduce the harmful effects of combat-related trauma, by buffering the risk of depression, anxiety, and PTSD (Lee, Sudom, & Zamorski, 2013; Romero, Riggs, & Ruggero, 2015). Social support has been positively associated with PTG in a variety of combat veterans, including, Gulf War veterans, OEF/OIF veterans, and veteran amputees (Benetato, 2011; Maguen, Vogt, King, King, & Litz, 2006; Pietrzak et al., 2010; Tsai & Pietrzak, 2017). Some of the most meaningful sources of social support identified by soldiers in the post-deployment period include their intimate partner, extended family, and military unit members/fellow service members (Hawker & Nino, 2017). Military unit cohesion and perceived unit social support have been positively associated with post-deployment PTG in combat veterans (Pietrzak et al., 2010; Mitchell et al., 2013). Social support appears to have an important and ongoing role in the post-deployment period, as higher levels of social support have been shown to foster a resurgence of PTG or promote the maintenance of PTG in the time following deployment (Saltzman, Pat-Horenczyk, Lombe, et al., 2018; Tsai & Pietrzak, 2017). As such, it was predicted that in this study, greater social support in National Guard soldiers would predict higher levels of PTG.



## **Posttraumatic Stress Symptoms/Disorder**

Posttraumatic stress disorder (PTSD) is one of the most commonly studied deployment-related outcomes in the military literature. It is likewise one of the variables frequently examined in connection with PTG among military populations. For the purpose of this paper, the term PTSD will be used to refer to posttraumatic stress symptoms, whether at clinical (PTSD) or non-clinical levels. There is an apparent connection between PTSD and PTG, with one report estimating that approximately 75% of U.S. combat veterans with PTSD demonstrate PTG in at least one domain (Tsai, El-Gabalawy, Sledge, et al., 2015). Additionally, in a qualitative study, seven out of ten veterans who demonstrated moderate to high growth also reported PTSD symptoms (Hawker & Nino, 2017). Multiple studies have corroborated these reports, finding that PTG is positively associated with PTSD symptoms among veterans (Jahn, Herman, Schuster, Naik & Moye, 2012; Morgan et al., 2017; Pietrzak et al., 2010). This has led some researchers to conclude that distress and growth can co-exist, and that they are in fact “not opposite ends of the same spectrum” (Morgan et al., 2017, p.442). Tedeschi and Calhoun (1996, p. 456) have posited that “more intense experiences with trauma may produce greater benefits,” and have used this line of reasoning to explain the positive association between PTSD and PTG. Building off this idea, Bensimon (2012) reported in a study of college students that PTSD mediated the relationship between trauma and growth.

However, PTSD in combat veterans has demonstrated a curvilinear relationship with PTG in certain cases, meaning that moderate levels of PTSD were more predictive of PTG than low or high levels (Solomon & Dekel, 2007; Tsai et al., 2015). This curvilinear pattern between PTSD and PTG has also been seen in civilian populations, including survivors of a terrorist attack and breast cancer patients (Butler, Blasey, Garlan, et al., 2005; Lechner, Carver, Antoni, et

al., 2006). These findings imply that there may be a threshold at which the stress caused by a traumatic event may overwhelm one's ability to cope (Butler et al., 2005).

In an attempt to further elucidate the direction of the relationship between PTSD and PTG, some studies have explored how they relate over time. Two recent studies have reported that higher PTG post-deployment predicts lower severity and incidence of PTSD symptoms at a future time point (Britt et al., 2017; Tsai, Mota, Southwick, et al., 2016). Further, among veterans with PTSD, those demonstrating PTG reported better mental and physical health outcomes than those who did not demonstrate PTG (Tsai, El-Gabalawy, & Sledge et al., 2015). Therefore, although the relationship between PTG and PTSD does appear to be complex, there is evidence that the facilitation of PTG could help ameliorate PTSD or protect against PTSD. This makes the study of PTSD together with PTG important. For study 1, it was hypothesized that PTSD in NG soldiers would be positively associated with PTG.

### **Avoidant Coping**

Coping strategies are the cognitive and behavioral efforts employed in order to control stressors (Folkman & Moskowitz, 2004). Avoidant coping is a coping strategy marked by attempts to withdraw from, suppress, or deny experiences which cause distress, often including substance use. It is linked to multiple adverse outcomes in the military population. Avoidant coping is positively associated with hazardous alcohol use and substance abuse in veterans (Lee, Possemato, & Ouimette, 2017; Norman, Schmied, & Larson, 2014). Several studies link avoidant coping strategies in combat veterans to more severe levels of PTSD (Blow, Bowles, Farero, et al., 2017; Boden, Kimerling, Kulkarni, et al., 2014; Lee et al., 2017; Romero, Riggs, & Ruggero, 2015; Sheerin, Chowdhury, Lind, et al., 2018). Worse depressive and anxiety symptoms are also attributed to avoidant coping in combat veterans (Blow et al., 2017; Romero et al., 2015),

whereas a reduction in avoidant coping post-deployment is associated with better soldier mental health functioning (McAndrew, Lu, Rothman, et al., 2017).

According to cognitive processing models of trauma, avoidant coping is generally considered to be maladaptive to the process of PTG (Creamer et al., 1992). Avoidance of the intrusive memories that trauma induces may provide immediate relief from distress. However, relying on this strategy too much prevents the processing of the trauma necessary to facilitate growth (Creamer et al., 1992). Consequently, as the recovery process is hindered by avoidant coping, symptoms of posttraumatic stress continue (Hagenaars, Flisch, & van Minnen, 2011).

This theorized hindrance of PTG by avoidance coping is evidenced in studies of civilian populations. In a study of adults exposed to a variety of stressors, avoidant coping predicted lower levels of PTG (Brooks, Graham-Kevan, Robinson, & Lowe, 2019). Avoidant coping may also diminish the benefits from growth that has occurred, as one study of cancer patients demonstrated that the use of avoidant coping weakened the relationship between PTG and quality of life (Li, Sun, Wang, et al., 2019).

Although multiple studies highlight the negative impact of avoidant coping on soldier well-being following combat, none to-date have examined the link between avoidant coping and PTG in a military population. Multiple studies have, however, linked deliberate rumination (purposeful thought regarding the traumatic event) to higher levels of PTG in veterans (Benetato, 2011; Morgan & Desmarais, 2017; Morgan, Desmarais, Mitchell, et al., 2017). One study reported that among veterans transitioning to college, those who had made more efforts to make sense of their combat experiences were at lower risk for suicide and driving under the influence (Holland, Mallot, & Currier, 2014). Thus, it appears that making efforts to actively face the struggles of combat, rather than avoid them, contributes to PTG. In addition, self-efficacy has

been shown to be negatively associated with avoidant coping (Levin, Ilgen, & Moos, 2007), indicating that perhaps as an individual feels a greater sense of empowerment over his/her situation, the less avoidant coping strategies such as denial and substance use are utilized. Considering that perceived ability to handle stress (which is closely related to self-efficacy) was selected as a PTG domain, and also taking into account the discussed avoidance coping literature, it was predicted that more avoidant coping in NG soldiers would predict lower levels of PTG.

In summary, despite the widespread study of PTG, the military population, particularly the National Guard, is underrepresented in the literature. Additionally, existing literature on PTG is generally cross-sectional, and subject to the above mentioned critiques of the PTGI. In an effort to measure PTG in a more objective, longitudinal manner, I proposed the measurement of three PTG domains (perceived ability to handle stress, social support seeking, and purpose in life) over time. Each of these domains are reflective of the original three areas of PTG (perception of self, relationships with others, and philosophy of life), as theorized by Tedeschi and Calhoun (1996). Therefore, increases in these domains over time can be indicative of PTG. Optimism, social support, PTSD, and avoidant coping are each pertinent in the study of PTG and National Guard soldiers. Examination of how they are related to PTG with this domain-based approach allows for comparison to previous military PTG literature and may provide insight for post-deployment intervention for soldiers and their families. Finally, evidence suggests that both secondary traumatization and secondary PTG may occur among couples. However, there is a need for the specific study of the influence that soldiers and their romantic partners may have on one another's PTG. The current studies address these questions, and the following chapter will discuss the research methods that were used.

## CHAPTER 3: METHODS FOR THE STUDY OF POSTTRAUMATIC GROWTH OVER TIME AMONG NATIONAL GUARD SOLDIERS AND PARTNERS

### **Procedure and Participants**

Data for both studies were drawn from a U.S. Department of Defense-funded longitudinal study of National Guard members and their partners (Congressionally Directed Medical Research Programs, 2010). Participants were recruited at National Guard pre-deployment events for soldiers and their families throughout a state in the Midwest, and the study included soldiers and, if present, each soldier's significant other. Soldiers belonged to one of two National Guard combat arms battalion units that deployed to Afghanistan in 2012. Participants completed surveys at various time points in the deployment process, including within a few months prior to deployment, at reintegration (approximately 45 days after returning from a one-year deployment), and one and two years after returning home from deployment, for a total of 4 possible waves of data collection. Participants each received \$25 as incentive for participation in each wave. Data collection involved in-person or online completion of surveys involving multiple measures. Soldiers were allowed to enter the study at any one of the four waves, and data were matched over time following data collection by the unique individual survey IDs created by the soldiers.

Each of the proposed studies has its own inclusion criteria and therefore subsets of the overall dataset were used to answer each studies specific questions. For the first study, the sample consisted of soldiers who participated in the study in at least one wave starting with the pre-deployment wave of data collection (n=651). Of those 651 soldiers who participated in the pre-deployment data collection, 596 paired matches to post-deployment data were able to be

made. The total sample consisted of 1,356 soldiers who participated throughout the study with 878 soldiers participating in at least two waves of data collection. The majority of soldiers were male (95.2%) and were between the ages of 18 and 30 (70.7%). They were predominantly Caucasian (88.4%) and most had at least some college experience (65.6%). The majority also indicated that they were in a committed relationship of some sort (61.4%).

The sample for the second study included 371 military couples where each member of the couple participated in at least one of the four waves of data collection with a total of 1406 surveys completed in this sample. In total, 248 couples started participating at the pre-deployment wave of data collection, with complete data at that wave for 225 couples. Soldiers and partners were able to join the study at any proceeding wave, but to be included in this study, both members of the couple needed to participate in at least one wave of data collection. Additionally, to be included in the sample both partners needed to indicate throughout the course of the study that they were still in the relationship. The soldiers were predominantly male (98.3%), and the partners were predominantly female (98.6%). The majority of the participants were Caucasian (soldiers: 83.4%; partners: 84.0%), between the ages of 18 and 30 (soldiers: 58.4%; partners: 60.5%), and had at least some college experience (soldiers: 63.4%; partners: 76.2%).

## **Shared Measures**

### **Perceived Ability to Handle Stress**

Perceived ability to handle stress was measured using responses to the Perceived Stress Scale-4 (PSS-4; Cohen & Williams, 1988). The Perceived Stress Scale was originally developed by Cohen and colleagues (1983) in order to measure an individual's perception of their own ability to respond to threatening situations. The PSS-4 is a very brief version of the original

Perceived Stress Scale (Cohen, Kamarch, & Mermelstein, 1983) which inquires about participants' perception of their ability to manage life events in the past month. It consists of four items, such as "In the last month, how often have you felt that you were unable to control the important things in your life?" and "In the last month, how often have you felt confident about your ability to handle your personal problems?" Response options are on a 5-point scale, and include 0=never, 1=almost never, 2=sometimes, 3=fairly often, and 4=often. Two of the four items were reverse coded, and the scores were summed for a total score. A higher score indicated a higher level of perceived ability to handle stress. The PSS-4 has demonstrated good internal consistency, with a Cronbach's alpha of .82 (Mitchell, Crane, & Kim, 2008).

### **Social Support Seeking**

The using emotional support and using instrumental support subscales from the Brief COPE scale (Carver, 1997) were used to measure social support seeking. The Brief COPE was developed by Carver (1997) as a shortened version of the COPE inventory (Carver, Scheier, & Weintraub, 1989). Its aim is to assess how frequently an individual uses various coping resources in response to a traumatic event. The using emotional support and using instrumental support subscales specifically assess the frequency of reaching out to others for support. These scales use self-report to assess how frequently participants have been utilizing various coping strategies in response to their stressor/trauma (in this case, deployment-related experiences). The using emotional support subscale includes the following two items: "I've been getting emotional support from others" and "I've been getting comfort and understanding from someone." The using instrumental support subscale consists of the following two items: "I've been getting help and advice from others and I've been trying to get advice or help from other people about what to do." Response options are measured using a 4-point scale ranging from 1-4, with 1=not at all,

2=several days, 3=more than half the days, and 4=nearly every day. Scores from each subscale were summed to create a total score, with a higher score indicating a higher level of support seeking. Both of these subscales have demonstrated acceptable psychometric properties, with Carver (1997) reporting the following Cronbach's alphas:  $\alpha = .71$  for using emotional support and  $\alpha = .64$  for using instrumental support.

### **Purpose in Life**

Purpose in life was measured using the Life Engagement Test (LET; Scheier et al., 2006). This self-report six-item scale was designed to assess purpose in life by measuring the extent to which an individual currently engages in activities that they value (Scheier et al., 2006). The LET is ideal for measuring purpose in life over time, as it asks individuals to report their current experiences with purpose in their activities, rather than inquiring whether or not one's life *has been filled* with purpose, as is found in other purpose in life scales (Scheier et al., 2006). Items include questions such as "To me, the things I do are all worthwhile," and "I have lots of reasons for living." Responses are coded using a 5-point scale ranging from 0-4, with response options including 0=Disagree a lot, 1=Disagree a little, 2=Neither agree or disagree, 3=Agree a little, and 4=Agree a lot. Three items were reverse coded, and a higher summed score indicated greater purpose in life. The LET has shown good internal consistency in a variety of populations, with Scheier and colleagues (2006) reporting on average a Cronbach's alpha of .80.

## **Measures Unique to Study 1**

### **Optimism**

Optimism were measured using the Revised Life Orientation Test (LOT-R; Scheier, Carver, & Bridges, 1994). This test inquires about participants' dispositional optimism, or their expectation for positive things to happen in their life. It includes six items, some of which



include “I’m always optimistic about my future” and “In uncertain times, I usually expect the best.” Participants’ responses were coded on a five-point scale, with response options including 0=disagree a lot, 1=disagree a little, 2=neither agree or disagree, 3=agree a little, and 4=agree a lot. Three of the items were reverse coded when scoring, and a higher total score indicated greater optimism. The LOT-R has demonstrated acceptable internal consistency, with a Cronbach’s alpha of .78 (Scheier et al., 1994).

### **Social Support**

The Interpersonal Support Evaluation List-12 (ISEL-12; Cohen, Mermelstein, Kamarck, & Hoberman, 1985) were used to assess social support. This scale consists of 12 items which measure participants’ perceptions of the social support resources available to them. Items inquire about how true various statements about social support are, such as “There is someone I can turn to for advice about handling problems with my family” and “If I were sick, I could easily find someone to help me with my daily chores.” Responses were coded on a 4-point scale, and included 1=definitely false, 2=probably false, 3=probably true, and 4=definitely true. Six of the twelve items were reverse coded when scoring, and a higher summed score indicated a higher perception of available social support. The ISEL-12 has shown good internal consistency, with a Cronbach’s alpha of .82 (Merz, Roesch, Malcarne, et al., 2014).

### **Posttraumatic Stress Disorder Symptoms**

Posttraumatic stress disorder symptoms were assessed using the Posttraumatic Stress Disorder Checklist – Military Version (PCL-M; Weathers, Litz, Herman, Huska & Keane, 1993). This 17-item self-report measure is specifically aimed at measuring and diagnosing PTSD in military populations. Soldiers are asked to respond while taking into account their experiences in the last 30 days related to the most distressing event from their most recent deployment. Some of

the PTSD symptoms inquired about include “Repeated, disturbing memories, thoughts, or images of the stressful experience” and “Trouble falling asleep or staying asleep.” Responses are coded on a 5-point scale, with response options including 1=not at all, 2=a little bit, 3=moderately, 4=quite a bit, and 5=all the time. A higher score indicated greater symptom severity, with a score of 50 or higher representing a clinical level of PTSD (Weathers et al., 1993). The PCL-M has demonstrated excellent internal consistency, with a Cronbach’s alpha of .93 (Badour, Blonigen, Boden, et al., 2012),

### **Avoidant Coping**

Responses to the denial, substance use, and behavioral disengagement subscales from the Brief COPE instrument (Carver, 1997) were used to measure avoidant coping. The purpose of these subscales is to assess how frequently participants have utilized these forms of avoidant coping due to their deployment. Each of these subscales include two items, such as “I’ve been refusing to believe it’s happening,” “I’ve been using alcohol or drugs to help me get through it,” and “I’ve been giving up trying to deal with it.” Response options are on a four-point scale, and include 1=not at all, 2= several days, 3=more than half the days, and 4=nearly every day. All six items were summed to give a total score, with a higher score indicating more avoidant coping. The combination of these three subscales together to represent avoidance coping is consistent with methods used in previous coping studies (Badour et al., 2012; Blow, Bowles, Farero, et al., 2017). The Brief COPE has excellent psychometric properties (Carver, 1997), and avoidance coping specifically has demonstrated good internal reliability, with a Cronbach’s alpha of .80 (Badour et al., 2012).

## **Measure Unique to Study 2**

### **Dyadic Adjustment**

The Revised Dyadic Adjustment Scale (RDAS; Busby et al., 1995) was used to measure dyadic adjustment. The RDAS is a 14-item scale consisting of three subscales: consensus, satisfaction, and cohesion. For the consensus subscale, participants rate the degree to which they agree or disagree with various statements about their relationship. Response options are on a six-point Likert scale ranging from 0 to 5, with 0 = always disagree and 5 = always agree. The satisfaction subscale enquires about frequency of specific events related to relationship stability and conflict. Responses range from 0 to 5, where 0 = all the time and 5=never. The cohesion subscale asks participants to report the frequency with which certain relationship-building events take place. Three items are scored on a six-point scale ranging from 0 to 5, where 0 = never, 1= less than once a month, 2 = once or twice a month, 3 = once or twice a week, 4 = once a day, and 5= more often. The fourth item of the cohesion subscale (“Do you and your mate engage in outside interests together?”) has a five-point response scale which ranges from 0 (never) to 4 (every day). Scores from all three subscales were summed, with a higher score indicating higher dyadic adjustment. The RDAS has shown good internal consistency (Cronbach’s  $\alpha = .90$ ) and reliability (Spearman-Brown split-half reliability coefficient= .95; Crane et al., 2000).

### **Study 1 Data Analysis**

The purpose of study 1 is to examine whether there is evidence that soldiers experience posttraumatic growth (PTG) following a combat deployment and if so, what factors at reintegration predict this growth. In order to accomplish this, soldier PTG was measured using three PTG-related domains assessed at pre-and post-deployment. These domains include perceived ability to handle stress, social support-seeking, and purpose in life. For each domain,

these data were person centered based upon soldier pre-deployment levels of their domain scores. This is an important first step in that it allows for change overtime to be modeled based upon each soldier's individual pattern of change. Following the re-centering of the data, a repeated measures latent profile analysis (RMLPA) was fit to the data (Lanza, 2003; Lanza & Collins, 2006; Oberski, 2016). RMLPA is a statistical approach that allows for the uncovering of latent groups within a sample while allowing change to occur overtime in different ways for each latent class. RMLPA conceptually is similar to growth mixture modeling in that it uncovers latent classes previously unknown in the data. However, one important distinction between the two models is that, unlike mixture modeling, RMLPA does not force any specific form of growth on the data. Change over time is allowed to take dissimilar forms in each latent class. Due to each soldier's data being centered upon their pre-deployment baseline scores, latent classes were uncovered based upon similar patterns of change, instead of based upon mean levels of the domain scores. An RMLPA was first fit to each domain of PTG concurrently, and next for each domain individually. For each RMLPA that was fit, the number of latent classes was selected using fit statistics (average AIC, BIC and sample adjusted BIC), parsimony and interpretability within the context of PTG theory. The different latent classes found in each RMLPA were graphed, examined, and interpreted in the context of PTG theory.

Following selection of final RMLPA models, a multinomial logistic regression approach was used in order to determine if any of the following factors at reintegration were significant predictors of soldiers belonging to the PTG latent class. This was done using the three-step method (Nylund-Gibson, Grimm, Quirk, & Furlong, 2014; Vermunt, 2010) using Mplus version 8 (Muthén & Muthén, 1998-2017). The three-step method takes the results of the RMLPA (first step), and estimates the most likely latent class membership for each soldier (second step), and

regresses class membership onto the predictor variables, while taking into account misclassification in the second step (third step). The predictor variables included optimism, social support, avoidant coping, and PTSD symptoms. Specifically, it was hypothesized that: 1) Higher levels of soldier optimism at reintegration would be associated with soldiers who experience PTG at post-deployment; 2) Higher levels of soldier-reported social support at reintegration would be associated with soldiers who experience PTG post-deployment; 3) Higher levels of PTSD symptoms at reintegration would be associated with soldiers who experience PTG post-deployment; and 4) Higher levels of soldier avoidant coping at reintegration would be associated with soldiers who experience PTG post-deployment. For each model, pre-deployment baseline levels of the domain being studied were also controlled for in the three-step process.

### **Study 2 Data Analysis**

The purpose of study 2 was to examine PTG within military couples to determine if the growth of one member of the couple can influence their partner's growth over time. Specifically, this was meant to test the assertion that PTG can be contagious within couples. To examine these associations over time, soldier and partner PTG were measured using three PTG-related domains assessed pre-deployment and then again post-deployment, at reintegration, 1-year and 2-year follow up. These domains include perceived ability to handle stress, social support seeking, and purpose in life. In order to uncover evidence of soldiers' and partners' levels of growth predicting subsequent growth within their partner, a dyadic latent change score model (LCSM) was first fit to the data. LCSM is a statistical approach that allows for the examination of change over time to be modeled for each member of a dyad concurrently in order to reflect the dependent data structure of the dyadic data (see Kenny et al., 2006; Ledermann & Kenny, 2017; Hilpert, Bodenmann, Nussbeck, & Bradbury, 2016). Specifically, a separate LCSM was fit to

these data for each of the domains of PTG being examined. Each LCSM modeled for both member of the dyad (soldier and partner) the pre-deployment baseline level of the PTG domain as an intercept and change scores at reintegration, one-year and two-year follow-up. The LCSM was modeled in such a way that each change score represents the changes in the PTG domain for soldier and partner compared to their respective pre-deployment baseline. First, to determine if there was a partner effect such that one person's level of change predicts their partner's level of change at subsequent time points, a fully recursive model with actor and partner effects for each domain was examined. Specifically, change scores at one-year and two-year post-deployment were predicted by prior change scores within and across persons in the dyad while controlling for each individuals baseline intercept. All analyses were conducted using Mplus version 8 (Muthén & Muthén, 1998-2017). Finally, in order to test the hypothesis that better dyadic adjustment was predicted by PTG, dyadic adjustment for both soldiers and partners were added to the models, with each change score (both soldier and partner) as predictors, while simultaneously controlling for initial baseline levels of the domain scores.

## CHAPTER 4: WHAT PREDICTS PERSONAL GROWTH FOLLOWING A DEPLOYMENT?

### AN EXAMINATION OF NATIONAL GUARD SOLDIERS THROUGH THE LENS OF POSTTRAUMATIC GROWTH

Since the terrorist attacks of September 11<sup>th</sup> 2001, more than 2.6 million military service members deployed as part of Operation Enduring Freedom, Operation Iraqi Freedom, and Operation New Dawn (Institute of Medicine, 2014). This era of deployments to Afghanistan and Iraq were unique in comparison to deployments in other eras for multiple reasons. These operations involved deployments which were longer and more frequent, meaning multiple deployments were required of many military personnel, and often with a short reprieve between deployments (Institute of Medicine, 2010). The requirement of more troops meant a greater reliance on service members from the National Guard and Reserves, who comprised 44% of troops deploying for these operations (Institute of Medicine, 2010). This translated to high strain being placed on National Guard service members and families, a population which already faces unique challenges when compared to active duty soldiers (Institute of Medicine, 2010). National Guard soldiers, or “citizen warriors,” have a distinct deployment and subsequent reintegration experience, and consequently endure unique challenges, including regaining employment as a civilian and dispersing from their unit peers upon reintegration (Gorman, Blow, Ames, & Reid, 2011; Werber, Schaefer, Osilla, et al., 2013). Following deployment they may also experience barriers to accessing quality healthcare including mental health care, due to a lack of services in their area, a pervasive stigma in the military regarding mental health treatment, and concerns of how it could negatively impact their careers (Gorman et al., 2011; Valenstein et al., 2014).

Extensive research has documented the adverse physical and mental health outcomes that soldiers experience related to deployment. Soldiers demonstrate impairment in their physical health, mental health, social and role functioning, relationship functioning and family life, spirituality, as well as financial well-being (Sherman, Larsen, & Borden, 2015). Among these domains impacted by deployment, mental health problems are particularly predictive of future struggles (Sherman et al., 2015). Posttraumatic stress disorder (PTSD) is estimated to affect 10-17% of service members who have served combat deployments and is associated with detrimental outcomes including a higher risk of suicide and emotional distance in intimate relationships (Allen, Rhoades, Stanley, & Markman, 2010; Pietrzak, Goldstein, Malley et al., 2010; Sundin, Fear, Iversen, et al., 2010). Among Operation Enduring Freedom and Operation Iraqi Freedom (OEF/OIF) veterans, nearly one-fifth are estimated to suffer from depression (Lane, Hourani, Bray, & Williams, 2012; Seal, Metzler, & Gima, et al., 2009), and nearly one-third report hazardous drinking shortly after return from deployment (Blow, Gorman, Ganoczy, et al., 2013).

During the post-deployment period, National Guard members are estimated to experience similar levels of mental health difficulties as active duty soldiers (Blow et al., 2013; Gorman, et al., 2011). One study reported that following deployment, nearly 40% of National Guard soldiers presented with at least one of the following mental health problems: hazardous alcohol use, depression, PTSD, or suicidal ideation (Gorman et al., 2011). Reserve component soldiers may even be at greater risk than active-duty soldiers in certain areas, as one study reported that reservists who had been deployed had higher rates of suicidal ideation and attempts than their active-duty counterparts (Lane et al., 2012). This risk for mental health challenges, combined



with barriers to receiving quality mental health care, is particularly concerning for the well-being of members of the National Guard and Reserves.

Despite the evidence for deployment-related adversity, many soldiers demonstrate positive outcomes (Dickstein, Suvak, Litz & Adler, 2010). Many studies have explored qualities that enable soldiers to be resilient, or in other words, resistant to negative outcomes, in the time following deployment (e.g. Meredith, Sherbourne, Gaillot, et al., 2011). More recently, other studies have explored posttraumatic growth, which differs relative to resilience, in that it asserts that soldiers not only return to normative functioning following deployment, but may in fact experience personal growth in certain areas of their lives as the result of struggling with the challenges of trauma.

### **Posttraumatic Growth Definition and Theory**

Posttraumatic growth (PTG) was originally defined as the “subjective experience of positive psychological change reported by an individual as a result of the struggle with highly challenging life circumstances” (Tedeschi & Calhoun, p. 12, 1996). Recent studies have added understanding to PTG’s definition, including the idea that PTG is a “cluster of benefits that result from a complex combination of cognitive, emotional, and social processes (Tedeschi & Blevins, p. 373, 2015).

The predominant framework in the PTG literature is Tedeschi and Calhoun’s, which describes the phenomenon of PTG using the earthquake metaphor (Calhoun & Tedeschi, 1998; Calhoun & Tedeschi, 2004). This metaphor posits that the process of PTG is initiated within an individual when the experience of a traumatic event shatters core beliefs and assumptions about the world, and thereby causes a crisis (Janoff-Bulman, 1997). Although trauma typically causes psychological distress, the trauma alone cannot bring about growth. If the crisis is likened to the

earthquake, emotional and cognitive processing are akin to the rebuilding process. Just as buildings can be restructured in a way that makes them more earthquake-resistant in the future, an individual's view of self and the world can be rebuilt in a way that provides protection against damage from future trauma. In addition to emerging from trauma with increased resilience, the process of developing PTG may endow individuals with attributes that enrich their everyday life, including a greater sense of wisdom, compassion, and appreciation for life (Tedeschi & Calhoun, 2004).

This process of rebuilding requires effort, and if it does not occur, or occurs in a negative way, PTG cannot happen. One of the major processes that facilitates this process is deliberate rumination about the event, during which an individual takes time to consider why the event occurred. Connected with rumination is the process of meaning making (Tedeschi & Calhoun, 2004). People desire meaning in their experiences, and as they find it, it enables them to cope with trauma (Frankl, 1992). Self-disclosure to empathetic individuals who provide social support may facilitate this rumination process, and thereby help survivors develop new narratives surrounding their traumatic experiences (Tedeschi & Calhoun, 2004). It is important, however, to note that even with perceived growth in certain areas, the individual does not typically view the traumatic event as desirable. Rather, PTG can be viewed as the positive outcomes derived from a negative experience (Tedeschi & Calhoun, 2004). Tedeschi and Calhoun (1996) originally identified three main areas of change following trauma: 1) perception of self, 2) relationships with others, and 3) philosophy of life. These three categories were then expanded to five domains of the Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996): 1) Relating to others, 2) new possibilities, 3) personal strength, 4) spiritual change, and 5) appreciation of life.

Although the PTGI is currently the predominant measurement tool for PTG, it has received criticism. Perhaps the largest critique of the measurement of PTG using the PTGI is its requirement for individuals to retrospectively evaluate themselves. Specifically, the PTGI requires individuals to 1) assess their current standing on a given domain, 2) assess their previous standing on that domain, 3) compare the current and previous standing responses, 4) assess how much change had occurred, and 5) decide to what degree their perceived change was related to the traumatic event (Frazier et al., 2009). Due to the subjective and complex nature of the PTGI, some have questioned if it is indicative of actual growth (Frazier et al., 2009; Jayawickreme et al., 2014; Nolen-Hoeksema & Davis, 2004). This study takes a longitudinal domain-based approach at measuring PTG, as will be discussed below, in an effort to investigate if real growth occurs over time in soldiers.

### **Three Constructs as PTG Domains**

The type and amount of growth that may occur following a traumatic event is influenced by a variety of factors, including the type of trauma and cultural ideas regarding growth (Mangelsdorf et al., 2019; Pals & McAdams, 2004). Mangelsdorf and colleagues (2019) called for a broader conceptualization of PTG to extend what the PTGI's five domains allow. They, along with others, suggested the consideration of other psychological domains in the measurement of PTG, including self-esteem and mastery, self-confidence, self-awareness, interpersonal involvement, and social adaptability (Mangelsdorf et al., 2019; Nordstrand, Hjerndal, Holen, et al., 2017). The importance of measuring trauma-specific domains has also been highlighted. For example, survivors of cancer and other serious illnesses reported gaining a new awareness of their bodies due to their health struggles (Hefferon, Greal, & Mutrie, 2009).

As such, below are three domains which are relevant to the study of PTG, and were used in the measurement of PTG in the current study.

### **Perceived Ability to Handle Stress**

The first domain to be used in the measurement of PTG is the perceived ability to handle stress. According to Lazarus and Folkman's (1984) Theory of Cognitive Appraisal, a model of psychological stress and coping, the impact of an objective stressor is to some extent related to an individual's subjective perspective of that stressor. From this perspective, it is the level to which one appraises a situation as stressful, rather than the objective stressfulness, that determines how one responds. One's appraisal of stress is related to one's perceived coping resources. When a situation is appraised as highly stressful, this is an indication that the individual perceives the demands of the situation to be beyond his/her own abilities to cope (Lazarus, 1977; Lazarus & Folkman, 1984). When taken in this light, the construct of perceived stress can be considered to be a reflection of one's own ability to cope with stressful situations. This makes an individual's perceived ability to handle stress an ideal construct to measure over time in response to trauma in order to determine PTG related to one's self-perception.

The connection between perceived ability to handle stress and PTG has been examined in a handful of studies. In a variety of populations, including high school students and cancer survivors, perceived ability to handle stress and PTG have been shown to have a positive relationship (Arpawong, Rohrbach, Milam, et al., 2016; Bussell & Naus, 2010; Diaz, Aldridge-Gerry, & Spiegel, 2014; Love & Sabiston, 2011). In a study of Chinese American breast cancer survivors, Yeung and Lu (2018) explored the relationships between social support, perceived ability to handle stress, and PTG. They reported that perceived ability to handle stress was positively associated with both social support and PTG. Further, they found that perceived ability

to handle stress mediated the relationship between social support and PTG (Yeung & Lu, 2018). These findings lend credence to Lazarus and Folkman's (1984) theory that greater perceived resources (i.e. social support) can improve one's perception of one's ability to handle stress. Consequently, this increased sense of one's ability translates to greater PTG. The perception of one's ability to effectively face adversity is pertinent to the lives of deploying soldiers and their families. They are at risk for experiencing ongoing adversity in addition to the current deployment, such as reintegration challenges for themselves and their family, as well as possible future deployments. However, the perceived ability to handle stress does not yet appear to have been examined over time, nor in connection with PTG, in a military population.

### **Social Support Seeking**

Social support seeking is the second domain used in the measurement of PTG in National Guard soldiers. In social science literature, reaching out to others in times of adversity is known as social support seeking, and has been conceptualized as a dimension of coping (Amirkhan & Greaves, 2003; Carver, 1997). The term social support seeking encapsulates both instrumental support seeking, which involves seeking advice, help, or information, and emotional support seeking, which refers to seeking sympathy, understanding, and moral support (Carver, Scheier, & Weintraub, 1989). The act of seeking social support is a reflection of one's relationships with others, as it indicates a willingness to allow others to help bear the burden of adversity. In one qualitative study, partners of deployed soldiers described the value of seeking emotional support from their partner, family, friends, and support groups. One partner explained that soliciting emotional support required her to "get over that feeling of not wanting to bother people or not having to ask for help, because [she needed] help" (p. 257, Rossetto, 2015). This example highlights how the act of seeking social support reflects an individual's recognition that it is

acceptable to turn to others for help in times of adversity. Seeking social support has also been positively associated with problem solving as a coping strategy (Daniels, Beesley, Wimalasiri et al., 2013). As PTG has been conceived as both a process and an outcome, it stands to reason that this coping strategy could be both a facilitator and an indicator of personal growth in response to trauma.

Social support seeking following a traumatic event has been positively associated with PTG in a variety of populations, including undergraduate students, paramedics, and incarcerated prisoners (McMillen, Smith, & Fischer, 1997; Vanhooren, Leijssen, & Dezutter, 2018). Among women who were recently widowed, those who sought support from family and friends reported higher levels of appreciation for life and overall personal growth (Recksiedler, Loter, Klaas, et al., 2018). An increase in social support seeking over time among soldiers in response to deployment could indicate an altered perspective of one's relationships with others, and therefore, demonstrate the occurrence of PTG.

### **Purpose in Life**

Finally, purpose in life is the third domain used in the measurement of PTG. Purpose in life has been defined as one's perception of having long-term goals, direction, and meaning in past and present life (Kim, Sun, Park, et al., 2013; McKnight & Kashdan, 2009). Further, one's sense of purpose in life has also been conceptualized as a psychosocial resource which can help individuals respond more positively to challenging circumstances (Burrow, Hill, & Sumner, 2016; Fogelman & Canli, 2015). Consequently, the subject of purpose has been widely studied in the stress and trauma literature. Purpose in life is associated with better physical and mental health, including less chronic illness, reduced cortisol reactivity and output, as well as lower levels of perceived stress and negative affect (Fogelman & Canli, 2015; Hill, Sin, Turiano et al.,

2018; Kim et al., 2013; Lindfors & Lundberg, 2002; Scheier, Wrosch, Baum, et al., 2006). More specifically, purpose in life has been shown to moderate the relationship between daily stressors and well-being (Hill et al., 2018). Resilience and social support are also positively associated with purpose in life (Musich, Wang, Kraemer et al., 2018; Nygren, Alex, Jonsen et al., 2005).

A sense of purpose in life is likewise beneficial in the lives of soldiers. Soldiers who report greater purpose or meaning in life tend to display more resilience (Isaac, Mota, Tsai, et al., 2017), including fewer suicidal behaviors, less distress, and better functioning at work, in recreation, and in their interpersonal relationships (Bryan, Elder, McNaughton-Cassill et al., 2013; Kachadourian, Tsai, et al., 2019). As such, some regard purpose in life to be a protective psychosocial characteristic for soldiers (Kachadourian et al., 2019; Straus, Norman, Haller et al., 2019). Bryan and colleagues (2013) suggest that promoting meaning in life among combat veterans may help reduce their risk for maladaptive coping behaviors (i.e. suicide-related behaviors, substance abuse, etc.).

Purpose/meaning in life is also related to PTG. In the aftermath of terrorist attacks, college students demonstrated a positive association between meaning in life and PTG (Steger, Frazier, & Zacchanini, 2008). Triplett and colleagues (2012) developed a path model which showed that higher PTG predicted more meaning in life among undergraduate students who had experienced a traumatic event. Among veterans, purpose in life has been positively associated with PTG (Tsai, El-Gabalawy, & Sledge, et al., 2015; Tsai & Pietrzak, 2017). When examined longitudinally, purpose in life positively predicted the sustainment or increase in PTG levels two years later in U.S. veterans (Tsai & Pietrzak, 2017). Linley and Joseph (2011) reported that the presence of meaning was positively associated with PTG, but that the search for meaning was associated with more negative change. These findings demonstrate that although the process of

undergoing PTG can be marked by increased distress, it may ultimately culminate in personal growth.

### **PTG in the Military and Related Variables**

Recent reports indicate that a moderate level of PTG in military soldiers is common (Hijazi, Keith, & O'Brien, 2015; Mark, Stevelink, Choi, & Fear, 2018; Pietrzak et al., 2010; Tsai, Gabalawy & Sledge et al., 2015). Multiple studies show that as many as 70% of combat veterans experience moderate levels of PTG in at least one domain (Hijazi et al., 2015; Pietrzak et al., 2010). Reporting the experience of a challenge to core beliefs, rumination, and the perception of moral wrongdoing have each been associated with higher levels of PTG in soldiers (Hijazi et al., 2015; Morgan et al., 2017). Ethnic minorities also demonstrate higher levels of PTG than Caucasians among military populations (Gallaway, Millikan & Bell, 2011; Kaler, Erbes, Tedeschi, et al., 2011; Mitchell, Gallaway, Millikan, et al., 2013). PTG in combat veterans has been significantly linked with higher life satisfaction and lower risk for suicidal ideation (Bush, Skopp, McCann, et al., 2011; Gallaway et al., 2011). Consequently, some researchers assert that the encouragement of PTG could be an effective alternative to treating posttraumatic stress symptoms, and could therefore help improve overall well-being (Mark et al., 2018; Morgan et al., 2017). This makes the study of PTG in military populations timely and meaningful. However, to date there has been limited focus on National Guard soldiers in the PTG literature.

Only one study to date has explored a longitudinal measurement approach of PTG in a military sample with more than two time points (Tsai & Pietrzak, 2017). This study found that among combat veterans, PTG levels have varying trajectories over time. A sample of 2,718 veterans were surveyed at three time points over a span of four years. Latent growth mixture



modeling identified three distinct PTG trajectories among veterans: 1) low and decreasing PTG (74%), 2) consistently moderate PTG (12%), and high and increasing PTG (14%). Predictors of PTG levels being maintained or increasing two years later included purpose in life, altruism, gratitude, religiosity, and an active lifestyle. It is important to note, however, that the reports of PTG were not deployment-specific, and that no baseline was measured. This study highlighted the dynamic and divergent nature of PTG, and the need for further examination of PTG trajectories and predictors surrounding deployment. Below is a review of each of the variables the current study examined as a potential predictor of PTG.

### **Social Support**

Social support is one of the most impactful variables on both resilience and PTG (Grills-Taquechel, Littleton, & Axsom, 2011; Hall, Hobfoll, Canetti, et al., 2010; Tedeschi & Calhoun, 2004), and may be particularly beneficial to soldiers. Social support may reduce the harmful effects of combat-related trauma by buffering the risk of depression, anxiety, and PTSD (Lee, Sudom, & Zamorski, 2013; Romero, Riggs, & Ruggero, 2015), and has been positively associated with PTG in a variety of combat veterans, including, Gulf War veterans, OEF/OIF veterans, and veteran amputees (Benetato, 2011; Maguen, Vogt, King, King, & Litz, 2006; Pietrzak et al., 2010; Tsai & Pietrzak, 2017). Some of the most meaningful sources of social support identified by soldiers in the post-deployment period include their intimate partner, extended family, and military unit members/fellow service members (Hawker & Nino, 2017). Military unit cohesion and perceived unit social support have been positively associated with post-deployment PTG in combat veterans (Mitchell et al., 2013; Pietrzak et al., 2010). Social support appears to have an important and ongoing role in the post-deployment period, as higher levels of social support have been shown to foster a resurgence of PTG or promote the

maintenance of PTG in the time following deployment (Saltzman, Pat-Horenczyk, Lombe, et al., 2018; Tsai & Pietrzak, 2017).

## **Optimism**

Optimism, or one's tendency to anticipate either good or bad outcomes in the future (Scheier & Carver, 1985), is a relevant trait to study in soldiers, as it has been linked to less suicidal ideation in military personnel (Bryan, Ray-Sannerud, Morrow, & Neysa, 2013). It has frequently been identified as a predictor of resilience in response to adversity (e.g. Segovia, Moore, & Linnville et al., 2012). Tedeschi and Calhoun (2004) distinguished optimism from PTG, conceptualizing optimism as an enduring trait involving positive expectations for the future, as opposed to PTG which has a quality of transformational change. Despite this distinction, Tedeschi and Calhoun (2004) posit that optimism is a trait that may enable individuals to develop PTG. Specifically, they explain that optimists may be more effective at cognitively processing traumatic events, which may facilitate personal growth (Tedeschi & Calhoun, 2004). Optimism is positively associated with PTG in a variety of situations including natural disasters and cancer (Bozo, Gundogdu, & Buyukasik-Colak, 2009; Buyukasik-Colak, Gundogdu-Akturk, & Bozo, 2012; Martinez, Reyes, & Solar, 2014). Although optimism is commonly linked with PTG in the literature, to date no studies were found which examine it as a predictor of PTG in combat veterans.

## **PTSD**

The relationship between PTSD and PTG in soldiers has proven complex. PTSD in combat veterans has demonstrated a curvilinear relationship with PTG in certain cases, meaning that moderate levels of PTSD were more predictive of PTG than low or high levels (Solomon & Dekel, 2007; Tsai et al., 2015). There may be a threshold at which the stress caused by a

traumatic event may overwhelm one's ability to cope (Butler et al., 2005). To further elucidate the direction of the relationship between PTSD and PTG, some studies have explored how they relate over time. Two recent studies reported that higher PTG post-deployment predicts lower severity and incidence of PTSD symptoms at a future time point (Britt et al., 2017; Tsai, Mota, Southwick, et al., 2016). Further, among veterans with PTSD, those demonstrating PTG reported better mental and physical health outcomes than those who did not demonstrate PTG (Tsai et al., 2015). Therefore, although the relationship between PTG and PTSD does appear to be complex, there is evidence that the facilitation of PTG could help ameliorate PTSD or protect against PTSD. This makes the study of PTSD together with PTG important.

### **Avoidant Coping**

Avoidant coping, which is marked by attempts to withdraw from, suppress, or deny experiences which cause distress, is linked to adverse outcomes in veterans. Soldiers who demonstrate avoidant coping report higher levels of hazardous alcohol use, substance abuse, and PTSD (Blow, Bowles, Farero, et al., 2017; Boden, Kimerling, Kulkarni, et al., 2014; Lee, Possemato, & Ouimette, 2017; Norman, Schmied, & Larson, 2014; Romero, Riggs, & Ruggero, 2015; Sheerin, Chowdhury, Lind, et al., 2018). Worse depressive and anxiety symptoms are also attributed to avoidant coping in combat veterans (Blow et al., 2017; Romero et al., 2015), whereas a reduction in avoidant coping post-deployment is associated with better soldier mental health functioning (McAndrew, Lu, Rothman, et al., 2017).

According to cognitive processing models of trauma, avoidant coping is generally considered to be maladaptive to the process of PTG (Creamer et al., 1992). Avoidance of the intrusive memories that trauma induces may provide immediate relief from distress. However, relying on this strategy too much can prevent the necessary processing of trauma for facilitating

growth (Creamer et al., 1992). Consequently, as the recovery process is hindered by avoidant coping, symptoms of posttraumatic stress continue (Hagenaars, Fisch, & van Minnen, 2011). Although multiple studies highlight the negative impact of avoidant coping on soldier well-being following combat, none to-date have examined the potential link between avoidant coping and PTG in a military population.

### **Current Study**

The current study seeks to add to the current discourse on PTG in the military, both by focusing on the National Guard population, and by taking a domain-based measurement approach. As previously discussed, the goal of this domain-based approach is to avoid the retrospective self-evaluation that the PTGI requires. More specifically, this study aims to explore whether or not certain variables significantly predict PTG in National Guard soldiers. As such, the main research questions are as follows: Is there evidence of soldiers experiencing PTG in the domains of perceived ability to handle stress, social support seeking and purpose in life? If so, are a soldier's levels of optimism, social support, PTSD symptoms, and avoidant coping at reintegration associated with PTG following a combat deployment?

Based on findings previously reported in PTG literature, hypotheses for this study are as follows: 1) Higher levels of soldier optimism at reintegration will be associated with soldiers who experience PTG post-deployment; 2) Higher levels of soldier-reported social support at reintegration will be associated with soldiers who experience PTG post-deployment; 3) Higher levels of PTSD symptoms at reintegration will be associated with soldiers who experience PTG post-deployment; and 4) Higher levels of soldier avoidant coping at reintegration will be associated with soldiers who experience PTG post-deployment.

## **Methods**

### **Procedure and Participants**

The current study was done using existing data from a U.S. Department of Defense-funded longitudinal study of National Guard soldiers who had deployed to Afghanistan as part of a combat arms battalion in 2012 (Congressionally Directed Medical Research Programs, 2010). Participants were recruited at National Guard pre-deployment events for soldiers and their families throughout a state in the Midwest. Participants completed surveys at various time points in the deployment process, including within a few months prior to deployment, at reintegration (approximately 45 days after returning from a one-year deployment), and one and two years after returning home from deployment. Participants each received \$25 as incentive for participation in each wave. Data collection involved in-person or online completion of surveys involving several measures. Soldiers were allowed to enter the study at any one of the four waves, and data were matched over time following data collection by the unique individual survey IDs created by the soldiers.

The sample consists of soldiers who participated in the study in at least one wave starting with the pre-deployment wave of data collection (n=651). Of those 651 soldiers who participated in the pre-deployment data collection, 596 paired matches to post-deployment data were able to be made. The total sample consisted of 1,356 soldiers who participated throughout the study with 878 soldiers participating in at least two waves of data collection. The majority of soldiers were male (95.2%) and were between the ages of 18 and 30 (70.7%). They were predominantly Caucasian (88.4%) and most had at least some college experience (65.6%). The majority also indicated that they were in a committed relationship of some sort (61.4%).

## Measures

**Perceived ability to handle stress.** Perceived ability to handle stress was measured using responses to the Perceived Stress Scale-4 (PSS-4; Cohen & Williams, 1988). The Perceived Stress Scale was originally developed by Cohen and colleagues (1983) in order to measure an individual's perception of their own ability to respond to threatening situations. The PSS-4 is a very brief version of the original Perceived Stress Scale (Cohen, Kamarch, & Mermelstein, 1983) which inquires about participants' perceptions of their ability to manage life events in the past month. It consists of four items, such as, "In the last month, how often have you felt that you were unable to control the important things in your life?" and "In the last month, how often have you felt confident about your ability to handle your personal problems?" Response options are on a 5-point scale, and include 0=never, 1=almost never, 2=sometimes, 3=fairly often, and 4=often. Two of the four items were reverse coded, and the scores were summed for a total score. A higher score indicated a higher level of perceived ability to handle stress. The PSS-4 has demonstrated good internal consistency, with a Cronbach's alpha of .82 (Mitchell, Crane, & Kim, 2008).

**Social support seeking.** This construct was measured using the emotional and instrumental support subscales from the Brief COPE (Carver, 1997). The Brief COPE was developed by Carver (1997) as a shortened version of the COPE inventory (Carver, Scheier, & Weintraub, 1989). It aims to assess how frequently an individual uses various coping resources in response to a traumatic event. The emotional support and instrumental support subscales specifically assess the frequency of reaching out to others for support. These scales aim to assess through self-report how frequently participants have been utilizing various coping strategies in response to their stressor (in this case, deployment-related experiences).The using emotional

support subscale includes the following two items: “I’ve been getting emotional support from others” and “I’ve been getting comfort and understanding from someone.” The using instrumental support subscale consists of the following two items: “I’ve been getting help and advice from others” and “I’ve been trying to get advice or help from other people about what to do.” Response options are measured using a 4-point scale ranging from 1-4, with 1=not at all, 2=several days, 3=more than half the days, and 4=nearly every day. Scores from each subscale were summed to create a total score, with a higher score indicating a higher level of support seeking. Both of these subscales have demonstrated acceptable psychometric properties, with Carver (1997) reporting the following Cronbach’s alphas:  $\alpha = .71$  for using emotional support and  $\alpha = .64$  for using instrumental support.

**Purpose in life.** Purpose in life was measured using the Life Engagement Test (LET; Scheier et al., 2006). This self-report six-item scale was designed to assess purpose in life by measuring the extent to which an individual currently engages in activities that they value (Scheier et al., 2006). The LET is ideal for measuring purpose in life over time, as it asks individuals to report their current experiences with purpose in their activities, rather than inquiring whether or not one’s life has been filled with purpose, as is found in other purpose in life scales (Scheier et al., 2006). Items include questions such as “To me, the things I do are all worthwhile” and “I have lots of reasons for living.” Responses are coded using a 5-point scale ranging from 0-4, with response options including 0=disagree a lot, 1=disagree a little, 2=neither agree or disagree, 3=agree a little, and 4=agree a lot. Three items were reverse coded, and a higher summed score indicated greater purpose in life. The LET has shown good internal consistency in a variety of populations, with Scheier and colleagues (2006) reporting on average a Cronbach’s alpha of .80.

**Optimism.** Optimism was measured using the Revised Life Orientation Test (LOT-R; Scheier, Carver, & Bridges, 1994). This test inquires about participants' dispositional optimism, or their expectation for positive things to happen in their lives. It includes six items, some of which include, "I'm always optimistic about my future," and "In uncertain times, I usually expect the best." Participants' responses were coded on a five-point scale, with response options including 0=disagree a lot, 1=disagree a little, 2=neither agree or disagree, 3=agree a little, and 4=agree a lot. Three of the items were reverse coded when scoring, and a higher total score indicated greater optimism. The LOT-R has demonstrated acceptable internal consistency, with a Cronbach's alpha of .78 (Scheier et al., 1994).

**Social support.** The Interpersonal Support Evaluation List-12 (ISEL-12; Cohen, Mermelstein, Kamarck, & Hoberman, 1985) was used to assess social support. This scale consists of 12 items which measure participants' perceptions of the social support resources available to them. Items inquire about how true various statements about social support are, such as "There is someone I can turn to for advice about handling problems with my family," and "If I were sick, I could easily find someone to help me with my daily chores." Responses were coded on a 4-point scale, and included 1=definitely false, 2=probably false, 3=probably true, and 4=definitely true. Six of the twelve items were reverse coded, and a higher summed score indicated a higher perception of available social support. The ISEL-12 has shown good internal consistency, with a Cronbach's alpha of .82 (Merz, Roesch, Malcarne, et al., 2014).

**Posttraumatic stress disorder symptoms.** Posttraumatic stress disorder symptoms were assessed using the Posttraumatic Stress Disorder Checklist – Military Version (PCL-M; Weathers, Litz, Herman, Huska & Keane, 1993). This 17-item self-report measure is aimed at measuring and diagnosing PTSD in military populations. Soldiers were asked to respond while



taking into account their experiences in the last 30 days related to the most distressing event from their most recent deployment. Some of the PTSD symptoms inquired about include, “Repeated, disturbing memories, thoughts, or images of the stressful experience,” and “Trouble falling asleep or staying asleep.” Responses were coded on a 5-point scale, with response options including 1=not at all, 2=a little bit, 3=moderately, 4=quite a bit, and 5=all the time. A higher score indicated greater symptom severity, with a score of 50 or higher representing a clinical level of PTSD (Weathers et al., 1993). The PCL-M has demonstrated excellent internal consistency, with a Cronbach’s alpha of .93 (Badour, Blonigen, Boden, et al., 2012).

**Avoidant coping.** Responses to the denial, substance use, and behavioral disengagement subscales from the Brief COPE instrument (Carver, 1997) were used to measure avoidant coping. The purpose of these subscales is to assess how frequently participants have utilized these forms of avoidant coping due to their deployment. Each of these subscales include two items, including “I’ve been refusing to believe it’s happening,” “I’ve been using alcohol or drugs to help me get through it,” and “I’ve been giving up trying to deal with it.” Response options are on a four-point scale, and include 1=not at all, 2= several days, 3=more than half the days, and 4=nearly every day. All six items were summed to give a total score, with a higher score indicating more avoidant coping. The combination of these three subscales together to represent avoidance coping is consistent with methods used in previous coping studies (Badour et al., 2012; Blow, Bowles, Farero, et al., 2017). The Brief COPE has excellent psychometric properties (Carver, 1997), and avoidance coping specifically has demonstrated good internal reliability, with a Cronbach’s alpha of .80 (Badour et al., 2012).

## **Data Analysis**

In order to uncover evidence of soldiers' experiencing PTG, a repeated measure latent profile analysis (RMLPA) was fit to the data. RMLPA is a statistical approach that allows for the uncovering of latent groups within a sample while allowing change to occur overtime in different ways for each latent class. Before the RMLPA was ran, each person's data were centered based upon soldier pre-deployment levels of their domain scores. Latent classes found in the RMLPA are therefore based upon patterns of change rather than on high or low values of the domain scores. We first fit an RMLPA using all three domains of PTG concurrently, and next looked at each domain individually. The number of latent classes was selected for each RMLPA using fit statistics (average AIC, BIC and sample adjusted BIC), parsimony and interpretability within the context of PTG theory. Next, in order to identify possible predictors of PTG group membership for any of the soldiers, a multinomial logistic regression approach was used. Following selection of final LPA models, predictors were added using the three-step method (R3Step in Mplus) which takes the results of the RMLPA (first step) and estimates the most likely latent class membership for each soldier (second step), and regresses class membership onto the predictor variables, while taking into account misclassification in step two (third step; Muthén & Muthén, 1998-2017; Vermunt, 2010). The predictor variables included optimism, social support, avoidant coping and PTSD symptoms, all while controlling for pre-deployment baseline levels of the domains examined.

## **Results**

First, results of the RMLPA will be discussed in the context of each of the domains examined. Following this, the relationship between latent classes and the predictor variables will be discussed.

## Trajectories of Change

**Overall PTG.** A series of RMLPA models were fit to the data starting with the two-class model. The number of classes was then increased by one until a final solution was reached. The results of the RMLPA when including all three of the PTG domains (perceived ability to handle stress, support seeking, and purpose in life) suggested 5 separate latent classes of change. The 5 class solution was chosen after considering average fit statistics, theory, and generalizability (see Figure 1.1). Specifically, the average AIC, BIC and sample adjusted BIC decreased for each subsequent model. However, an “elbow” was reached with the 4 and 5 class models (Nylund, Asparouhov, & Muthén, 2007). Next, examining the item profile plots for the four, five and six class models in context of PTG theory led to the 5 class model being chosen for its clearly defined and interpretable separate classes. The following 5 latent classes were identified as follows: a *PTG Class* (showing growth in all domains; this included 10.9% of the sample), a *Resilient Class* (showing little change from baseline in all domains; this included 39% of the sample), a *Declining Class* (showing a decline in all domains from baseline scores; this included 17.6% of the sample), a *Support Seeking Class* (showing growth in the Support Seeking domain and decline in the other two domains; this included 22.6% of the sample), and finally a *Stress Handling Class* (showing growth in the Perceived Ability to Handle Stress domain and decline in the Support Seeking domain; this included 9.9% of the sample). Figure 1.1 shows these latent classes for the different patterns of change. Due to the person-centering of the variables, anything higher than zero can be considered evidence of PTG, while anything lower than zero demonstrates a decline, and scores near zero seem to demonstrate stability in the domains measured. Figure 1.1 shows that there were multiple classes that demonstrate evidence of

soldiers experiencing PTG in at least one domain, however only the *PTG Class* demonstrated growth in all three domains.

**Individual domains.** For each of the three examined domains, the process described above was repeated and for each domain the results of the RMLPA suggest three latent classes. Again, considering that these data were all person-centered from soldier baseline scores, the three classes in each domain were able to be defined in a similar way. Specifically, each domain had a latent class which showed evidence of PTG, a class which showed evidence of stability or resilience, and a latent class which showed evidence of decline (see Figures 1.2-1.4).

### **Predictors of PTG**

Upon selection of the RMLPA for all domains concurrently and each domain separately, estimated class membership was regressed onto predictor variables using the Mplus 3-step procedure. Multinomial logistic regression results for overall PTG and for each individual domain will be discussed separately.

**Predicting overall PTG.** The *PTG Class* had several significant predictors when compared to the other latent classes found. Specifically, being more optimistic was significantly predictive of *PTG Class* membership over both the *Declining Class* ( $b=.379$ ,  $p<.001$ ,  $OR=1.46$ ) and the *Support Seeking Class* ( $b=.328$ ,  $p=.001$ ,  $OR=1.46$ ). Additionally, having less PTSD symptoms also significantly indicated *PTG Class* membership over the *Support Seeking Class* as well ( $b=-.065$ ,  $p=.015$ ,  $OR=.937$ ). There were no significant predictors between the *PTG Class* and either the *Resilient Class* or the *Stress Handling Class* (see Table 1.1 for full results comparing the *PTG Class* to each other class).

There were some significant predictors between the other non-PTG classes as well. Specifically, similar to comparisons with the *PTG Class*, the *Resilient Class* was also

significantly related to having more optimism (compared to the *Declining Class* and the *Support Seeking Class*;  $b=.217$ ,  $p=.001$ ,  $OR=1.24$  and  $b=.165$ ,  $p=.001$ ,  $OR=1.18$  respectively) and less PTSD symptoms (again similar to above, when compared with the *Support Seeking Class*;  $b=-.055$ ,  $p<.001$ ,  $OR=.946$ ). Additionally, being more optimistic was also predictive of *Stress Handling Class* membership compared to the *Declining Class* ( $b=.246$ ,  $p=.012$ ,  $OR=1.28$ ).

**Predicting PTG: Perceived ability to handle stress domain.** Among the three classes found (*PTG Class*, *Resilient Class*, and *Declining Class*) there were some significant predictors. Specifically, compared to the *Declining Class*, both the *PTG Class* and the *Resilient Class* were significantly more likely to have higher optimism ( $b=.342$ ,  $p<.001$ ,  $OR=1.41$ ; and  $b=.197$ ,  $p=.001$ ,  $OR=1.22$  respectively) and lower PTSD symptoms ( $b=-.098$ ,  $p<.001$ ,  $OR=.907$ ; and  $b=-.049$ ,  $p=.001$ ,  $OR=.952$  respectively). Compared to the *Resilient Class*, the *PTG Class* was also significantly more likely to have higher optimism ( $b=.145$ ,  $p=.008$ ,  $OR=1.16$ ) and less severe PTSD symptoms ( $b=.050$ ,  $p=.007$ ,  $OR=1.05$ ).

**Predicting PTG: Social support seeking domain.** Unlike the ability to handle stress domain, among the three classes found for the social support seeking domain (*PTG Class*, *Resilient Class*, and *Declining Class*) there was only one significant predictor. Specifically, compared to the *Declining Class* the *PTG Class* was significantly more likely to have higher optimism ( $b=.122$ ,  $p=.034$ ,  $OR=1.13$ ). There was no significant predictor between the *Resilient Class* and either the *PTG Class* or the *Declining Class*.

**Predicting PTG: Purpose in life domain.** For the purpose in life domain, there were significant predictors between each of the three classes (*PTG Class*, *Resilient Class*, and *Declining Class*). Specifically, the *PTG Class* was more likely to have higher optimism compared to both the *Declining Class* ( $b=.464$ ,  $p<.001$ ,  $OR=1.59$ ) and the *Resilient Class*

( $b=.228$ ,  $p=.001$ ,  $OR=1.26$ ). Additionally, compared to the *Declining Class*, membership in the *Resilient Class* was significantly predicted by having higher optimism ( $b=.236$ ,  $p<.001$ ,  $OR=1.27$ ) and lower PTSD symptoms ( $b=-.032$ ,  $p=.024$ ,  $OR=.969$ ).

## Discussion

As discussed earlier, military deployment can lead to potentially detrimental consequences for soldiers, as is evidenced in the substantial research that has been done to date on PTSD in soldiers. However, the majority of soldiers do not experience psychopathology following deployment, and increasing research suggests instead that resilience, and in some cases even PTG, are common (Hijazi et al., 2015; Mark et al., 2018; Pietrzak et al., 2010; Tsai et al., 2015). The study of PTG in the military that has been done to this point is therefore timely and laudable. However, the construct of PTG has been the recipient of some criticism, particularly when it has been studied using the PTGI. Although the PTGI has provided a necessary foundation for the study of PTG, some argue that it is flawed by its retrospective nature and cross-sectional use (Frazier et al., 2009; Jayawickreme et al., 2014; Nolen-Hoeksema & Davis, 2004). This has led some to question whether reports of PTG are valid, and if PTG actually occurs. Considering these critiques, along with the importance of studying PTG in the military, the aim of this study was to explore PTG and its potential predictors among National Guard soldiers using a longitudinal domain-based approach. The most substantial finding is that we found quantifiable evidence suggesting that a subset of soldiers do in fact experience PTG following deployment. This was demonstrated in one group of soldiers who had significant growth from pre- to post-deployment in all three PTG domains. Although previous studies have reported PTG in soldiers (Hijazi et al., 2015; Pietrzak et al., 2010), this is the first study to confirm these reports by controlling for a pre-trauma baseline. Additionally, the current study

addressed concerns with the PTGI by taking a domain-based measurement approach. This means that this study's findings can corroborate previous reports of PTG in soldiers without relying on soldiers to retrospectively assess their own growth. The study's longitudinal approach also confirms Tsai and Pietrzak's (2017) previous reports of three trajectories of growth in soldiers (growth, resilience, and decline). Among these three trajectories, resilience and growth occurred more frequently than decline. These findings indicate that the narrative on deployment should include increased strength and personal development as possible outcomes resulting from soldiers' experiences of pain, sacrifice, and trauma.

Further, this study found that optimism and PTSD significantly predict PTG in soldiers. Evidence of greater optimism and less severe PTSD as predictors of PTG among soldiers is well-supported in the literature. Although distinct constructs, optimism and PTG have frequently been positively associated in studies of growth following trauma (e.g. Martinez, Reyes, & Solar, 2014). Tedeschi and Calhoun (2004) have posited that optimistic individuals may be better at cognitively processing traumatic events, and therefore more likely to experience PTG. Likewise, lower PTSD appears to be related to greater personal growth in soldiers. Although the study of the link between PTSD and PTG has garnered mixed results, several studies have suggested a curvilinear relationship between the two (Solomon & Dekel, 2007; Tsai et al., 2015), making it feasible to expect that having less severe PTSD symptoms could be predictive of greater growth.

The two classes which showed growth in one domain also contribute insight to understanding of PTG in soldiers. Such findings are fitting with PTG literature which asserts that the extent of PTG and the areas in which it may occur are variable, depending on an individual's context (Pals & McAdams, 2004). Perhaps those who show growth in support seeking, but not the other domains, are looking outward for help as they recognize their difficulty with coping.

Additionally, it is possible that as some soldiers grow in their perception of their ability to handle the challenges of deployment and reintegration, they may feel greater self-reliance, and therefore less need to turn to others for support.

When considering participants as a whole, the results demonstrated that soldiers' responses to the deployment process can be quite varied. From examining the five classes which emerged from the data, the most common post-deployment response was to demonstrate little or no change from pre-deployment scores. This is in line with a wealth of existing military literature documenting soldiers' ability to exhibit resilience (e.g. Meredith, Sherbourne, Gaillot, et al., 2011). Additionally, some soldiers exhibited decline in the PTG domains, which is also to be expected. Numerous studies to-date have documented manifestations of such decline, including PTSD, depression, substance abuse, and suicide (e.g. Steenkamp, Corry, Qian et al., 2018). Despite the fact that some soldiers exhibited decline, the group which demonstrated growth serve as an example of hope and encouragement to National Guard soldiers who have or will experience deployment.

### **Clinical Implications**

As this study strengthens the argument that soldiers can experience PTG following deployment, there are some important implications for clinicians. Clinicians may be able to play an important role in facilitating PTG by helping soldiers construct a growth-minded narrative regarding deployment. Tedeschi and Calhoun (2011) have termed this unique role for clinicians as "expert companionship." Considering the earthquake metaphor of PTG theory, clinicians can help soldiers identify areas in which they may have experienced this "shattering of world assumptions." Rather than viewing these "shattered assumptions" as a sign of weakness or failure, clinicians can help soldiers recognize them as a natural response to the trauma of combat,



and as an opportunity for personal growth and development. Along with providing this growth-minded insight, clinicians can also provide soldiers with skills for constructive self-disclosure and emotional regulation, which can aid in the growth process (Tedeschi & McNally, 2011). As this study highlighted that soldiers may experience PTG to varying degrees in a variety of domains, clinicians should be open to exploring various areas of potential growth. Additionally, considering the negative relationship between PTSD symptoms and PTG, it may be important for clinicians to first help soldiers cope with the symptoms of PTSD before making efforts to facilitate PTG. Consistent with this study's findings, Tedeschi and Calhoun (2011) assert that not all soldiers who deploy will experience PTG as a result. This is particularly thought to be true for those who already demonstrate resilience prior to deployment. However, for those soldiers seeking mental health care, receiving support from a clinician who is knowledgeable in PTG theory and its applications may make PTG more likely.

### **Limitations and Future Directions**

The main limitations of the current study are related to the fact that it used existing data. As such, only three PTG domains were examined. As PTG is conceived to be multi-faceted and trauma-specific, there may be several other domains related to deployment in which growth could be observed. Therefore, additional domains beyond the three in this study should be explored, along with other potential predictors. The discovery of optimism and PTSD as predictors of PTG in this study is meaningful, in that it indicates that through this measurement approach PTG can not only be identified, but also predicted. However, optimism itself is broadly considered to be an enduring personality trait (Scheier & Carver, 1985), implying that it can't necessarily be altered or encouraged in soldiers in a way which would facilitate greater PTG. Nonetheless, its significance as a predictor sheds some light on the process by which PTG

occurs, and makes the case for the study of others predictors in future studies using this longitudinal domain-based approach. As new domains and predictors are explored over time, more insight into the mechanisms of PTG development may be achieved, which ultimately could be used to influence military soldier support programs. Additionally, the study's sample was limited in its diversity, as it was composed of primarily white, male soldiers. Further study should explore PTG in National Guard soldiers who are female or represent minority populations.

### **Conclusion**

In conclusion, this study provides meaningful evidence for the case of PTG occurring in National Guard soldiers who have experienced deployment, and does so using a domain-based longitudinal approach. Although growth was not demonstrated universally among soldiers, there is evidence that a distinct class of soldiers experienced growth in all three PTG domains. Further, optimism and lower levels of PTSD significantly predict this growth. This work is meaningful to the study of soldiers and deployment, and opens the door for ongoing study of how to encourage PTG in National Guard soldiers.

## CHAPTER 5: IS DEPLOYMENT-RELATED PERSONAL GROWTH CONNECTED AMONG ROMANTIC PARTNERS? A LONGITUDINAL EXAMINATION OF NATIONAL GUARD SOLDIERS AND PARTNERS THROUGH THE LENS OF POSTTRAUMATIC GROWTH

The detrimental effects of military deployment can be pervasive, impacting soldiers and their romantic partners alike. Among National Guard soldiers, approximately 40% are estimated to suffer from at least one type of mental health challenge, which may include depression, substance abuse, PTSD, or suicidal ideation (Gorman, Blow, Ames, & Reed, 2011). Partners of National Guard soldiers are likewise at risk for adverse mental health outcomes. A study using data from the Millennium Cohort Family Study reported that among partners of soldiers who had deployed to the Middle East, over one-third met criteria for at least one psychiatric condition, with a partner's experience of combat specifically relating to higher anxiety, insomnia, and somatization (Steenkamp, Corry, Qian et al., 2018). National Guard members' partners may also experience mental health symptoms comparable to their military spouse, with studies estimating that as many as one-third of National Guard spouses experience clinical levels of depression, anxiety, or posttraumatic stress (Blow, Gorman, Ganoczy, et al., 2013; Gorman et al., 2011).

The challenges experienced by soldiers and partners may also translate to relational difficulties. Soldier PTSD symptoms are linked with lower marital satisfaction and higher levels of negative communication, as well as higher divorce rates (Allen et al., 2010; Cook et al., 2004; Levin, Greene, & Solomon, 2016). On top of this, military couples face other serious relational challenges following deployment which may contribute to relational strain, including renegotiating their roles and reestablishing intimacy at reintegration. As 39% of National Guard

soldiers are married (Department of Defense, 2016), the soldier-partner relationship, as well as the psychological health of National Guard partners, requires ongoing study in order to gain insight on how to best support these couples through the deployment process.

### **Posttraumatic Growth**

Although there are many deployment-related challenges experienced by soldiers and their partners, a positive development is the increased focus on the occurrence of posttraumatic growth (PTG) in the military. Tedeschi and Calhoun (1996), the developers of PTG theory, posit that some individuals are able to experience positive psychological change as a result of processing a traumatic event (Calhoun & Tedeschi, 1998; Tedeschi & Calhoun, 2004). The process of PTG is initiated when the experience of a traumatic event shatters an individual's core beliefs and assumptions about the world, and thereby causes a crisis (Janoff-Bulman & Frantz, 1997). Although trauma typically causes psychological distress, the trauma alone cannot bring about growth. If the traumatic crisis is likened to an earthquake, the emotional and cognitive processing can be seen as symbolizing the rebuilding process of a city after the earthquake. In the same way that buildings can be re-built to be more earthquake-resistant, an individual's view of self and the world can be restructured in a manner which can provide greater resilience, wisdom, and appreciation for life. Thus, PTG can be understood as positive outcomes derived from a negative experience (Tedeschi & Calhoun, 2004). Tedeschi and Calhoun (1996) originally identified three main areas of change that had been reported following trauma: 1) perception of self, 2) relationships with others, and 3) philosophy of life.

Recent studies of PTG in soldiers indicate that higher post-deployment PTG is predictive of a lower severity and incidence of PTSD symptoms at a future time point (Britt, Herleman, Olde-Dusseau, et al., 2017; Tsai, Mota, Southwick, et al., 2016). Such findings imply that

learning more about the development of PTG in soldiers is of value. However, theory and research indicate that the occurrence of PTG may not be limited to the individual who directly experienced the trauma. Indeed, loved ones of trauma survivors may in fact experience their own PTG. This makes the consideration of military partners, and military couples as a whole, important to study regarding the development of PTG.

### **Theoretical Approaches for Understanding PTG in Couples**

In order to understand how PTG may be related among partners, it is necessary to first examine theory of how partners interact in the experience of trauma. There is theoretical and empirical evidence that romantic partners have an influence on each other in their experiences of and reactions to stress (Bodenmann, 1997). Trauma impacts not only the individual, but can also, in a sense, “infect” the romantic partner, even if the partner has not experienced the trauma directly (Salston & Figley, 2003). This may occur as the trauma survivor shares the details of their experience, and their partner consequently feels distress upon learning what their loved one endured. This phenomenon of one partner’s experience of stress impacting the other is known by multiple terms in the literature, including secondary traumatic stress, secondary traumatization, and vicarious traumatization (Arzi et al., 2000; Lev-Wiesel & Amir, 2001). The partner “infected” by stress, then in turn, may respond negatively to the trauma survivor, creating a cycle of distress which can be detrimental to couple functioning and exacerbate trauma responses (Allen et al., 2010; Arzi et al., 2000; Nelson Goff & Smith, 2005; Oseland, Gallus, & Nelson Goff, 2016).

On the contrary, there is also support for the idea that partners are able to influence each other positively as they respond to adversity (Bodenmann, 1997; Canevello, Michels, & Hilaire, 2016). Multiple scholars have concluded that PTG, like distress, may be contagious within

couples (Canevello et al., 2016; Manne, Ostroff, Winkel, et al., 2004). This phenomenon has been observed in varying contexts, from couples experiencing national disasters to those navigating cancer (Canevello et al., 2016; Manne et al., 2004). These observations coincide with the systemic transactional model, which posits that as couples engage in supportive behavior in response to stress, they are able to cope together and experience better couple outcomes (Bodenmann, 1997). The concept of “contagious” PTG in couples is supported by other reports of one person’s PTG influencing another’s. For example, trauma survivors have demonstrated higher PTG when they have had contact with a PTG role model, someone who experienced similar challenges but who reported perceived benefits (Cobb et al., 2006; Weiss, 2004b). Therefore, when considered together, secondary traumatization and the systemic transactional model support the idea that PTG in one partner may influence PTG in the other.

### **PTG in Non-military Couples**

Much of the literature on PTG in couples has focused on cancer survivors and their partners. In a study of cancer patients and their partners, patients demonstrated higher PTG than partners (Zwahlen, Hagenbuch, Carley, et al., 2010). The same study reported that female partners experienced higher PTG than their male partners (Zwahlen et al., 2010), a finding supported by other literature in which women demonstrate significantly higher levels of growth than men in general (Jeon et al., 2017; Tedeschi & Calhoun, 1996). Despite these discrepancies in the extent to which partners may experience PTG, partners appear to have an influence on one another’s experience of PTG. Among breast cancer survivors and their husbands, greater PTG in the wife was associated with greater PTG in the husband (Weiss, 2004a), and this same association has been demonstrated in couples who experienced the loss of a premature baby

(Büchi et al., 2009). However, each of these studies was cross-sectional in nature, and therefore provided limited understanding about the full picture of how PTG among partners is related.

To date, few longitudinal studies of PTG in couples have been conducted. Manne and colleagues (2004) found that PTG increased for both cancer survivors and their partners in the one and a half years following diagnosis. Likewise, PTG was positively correlated in cancer patients and their partners at 6 and 12 months following diagnosis (Künzler, Nussbeck, Moser, et al., 2014). Although both of these studies provided evidence that PTG in couples may be linked over time, these data were collected only after the occurrence of the traumatic event and thus pre-trauma baselines were not accounted for. No studies to date have measured PTG in couples using a longitudinal approach which includes both pre- and post-trauma data.

### **PTG in Military Couples**

Although several studies report that moderate PTG is common among military soldiers (Hijazi, Keith, & O'Brien, 2015; Mark, Stevelink, Choi, & Fear, 2018; Pietrzak, Goldstein, Malley, et al., 2010; Tsai, El-Gabalawy, & Sledge., 2015), only a handful of studies have documented that partners of soldiers also experience PTG following their partner's deployment (Dekel, 2007; Lahav, Kanat-Maymon, & Solomon, 2017; Monk, Oseland, Goff, et al., 2017; Renshaw & Campbell, 2017). Only one study, however, examined how one partner's PTG is related to the other partner's in a sample of military couples. A study of male Israeli soldiers who served in the Yom Kippur War reported that a wife's PTG was associated with higher PTG in her husband (Lahav et al., 2017). However, this study was conducted over 30 years after the soldiers experienced deployment, and therefore cannot provide insight into the occurrence of PTG in couples immediately following deployment. It is unclear, based on existing literature, whether or not a partner's PTG is related to better relationship outcomes in military couples. One

study of military couples found that wives' reports of personal growth following deployment was associated with significant increases in soldiers' marital satisfaction six months later (Renshaw & Campbell, 2017). In contrast, the previously mentioned study on Israeli soldiers and their wives reported that higher PTG in wives was associated with lower dyadic adjustment in soldiers a few years later (Lahav et al., 2017). Finally, a recent study explored whether or not PTG can be facilitated in military couples. This study reported that following a four-day systemic retreat, partners of veterans experienced a significant increase in their perceptions of PTG, and additionally that both veterans and their partners reported increased dyadic adjustment (Monk et al., 2017). This implied that appropriate interventions for military can encourage the development of PTG in military partners.

Thus, from the limited study that has been done on military couples, there is evidence that PTG may occur not only in soldiers, but also in their at-home partners. Further, it has been suggested that PTG can be facilitated in these partners, and that one partner's PTG may positively influence the other's PTG. These findings emphasize the importance of including partners in the study of PTG in soldiers. As there is evidence that more PTG in soldiers following deployment is associated with better future mental health outcomes for soldiers (Britt et al., 2017; Tsai, Mota, Southwick, et al., 2016), exploring how military couples experience PTG together may be an important piece in understanding how to best encourage well-being in soldiers. However, little has been done to verify these findings or to explore the nuances of how one partner's development of PTG may be related to the other partner's. Additionally, there remains uncertainty regarding whether or not PTG within military couples is related to better couple outcomes.



## **Current Study**

Despite the growing body of research on PTG in couples and in soldiers, military couples remain underrepresented. To date, much of the literature is focused on couples dealing with cancer (Zwahlen et al., 2010), and particularly breast cancer survivors and their partners (Hagedoorn et al., 2008; Lee, Kim, Lim et al., 2017; Manne et al., 2004). Additionally, past study of PTG in couples has been limited to generally cross-sectional designs, and has yet to thoroughly explore how PTG is related in military couples. In an effort to explore the relationship between soldier and partner PTG in a more robust manner, a longitudinal, domain-based measurement approach is used to study PTG in military couples. Measuring change in three PTG domains (perceived ability to handle stress, social support seeking, and purpose in life) from pre- to post-deployment serve to indicate PTG. This measurement approach allows for PTG in military couples to be studied longitudinally, taking into account a pre-trauma baseline.

The current study explores the following research question: In a military couple, can an individual's level of PTG predict their partner's PTG at a future time point, i.e., do partners in a military relationship influence one another's PTG? Additionally, is PTG in either partner predictive of better relationship outcomes for both partners? Based on the existing literature on PTG in military couples, hypotheses for this examination of PTG in military couples are as follows: 1) Higher levels of soldier scores on PTG domains at reintegration will predict higher partner scores on PTG domains at one-year and two-year post-deployment, 2) higher partner PTG domain scores at reintegration will predict higher soldier PTG domain scores at one-year and two-year post-deployment, 3) higher soldier PTG domain scores at one-year post-deployment will predict higher partner PTG domain scores at two years post-deployment, 4) higher partner PTG domain scores at one-year post-deployment will predict higher soldier PTG

domain scores at two years post-deployment, and 5) higher post-deployment PTG domain scores will predict better relationship adjustment at two years post-deployment for both soldier and partner.

## **Methods**

### **Procedure and Participants**

Data were taken from a U.S. Department of Defense-funded longitudinal study of National Guard members and their partners (Congressionally Directed Medical Research Programs, 2010). Participants were recruited at pre-deployment events for National Guard soldiers and their families throughout a state in the Midwest. The study included soldiers and, if present, the soldier's romantic partner. Soldiers had deployed to Afghanistan in 2012 as part of National Guard combat arms battalion units. Participants were invited to complete surveys at four separate time points in the deployment process, including a few months prior to deployment, reintegration (approximately 45 days after returning from a one-year deployment), and one and two years after returning home from deployment, for a total of four possible waves of data collection. Participants were each given \$25 as incentive for participation in each wave. Surveys contained several measures, and were completed by participants either in-person or online.

The sample included 371 military couples where each member of the couple participated in at least one of the four waves of data collection with a total of 1,406 surveys completed in this sample. In total, 248 couples started participating at the pre-deployment wave of data collection, with complete data at that wave for 225 couples. Soldiers and partners were able to join the study at any proceeding wave, but to be included in this study, both members of the couple needed to participate in at least one wave of data collection. Additionally, to be included in the sample both partners needed to indicate throughout the course of the study that they were still in the

relationship. The soldiers were predominantly male (98.3%), and the partners were predominantly female (98.6%). The majority of the participants were Caucasian (soldiers: 83.4%; partners: 84.0%), between the ages of 18 and 30 (soldiers: 58.4%; partners: 60.5%), and had at least some college experience (soldiers: 63.4%; partners: 76.2%).

## **Measures**

**Purpose in life.** The Life Engagement Test (LET; Scheier et al., 2006) was used to measure purpose in life. This self-report six-item scale aims to measure the extent to which an individual currently engages in activities that they value (Scheier et al., 2006). The LET is useful for measuring purpose in life longitudinally, as it asks individuals to report their current experiences with purpose in their activities, rather than inquiring whether or not one's life has been filled with purpose, as is found in other purpose in life scales (Scheier et al., 2006). Items include questions such as "To me, the things I do are all worthwhile," and "I have lots of reasons for living." Responses are coded using a 5-point scale ranging from 0-4, with response options including 0=disagree a lot, 1=disagree a little, 2=neither agree or disagree, 3=agree a little, and 4=agree a lot. Three items were reverse coded, with a higher total score indicating greater purpose in life. The LET has shown good internal consistency in a variety of populations, with Scheier and colleagues (2006) reporting on average a Cronbach's alpha of .80.

**Perceived ability to handle stress.** The Perceived Stress Scale-4 (PSS-4; Cohen & Williams, 1988) was used to measure perceived ability to handle stress. A brief version of the Perceived Stress Scale (Cohen, Kamark, & Mermelstein, 1983), the PSS-4 inquires about participants' perception of their ability to manage life events in the past month. It includes four items such as, "In the last month, how often have you felt confident about your ability to handle your personal problems?" and "In the last month, how often have you felt that you were unable

to control the important things in your life?” Response options vary on a 5-point scale, and include 0=never, 1=almost never, 2=sometimes, 3=fairly often, and 4=often. Two of the items were reverse coded. A higher total score indicated a higher level of perceived ability to handle stress. The PSS-4 has shown good internal consistency, with a Cronbach’s alpha of .82 (Mitchell, Crane, & Kim, 2008).

**Social support seeking.** The using emotional support and using instrumental support subscales from the Brief COPE scale (Carver, 1997) were used to measure social support seeking. The Brief COPE was developed by Carver (1997) as a shortened version of the COPE inventory (Carver, Scheier, & Weintraub, 1989). The using emotional support and using instrumental support subscales ask individuals to assess how frequently they have reached out to others for support related to a traumatic event (in this case, deployment-related experiences). The using emotional support subscale contains these two items: “I’ve been getting emotional support from others” and “I’ve been getting comfort and understanding from someone.” The using instrumental support subscale includes the following two items: “I’ve been getting help and advice from others” and “I’ve been trying to get advice or help from other people about what to do.” Response options are measured using a 4-point scale ranging from 1-4, with 1=not at all, 2=several days, 3=more than half the days, and 4=nearly every day. Scores from each subscale were summed to create a total score, with a higher score indicating a higher level of support seeking. Both of these subscales have demonstrated acceptable psychometric properties, with Carver (1997) reporting the following Cronbach’s alphas:  $\alpha = .71$  for using emotional support and  $\alpha = .64$  for using instrumental support.

**Dyadic adjustment.** The Revised Dyadic Adjustment Scale (RDAS; Busby, Crane, Larson et al., 1995) was used to measure dyadic adjustment. The RDAS is a 14-item scale

consisting of three subscales: consensus, satisfaction, and cohesion. For the consensus subscale, participants rate the degree to which they agree or disagree with various statements about their relationship. Response options are on a six-point Likert scale ranging from 0 to 5, with 0 = always disagree and 5 = always agree. The satisfaction subscale enquires about frequency of specific events related to relationship stability and conflict. Responses range from 0 to 5, where 0 = all the time and 5=never. The cohesion subscale asks participants to report the frequency with which certain relationship-building events take place. Three items are scored on a six-point scale ranging from 0 to 5, where 0 = never, 1= less than once a month, 2 = once or twice a month, 3 = once or twice a week, 4 = once a day, and 5= more often. The fourth item of the cohesion subscale (“Do you and your mate engage in outside interests together?”) has a five-point response scale which ranges from 0 (never) to 4 (every day). Scores from all three subscales were summed, with a higher score indicating higher dyadic adjustment. The RDAS has shown good internal consistency (Cronbach’s  $\alpha = .90$ ) and reliability (Spearman-Brown split-half reliability coefficient= .95; Crane et al., 2000).

### **Data Analysis**

In order to uncover evidence of soldiers’ and partners’ levels of growth predicting subsequent growth within their partner, a dyadic latent change score model (LCSM) was fit to these data. LCSM is a statistical approach that allows for the examination of change over time to be modeled for each member of a dyad concurrently in order to reflect the dependent data structure of dyadic data (Hilpert, Bodenmann, Nussbeck, & Bradbury, 2016; Kenny et al., 2006; Ledermann & Kenny, 2017). Specifically, a separate LCSM was fit to these data for each of the domains of PTG being examined. Each LCSM modeled for both member of the dyad (soldier and partner) the pre-deployment baseline level of the PTG domain as an intercept and change

scores at reintegration, one-year and two-year follow-up. The LCSM was modeled in such a way that each change score represents the changes in the PTG domain for soldier and partner compared to their respective pre-deployment baseline. First, to test the hypothesis that there was a partner effect such that one person's level of change predicts their partner's level of change at subsequent time points, a fully recursive model with actor and partner effects for each domain was examined. Specifically, change scores at one-year and two-year post-deployment were predicted by prior change scores within and across persons in the dyad while controlling for each individual's baseline intercept (see Figure 2.1 for a depiction of the LCSM). All analyses were conducted using Mplus version 8 (Muthén & Muthén, 1998-2017). Finally, in order to test the hypothesis that better dyadic adjustment was predicted by PTG, dyadic adjustment for both soldiers and partners were added to the models, with each change score (both soldier and partner) as predictors, while simultaneously controlling for initial baseline levels of the domain scores (see Figure 2.2 for a depiction of the LCSM).

## **Results**

The results of the LCSM for each domain will be discussed separately. Specifically, significant actor and partner effects of prior change scores predicting later change will first be discussed within the context of each domain examined. Finally, results from change scores for each domain predicting 2-year post-deployment relationship adjustment will then be discussed.

### **Purpose in Life**

Each purpose in life change score at one-year and two-year post-deployment was regressed on previous change scores and pre-deployment baseline levels of purpose in life. For soldiers, growth at one-year post-deployment was significantly predicted by their own growth at reintegration ( $\beta=.406$ ,  $p<.01$ , actor effect) and by their partner's growth at reintegration as well

( $\beta=.372$ ,  $p<.01$ , partner effect). However, at two years post-deployment, the only significant predictor of soldier growth was their own growth at reintegration ( $\beta=.304$ ,  $p<.05$ , actor effect). For partners, growth at both one-year and two-year post-deployment was significantly predicted by previous growth at reintegration and one-year follow-up (actor effects), but there were no significant partner effects present (see Table 2.1 for standardized coefficients for the whole model).

### **Perceived Ability to Handle Stress**

While the model examining purpose in life did yield significant actor and partner effects, the model examining the perceived ability to handle stress only yielded significant actor effects. Specifically, both soldier and partner growth at one-year post-deployment were only significantly predicted by their own growth at reintegration ( $\beta=.375$ ,  $p<.01$ , actor effect for soldier;  $\beta=.342$ ,  $p<.01$ , actor effect for partner). Additionally, soldier growth at two years post-deployment was also significantly predicted by their own growth one year previously ( $\beta=.557$ ,  $p<.01$ , actor effect). There were no other significant predictors of soldier or partner growth (see Table 2.2 for standardized coefficients for the whole model).

### **Social Support Seeking**

Thus far, all significant predictors of growth (both actor and partner effects) have been positive, implying that growth predicts future growth. However, that is not the case with the Social Support Seeking domain. The same model was again run and significant actor and partner effects were found for both soldier and partner (see Table 2.3 for standardized coefficients for the whole model). Specifically, partner growth at one-year post-deployment was significantly predicted by their own growth at reintegration ( $\beta=.440$ ,  $p<.01$ , actor effect) and by their soldier's decline at reintegration ( $\beta=-.276$ ,  $p<.05$ , partner effect). However, for soldiers there was a

significant actor effect ( $\beta=.186$ ,  $p<.05$ , actor effect) but no significant partner effect predicting growth at one-year post-deployment. At two years post-deployment though, significant actor and partner effects were found for soldiers, but only one significant actor effect for partners.

Specifically, soldier growth at two years post-deployment was significantly predicted by their own growth at reintegration and at one-year post-deployment ( $\beta=.251$ ,  $p<.05$ , and  $\beta=.301$ ,  $p<.01$  respectively, actor effects) and by their partner's decline at reintegration ( $\beta=-.317$ ,  $p<.05$ , partner effect) and growth at one-year post-deployment ( $\beta=.459$ ,  $p<.01$ , partner effect). Partner growth at two-year post-deployment was only significantly predicted by their own growth at one-year post-deployment ( $\beta=.360$ ,  $p<.05$ , actor effect).

### **Predicting Relationship Adjustment**

For each of the three models discussed above, relationship adjustment for soldier and partner at 2-year post-deployment were added as outcome variables, with each change score (both actor and partner effects tested) as predictors while controlling for baseline intercepts. For both the purpose in life domain and the perceived ability to handle stress domain, there was no statistical significant evidence of change being associated with dyadic adjustment in either partner or soldier. However, for the support seeking domain, there were two significant actor effects present for at-home partners' levels of dyadic adjustment. Specifically, partners' growth at one-year post-deployment significantly predicted their own higher dyadic adjustment at two-year post-deployment ( $\beta=.739$ ,  $p<.05$ , actor effect). However, partner growth at two years post-deployment was significantly related to their own lower dyadic adjustment at that same time point ( $\beta=-.500$ ,  $p<.05$ , actor effect).



## **Discussion**

The subject of PTG in the military has received increasing attention in recent years, as it offers a hopeful, strengths-based narrative to deployment, an experience which had previously been overshadowed with the discussion of PTSD and other negative outcomes. However, examination of PTG in soldiers as individuals fails to account for the part that romantic partners may play in the development of PTG. Approximately 40% of National Guard soldiers are married (Department of Defense, 2016), making the study of how PTG may occur within their couple relationship very relevant. Although there has been some study of PTG in couples, the majority of research has involved couples experiencing cancer, with few studies exploring PTG in military couples specifically. Many of the studies have been cross-sectional, and do not account for a pre-trauma baseline. Among these studies' findings, the general conclusion has been that growth in response to trauma is positively associated among partners (Büchi et al., 2009; Lahav et al., 2017; Weiss, 2004a). The current study sought to examine PTG in National Guard couples using a longitudinal approach, with pre-deployment scores serving as a baseline for soldiers and partners. The most significant finding was that in some situations, there is evidence that PTG in one partner does predict higher future PTG in the other partner. However, contrary to previous findings, we found that depending on the domain, PTG among partners was not always positively associated over time. This implies that the idea that "growth predicts growth" among partners may be overly simple, and instead that PTG within military couples may be more complex.

The results of the current study highlight the importance of considering each PTG domain uniquely in the study of PTG in couples. Each domain displayed distinct trends in how one's PTG was related to future PTG in their partner (partner effects). For example, in for

perceived ability to handle stress there were no significant partner effects for soldiers or partners. However, in both the purpose in life domain and the social support seeking domain there were significant partner effects, although these significant partner effects were opposite in direction. Specifically, in the social support seeking domain there were negative partner effects for both soldier and partner, while there was a positive partner effect present in the purpose in life domain. This variation points to the complex and multi-faceted nature of PTG, particularly in the context of a military relationship. Pals and McAdams (2004) have asserted that both the areas and extent of growth that may occur following a traumatic event are influenced by the context of the trauma (i.e. culture, societal norms, etc.). Thus, the ways in which a military couple respond to deployment may be quite different to how partners navigate a breast cancer diagnosis. Considering a military couple relationship to be its own unique context, it stands to reason that PTG within a military couple would occur in a variety of domains, each with perhaps its own trajectory.

Additionally, it is worth examining the differences between soldier and at-home partner and how their own growth may influence each other over the deployment cycle. Specifically, soldiers' growth in purpose in life was predicted by both their own previous growth, as well as their partners' growth. However, the reverse was not found to be true, as partners' growth in purpose in life was predicted by their own, but not the soldier's, increased purpose in life. Thus, in certain areas, soldiers and partners may experience growth separately from each other. Perhaps as they each strive to define their purpose in life following deployment they arrive at different conclusions of what that purpose is, and this growth could be good for the individuals but be possibly negative for the relationship. It is also of interest that for the social support seeking domain, there were negative associations among soldiers' and partners' PTG. For

example, soldiers' and at-home partners' decline in social support seeking at reintegration were each associated with future growth for their counterpart (partner effects). This may imply that one's lack of seeking support from others after the soldier returns home from a deployment could result in increased efforts by their partner to reach out in an effort to get needed help. This is an interesting interaction to observe, as previous reports of PTG in couples have focused on growth in one partner positively predicting growth in the other (Kunzler et al., 2014; Lahav et al., 2017; Weiss et al., 2004).

Finally, examining how growth was related with relationship outcomes yielded some interesting findings. We found that there was no relationship between PTG and dyadic adjustment for perceived ability to handle stress and purpose in life. However, for the social support seeking domain, partner PTG was related to both positive and negative relationship adjustment. This ambiguity in the relationship between PTG and couple outcomes has been reflected in the contradictory findings of previous studies of military couples (Lahav et al., 2017; Renshaw et al., 2017). This finding may be a function of our inclusion criteria for this sample, as couples were only included who stayed together throughout the course of the study. However, it provides evidence that PTG does not automatically equate to a better relationship, particularly if it involves partners growing independently of each other, rather than together. Thus, for the success of military couples in their relationships, perhaps the amount of growth that occurs is less important than the way in which it occurs.

### **Clinical Implications**

The findings of this study highlight the importance of including partners in the therapeutic support afforded to soldiers following deployment. The case has already been made that PTG can and should be facilitated in soldiers following deployment (Tedeschi & McNally,

2011). With the Comprehensive Soldier Fitness program, Tedeschi and McNally (2011) proposed a program for the U.S. Army that is aimed at supporting soldiers in viewing trauma as a necessary precursor to PTG, engaging in constructive disclosure, creating a growth-minded trauma narrative, and improving their emotional regulation. Although it is implied that the benefits of facilitating PTG in soldiers may extend to soldiers' families as well, Tedeschi and McNally (2011) do not specifically discuss how partners may be involved in the growth process. Based on our study's evidence that soldier and partner PTG are in fact related, partners should be included in this process of facilitating PTG. However, it should not be assumed that fostering PTG in a military couple will automatically result in better relational outcomes. As our findings imply, depending on the area in which growth occurs, it is possible for military couples to grow apart or grow together. If the goal of the couple is to strengthen their relationship, it may be important to be intentional in providing the couple with opportunities to construct their growth narrative together, rather than independently. This point is particularly important for sustained growth. For example, growth in a soldier post deployment can cause strain on the intimate relationship. This relationship strain could serve to exacerbate trauma symptoms in negative ways and even lead to decline. Jointly helping couples work through trauma together seems to be an optimal process.

### **Limitations and Future Directions**

This study was limited primarily by only three domains being examined. Although it was a good starting point for examining PTG in military couples from a longitudinal, domain-based approach, future research should examine a greater variety of domains. While exploring other domains, it would be helpful also to measure other couple variables in order to gain insight on the mechanisms by which military partners may influence each other's experience of PTG. For

example, Canevello and colleagues (2016) posited that partners' influence one another's PTG through perceived responsiveness, which is the perception of being understood, valued, and supported by one's partner. Exploring variables such as perceived responsiveness and others related to emotional connectedness may shed light on how growth in one partner could affect growth in the other.

Other limitations of this study involve the sample that was utilized. Couples who indicated separating or divorcing during the course of the study were excluded from the study. This means that we were unable to examine PTG in those individuals whose relationships dissolved, and whether it not it may have been related to that dissolution. Future longitudinal study of PTG in military couples should strive to include even those couples which break up, in order to better understand the circumstances which may lead military couples to "grow apart," so to speak, in response to deployment. Additionally, considering that the sample was fairly homogenous, future study of PTG in military couples should explore more diverse samples in terms of race and gender roles within the partnerships.

### **Conclusion**

In summary, this study took an important approach at studying PTG in National Guard soldiers and their partners from a longitudinal perspective. Most significantly, it confirmed that growth in one partner can indeed predict growth in another. However, it also highlighted the complexities of growth over time and across different domains. This study calls for the need of future longitudinal study of PTG in military couples in order to better elucidate how to foster growth and support them as they navigate the deployment process.

## CHAPTER 6: CONCLUSION

### **Review of Problem Statement and Aims of the Current Studies**

The topic of posttraumatic growth has important applications to soldiers and their partners. Literature on deployment and its outcomes has primarily been focused on the negative, with particular emphasis placed on PTSD and its detrimental consequences for soldiers and their families. On top of this, military culture is known for an enduring stigma surrounding mental health treatment. Adding to this the fact that for many National Guard soldiers, adequate mental health services are difficult to access, the situation may appear bleak for soldiers after deployment. Even for soldiers who do not develop psychopathology, the period following deployment is marked by challenging transitions, particularly for National Guard soldiers as they return to civilian life.

In contrast, the idea of PTG offers hope and encouragement to soldiers and their families. This notion that trauma, in this case deployment, can provide an opportunity for personal growth, is a stark change in narrative when compared to the dark picture painted by PTSD. Particularly, given PTG theory's assertion that the shattering of assumptions in one's life is a necessary precursor to growth could help rewrite the message conveyed to soldiers that struggle is indicative only of weakness.

### **Integrated Discussion of Studies 1 and 2**

Despite the hope that PTG offers to those the military, to-date it has not been studied with enough depth or rigor to conclude if and how it may truly benefit soldiers and their loved ones. As such, this dissertation, through two separate studies, sought to fill two major gaps in the literature. The aim of the first study was to examine whether or not PTG really occurs in soldiers,

and if it does, can it be predicted by other variables at reintegration. The goal of the second study was to explore PTG in military couples, as existing literature on this population is sparse. Specifically, the study examined if PTG in one partner predicted PTG in the other, and if this growth predicted better dyadic adjustment. Both studies sought to examine these research questions in a rigorous manner by using a longitudinal domain-based approach, rather than a cross sectional approach with the PTGI that is used in most current PTG literature.

Overall, both studies confirmed the basic statements regarding PTG in soldiers and couples that have already been made in the literature. Namely, they provide evidence that PTG does indeed occur in a subset of soldiers following deployment, and that in some cases, PTG among partners in military couples is related. More specifically, study 1 confirmed previous reports that higher optimism and lower PTSD are associated with higher PTG. Therefore, these studies add support to the narratives that PTG in soldiers is real, and that soldiers and partners merit being studied jointly regarding their experiences of growth. It is, however, the design of these two studies is that sets them apart and allows them to add strength to existing PTG findings. The use of a longitudinal, rather than cross-sectional, approach allowed for a broader picture of what PTG looks like across deployment. In particular, the utilization of pre-deployment data using PTG domains enabled the establishment of a pre-trauma baseline. This allowed for a more objective means of measuring change in each PTG domain, in contrast's to the PTGI's requirement for retrospective estimation of growth. Thus, the current studies confirmed existing reports of PTG in soldiers and the interplay between partners, while effectively addressing some of the major criticisms of previous studies' approaches.

In addition to validating previous statements on PTG in the military, the current studies offer insight and complexity to this topic. Both studies highlight the importance of considering

PTG domains individually when exploring the intricacy of PTG in soldiers and partners. Study 1 demonstrated that depending on the domain examined, there may be different predictors of PTG in soldiers. To illustrate, optimism and PTSD were significant predictors of PTG for the purpose in life and perceived ability to handle stress domains, but not for the social support seeking domain. When looking at study 2, the differences across domains were manifest in three ways. First, depending on the domain, there may or may not have been significant partner effects of PTG. For example, for perceived ability to handle stress there were no significant partner effects for soldiers or partners. However, in both the purpose in life domain and the social support seeking domain there were significant partner effects, meaning that one partner's PTG was predictive of the others. Second, results of study 2 showed that depending on the domain, the association between partners' PTG over time was not always positive. Specifically, in the social support seeking domain there were negative partner effects for both soldier and partner, implying that growth in one partner does not always indicate growth in the other. Perhaps, for this domain, decline in one partner may instead inspire growth in the other. This finding stands in contrast to previous reports (Büchi et al., 2009; Lahav et al., 2017; Weiss, 2004a) which had bolstered the notion of "contagious PTG" among couples (Canevello et al., 2016). Finally, depending on the domain, study 2 demonstrated variability in the relationship between PTG within couples and dyadic adjustment, implying that in certain cases, growth may not necessarily benefit the couple.

### **Clinical Implications**

The findings of the current studies highlight the importance of providing growth-minded therapeutic support for soldiers after deployment that where applicable, should involve romantic partners. Tedeschi and McNally (2011) proposed, a program aimed at helping soldiers by helping them to view trauma as a necessary precursor to PTG, engage in constructive disclosure,



create a growth-minded trauma narrative, and improve their emotional regulation. As findings from study 1 assert that soldiers can in fact experience PTG, this lends credence to the potential effectiveness of such a program.

Although it is implied that the benefits of facilitating PTG in soldiers may extend to soldiers' families as well, Tedeschi and McNally (2011) do not specifically discuss how partners may be involved in the growth process. Based on our study's evidence that soldier and partner PTG are in fact related, partners should be included in this process of facilitating PTG. However, it should not be assumed that fostering PTG in a military couple will automatically result in better relational outcomes. As our findings imply, depending on the area in which growth occurs, it is possible for military couples to either grow apart or grow together. If the goal of the couple is to strengthen their relationship, it may be important to be intentional in providing the couple with opportunities to construct their growth narrative together, rather than independently. As PTG can contribute to a greater sense of loneliness in soldiers (Stein, Levin, Bachem, & Solomon, 2018), and yet strength in their intimate relationship can serve as a protective factor for soldiers throughout deployment (Cohen, 2004), jointly helping couples work through trauma together through the lens of PTG seems to be an optimal process.

### **Limitations and Future Directions**

A limitation which applies to both studies is a lack of sample diversity. As the majority of participants included primarily white, male soldiers, further study should explore PTG in National Guard soldiers who are female or represent minority populations. Another limitation related to the sample were the exclusion criteria, specifically that couples who broke up at any point in the study were not included. It may be of worth to explore whether an individual's

growth is related to relationship dissolution. It is possible that some of the relationships that ended throughout the course the study due to one or both couples growing apart, so to speak.

Another major limitation is that only three PTG domains were examined. PTG is conceived to be multi-faceted and trauma-specific. The variability in results depending on domain examined in both studies 1 and 2 lends credence to this idea. As such, there may be several other domains related to deployment in which growth could be observed. Additional domains beyond the three in this study should be explored, along with other potential predictors. As new domains and predictors are explored over time, more insight into the mechanisms of PTG development in soldiers and couples may be achieved, which ultimately could be used to influence military soldier support programs and therapeutic intervention.

### **Conclusion**

Pals and McAdams (2004) offered this insight on the impact of culture on PTG: “the characteristic growth patterns that can occur in life, and the ways they are narrated within the self-defining life story, are strongly driven by cultural narratives” (p.68). The current studies illustrate that the narrative surrounding deployment within the military culture should include PTG. This is not to say that the pitfalls of deployment are to be glossed over or ignored. On the contrary, these studies support the message to soldiers that distress, perceived weakness, and uncertainty within one’s self may be the precursor to greater strength, meaning, and wisdom. As demonstrated by these findings, the journey towards PTG which certain soldiers and partners experience is complex. However, as ongoing effort is made to understand the intricacies of deployment-related PTG, an increasing number of soldiers and their families may press on from deployment with success.

## APPENDICES

## APPENDIX A

### Tables

Table 1.1. *Results of latent variable multinomial logistic regression using the 3-step procedure. Using the PTG class as a reference, this table shows each variable predicting membership in each specified class compared to membership in the PTG class.*

Variable	Declining Class Vs PTG Class		Resilient Class Vs PTG Class		Support Seeking Class Vs PTG Class		Stress Handling Class Vs PTG Class	
	b	SE	b	SE	b	SE	b	SE
Optimism	-.379*	.079	-.162	.084	-.328*	.095	-.133	.102
PTSD Symptoms	.048	.025	.010	.025	.065*	.027	.003	.031
Social Support	-.035	.041	-.025	.035	.006	.040	-.043	.050
Avoidant Coping	-.198	.142	-.115	.103	-.115	.127	-.242	.164
Pre-Deployment Baselines of Each Domain								
Perceived Ability to Handle Stress Baseline	1.160*	.193	.443	.267	1.250*	.341	.175	.228
Purpose in Life Baseline	.279*	.075	.158	.084	.235*	.069	.107	.095
Social Support Seeking Baseline	1.017*	.227	.544	.278	.060	.245	1.327*	.375

\*p<.05

Table 2.1. *Standardized coefficients for the actor and partner effects of the dyadic latent change score model for the purpose in life domain (see Figure 2.1 for depiction of model).*

Variable	Soldier PTG at one-year post-deployment		Partner PTG at one-year post-deployment		Soldier PTG at two-year post-deployment		Partner PTG at two-year post-deployment	
	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE
Soldier PTG at Reintegration	.406*	.107	.238	.126	.304*	.130	-.003	.121
Partner PTG at Reintegration	.372*	.132	.336*	.112	-.018	.207	.514*	.096
Soldier PTG at One-Year	NA	NA	NA	NA	.464	.296	-.106	.189
Partner PTG at One-Year	NA	NA	NA	NA	-.437	.314	.460*	.175
Soldier Baseline Purpose in life Intercept	-.369*	.098	.030	.103	-.079	.155	-.107	.118
Partner Baseline Purpose in life Intercept	.213	.133	-.316*	.103	-.310	.166	-.090	.129

\*p<.05

Table 2.2. *Standardized coefficients for the actor and partner effects of the dyadic latent change score model for the perceived ability to handle stress domain (see Figure 2.1 for depiction of model).*

Variable	Soldier PTG at one-year post-deployment		Partner PTG at one-year post-deployment		Soldier PTG at two-year post-deployment		Partner PTG at two-year post-deployment	
	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE
Soldier PTG at Reintegration	.375*	.080	.106	.146	.181	.100	-.005	.157
Partner PTG at Reintegration	.118	.081	.342*	.126	.012	.108	-.013	.134
Soldier PTG at One-Year	NA	NA	NA	NA	.557	.165	.245	.192
Partner PTG at One-Year	NA	NA	NA	NA	-.095	.224	.141	.261
Soldier Baseline Purpose in life Intercept	-.352*	.080	.245	.137	-.107	.152	-.080	.201
Partner Baseline Purpose in life Intercept	-.011	.079	-.318*	.110	.018	.105	-.532*	.134

\* $p < .05$

Table 2.3. *Standardized coefficients for the actor and partner effects of the dyadic latent change score model for the social support seeking domain (see Figure 2.1 for depiction of model).*

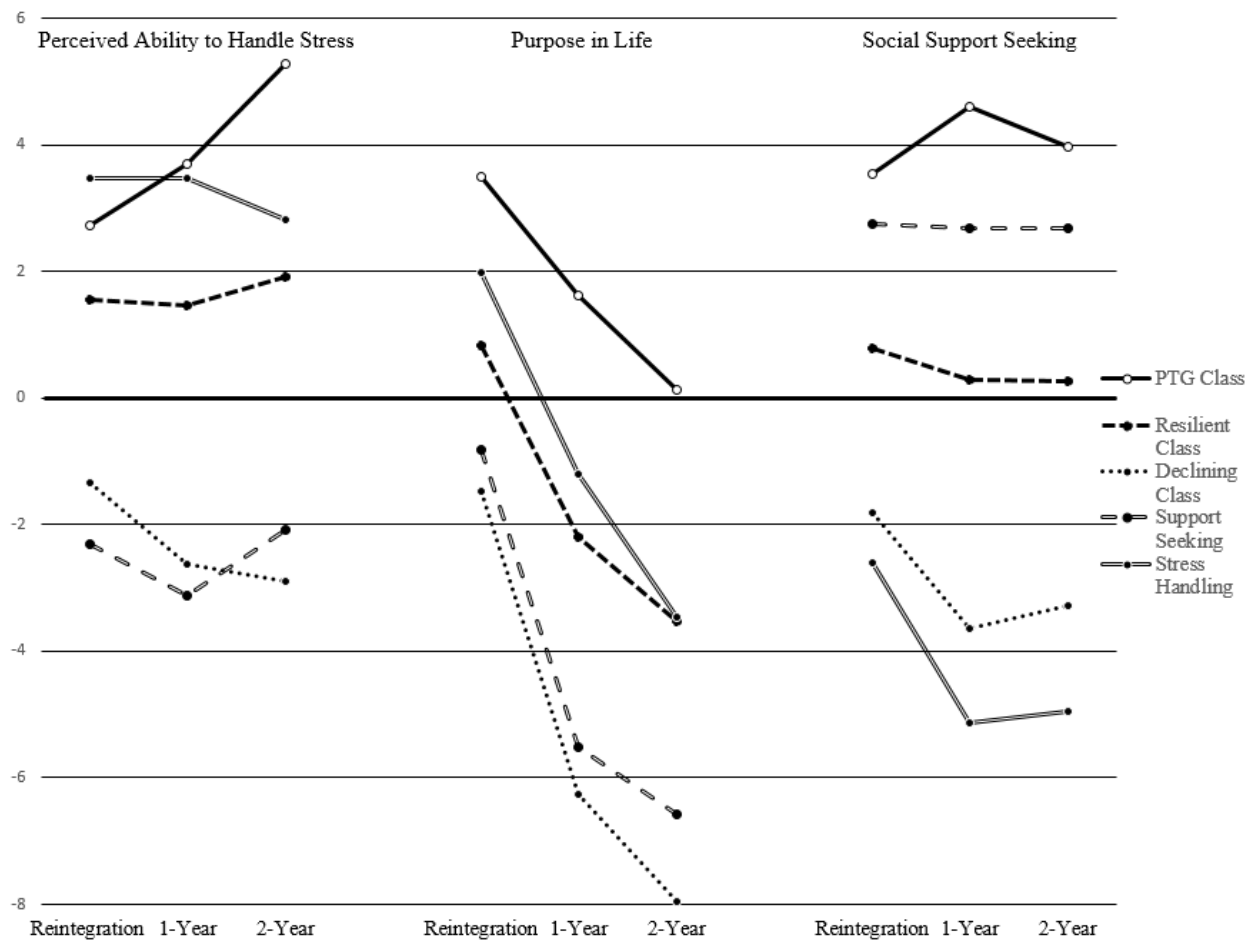
Variable	Soldier PTG at one-year post-deployment		Partner PTG at one-year post-deployment		Soldier PTG at two-year post-deployment		Partner PTG at two-year post-deployment	
	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE
Soldier PTG at Reintegration	.186*	.088	-.276*	.111	.251*	.114	.007	.123
Partner PTG at Reintegration	-.009	.091	.440*	.111	-.317*	.148	.096	.159
Soldier PTG at One-Year	NA	NA	NA	NA	.301*	.099	-.015	.143
Partner PTG at One-Year	NA	NA	NA	NA	.459*	.157	.360*	.166
Soldier Baseline Purpose in life Intercept	-.476*	.078	-.178	.118	-.299*	.118	-.157	.154
Partner Baseline Purpose in life Intercept	.076	.092	-.391*	.110	.073	.119	-.415*	.122

\* $p < .05$

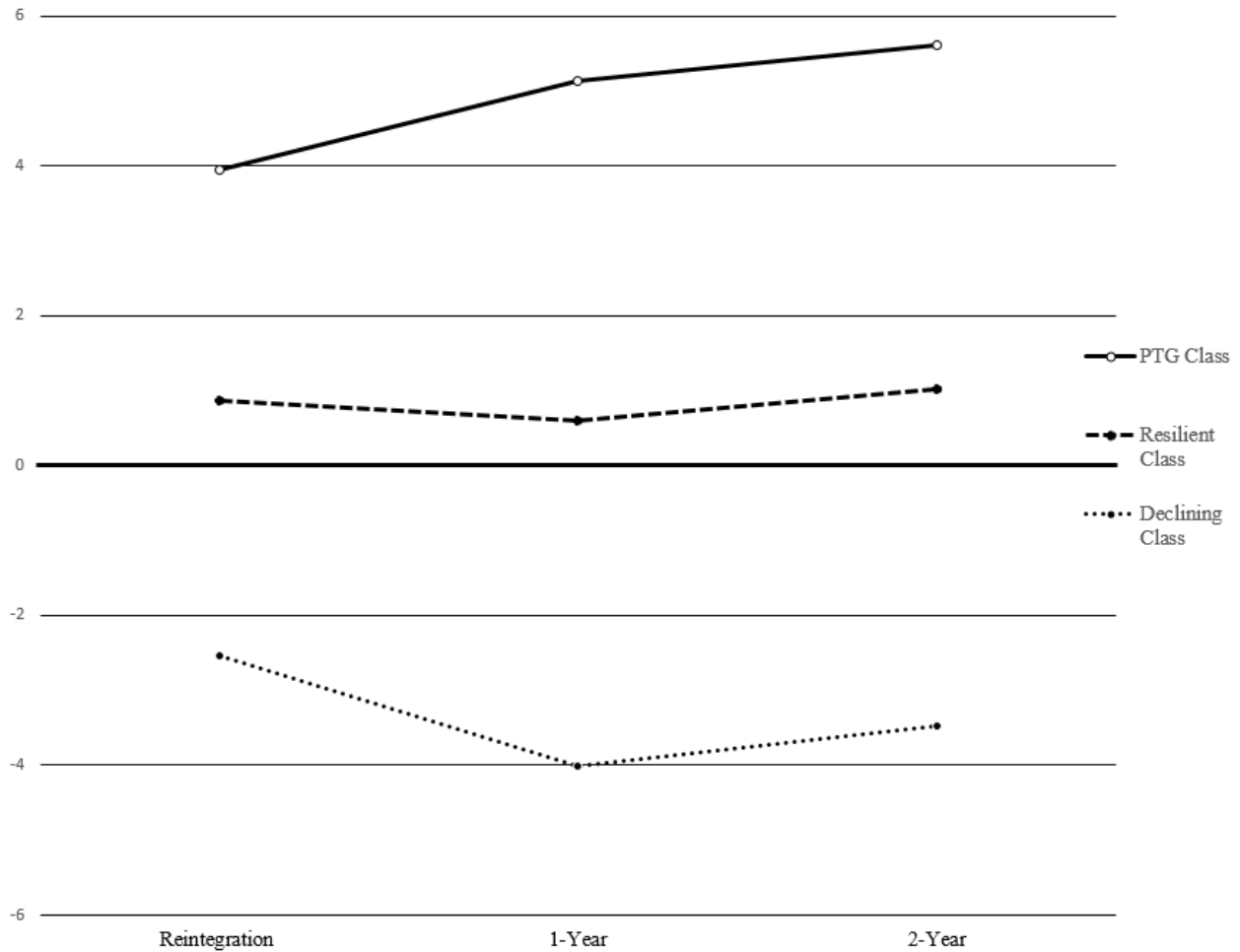


## APPENDIX B

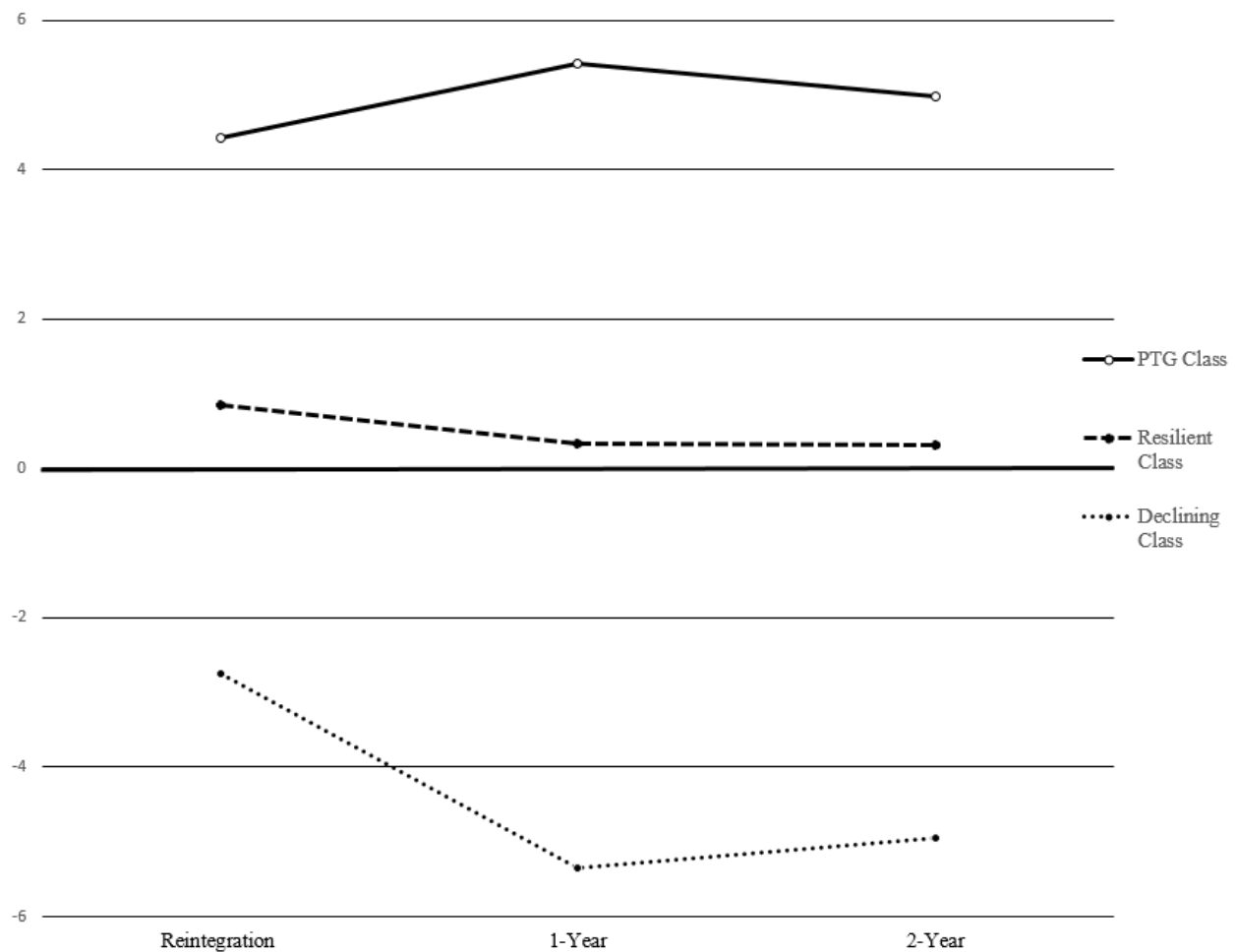
### Figures



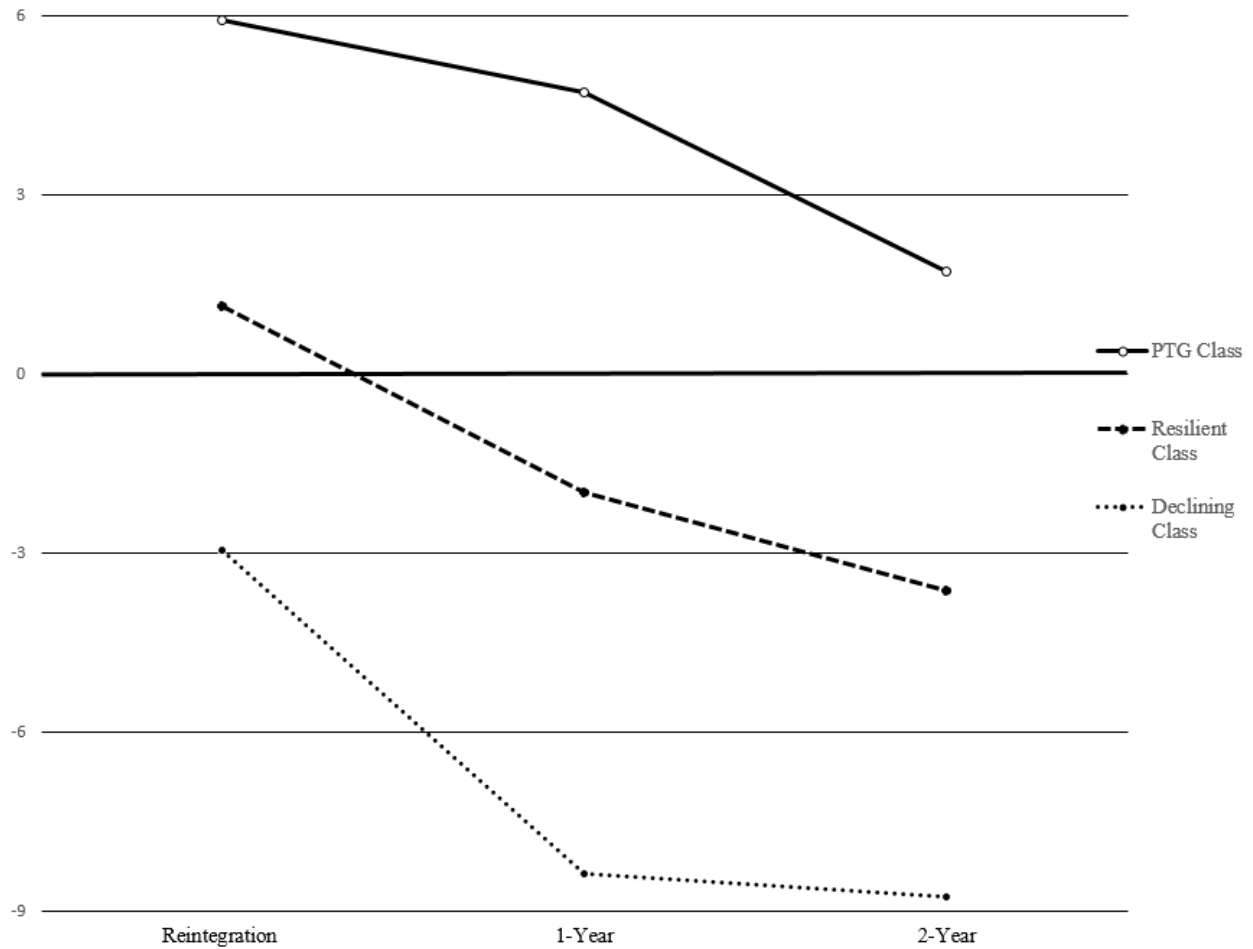
*Figure 1.1.* Graph of the post-deployment estimated means for each domain for the five latent classes found in the RMLPA examining all three domains concurrently. Due to centering of these data, anything above 0 represents growth from pre-deployment baselines, following a deployment. Evidence of a PTG Class, a Resilient Class, a Declining Class, a Support Seeking Class, and a Stress Handling Class were found.



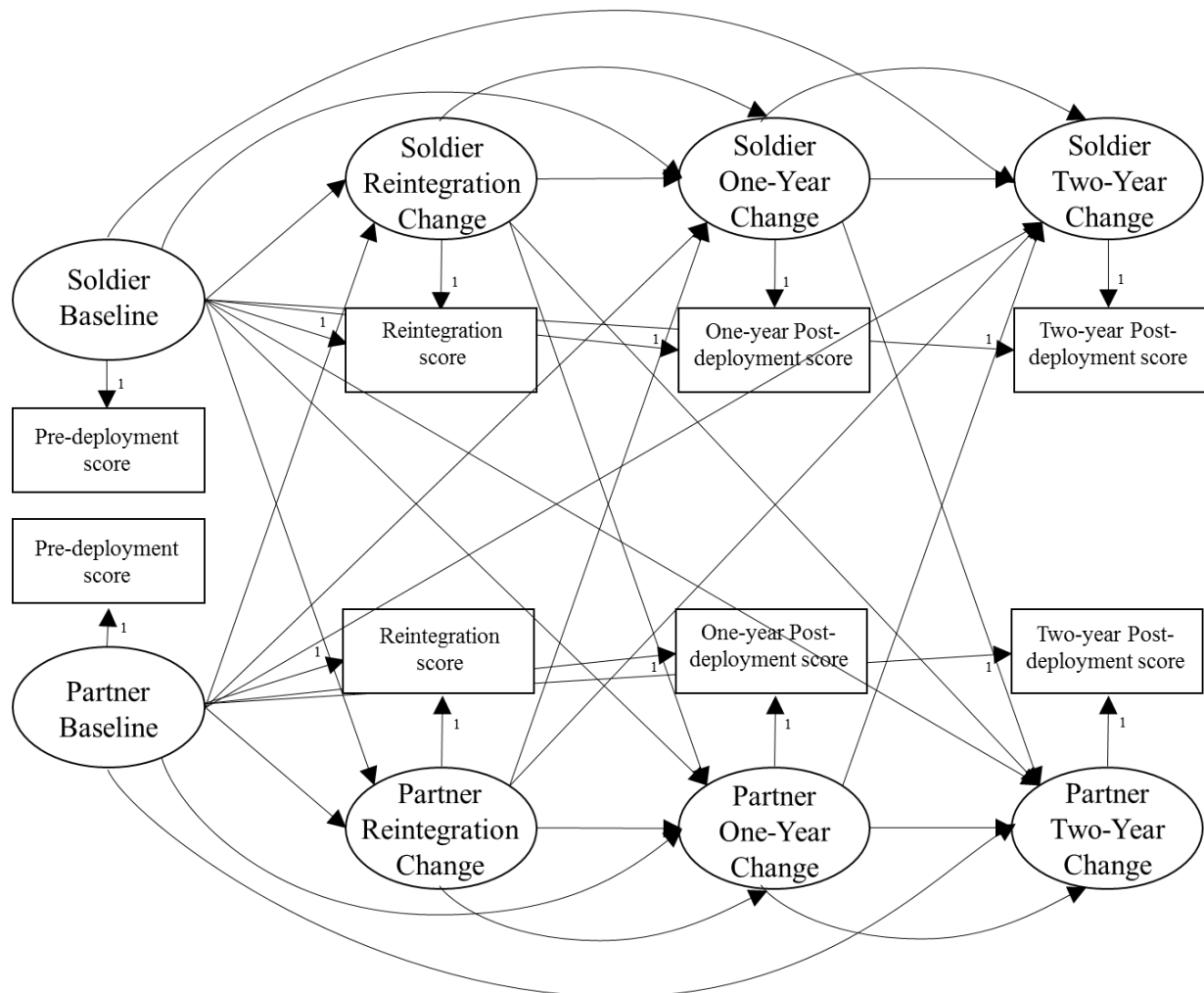
*Figure 1.2.* Graph of the post-deployment domain score estimated means for the “Perceived ability to handle stress” domain for the three latent classes found in the RMLPA. Due to centering of the data, anything above 0 represents growth from pre-deployment baselines, following a deployment. Evidence of a PTG Class, a Resilient Class, and a Declining Class were found in this domain.



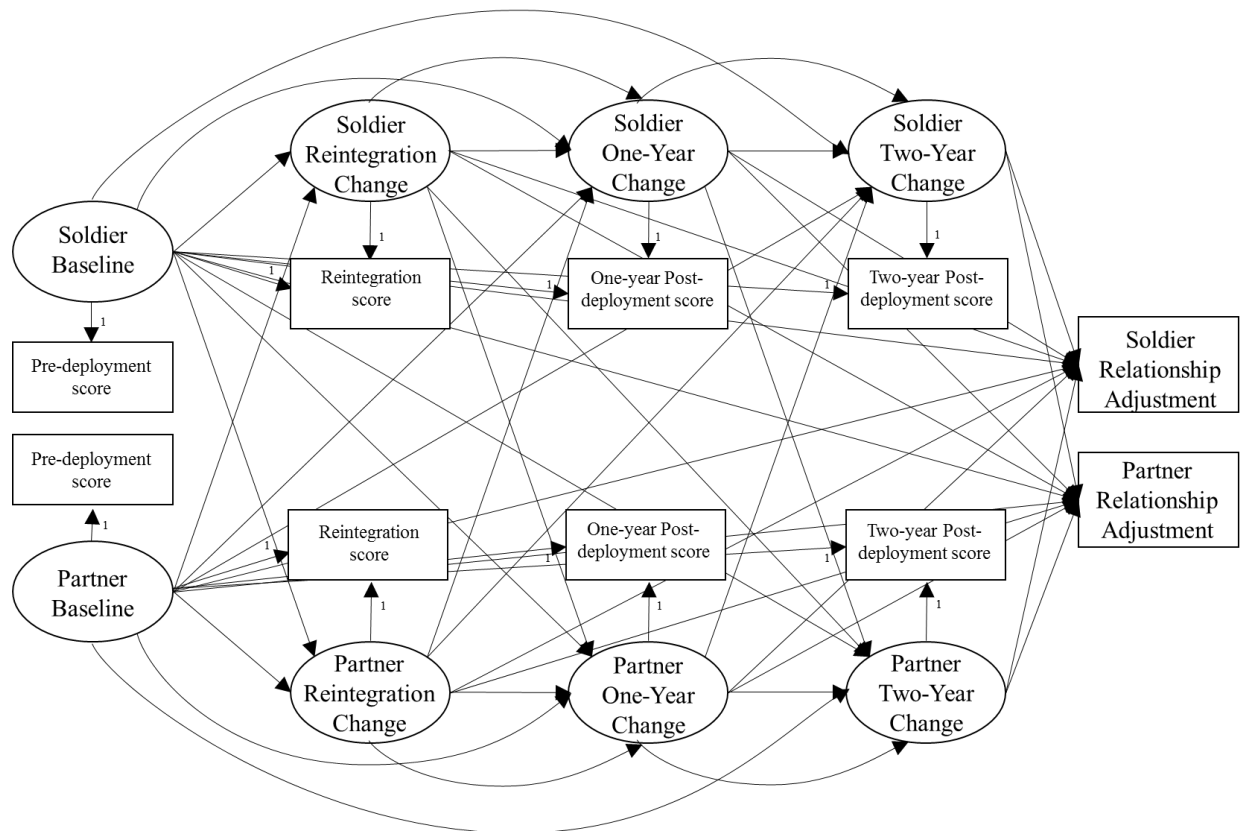
*Figure 1.3.* Graph of the post-deployment domain score estimated means for the “Social Support Seeking” domain for the three latent classes found in the RMLPA. Due to centering of the data, anything above 0 represents growth from pre-deployment baselines, following a deployment. Evidence of a PTG Class, a Resilient Class, and a Declining Class were found in this domain.



*Figure 1.4.* Graph of the post-deployment domain score estimated means for the “Purpose in Life” domain for the three latent classes found in the RMLPA. Due to centering of the data, anything above 0 represents growth from pre-deployment baselines, following a deployment. Evidence of a PTG Class, a Resilient Class, and a Declining Class were found in this domain.



*Figure 2.1.* The dyadic latent change score model here was used for each of the three domains in examining both actor and partner predictors of change. Latent change scores were regressed on previous latent change scores and latent incepts for both actor and partner effects.



*Figure 2.2.* Soldier and Partner relationship adjustment were added as outcomes to each of the three domains LCSM model. Soldier and Partner relationship adjustment were regressed on each latent change score and latent intercept.

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