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Posttraumatic Growth Reported by Emerging Adults: A Multigroup Analysis of the Roles of Attachment, Support, Coping, and Life Satisfaction

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Abstract

Posttraumatic Growth Reported by Emerging Adults: A Multigroup Analysis of the Roles of Attachment, Support, Coping, and Life Satisfaction

Steven David Schmidt
University of Connecticut, 2013

Research on posttraumatic growth (PTG) has mostly been conducted with individuals who experienced traumatic events during adulthood, and relatively little research has been conducted with survivors of traumatic events experienced during adolescence. In addition to the paucity of research with younger samples, growth – as conceptualized in the theoretical framework on PTG – can also arise from non-traumatic events such as normative life transitions (e.g., entering college); however, the differentiating characteristics of growth that develop from these two paths has not been empirically investigated. The current study explores these different pathways to growth by analyzing data from a group of emerging adults (ages 18-25) who reported experiencing a traumatic event during adolescence ($n = 359$) and a group of emerging adults recruited from the same sample frame who reported never experiencing a traumatic event ($n = 187$). This cross-sectional, multigroup study examined a model of PTG which included the independent variables of attachment style, coping strategies, and perceived support. Additionally, this study looked at the relationship between PTG and present-day life satisfaction across groups. Results revealed that the control group scored significantly higher on overall PTG, and this difference was most significant in the domain of new possibilities. However, the trauma group
did report higher levels of growth in the domain of appreciation for life. Structural equation modeling revealed little difference in the factor structure of the domains of growth or the pathways to growth between groups. However, significant differences were found in the levels of growth in various PTG domains and coping strategies reported across groups, but no such differences were found with attachment or perceived support. Pathways to growth appear to be consistent across both traumatic and non-traumatic events, with coping playing a critical role; however, the nature of the event being reported on and the developmental stage of the survivor at the time of exposure appear to moderate the type of coping strategies used and thus the levels of PTG. Despite these findings, there was no difference in reported present-day life satisfaction between the groups.
Posttraumatic Growth Reported by Emerging Adults: A Multigroup Analysis of the Roles of Attachment, Support, Coping, and Life Satisfaction

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Chapter 1

Introduction

News stories, memoirs, and most forms of popular media contain stories of survivors of traumatic events. When the term trauma is heard, thoughts of negative experiences and negative outcomes are common. Trauma is often associated with posttraumatic stress disorder (PTSD) and other pathological outcomes; however, many researchers of traumatic events and trauma survivors are now focusing on the positive outcomes associated with exposure to traumatic events (e.g., Antoni, Carver, & Lechner, 2009; Park, Chmielewski, & Blank, 2010; Phipps, 2007; Schmidt, Blank, Bellizzi, & Park, 2012; Sheikh, 2008). Certainly, traits such as hardiness and resilience have been included in research with trauma survivors (e.g., Bensimon, 2012; Waysman, Schwarzwald, & Solomon, 2001), but more recently, the concept of posttraumatic growth (PTG) – changing in positive, constructive, or beneficial ways that exceed what was previously considered normal for the trauma survivor (Tedeschi & Calhoun, 1996) – has burgeoned.

Since the mid-1990s, despite the fact that research on exposure to trauma and subsequent adjustment and quality of life has historically focused on maladaptive responses (e.g., avoidance, substance use) and psychological consequences (e.g., depression, anxiety) associated with the traumatic event (Tedeschi, Park, & Calhoun, 1998), research on posttraumatic growth has flourished. For example, a cursory search of the PsycINFO database for published journal articles with “posttraumatic growth,” “stress-related growth,” or “benefit finding” in the title resulted in 451 articles published between 1996 and 2012, but prior to 1996 only one article matched the search criteria. This exemplifies the shift in research in the mid 1990s to develop a
theoretical model of posttraumatic growth and to accordingly develop associated operational definitions and measures.

The majority of empirical studies in this area have focused on adult survivors of traumatic events (e.g., life-threatening events such as natural disasters and terrorist attacks and illnesses such as cancer and AIDS), and establishing and continuing this body of research has been rationalized based on the goals of positive psychology to “better understand how individuals can negotiate, resolve, and grow in the face of life’s stressors and challenges” (Keyes and Haidt, 2003, p. 6) and the potential implications for clinical interventions in efforts to minimize distress and set a foundation for the development of psychological growth (e.g., Antoni et al., 2009; Nelson, 2011; Stanton & Low, 2004; Tedeschi & Calhoun, 2009).

However, there has been relatively little research on PTG with survivors of traumas experienced during childhood and adolescence. Some researchers have questioned whether children and adolescents have the cognitive ability to experience such growth (Campbell, Scaduto, Van Slyke, Niarchos, Whitlock, & Compas, 2009; Helgeson, Reynolds, & Tomich, 2006). However, of the few PTG studies that have been conducted with survivors of childhood and adolescent traumas, findings have supported the notion that PTG can be experienced by youth, especially by those who have experienced trauma during adolescence (Cryder, Kilmer, Tedeschi, & Calhoun, 2006; Loiselle, Devine, Reed-Knight, & Blount, 2011, Wild & Paivio, 2003; Wolchik, Coxe, Tein, Sandler, & Ayers, 2008; Yaskowich, 2003).

Adolescence is a critical stage in development that is, by definition, separate from and a precursor to adulthood. As a result, factors that influence how people respond to traumatic events and the psychological outcomes related to the trauma exposure during this life stage are likely to differ compared with exposure to traumatic events during adulthood. Furthermore,
because of the potential disruption in the typical developmental processes that happens during adolescence, trauma exposure may be perceived as being more detrimental long-term compared with traumas that are experienced during young, middle, and later stages of adult development. In essence, there is potential for a ripple effect in which early effects of trauma exposure can influence later adult developmental tasks (e.g., career, marriage), which justifies the inclusion of adolescent populations in research on posttraumatic growth.

Tedeschi and Calhoun (2004) comment that the prerequisite of established schemas and worldviews about life (discussed later) makes adolescents and adults more likely than younger children (who may not have fully developed these belief systems) to have the cognitive development needed to realize and report PTG. Accordingly, there is a rationalized need for continued and expanded research on PTG and its correlates with people who have been exposed to traumatic events during adolescence in order to better understand how younger individuals respond to traumatic events, what factors are associated with these responses, and how responses to these events influence their reports of well-being.

Emerging adulthood has been defined as a transition stage of the life course (typically 18-25 years) during which people explore options available to them as they transition from late adolescence into young adulthood (Arnett, 2000; Gottlieb, Still, & Newby-Clark, 2007). The primary focus of this study is to empirically investigate reports of PTG by emerging adults who have experienced trauma during adolescence compared with a control group. Specifically, the objectives are to 1) compare the levels of and types of reported growth between these two groups, 2) examine the contributions that predictive factors (e.g., attachment, coping, and social support – discussed later) play in reports of PTG in these groups, 3) examine how these structural models of PTG differ between the two groups, and 4) examine the relationship
between PTG and present-day life satisfaction. As a precursor to the study hypotheses, conceptual model, and research design, an overview of the theoretical framework guiding this study and the empirical research on PTG will be presented along with a review of factors associated with PTG in adult and adolescent samples.

**Conceptualization of Posttraumatic Growth**

Conceptually, posttraumatic growth is similar to but distinct from resilience and hardiness (Clay, Knibbs & Joseph, 2009). Resilience is commonly defined as the “ability to continue to function normally in spite of adversity” (Clay et al., 2009, p. 413); whereas, hardiness has been described as a personality trait used to describe people who are more likely than others to regard a typically distressing event as less threatening and something that is controllable (Tedeschi & Calhoun, 2004). Conversely, PTG is the reported experience of psychological growth on intrapersonal benefits that develop following exposure to a traumatic event (Tedeschi & Calhoun, 1996; 2004), and these positive changes enhance or exceed what was previously considered to be normal by the individual exposed to the trauma (Clay et al., 2009).

Posttraumatic growth has also been used interchangeably with terms such as benefit finding, perceived benefits, and stress-related growth (e.g., Lechner, Zakowski, Antoni, Greenhawt, Block, & Block, 2003; Park, Chmielewski, & Blank, 2010; Swickert & Hittner, 2009). Despite similarities, benefit finding and PTG are operationally unique from one another as evident from studies that have reported weak correlations between measures of PTG and perceived and actual benefits (Mols, Vingerhoets, Coebergh, & van de Poll-Franse, 2009; Sears, Stanton, & Danoff-Burg, 2003). Moreover, stress-related growth can include events that are stress-inducing but may lack the threat-inducing component (discussed later) that is a key aspect
of PTG. Although reports of recent stressful events can certainly include those considered to be potentially traumatic, others such as problems in relationships and academic performance may be stressful and worthy of investigation but are less likely to be considered traumatic as outlined in the theoretical framework of posttraumatic growth (Tedeschi and Calhoun, 1996).

Tedeschi and Calhoun (2004) note that these reports of growth can manifest through five domains: appreciation for life, relating to others, personal strength, spiritual change, and new possibilities. Appreciation for life can be exemplified in the phrases “don’t take life for granted” and “stop and smell the roses,” which are themes that are descriptive of some changes that many trauma survivors report. Survivors may come to regard life as precious and limited, and one possible outcome is a greater awareness of the aspects of life that were regarded as low priority or taken for granted prior to experiencing the traumatic event. For example, survivors may shift priorities (e.g., work versus personal life) and may be more likely to pay greater attention to and have a deeper appreciation for various aspects of life that are intrinsic (e.g., love and caring for others) rather than extrinsic (e.g., salary and job title).

Tedeschi and Calhoun (2004) identify another domain, relationships with others, as descriptive of new and deeper evaluations of the bonds and interactions which survivors have with other people. It is common for survivors of traumatic events to report changes in preexisting relationships and the development of new relationships as resulting from experiencing and coping with a traumatic event. Changes can include increased closeness within relationships, disintegration of problematic or stressful relationships, and the development of new relationships, often with other survivors of similar trauma exposure. Survivors also may develop a greater sense of compassion and empathy in response to the ordeal they experienced and, as a result, may put more of a concerted effort into relationship building and maintenance.
By dealing with a traumatic event and the personal challenges a survivor has to overcome, a greater sense of self-reliance can result, which, as outlined by Tedeschi and Calhoun (2004) characterizes the personal strength dimension of PTG. Survivors may come to believe that because they overcame such a threatening event, they have the strength to overcome other challenging events. This may include a sense of being able to overcome future occurrences of the trauma already experienced as well as taking on stressful life events that had not previously been faced. A fourth dimension of PTG, which can be conceptually tied to personal strength, is spiritual growth. Although spiritual or religious convictions can be challenged by the threat and suffering associated with a traumatic event and may result in survivors questioning their faith, they can also act as meaning-making resources for many people (Park, 2006). If religious or spiritual conviction is undaunted, faith can be a strong tool for developing a sense of inner strength. Turning to religion or spirituality and utilizing the supportive nature of associated religious communities can further foster a sense of understanding of and reasoning for the trauma, which can further result in realized growth in the domain of spiritual change.

Lastly, Tedeschi and Calhoun (2004) suggest that overcoming a trauma can result in new opportunities and possibilities that survivors can explore. Survivors may quit roles that they no longer find satisfying and pursue other roles they believe to be more rewarding intrinsically. Some survivors take on advocacy roles related to the trauma experienced; whereas, other survivors develop new hobbies or career choices. Although exposure to traumatic events may close some doors, exposure to trauma can also open up many others.

Theoretical Framework of Posttraumatic Growth

Park and others (Park, 2009; Tedeschi & Calhoun, 1995; 1996; 2004) outline the base theoretical model of PTG as starting with exposure to a traumatic event. Although necessary, the
trauma itself is not considered the primary antecedent to PTG, nor is it sufficient. It is likely that these traumatic events will produce distress within the individual, and some level of distress or struggle is required for growth to occur. More specifically, this theoretical framework of PTG posits that exposure to a traumatic event needs to be accompanied by or followed with a perceived threat of significant loss, physical impairment, or death. It is the perceived threat related to the trauma, not the traumatic event itself, that is the trigger required for PTG to develop. It is further important to recognize the subjective nature of the extent to which the event is perceived as threatening. Although certain events can be labeled as traumatic because of the invasive and personally threatening nature of the event (e.g., rape, armed robbery), other events are more likely to vary in perceived level of threat based on individual (e.g., personality, support network) and contextual (e.g., objective severity, impact on personal functionality) characteristics. Thus, inclusion of both subjective and objective appraisals of the event is needed to understand the magnitude of impact of the event when researching PTG.

In their model, Tedeschi and Calhoun (1995; 2004) further posit that all individuals have beliefs and assumptions about the world they live in, and it is when these global meanings or life schemas are violated that PTG can develop. Not every bad or negative experience, however, will result in this struggle with violated beliefs and result in reported growth. Calhoun and Tedeschi (1998) have used the term *seismic* to describe the perceived impact needed for these traumatic events to lead to a shattering of ones’ worldviews. As mentioned, perceived threats and levels of distress associated with the trauma are critical in fostering the questioning or shattering of these assumptions and global meanings about life, which can then lead to modifications in personal belief systems in order to accommodate the meaning of the trauma into new or restructured personal views of and assumptions about life and the world. In essence, people are motivated to
alleviate the cognitive dissonance and discord that develops from the reality of the events and the conflicting worldviews of the individual. As a result of this shattering of beliefs and subsequent dissonance, Tedeschi et al. (1998) note that people “establish new psychological constructs that incorporate the possibility of such traumas and better ways to cope with them” (p. 2). However, it has been argued that if a large enough threat is not perceived and assumptions are not challenged, there is no need for a change of worldviews, and the event may simply be assimilated into existing schemas (Neimeyer, 2006), indicating outcomes associated hardiness or resilience but not growth per se. Conversely, if too much distress related to the perceived threat is experienced, the individual may develop pathological symptoms that can impede cognitive processing of the event. Such pathological symptoms may need to be resolved before posttraumatic growth can be experienced. This curvilinear effect of distress and growth has been documented in empirical research (Kleim & Ehlers, 2009).

Despite the empirical evidence of PTG as a valid psychosocial construct, differentiating PTG as a process versus an outcome remains debatable. Park (2004) offers that establishing the validity of PTG as a unique construct independent from coping processes is a difficult task, and Tedeschi et al. (1998) have suggested that PTG is both a process and an outcome. As discussed later, research on PTG and coping has commonly identified correlations between PTG and positive reframing, but these correlations are far from perfect, suggesting that these two constructs are similar but empirically and theoretically distinct from one another (Stanton & Low, 2004). Moreover, as an outcome variable, actual change is often assumed in research on PTG. However, it is possible that people can perceive growth following a traumatic event by downgrading their retrospective evaluation of self, which allows for a way to enhance their present day self, leading to a false belief of actual change. This biased evaluation does not
reflect actual growth in the individual, but can be regarded as a way of coping with the impact of the trauma and alleviating the associated distress. However, Park and Helgeson (2006) also state that perceptions of change or growth may actually be more important than measures of actual growth in understanding quality of life and adjustment following traumatic events, and it is plausible that the psychological and cognitive changes that define PTG can set the stage for actual changed behaviors.

Although at times conceptualized as a coping mechanism (Tedeschi et al., 1998) or personality trait (Park, 1998), PTG is often regarded as an outcome by the survivors of trauma who report it, and PTG has been found to be associated with several measures of adjustment to major events (e.g., well-being, depression) with different populations and methodologies (Park, 1998). Furthermore, Tedeschi and Calhoun (1996) argue in their early psychometric approach to PTG that the wording of the scale items used to measure PTG treat the indicators as “outcomes [original emphasis] of coping with traumatic events … and its focus is on the variety of possible benefits that may be discovered” (pp. 466-7). Calhoun and Tedeschi (1998), thus, suggest that researchers should include this conceptualization of PTG as an outcome in their research designs and investigate the factors associated with its occurrence as well as the processes by which it occurs.
Chapter 2

Review of the Literature

Research on Posttraumatic Growth in Adults

Most research on PTG to date has been conducted with adults (see Helgeson et al., 2006; Linley & Joseph, 2004; Prati & Pietrantoni, 2009 for reviews). A review of these empirical studies has highlighted several factors associated with the development of PTG including cognitive appraisals (e.g., perceived threat, Cordova, Cunningham, Carlson, & Andrykowski, 2001), demographics (e.g., gender, Tedeschi & Calhoun, 1996), personality (e.g., optimism, Prati & Pietrantoni, 2009), and religiosity (e.g., Park, 2006). Of particular relevance to the current study, two of the more commonly cited psychosocial factors investigated and found to be associated with PTG are coping (e.g., Bellizzi & Blank, 2006) and social support (e.g., Park et al., 1996). Also relevant to this study is attachment style, which has recently been identified as a variable related to PTG, particularly through its influence on active and positive reframing coping strategies (Schmidt et al., 2012).

Coping strategies. Whereas coping styles are considered to be personality characteristics or dispositions, coping strategies can be situational (Carver, Scheier, & Weintraub, 1989). It is plausible that coping strategies (situational) may override coping styles (dispositional) in particular situations, and their use is likely to vary based on several factors, including aspects of the trauma being coped with (e.g., type, duration, perceived severity) and available resources (e.g., social support). For example, significant life events (e.g., diagnosis of a serious illness) may result in the use of coping strategies that differ from those strategies that define one’s coping style – strategies regularly used in more routine or less significant events (i.e., managing day-to-day stressors).
Two types of coping most commonly associated with reports of growth are positive reappraisal (Loiselle et al., 2011; Morris, Shakespeare-Finch, & Scott, 2007; Park et al., 1996; Park & Fenster, 2004; Schmidt et al., 2012; Sears et al., 2003; Thornton & Perez, 2006; Urcuyo, Boyers, Carver, & Antoni, 2004; Weiss, 2004) and use of support coping (Park & Fenster, 2004; Sheikh, 2004, Swickert & Hittner, 2009; Thornton & Perez, 2006). In a recent meta-analysis on factors contributing to PTG, reappraisal coping ($r = .36$) and support coping ($r = .25$) had moderate effect sizes (Prati & Pietrantoni, 2009). Some researchers (e.g., Bellizzi & Blank, 2006; Kinsinger, Penedo, Antoni, Dahn, Lechner, & Schneiderman, 2006; Wild & Paivio, 2003) have combined various coping strategies (e.g., active coping, planning, acceptance) based on either conceptual similarity or empirical justification (statistical factor analyses) to create composite scores often labeled adaptive or positive coping. These studies have also revealed moderate to strong associations between custom composite scores of adaptive or positive coping and reports of growth, ranging from .27 to .53 (Bellizzi & Blank, 2006; Kinsinger et al., 2006; Park, Aldwin, Fenster, & Snyder, 2008; Shakespeare-Finch, Gow, & Smith, 2005; Wild & Paivio, 2003).

One of the few studies in which no relationship was found between PTG and positive reframing analyzed these variables over a period of 9 months, and it was noted that although there was a linear increase (at three data collection points) in reports of PTG by breast cancer survivors, the scores of reported positive reappraisal remained consistent across the three data collection points (Manne, Ostroff, Winkel, Goldstein, Fox, & Grana, 2004). This provides support for the notion that PTG is a construct uniquely different from positive reframing. Conversely, an earlier study by Park et al. (1996) found no relationship between PTG and positive reframing at initial assessment, but they did find a strong correlation between them six
months later, suggesting a change in association between these variables over time. The difference in association between these variables suggests differing reports of each over time. Of note, there are three major differences between these studies: 1) the measures used to operationalize growth (posttraumatic growth versus stress-related growth), 2) the events used to define trauma, and 3) the gender make-up of the samples. Manne and colleagues collected data from married women who had been diagnosed with breast cancer on average 4.5 years earlier; whereas, Park and colleagues asked college students to report on two events: “the most negative/stressful and the most positive that had occurred during the past year” (p.87). Not only do these studies demonstrate that PTG and positive reframing are different constructs, but the amount of time that has elapsed since the traumatic event was experienced and the type of traumatic event being reported on are likely to differentially influence the process of reframing and the level of PTG reported.

Regarding the use of social support as a coping strategy, the simple act of talking about fears and worries with supportive others can foster a deeper understanding and processing of the trauma in a more positive light and lead to the development of new life narratives and personal beliefs (Cordova et al., 2001; Kinsinger et al., 2006; Luszczynska, Mohamed, & Schwarzer, 2005; Weiss, 2004). This view of the role of engagement in social support is most evident in a study by Weiss (2004) in a study of 72 married breast cancer survivors. Reported contact with a person who went through a similar ordeal and also perceived growth from the experience resulted in scores of PTG that were significantly higher ($M = 64.9$) compared with those who did not report such contact ($M = 46.8$). Thus, there is some evidence to suggest that the type or source of support is an important factor to consider in the relationship between use of support and PTG.
**Perceived Social support.** In addition to the use of social support as a coping strategy, perceived availability/quality of and satisfaction with social support have been identified as positively related to reports of PTG (Cadell, Regehr, & Hemsworth, 2003; Kinsinger et al., 2006; Leung, Gravely-Witte, MacPherson, Irvine, Stewart, & Grace, 2010; Love & Sabiston, 2011; Park et al., 1996; Prati & Pietrantoni, 2009; Weiss, 2004). A recent meta-analysis (Prati & Pietrantoni, 2009) that combined these three aspects of support (perceived availability/quality, satisfaction, use of) and included multiple dimensions of support (e.g., emotional, instrumental) found an overall moderate effect size of the association between support and PTG ($r = .26$).

In conjunction with support seeking strategies, the perceived availability and quality of support can allow for opportunities to be emotionally expressive with others, which, as noted earlier, can result in the development of new life narratives for individuals (Lechner & Weaver, 2009), and in turn, developing new life narratives can be regarded as an adaptive strategy (Neimeyer, 2006; Tennen & Affleck, 2009). Moreover, more positive perceptions of support resources are likely to result in more frequent interactions with others who are supportive, providing more opportunities for cognitive processing (including meaning making strategies) of the traumatic event, which may lead to growth (Sheikh, 2008).

Park et al. (1996) found that perceived support was positively correlated with PTG and remained significantly associated with PTG six months later. Additionally, increases in perceived support from time 1 to time 2 were positively correlated with PTG scores at time 2. These findings suggest that the maintenance of perceived growth over time may be partially dependent upon levels of perceived support over time. However, although there was a positive correlation between perceived spousal support and PTG in a study with 72 married adult breast cancer survivors, this aspect of support was not as strong of a predictor of PTG as was actual...
contact with another survivor (Weiss, 2004). Wilson and Boden (2008) did not find a direct or indirect link between perceived support and PTG in their study with college students who reported on significant negative events in their lives at any time during the past five years, and the researchers suggest that the role of perceived support in the development of PTG may be a complex one.

**Attachment styles.** Not everyone who is exposed to a traumatic event experiences growth, and this variability may be explained, at least in part, by dispositional traits. Researchers (Tedeschi & Calhoun, 2004; Warbel, 2008) have suggested that dispositional traits (e.g., resilience, hardiness, & attachment style) can influence the level of perceived threat associated with an event and how people respond to such events, and this response mechanism will indirectly influence adjustment to the event through mutable factors such as coping strategies and social support resources.

One such dispositional trait is attachment style. Bowlby (1988) explains that attachment styles are developed early in life based on the relationship between the child and the primary caregiver. Secure attachment arises when the caregiver is responsive to the child’s needs, and in turn, the child develops a sense of trust and assurance with the caregiver. Insecure types of attachment are characterized by avoidant behaviors, and terms used to describe insecure attachment include: anxious, resistant, fearful, and worrisome. One type of insecure attachment is anxious-resistant. This style of attachment results from the child’s uncertainty of the caregiver’s reliability and will likely result in separation anxiety. A second type of insecure attachment is anxious-avoidant. This style develops when the child has a complete lack of confidence in the caregiver, which can result in moderate to severe personality disorders.
Schaefer and Moos (1998) posit, via their conceptual model, that personal system factors (which can include attachment style) can influence coping responses to traumatic events, which can contribute to personal growth. Ognibene and Collins (1998), in their theoretical perspective on attachment, posit that once an attachment style is developed within an individual, it will direct interpersonal and intrapersonal functioning throughout the lifespan, including making use of social support resources and actively coping with stressful events. Based on these theories, secure attachment is likely to benefit individuals facing a traumatic life situation due to their ability to trust themselves and others in charge of their care and well-being. Individuals with insecure attachment styles are likely to have less self-confidence and trust in others and may lack the abilities and resources to properly manage such stressful situations.

A small number of studies have investigated the relationship between attachment and PTG in trauma survivors, and the initial findings support the theoretical association between the two. In a cross-sectional study with 314 cancer caregivers, Kim, Carver, Deci, and Kasser (2008) included measures of adult attachment and benefit finding. They reported that secure attachment was significantly and positively associated with reports of benefit finding for both wives and husbands. Avoidant and anxious types of attachment were unrelated to benefit finding in men; anxiety but not avoidant attachment was negatively associated with reports of benefit finding for women. Similarly, Schmidt et al. (2012) found secure attachment to be positively associated with PTG in a small sample of cancer survivors \((n = 54)\), insecure types of attachment were unrelated to PTG, although the negative correlation between avoidant attachment and PTG approached statistical significance and was restricted due to the small sample size.

Although preliminary, these findings support the hypothesis that attachment style may be influential in the development of PTG. However, it is important to examine and understand
the interrelationships between coping, support, and attachment when investigating these variables in a theoretical model of PTG. Literature on attachment style and coping strategies in adults has shown that attachment style can dictate the development and use of appropriate coping strategies for individuals who are dealing with stressful or traumatic events (Alexander et al., 2001; Koopman et al., 2000; Mikulincer & Florian, 1995; Ognibene & Collins, 1998, Schmidt et al., 2012). This body of research has further shown that secure attachment style is often associated with the use of more positive reframing and acceptance coping strategies; whereas, insecure attachment style is often associated with the use of avoidant coping strategies such as substance use and disengagement. Furthermore, one study conducted with adult cancer survivors found that the positive relationship between secure attachment and PTG was mediated by positive reframing of the event (Schmidt et al., 2012). This suggests that individuals with a secure attachment style are more likely to engage in positive reframing in response to a traumatic event, and this relationship may be one pathway that results in reports of PTG.

Regarding attachment and social support, securely attached adults were noted to seek more social support as a way of coping following a stressful event; whereas, insecurely attached adults either tended to not seek out support or use avoidant coping strategies (Mikulincer & Florian, 1995; Ognibene & Collins, 1998). To this end, secure attachment allows for opportunities for open discussion with supportive others about worries and fears regarding the traumatic event, which can lead to the development of new self-reflections and personal understandings about the self and the world. These developments may further assist in the rebuilding of worldviews that have been shattered by the traumatic event. Indeed, secure attachment may foster open and expressive communications with others, which can lead to the
development of new life narratives for individuals, and such narratives can be positive adaptive strategies with the potential to promote growth (Neimeyer, 2006; Tennen & Affleck, 2009).

**Life satisfaction.** Both the role of life satisfaction in samples of trauma survivors and the relationship between life satisfaction and PTG have been explored. However, the findings from this body of research are mixed. For example, in one study, reports of life satisfaction were found to be lower in adult survivors of pediatric cancer compared with a community sample (Seitz et al., 2011). Conversely, another study found that reports of life satisfaction were higher in breast cancer survivors compared with a control sample (Mols et al., 2009). Both of these studies, however, did find that levels of life satisfaction were positively correlated with reports of PTG in the trauma groups ($r = .17$ & $.25$ respectively), and in a study with spousal caregivers of cancer survivors, Kim et al. (2008) reported that life satisfaction was positively associated ($r = .22$) with benefit finding for both wives and husbands. Although statistically significant, these correlations are small in magnitude, and other researchers have found no reliable correlations between PTG and life satisfaction. A study with young and middle-aged cancer survivors (Park, Chmielewski, & Blank, 2010) and one with emerging adults reporting on most stressful recent events (Cann, Calhoun, Tedeschi, Kilmer, Gil-Rivas, Vishnevsky, & Danhauer, 2010) found no relationship between life satisfaction and reports of growth. These inconsistent findings may be related to the differences among these studies in regards to the timing of the events, the sample demographics, and the measures used to assess PTG, and continued research is warranted.

**Research on Posttraumatic Growth in Adolescents**

As noted, the majority of research on PTG has been done with adult populations, and it has been suggested that children and adolescents may lack the skills needed, such as abstract thinking and executive functioning, to experience and process growth resulting from exposure to
traumatic events (Campbell et al., 2009; Cryder et al., 2006; Helgeson et al., 2006). However, Losoya, Eisenberg, and Fabes (1998) note that as children age, they tend to engage in more inner-focused coping strategies (e.g., emotional processing), and more cognitively advanced coping strategies come into use as children develop. Cognitive development, thus, is a key distinguishing feature between younger children and adolescents in regards to responses to and psychological processing of traumatic events. If reports of PTG in survivors of traumas during adolescence are accurate and valid, the differing developmental stages and life priorities associated with adolescence compared with adulthood (e.g., school versus career, social development versus family development) may result in different responses to traumatic events (e.g., coping strategies) and different outcomes (e.g., different levels and types of growth) compared with what is known about survivors of trauma in adulthood. This may have potential implications for clinical approaches to working with younger trauma survivors; interventions and clinical approaches that have been informed by PTG research conducted with survivors of adult trauma may not be appropriate for adolescent and emerging adult survivors.

Compared with other ages, the unique developmental tasks associated with adolescent development (e.g., social relationships, identity development, education / skill acquisition, vocational exploration) can foster variation in how adolescents respond to traumas and the effects the traumatic events and associated responses have on adjustment and adaptation. These differences can also form the basis for a theoretical model of PTG applicable to survivors of adolescent trauma that differs from what is currently known about individuals who experience traumatic events in adulthood. For example, based on the review of PTG and adults presented earlier, positive reframing coping and social support (perceived and seeking) appear to be the most significant and consistent correlates of PTG in adults. However, because of the limited
research to date, the abilities for adolescent survivors of trauma exposure to engage in positive reframing coping and make use of support resources are not clearly understood, and further research in this area is needed.

Salter and Stallard (2004) used secondary data from a study (which was not originally designed to examine PTG) to investigate growth as reported by children following a traumatic event. The data consisted of responses to open ended interview questions from 158 children, ages 7 to 18, involved in traffic accidents. The researchers were able to demonstrate that PTG is possible in children based on the spontaneous reports of growth (i.e., appreciation of life) by 42 percent of the sample.

Several other qualitative studies supporting the potentiality of PTG in adolescents have been conducted with pediatric cancer survivors. In one study of 150 pediatric cancer survivors ages 11 to 19, the Perceptions in Self Scale from the Impact of Traumatic Stressors Interview Schedule was used to measure growth (Barakat, Alderfer, & Kazak, 2006). This measure included a combination of open-ended questions and Likert scales. One-third of the sample reported at least four instances of positive change (e.g., appreciation of life, plans for the future), and 84 percent reported at least one. Similarly, positive outcomes from the process of dealing with and adjusting to a cancer diagnosis (e.g., a more positive view of life and improved self-esteem) were reported spontaneously in response to open-ended questions (collected via telephone interviews) from a smaller sample (n = 38) of adolescents and emerging adults aged 15 to 21 (Mattsson, Ringné, Ljungman, & von Essen, 2007). In a more recent qualitative study using in-depth interviews with ten adolescents and emerging adults (ages 16-22) who had been diagnosed with cancer during adolescence (on average 3.5 years prior to the interview), the majority reported growth in the domains of relationships with others, appreciation for life, and
personal strength (Wicks & Mitchell, 2009). These findings support the hypothesis that adolescents can and do report experiences of growth following exposure to trauma, especially in the domain of appreciation for life.

The aforementioned studies used qualitative methods and non-standard instruments to measure PTG. However, several other researchers have employed modified versions of the Posttraumatic Growth Inventory (PTGI, Tedeschi & Calhoun, 1996), which is the most widely used measure of PTG in adults, to measure PTG in adolescents. For example, Milam, Ritt-Olson, and Unger (2004) surveyed 435 high school students with a modified version of the PTGI and found that 30 percent of participants reported moderate overall growth following a negative life event (primarily the death of a close family member, relocation of primary residence, & loss of a close friend) and, therefore, concluded that PTG is possible in adolescent populations. Another study, also using a modified version of the PTGI, collected data from 514 8th grade adolescents following the September 11th terrorist attacks (Milam, Ritt-Olson, Tan, Unger, & Nezami, 2005) and found that, consistent with other findings, a third of the sample reported moderate levels of overall growth. In a third study that also used a customized version of the PTGI, researchers analyzed responses from 177 adolescents (ages 14-19), who responded to items in relation to their most difficult trauma experienced, and it was reported that participants scored especially high on the appreciation for life domain (Ickovics, Meade, Kershaw, Milan, Lewis, & Ethier, 2006). Thus, there is empirical quantitative evidence supporting the notion that PTG can be realized in adolescents, and the domain that appears to be most susceptible to growth during this life stage is appreciation for life.

Although these findings from the aforementioned studies investigating posttraumatic growth in adolescents are noteworthy, they mostly included distress and negative coping
strategies (e.g., avoidance) as independent variables. More relevant to the current study, a few researchers have included measures of social support and positive coping strategies in their designs. One study that included measures of coping and support was an unpublished dissertation on pediatric cancer survivors and their families using a modified version of the PTGI; 51 children, adolescents, and emerging adults ages 8 to 25 were enrolled, and perception of social support was found to be positively correlated with scores of overall PTG (Yaskowich, 2003). Another study that included measures of coping and support identified active coping and support seeking with a parent/guardian as the strongest correlates of reported PTG in a sample of 50 parentally bereaved adolescents and emerging adults ages 14 to 22 (Wolchik et al., 2008); use of active coping strategies was associated with the PTG domains of new possibilities and personal strength, and support seeking was found to be related to these same two domains plus the domain of relating to others.

Findings from other studies have supported coping as influential in reports of PTG with emerging adults who experienced a traumatic event during childhood. A moderately strong correlation was identified between positive reappraisal coping and PTG ($r = .45$) with a sample of 60 undergraduate students ($M \text{ age} = 20.3$) who had a close relative or friend with a serious illness while growing up (Loiselle et al., 2011), and active and emotional processing coping were positively related to PTG ($r = .27 \ & .53$ respectively) in a sample of 193 undergraduate students ($M \text{ age} = 20.0$) who had experienced a traumatic event (predominantly illness or death of a family member) within the past five years (Wild & Paivio, 2003). These findings suggest that, not only is the development of PTG possible in survivors of traumas experienced during adolescence, but coping strategies and social support factors appear to be influential in the development of PTG.
Although no published research on attachment and PTG was found with adolescent or emerging adult populations, research investigating constructs similar to (although conceptually different from) PTG have revealed some relevant findings. One study (Schmidt & Welsh, 2010) conducted with 171 college students actively dealing with a family member’s illness and included subjective well-being as an outcome variable, found that attachment (measured with the ability to depend on others and comfort with closeness subscales of the Adult Attachment Scale) was positively related with support seeking ($r = .39$ & $.41$) and positive reappraisal ($r = .23$ & $.29$) coping strategies as well as with perceived social support ($r = .30$ & $.31$). All of these variables were significantly correlated with subjective well-being, operationalized with measures of life satisfaction, positive and negative affect, and subjective happiness (Schmidt & Welsh, 2010). In another study with 367 undergraduate students, resilience was found to be positively correlated with positive attachments with close others (i.e., mothers $r = .31$ & peers $r = .38$) and satisfaction with social support ($r = .52$), and regression analyses identified satisfaction with social support as the strongest predictor of resilience for both males and females (Banyard & Cantor, 2004).

In summary, there is evidence that supports the notion that PTG can be realized in survivors of traumatic events experienced during adolescence. As with adults, the roles of coping and social support appear to be critical factors, but their relative contributions to the development of PTG is largely unknown. Another consistent finding in the literature on PTG research with adolescents and emerging adults is the reported growth in the domain of appreciation for life. This domain appears to be the area that adolescents and young adults are most likely to report growth in following exposure to a traumatic event.
Chapter 3
Present Study

Contributions to the Literature

As this review of the literature has identified, PTG has been reported with a variety of samples and traumas. Tedeschi and Calhoun (2004) have suggested that levels of reported growth may vary across the domains of PTG depending on the trauma experienced. Aldwin and Levenson (2004) add that growth, as conceptualized with the five domains of PTG, is also likely to result from other experiences not normally considered to be traumatic in nature but rather usually regarded as positive events (e.g., college entrance and graduation, marriage, becoming a parent). Anderson and Lopez-Baez (2008; 2011) support this argument by challenging the conceptual framework of PTG as beginning with a perceived threat and suggesting that threatening antecedents may not be necessary for PTG to develop. Tedeschi and Calhoun (2004) acknowledge that growth can be realized through other maturational processes, including college and other positive experiences, especially when these experiences are transformative enough to impact worldviews and personal schemas. Thus, in order to be able to better understand the development of and factors associated with PTG, there is a need for empirical studies that investigate growth following traumatic events compared with growth that develops following positive events or normal lifespan developmental processes (e.g., transitioning to college).

In addition to investigating growth following both traumatic and non-traumatic triggers, this current study approaches the investigation of PTG through a developmental lens. Arnett (2000) presents a conceptual perspective on development that includes emerging adulthood as a distinct stage of development between adolescence and young adulthood. Focused on ages 18-25, Arnett argues that this stage of development is marked by “relative independence from social
roles and from normative expectations” (p. 469). He goes on to identify normative markers of adolescence (living with at least one parent, enrolled in school, unmarried, childless, unemployed or working part-time) and adulthood (independent living, not in school, married, with children, employed full time). However, these markers are less predictable during the emerging adulthood stage, which is marked more by transition and variability than stability and predictability. Although identity exploration normally begins during the adolescent years, it is rarely achieved before high school graduation and is likely to continue to be explored into the twenties. Arnett highlights love, work, and worldviews as three main areas of identity exploration. Particularly relevant to the current study, worldviews are likely to vary and fluctuate as cognitive development continues into the early- to mid-twenties. This is especially true for college students who are regularly exposed to new concepts, perspectives, and theories as part of their education.

Gottlieb et al. (2007) examined reports of growth and decline related to the 21 items on the PTGI during emerging adulthood and found that reports of growth exceeded reports of decline, and the majority of changes were triggered by events related to the transition to college life and were not necessarily traumatic in nature. Moreover, growth in the PTG domains of relating to others, new possibilities, and personal strength was experienced by the majority of participants. Thus, it appears that some aspects of growth as conceptualized in the theoretical perspective on PTG may be commonly experienced by emerging adults during the college life experience; whereas, based on the literature review of PTG and adolescents, growth that is focused on appreciation for life may be more common in emerging adult survivors of trauma experienced during adolescence.
Gottlieb et al. (2007) further suggest that the associations that emerging adults make between their life experiences and general sense of personal growth are going to influence their identity formation via concepts of self-worth, mastery, and self-reliance. Discourse by Neimeyer (2006) supports this notion, and he suggests that identity formation is the result of the use of narratives or stories people tell about themselves. Alteration to these life narratives, either through exposure to traumatic events or other life events, can have profound effects on self-identity and result in the development of particular types of growth as conceptualized in one or more of the domains of PTG.

If there are aspects of growth that are uniquely reported by trauma survivors, then understanding how this type of growth differs from growth commonly associated with expected developmental tasks and life transitions may result in a deeper, more comprehensive understanding of PTG, which can inform clinical approaches to working with adolescent and emerging adult survivors of trauma. This methodological approach to studying PTG has important implications for strategies of working with adolescent and emerging adult populations. A better understanding of how growth differs based on the triggering event is likely to result in a better understanding of adjustment to trauma experienced during adolescence and emerging adulthood compared with adjustment to non-traumatic events and exposure to trauma during other stages of the lifespan. Moreover, recognizing that vulnerable areas of adolescent development, such as social relationships and new possibilities, can be interrupted following exposure to trauma can inform assessment and intervention designs aimed at facilitating adaptive adjustment and growth in the adolescent and emerging adult years.

One approach to addressing this need is to include age-matched control groups in research designs. Although little research has been conducted with non-trauma samples, the
existing research suggests that levels of overall PTG reported by individuals who have not reported experiencing a traumatic event are comparable with individuals who have reported exposure to trauma (Anderson & Lopez-Baez, 2011; Bayer, Lev-Wiesel, & Amir, 2007; Bossick, 2008; Cordova et al., 2001; Dekel, 2007; Tedeschi & Calhoun, 1996). However, the differences in levels of specific types of growth reported between trauma and control groups have not been reported in the scientific literature. Thus, it is of value to investigate models of PTG across groups in order to better understand the differences in how PTG develops, what types of growth are more prevalent, what factors influence reports of PTG, and what domains of PTG are most strongly affected for trauma and non-trauma individuals.

To this end, although perceived threat is likely to be minimal regarding the transition to college, there are factors associated with the transition to college (e.g., moving away from home, increased independence, greater personal responsibility) that have the potential to challenge individual beliefs and assumptions about life and lead to changes in one or more of the five domains of PTG. Furthermore, in attempts to understand the potential for PTG in adolescents and emerging adults, it is important to investigate factors that contribute to how they respond to traumatic events (e.g., attachment styles, coping strategies), the resources available to them (e.g., social support), and other well-being outcomes (e.g., life satisfaction), all or some of which may yield findings that differ from what is known about PTG based on samples of adults of other ages and life stages (Cryder et al., 2006).

**Purpose and Rationale**

The main purpose of this research is to examine reports of PTG by emerging adults who have experienced trauma during adolescence compared with a control group recruited from the same sample frame. Specifically, the goals are to compare the levels of and types of reported
growth and examine the differential contributions that attachment, coping, and social support play in reports of PTG (directly and indirectly) between these two groups. A final goal is to examine the correlation between PTG and present-day life satisfaction across groups. This design will allow for a better understanding of the ways that growth is commonly experienced by emerging adults without prior exposure to trauma and how the experiences of growth may differ for those who have experienced a traumatic event during adolescence.

**Hypotheses and Conceptual Models**

Based on the theoretical framework of PTG and published research with adults and younger populations, it was hypothesized that:

1. Emerging adults who have experienced a traumatic event in adolescence will report greater amounts of PTG compared with a control group.
2. Reports of PTG will be positively associated with reports of life satisfaction.
3. Secure attachment will be positively associated with reports of PTG
4. Avoidant attachment will be negatively associated with reports of PTG
5. Perceived social support will be positively associated with reports of PTG
6. Adaptive coping strategies (e.g., problem-focused, use of social support) will be positively associated with reports of PTG

Hypotheses 2-6 are specific to the participants in the trauma group, and because of the lack of published research on PTG with non-trauma groups, the structural model comparisons between the groups are exploratory and no hypotheses are postulated.

Figure 1 presents the theoretical model to be tested and includes the relationships among PTG, attachment style, adaptive coping (problem-focused & support seeking), and perceived social support. Using this model as a guide, the present research design will examine the relationships among these variables, including structural model comparisons between the trauma and control groups. Although no hypotheses are being put forth regarding the model comparisons, this design aims to determine if there are differences between the groups in the
factor loadings of the PTGI, the structural pathways to PTG and its domains, and the mean scores of the independent variables and the PTGI domains in order to test the main research question of what, if any, differences exist in the pathways to growth or the outcomes in levels of growth in the domains of the PTGI based on trauma versus no trauma exposure during adolescence.
Chapter 4

Method

Participants

Participants were undergraduate students at a large New England university recruited primarily through listserv announcements but also through classroom visits and flyers posted on campus. The announcement stated that the study is “investigating how individuals respond to significant life experiences.” Because the focus of this study is on reports of PTG in emerging adults who experienced trauma as adolescents, a college student body is a convenient but also appropriate sample frame to recruit from because the typical age range of college students is 18-23. The sample recruited was organized into two groups: those who have experienced a trauma as an adolescent (trauma group) and those who reported never having experienced a traumatic event (control group). The inclusion of this control group allows for a comparison of the models of PTG between those who experienced trauma exposure during adolescence and those without any prior exposure to traumatic events.

The inclusion criteria were that the participants 1) must be between the ages of 18 and 23, 2) must be currently enrolled at the university where recruitment took place, and 3) must have either experienced a traumatic event during high school (trauma group) or have never experienced a traumatic event (control group). This limits external validity of the findings, but the homogeneity of the sample allows for a more controlled design and greater focus on the relationship among the variables of interest for this particular population.

The recruitment announcement (see Appendix A) was sent to all students registered to receive the undergraduate student listserv which is used for general announcements. The announcement contained a brief description of the study, eligibility requirements to participate,
contact information, and a link to the study consent form and survey. This same announcement
was discussed in classroom visits and included on flyers posted around the campus. Three
phases of recruitment using these methods happened during 2012: March through May, June
through August, and September through November.

Incentive for participation was a chance to receive one of five $10 Starbucks gift cards
during the spring semester. An incentive of one of three $10 Starbucks gift cards was offered
separately for the summer and fall phases of recruitment. To be eligible for the incentive,
participants had the option of submitting their student email address after completion of the
survey as entry for the drawings. Email addresses were limited to university email accounts in
order to control for the submission of duplicate entries for the drawings (i.e., using multiple
email addresses for the same individual). Email addresses for the drawings were stored in a
separate database and were not linked to the survey data.

A recent meta-analysis on PTG revealed that the strongest predictor of PTG was positive
reappraisal, and the overall effect sizes of the relationship between positive reappraisal coping
and PTG was .36 (Prati & Pietrantoni, 2009). Power analyses (using G*Power software)
indicated that in order to detect medium correlations ($r = .30$) within each group using alpha =
.05 and beta = .80, a minimum sample of 64 would be needed for each group. Similarly, in order
to detect medium mean differences ($d = .50$) between the groups using alpha = .05 and beta =
.80, a minimum sample size of 64 would be needed for each group. Although these sample
sizes are sufficient for simple mean and correlation analyses, guidelines for sample size
requirements within a structural equation modeling framework suggest that a minimum of 200
cases should be obtained and included in analyses, but more complex models, especially with
considerably larger number of parameters, may require larger samples.
Procedure

This research design was approved by the university Institutional Review Board. The median time to complete the online questionnaires was 13.9 minutes. Participants entered the study by following a link included in the recruitment announcement which took them to the online survey, where they were initially presented with an information screen (see Appendix B).

Upon agreeing to participate by clicking a button on the information screen, participants were presented with a screening questionnaire (see Appendix C) and asked to respond yes or no to “Did you experience any of the following events during the years you were in high school?”

1) diagnosed with a life-threatening health condition
2) a life-threatening injury or accident
3) the death of a close family member or friend
4) victim or witness of a violent crime or assault
5) victim or witness of physical or sexual abuse
6) loss of your home
7) terrorist attack
8) natural or manmade disaster
9) unexpected pregnancy or miscarriage

These nine categories were selected based on a review of the events used in the *Diagnostic and Statistical Manual of Mental Disorders-IV (DSM-IV)* (American Psychological Association, 2005) to define a traumatic event and items included on the Traumatic Life Events Questionnaire (TLEQ, Kubany, Leisen, Kaplan, Watson, Haynes, Owens, & Burns, 2000). Some items listed in the *DSM-IV* were not considered applicable for this population (e.g., military combat) and were not included. Three items (loss of your home, death of a close family member or friend, and unexpected pregnancy or miscarriage) were included but are not part of the *DSM-IV* list of examples. Because the specific trauma is not germane to the aims of this study, indication of the specific trauma(s) experienced was not collected; however, the list of events was included in order to minimize subjectivity of a traumatic event and to create a clear
delineation between the trauma and control groups. For those participants who responded “no” to the question asking if any of the events were experienced during high school, the question was repeated for the time frame “prior to or since the years you were in high school.” Those who answered “yes” to this second question were screened out of the study.

Participants who responded “yes” to the initial question regarding trauma experience during high school (trauma group) were then instructed “if you experienced more than one of the above events during high school, please focus on the one that you believe has had the greatest impact on you for the remainder of this survey.” They were then asked to indicate the age at which that trauma was experienced (used to calculate approximate time in years since the trauma was experienced) and rate the level of perceived threat and fear that resulted from that trauma (described below). They then proceeded to the survey portion of the study, and questions for some survey items were worded in regard to the “traumatic event” they reported. All other participants (control group) proceeded to the survey questions, and some survey items were worded in regard to their “transition to college.”

Participants completed five quantitative measures assessing posttraumatic growth (see Appendix D), attachment style (see Appendix E), coping strategies (see Appendix F), social support (see Appendix G), and life satisfaction (see Appendix H). Counterbalancing of these measures was used to control for order effects. In the concluding portion of the survey, participants were asked to provide demographic information including age, gender, race/ethnicity, major, and class year (see Appendix I).

**Measures**

**Perceived threat/fear.** Several researchers have used the *DSM-IV* to guide data collection and measurement related to traumatic events (Cordova et al., 2001; Frazier, Anders,
Perera, Tomich, Tennen, Park, & Tashiro, 2009; Park, Mills, & Edmondson, 2010), and a similar method was used in this study. The trauma group participants reported perceived threat via two questions derived from the DSM-IV criteria for a traumatic stressor in diagnosing PTSD (American Psychiatric Association, 2005). The criteria for PTSD are that it “involves actual or threatened death or serious injury, or other threat to one’s physical integrity; or witnessing an event that involved death, injury, or other threat to the physical integrity of another person; or learning about unexpected or violent death, serious harm, or threat of death or injury experienced by a family member or close associate,” and the individuals’ response to the trauma “must involve intense fear, helplessness, or horror” (American Psychiatric Association, 2005, pp. 463). The actual proxy questions used in the current study to operationalize the two variables were 1) “To what extent did you perceive the experience as a threat of death or serious injury” and 2) “Given your experience with the event, to what extent has your response to it ever involved intense fear or helplessness?” Responses were scored separately on a 5-point Likert scale from 1 (not at all) to 5 (a lot); thus, higher scores indicated greater levels of perceived threat or fear.

**Posttraumatic growth.** The Posttraumatic Growth Inventory (PTGI, Tedeschi & Calhoun, 1996) is a widely used measure of perceptions of positive changes experienced by individuals following a traumatic event. This scale consists of 21 items representing five subscales: relating to others, new possibilities, personal strength/growth, spirituality, and appreciation for life. Tedeschi and Calhoun reported high internal consistency (α = .90) and test-retest reliability (r = .71) as well as good discriminate and construct validity. Cronbach’s alpha in this study was .93, and subscale alphas ranged from .73 (appreciation for life) to .88 (relating to others). The measure instructs participants to indicate the degree to which each item occurred in their life as a result of their identified trauma (or transition to college). For example: “I more
clearly see that I can count on people in times of trouble” (relating to others) and “I changed my priorities about what is important in life” (appreciation for life). Responses are scored on a 6-point Likert scale ranging from 0 (I did not experience this change as a result of my crisis) to 5 (I experienced this change to a very great degree as a result of my crisis). The phrasing of these scale endpoints was changed for this study by replacing crisis with traumatic event or transition to college for the trauma and control groups respectively. Higher scores indicate a greater amount of growth experienced.

**Attachment style.** The Measure of Attachment Qualities (MAQ; Carver, 1997a) consists of 14 items measuring four aspects of adult attachment: avoidance, ambivalence-worry, ambivalence-merger, and secure. Item responses are ratings of attachment attitudes and feelings in general and are not specific to the participants’ experiences or specific types of relationships. Examples include “When I'm close to someone, it gives me a sense of comfort about life in general” (security) and “Others want me to be more intimate than I feel comfortable being” (avoidant). Items are scored on a 4-point Likert scale from 1 (I disagree with this statement a lot) to 4 (I agree with this statement a lot). Carver (1997a) reported good convergent validity with other measures of attachment, test-retest reliabilities for the subscales have ranged from .61 to .80, and internal consistencies have been found to be adequate (α ranges from .69 - .76). Cronbach’s alpha in this study was .68, and the subscales alphas ranged from .67 to .78. Three items are reverse coded, and higher subscale scores indicate greater adherence to the corresponding dimension of attachment.

**Coping.** Coping strategies were assessed using the Brief COPE (Carver, 1997b). This scale is an abbreviated version of the original COPE and consists of 14 types of coping (self-distraction, active, denial, substance use, use of emotional support, use of instrumental support,
behavioral disengagement, venting, positive reframing, planning, humor, acceptance, religion, and self-blame), each measured with two items. Participants respond to items regarding how they have coped with their traumatic event (or transition to college) since its occurrence. Because of this specificity in the wording, this index attempts to measure coping strategies as, at least in part, situational and not necessarily dispositional. In order to measure coping strategies used in response to the traumatic event (or transition to college), the original scales’ use of present perfect tense was changed to include past tense. Participants were instructed to respond to each item on a 4-point Likert scale ranging from 1 (I didn’t or don’t do this at all) to 4 (I did or do this a lot) in regards to the reported trauma (or transition to college). Examples include: “I looked or have been looking for something good in what was happening” (positive reframing) and “I took or have taken action to try to make the situation better” (active coping). Higher scores indicate a more frequent use of that corresponding coping strategy. Carver and colleagues reported adequate internal consistency ($\alpha$ ranges from .45 - .92) and test-retest reliability ($r$ ranges from .42 - .89) of the measure’s subscales. Overall Cronbach’s alpha for this study was .84: subscale alphas ranged from .54 (self-distraction) to .93 (substance use).

Social support. The Medical Outcomes Study (MOS) Social Support Survey is a 19 item measure of functional social support that includes four subscales of emotional / informational, tangible, affectionate, and positive social interaction (Sherbourne & Stewart, 1991). It was originally designed for use with populations of patients with chronic conditions. Participants respond to: “People sometimes look to others for companionship, assistance, or other types of support. How often has each of the following kinds of support been available to you if you needed it since your traumatic event?” For the purposes of this study, the wording “since your traumatic event” (or “since your transition to college”) was added to the original
MOS instructions. Examples of items include “Someone you can count on to listen to you when you need to talk” (emotional) and “Someone to give you information to help you understand a situation” (instrumental). Responses are scored on a 5-point Likert scale from 1 (none of the time) to 5 (all of the time) with higher scores indicating a greater level of perceived support. Internal consistencies for each subscale have been reported to exceed 0.90, and discriminate, convergent, and construct validity have been demonstrated (Sherbourne & Stewart). In the current study, subscale Cronbach’s alpha ranged from .89 to .94 with an overall alpha of .95. The multidimensionality of this measure, as well as the single higher-level factor of overall growth, has been demonstrated by Sherbourne and Stewart (1991).

**Life satisfaction.** The Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985) is a five item measure of global life satisfaction. Examples include “In most ways my life is close to ideal” and “If I could live my life over, I would change almost nothing.” Items are scored on a 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree), and overall scores are calculated by summing the five responses (range 5 - 35) with higher scores indicating greater satisfaction. Diener et al. (1985) reported good internal consistency (α = .87) and test-retest reliability (r = .82), and the measure has good convergent validity with other measures of subjective well-being (Diener et al.; Pavot & Diener, 1993; Pavot, Diener, Colvin & Sandvik, 1991). Cronbach’s alpha in this study was .88.

**Data Analysis**

SPSS version 19 and AMOS version 20 were used for statistical analyses. There were 1,287 original cases in the dataset. Two hundred and nine of these individuals who accessed the survey declined to participate after being presented with the information screen, and another 246 were screened out of the survey because they had reported experiencing a traumatic event prior
to or since their time in high school. There were 254 cases in which the participants started but did not complete the survey, and their data were removed from the dataset. Twelve cases were excluded from analyses due to data missing for one or more entire measures, and another 16 cases were excluded due to age at trauma being reported as less than 13 or greater than 19. Finally, four cases were removed from analyses due to suspicious patterns in which the same score was entered for each item and the time to complete the entire survey was less than two minutes.

The final dataset was checked for missing data. No single item in the dataset had more than 1.5 percent (8 cases) of data missing, and Little's test of Missing Completely at Random (MCAR) revealed that missing data associated with three of the measures (PTGI, MOS, SWLS) were MCAR. Although the test was unable to verify that the missing data within the Brief COPE and MAQ measures was completely at random, Kline (2011) notes that less than five percent missing data on any single variable within a large sample is of little concern. Thus, a single-imputation method was used and missing data were replaced with item mean substitutions. Data were also checked for skewness and kurtosis. Although the overall PTGI scores were normally distributed with acceptable skewness and kurtosis values, there was a positive skew to the PTGI subscale of Spiritual Change indicating a greater distribution of lower scores for this domain of PTG. Several PTGI subscales had negative kurtosis values approaching the cutoff value of absolute one indicating a flatter distribution of data compared with a normal distribution and a wider spread of scores around the means of the subscales.

The goals of the data analytical approach are to: 1) determine and compare the levels of PTG reported in the trauma and control groups, 2) test the correlations of attachment, social support, and coping with reports of PTG for each group, 3) compare the resulting structural
models and amount of variance of PTG explained within each group, and 4) test the relationship of PTG on reported life satisfaction for each group. Goal one will be examined through the use of descriptive analyses (i.e., frequencies, means, and standard deviations) and independent sample t-tests. The second and fourth goals will be accomplished via bivariate correlations and Fisher’s z-tests. Finally, goal three will be analyzed with structural equation modeling.

Many common analytical approaches to group differences are based on observed item or composite scores (e.g., t-tests and ANOVA) and assume the absence of error in measurement. Structural equation modeling (SEM) can be used to compare relationships among variables across groups and addresses the aforementioned assumption by using latent variables. This procedure estimates and takes into account measurement and random error in the variance of the constructs. The variables of interest in the SEM analyses in this study are attachment styles, coping strategies, perceptions of social support, and posttraumatic growth, and all of these constructs can be defined as latent variables.

In addition, SEM allows for the testing of goodness of fit, or how well the conceptual model can reproduce the data. Good model fit is often achieved only after steps of respecification have been taken, and good model fit is required before analyses and interpretations of the structural paths of the model and the differences between groups can be conducted. Because of the complexity of models and the many parameters that can be analyzed, sample size is a concern. A general guideline for minimum samples sizes in SEM is 200 per group (Kline, 2011).

It is good practice to first evaluate each measurement model’s factor analysis and goodness of fit in SEM before analyzing causal pathway models. Without good-fitting measurement models and consistency across groups, making interpretations related to any
significant differences in structural causal pathways across groups would be faulty. Thus, in this study, the first step in the SEM analyses is the subjecting the measurement model of each variable of interest to tests of goodness of fit with the pooled sample data before being included in the final pathway structural models. The next step in the data analysis plan is to apply the structural models to tests of goodness of fit also with the pooled data. These steps will precede the multi-group analyses.

The purpose of multi-group SEM is to test for model invariance, which would indicate no difference in model comparison across groups. This is done by analyzing the model with all parameters being freely estimated at first, and then in progressive, aggregative steps, parameters (e.g., factors, paths, and intercepts) are constrained to be equal across groups. Findings of non-invariance at any step would indicate a difference between groups. Thus, the chi square of each constrained model is compared with and tested against the chi square values of the baseline and previously constrained models, and a statistically nonsignificant chi square difference test would indicate model invariance across groups. Based on this approach, it is possible to first test and identify if latent variables (particularly PTG) are measured the same way and have the same meaning across groups. If invariance is not found, then testing the equality of the paths and intercepts would be illogical, because the non-invariance in factor loadings would suggest differences in the constructs being measured and likely result in non-invariance in structural paths and intercepts that is most likely the outcome of poor psychometric validity and reliability across groups rather than any particular difference that is attributed to the groups. If invariance of the factor loadings is found, the next step would be to test if the causal pathways theorized to predict PTG are the same across groups, followed by testing of the invariance of means scores across groups.
Chapter 5

Results

Sample Characteristics

Overall, 546 college students were enrolled in the study. The trauma group was comprised of 359 students who reported having experienced a traumatic event during adolescence, and 187 students made up the control group. Sample characteristics are shown in Table 1. The average age of the sample was 19.65, Caucasian (75.6%) was the most common race reported, females made up 81.2 percent of the sample, and class year was evenly represented with freshmen (27.3%) being the most represented class year and seniors (23.7%) being the least represented. There were no differences found in these demographic characteristics between the trauma group and the control group.

Mean Comparisons

Comparison of mean scores were done to test the hypothesis that higher levels of PTG would be reported by the trauma group. Although only one hypothesis was stated in regard to the differences in mean scores of the variables, differences on all variables were analyzed and are reported here.

There were no differences found in overall scores of posttraumatic growth or life satisfaction by gender or class year, and the number of participants who made up racial categories other than Caucasian was too small to analyze. Table 2 displays the overall means of all variables of interest by group, including the results of independent sample t-tests to analyze the differences between the groups. Overall scores of posttraumatic growth (M = 49.80, SD = 22.34) were comparable with other studies that used the PTGI (see Linley & Joseph, 2004).
In contrast to hypothesis 1, the control group (M = 52.5, SD = 20.8) scored significantly higher on the overall PTGI than the trauma group (M = 48.4, SD = 23.0), t(544) = -2.080, p = .038. More specifically when looking at the PTGI subscales, the control group (M = 14.9, SD = 5.5) scored higher than the trauma group (M = 10.4, SD = 6.8) in the new possibilities domain, t(544) = -8.414, p < .001. Despite these findings that did not support the first hypothesis, partial support for hypothesis 1 was found in that the trauma group scores (M = 2.9, SD = 3.2) were higher than the control group scores (M = 2.4, SD = 2.8) on the spiritual change subscale, t(544) = 2.131, p = .034, and the trauma group scores (M = 8.8, SD = 4.0) were also significantly higher than the control group scores (M = 7.8, SD = 3.6) on the appreciation for life subscale, t(544) = 3.169, p = .002. There were no differences between the two groups on the relating to others and personal strength subscales.

No other hypotheses were presented regarding group differences in the independent variables, but exploratory findings are presented here. The only difference reported in attachment style between the trauma and control group was in the level of avoidant attachment. The individuals in the trauma group reported higher levels of avoidant attachment traits (M = 11.3, SD = 3.6) than the individuals in the control group (M = 10.6, SD = 3.3), t(544) = 2.192, p = .029. No differences were found in the other three styles of attachment as measured by the MAQ. Regarding social support, although there was no difference between the groups in overall reports of social support, the participants in the trauma group reported higher levels of tangible support (M = 15.5, SD = 4.7), t(544) = 2.840, p = .005 and positive social interaction (M = 12.1, SD = 3.2), t(544) = 2.761, p = .006 compared with the control group (M = 14.3, SD = 4.7, M = 11.3, SD = 3.4, respectively).
Several significant differences between the groups were revealed regarding coping strategies used. Compared with the control group, survivors of trauma experienced during adolescence reported engaging in more coping strategies that can be labeled as indirect or avoidant because of their lack of direct involvement with the event: self-distraction ($M = 6.1, SD = 1.6$ vs. $M = 5.7, SD = 1.6$) $t(544) = 2.733, p = .006$, denial ($M = 3.7, SD = 1.9$ vs. $M = 3.3, SD = 1.7$) $t(544) = 2.349, p = .019$, behavioral disengagement ($M = 3.8, SD = 1.8$ vs. $M = 3.4, SD = 1.6$) $t(544) = 2.219, p = .034$, acceptance ($M = 6.4, SD = 1.5$ vs. $M = 5.8, SD = 1.5$) $t(544) = 4.499, p < .001$ and religion ($M = 3.8, SD = 2.0$ vs. $M = 3.4, SD = 1.8$) $t(544) = 2.497, p = .013$.

Conversely, participants in the control group scored higher than the trauma group on coping strategies that could be categorized as engaged or active: active coping ($M = 5.6, SD = 1.4$ vs. $M = 5.0, SD = 1.8$) $t(544) = -4.211, p < .001$, use of instrumental support ($M = 5.3, SD = 1.8$ vs. $M = 4.7, SD = 1.9$) $t(544) = -3.040, p = .002$, positive reframing ($M = 5.3, SD = 1.6$ vs. $M = 4.7, SD = 1.9$) $t(544) = -3.766, p < .001$, and planning ($M = 5.7, SD = 1.6$ vs. $M = 4.8, SD = 1.9$) $t(544) = -6.216, p < .001$. The control group also scored high on the coping strategies of humor ($M = 4.7, SD = 2.0$ vs. $M = 3.7, SD = 2.0$) $t(544) = -5.642, p < .001$, and self-blame ($M = 5.3, SD = 2.0$ vs. $M = 4.5, SD = 2.0$) $t(544) = -4.075, p < .001$. Lastly, there were no significant differences between the groups in regards to reported levels of satisfaction with life.

**Correlation Analyses**

Bivariate correlations were used to test hypotheses 2 though 6. These analyses were also used to identify the variables to be included in the structural equation models. Hypothesis 2 – reports of PTG will be positively associated with reports of life satisfaction – was supported with a statistically significant association between satisfaction with life and overall PTGI ($r = .23$) using the pooled data; however, the magnitude of this association was small, and the domain
of the PTGI with the strongest correlation with satisfaction with life was relating to others domain \((r = .25)\). PTG was associated with life satisfaction for both the trauma \((r = .23)\) and control group \((r = .21)\). However, when investigating the relationship between life satisfaction and PTG domains across groups (see Table 3), the relationships between PTG and the relating to others \((r = .28)\) and appreciation for life \((r = .27)\) domains of posttraumatic growth within the trauma group were strongest.

Table 4 displays the correlations of the independent variables (coping, support, attachment) with overall scores on the PTGI and its subscales based on the sample pooled data. These data support hypotheses 3 and 4, which focused on the associations that secure and avoidant attachment had with PTG. That is both avoidant and secure types of attachment styles were associated with PTGI scores in the hypothesized directions \((r = -.18\) and .20 respectively). Although the correlations between these aspects of attachment and overall PTG were small, the relating to others domain was moderately associated with both avoidant \((r = -.30)\) and secure \((r = .26)\) types of attachment.

Similarly, support was found for the fifth hypothesis on perceived social support and PTG; overall support was positively correlated with overall PTG \((r = .22)\). The overall perceived support scores correlated with relating to others moderately \((r = .32)\), and the correlations among the four support domains with relating to others ranged from .14 (tangible) to .34 (emotional/instrumental).

The sixth and final stated hypothesis regarding coping strategies and PTG was also supported. Half of the subscales of the Brief COPE were found to have moderately strong associations \((> .29)\) with the overall scores of PTGI. Active coping \((r = .36)\), positive reframing \((r = .39)\), planning \((r = .34)\), use of emotional \((r = .36)\) and instrumental support \((r = .37)\),
religion ($r = .34$), and venting ($r = .29$) were all moderately correlated with overall PTGI scores. Regarding the domains of the PTGI, active coping was most strongly associated with new possibilities ($r = .39$) and personal strength ($r = .34$), positive reframing was most strongly associated with new possibilities ($r = .36$) and relating to others ($r = .32$), both use of emotional and instrumental support were most strongly associated with the relating to others domains ($r = .45$ and .43 respectively), and planning was most strongly associated with new possibilities ($r = .37$). Use of religion as a coping strategy was strongly associated with spiritual change ($r = .71$), and although the correlation between venting and overall PTG was close to .30, none of the correlations between venting and the subscales of the PTGI were moderate in magnitude.

The correlations presented in Table 4 were analyzed with the pooled sample data. These bivariate correlations were subsequently analyzed by group, and the differences between groups were analyzed with Fisher’s Z transformation. Although the correlations between the independent variables and the overall PTGI scores did not vary across groups, there were differences across groups regarding correlations between the independent variables and the PTGI domains. The correlations of three independent factors with the relating to others domain were significantly stronger for the trauma group: avoidant attachment ($r = -.35$ vs. $r = -.18$, $z = -2.103$, $p = .036$), perceived tangible support ($r = .21$ vs. $r = .02$, $z = 2.080$, $p = .038$), and use of instrumental support ($r = .48$ vs. $r = .31$, $z = 2.211$, $p = .027$). The relationship between acceptance coping and the appreciation for life domain of the PTGI was also significantly stronger for the trauma group ($r = .31$) than the control group ($r = .13$), $z = 2.147$, $p = .032$. Also stronger within the trauma group were the relationships between the spiritual change domain of the PTGI and the use of emotional support ($r = .24$ vs. $r = -.09$, $z = 2.800$, $p = .005$), use of instrumental support ($r = .27$ vs. $r = .03$, $z = 2.776$, $p = .006$), planning ($r = .27$ vs. $r = .03$, $z = .
2.722, \( p = .006 \), and religious coping (\( r = .74 \) vs. \( r = .61 \), \( z = 2.542, p = .011 \)). Lastly, the correlation between perceived affectionate support and the new possibilities domain of the PTG was stronger for the control group (\( r = .30 \)) than the trauma group (\( r = .04 \), \( z = -2.986, p = .003 \)).

Although data related to perceived threat and fear of the event reported were not collected for the control group and were not included in model comparisons, the effects of perceived threat and fear on PTG were analyzed for the trauma group. Perceived threat and fear were correlated with each other (\( r = .47 \)), but when analyzed with the domains of the PTGI, only the relationship between perceived fear and personal strength exceeded .20 (\( r = .21 \)). However, the data were subjected to further analyses to test for curvilinear effects, based on the theoretical understanding of the development of PTG and past empirical studies (Kleim & Ehlers, 2009). Figures 2 and 3 show the results. Regarding perceived threat, as seen in Figure 2, there was no evidence for a curvilinear effect, but appreciation for life, personal strength, and new possibilities all showed a slight trend toward increased levels of growth at the higher levels of perceived threat. Conversely, the data presented in Figure 3 show that a curvilinear effect was evident in the analysis with the single-item measure of perceived fear. Those who reported the midpoint (somewhat) of the perceived fear item scored highest on overall scores of PTG and all domains of the PTGI with the exception of personal strength, and those who reported no fear at all also scored the lowest on all domains of PTGI.

The results from these bivariate correlation analyses established the baseline variables to be used in the structural equation modeling. Because secure and avoidant attachment, overall social support, and several coping strategies were associated with reports of PTGI, it was appropriate to include and evaluate them in subsequent analyses. Of note, because perceived
threat and fear were not collected from the control group, these constructs were not included in the model analyses.

Measurement Models

The final sample size of 546 was adequate for SEM analyses, but only one-third (187) of the participants made up the control group. This sample size was found to be inadequate (resulting in Heywood cases) when all individual measurement items of all variables of interest were included in the initial models. Thus, the latent variables of coping and social support were defined with parcels – observed composite subscale scores derived from individual measurement items with identical Likert-scale responses (Kline, 2011) – in order to address this issue with the sample size; however, individual measurement items of the PTGI and MAQ were used to create those latent variables.

Prior to building the structural model, each variable of interest was analyzed with the pooled data for its measurement model goodness of fit. Chi square ($\chi^2$) is a standard measure of model fit in which non significant results are indicative of good model fit; however, larger sample sizes often result in statistically significant findings which can be misleading. Thus, in the current study, comparative fit index (CFI), root mean square error of approximation (RMSEA), and probability of close fit (PCLOSE) are used to test for goodness-of-fit. CFI is an incremental fit index of the amount of variance in the covariance matrix that the model can explain. CFI uses a maximum of likelihood approach with values ranging from 0.0 - 1.0, with good fit indicated by values of at least .95, and .93-.95 is considered adequate. RMSEA is an absolute measure of fit and takes sample size into account. Values at or below .05 are considered to represent good fitting models and values between .05 and .08 are considered adequate. Finally, PCLOSE is a test of the null hypothesis that the RMSEA is truly less than or
A $p$ value greater than .05 (i.e., not significant) would indicate that the model is a close-fitting model.

The original conceptualization of the PTGI as a five factor model was subjected to confirmatory factor analysis (CFA). The initial analysis revealed the model (Figure 4) to be a less than adequate fit of the data ($\chi^2(184) = 789.985, p < .001; \text{CFI} = .892; \text{RMSEA} = .078; \text{PCLOSE} < .001$). The spiritual change subscale loading on the PTGI was only .45, and considering that the subscale score was positively skewed, it was removed from analyses. The subsequent goodness of fit measures did not improve and the model was still a less than adequate fit of the data ($\chi^2(148) = 714.145, p < .001; \text{CFI} = .890; \text{RMSEA} = .084; \text{PCLOSE} < .001$), and modification indices, standard residual covariances, and item cross-loadings were analyzed. As a result and based on empirical and theoretical justifications, four items were dropped and several correlations of errors were made. Specifically, the following three items from the relating to others subscale and one item from the new possibilities subscale loaded on multiple domains of the PTGI and these were found to have problematic (> 1.96) standardized residual covariances with multiple other items:

- I more clearly see that I can count on people in times of trouble - relating to others
- I have more compassion for others - relating to others
- I put more effort into my relationships - relating to others
- I developed new interests - new possibilities

In addition to dropping these items from analyses, correlations were made between five pairs of items based on inspection of the modification indices. The resulting model is shown in Figure 5 and was of adequate fit ($\chi^2(81) = 205.699, p < .001; \text{CFI} = .968; \text{RMSEA} = .053; \text{PCLOSE} = .272$) and was included in the final structural models.
Because these changes resulted in modifications to the factor structure of the relating to others and new possibilities subdomains of the PTGI, the results from the prior bivariate analyses were put into question. Thus, the analyses presented in Tables 2 through 4 were rerun to check for significant changes. Only one change was noteworthy: the between-group differences in regard to the relating to others subscale scores became statistically significant with the control group ($M = 8.58, SD = 5.28$) scoring higher than the trauma group ($M = 7.50, SD = 5.73$), which was now statistically significant $t = -2.212, p = .028$.

The secure and avoidant subscales of the MAQ were correlated with the PTGI scores. Both types of attachment were initially included in separate SEM procedures, but they were also included together in the final model. The measurement models of the secure and avoidant subscales of the MAQ are shown in Figures 6 and 7 respectively. Because the secure subscale had only three items and 0 degrees of freedom, goodness of fit cannot be tested but is assumed. The only modification made to the avoidant subscale was a correlation added between the error variance of two items because of high modification indices (26.848). The measurement model for avoidant attachment was found to have good fit of the pooled data ($\chi^2(4) = 9.901, p = .042; \text{CFI} = .992; \text{RMSEA} = .052; \text{PCLOSE} = .401$). A follow-up CFA was conducted on a measurement model that combined the secure and avoidant measurement models in Figures 6 and 7 in order to identify any items that loaded on both measures. Using pooled data, this measurement model was found to have adequate fit of the data ($\chi^2(18) = 49.692, p < .001; \text{CFI} = .975; \text{RMSEA} = .057; \text{PCLOSE} = .252$), and there was no evidence of any items double loading based on evaluation of the modification indices.

Figure 8 shows the final measurement model of the MOS. The error variances of the tangible and affection subscales were correlated because of high modification indices (21.039).
The modified model was found to have very good fit of the data ($\chi^2(1) = 1.935, p = .164; \text{CFI} = .999; \text{RMSEA} = .041; \text{PCLOSE} = .417$).

The initial measurement model of coping strategies based on the COPE subscales included six of the previously identified subscales that had bivariate correlations with the PTGI greater than .25. The seventh subscale, religious coping, also had strong correlations with the PTGI, but this association was mostly explained by the strong link with the PTGI domain of spiritual change, which was removed from the model. These remaining six subscales loaded onto two latent variables labeled intrapersonal coping (active coping, positive reframing, and planning) and interpersonal coping (use of emotional support, use of instrumental support, and venting); however, the venting subscale loaded onto both latent variables, and it’s standardized residual covariances with planning and active coping were greater than 2.4, indicating a psychometrically problematic item. As a result, the venting subscale was removed from analyses. The final coping measurement model with it’s two latent variables is shown in Figure 9, and this measurement model had very good fit ($\chi^2(4) = 3.587, p = .465; \text{CFI} = 1.000; \text{RMSEA} = .000; \text{PCLOSE} = .881$). Follow-up tests of reliability were conducted on these two custom subscales, and the Cronbach’s alphas were .90 for the intrapersonal items and .81 for the interpersonal items.

**Structural Models**

The final individual measurement models were analyzed collectively with the pooled data to establish overall goodness of fit for the final structural models. Two models were analyzed. Both models contained the same latent variables and associated observed indicators for interpersonal coping, intrapersonal coping, perceived support, and posttraumatic growth. The difference between the final two models was the type of attachment style included: secure or
avoidant. Although both measurement models were analyzed independently, the identified respecifications ended up being identical for each model. The first model tested was with the secure type of attachment style. Initially, the model fit was close to acceptable ($\chi^2(304) = 802.553, p < .001; \text{CFI} = .928; \text{RMSEA} = .055; \text{PCLOSE} = .041$), and review of the modification indices revealed that the emotional/instrumental subscale of the MOS should be correlated with the use of emotional support subscale of the COPE measure, and by extension of the conceptual and theoretical justification for that modification, a correlation was also applied between the use of instrumental support subscale of the COPE and the emotional/instrumental subscale of the MOS. These modifications resulted in a model (see Figure 10) with improved fit of the pooled data ($\chi^2(302) = 733.758, p < .001; \text{CFI} = .937; \text{RMSEA} = .051; \text{PCLOSE} = .329$). Although the CFI value is below the preferred cutoff of .95, it can be considered acceptable in conjunction with good RMSEA and PCLOSE values and can be explained, at least in part, by the sample size, the complexity of the model, and the high MIs between disturbances and other parameters (e.g., latent and observed variables).

The same steps were followed in the establishment of the measurement model with avoidant attachment style. The initial goodness of fit indices approached adequate levels ($\chi^2(357) = 915.505, p < .001; \text{CFI} = .924; \text{RMSEA} = .054; \text{PCLOSE} = .083$), and making the same respecifications (also based on a review of the modification indices) resulted in a model (see Figure 11) that better fit the data ($\chi^2(355) = 844.924, p < .001; \text{CFI} = .934; \text{RMSEA} = .050; \text{PCLOSE} = .445$). Thus, these two measurement models fit the data well and were transformed into structural models by replacing the correlations among the latent variables with single-headed arrows depicting theorized causal relationship among the latent variables as guided by the conceptual model presented in Figure 1.
Progressing from the established measurement model to the conceptual structural model, the first step was to establish the best fitting model with the pooled data by investigating the modification indices for opportunities to respecify the model. In addition to the *a priori* correlation between the disturbances of the two latent coping variables, three other correlations were included in both models based on modification indices > 20. These correlations were:

- Perceived social support and interpersonal coping
- Perceived social support and the relating to other domain of the PTGI
- Interpersonal coping and the relating to other domain of the PTGI

The respecified structural model for secure attachment (see Figure 12) was found to have adequate fit of the data ($\chi^2(301) = 687.972, p < .001; \text{CFI} = .944; \text{RMSEA} = .049; \text{PCLOSE} = .682$). This was also true for the avoidant attachment model (Figure 13; $\chi^2(354) = 811.763, p < .001; \text{CFI} = .938; \text{RMSEA} = .049; \text{PCLOSE} = .679$).

The pooled sample data were then split into the trauma ($n = 359$) and control ($n = 187$) groups so comparisons could be made. Regression weights of the paths were examined for nonsignificance across groups; paths that were not significant in both groups were trimmed from the model for parsimony. It was revealed that, for both groups, the paths of interpersonal coping $\rightarrow$ PTGI and secure attachment $\rightarrow$ PTGI were non significant. As a result, those paths were trimmed from the models. Although there was still a significant correlation between secure attachment $\rightarrow$ interpersonal coping, there was no direct or indirect pathway to PTGI, and as a result, the interpersonal coping construct was also removed from the models. Secure attachment was retained in the model because of the indirect paths through perceived support and intrapersonal coping. One respecification was made to the model with avoidant attachment but not the model with secure attachment. Based on a high MI (38.528), the disturbances of the
relating to others domain of the PTGI and avoidant attachment were correlated. The same correlation was not made in the model with secure attachment because of the lack of empirical justification. The final trimmed models are shown in Figures 14 and 15. Included are the direct pathways:

perceived support → PTGI
intrapersonal coping → PTGI

and the indirect pathways:
secure attachment → perceived support → PTGI
secure attachment → intrapersonal coping → PTGI

These final models were deemed to be reasonable as configural baseline models for subsequent multi-group analyses.

For the model investigating secure attachment, the total variance of PTGI that was explained by the factors in the baseline model was 28.5 percent in the trauma group (Figure 16) and 22.4 percent in the control group (Figure 17). For the model investigating avoidant attachment, the percentages were 27.2 and 20.0 respectively (Figures 18 & 19).

With the configural baseline model established, the first parameters constrained across groups were the factor loadings of the observed items or composites on their respective latent variables (i.e., attachment, intrapersonal coping, perceived support, posttraumatic growth). Table 5 shows the factor loadings that were constrained and the standardized estimates (before they were constrained to be equal across groups) for both the trauma and control groups across models. The second set of constraints was the causal paths in the model, and table 6 shows the standardized weights of these path coefficients. There was little variation across models with regard to the factor loadings of the observed items on the latent variables and the paths among
the latent variables in the model. The summary of the structural equation multi-group analyses for the avoidant and secure models are shown in Tables 7 and 8 respectively. The increases in the chi square of the first two constrained models (factor loadings and paths) from the baseline configural model were nonsignificant.

However, significant differences between groups were found when the intercepts of the observed variables of the perceived support, intrapersonal coping, and attachment variables were constrained (refer to Table 2 for means and standard deviations). When the intercepts of these items and parcels were constrained in the secure attachment model, the differences from the baseline model ($\Delta \chi^2 = 75.786 \Delta df = 35, p < .001$) and the prior model with constrained factor loadings and paths ($\Delta \chi^2 = 57.345 \Delta df = 10, p < .001$) resulted in a fit of the model that was significantly worse. This finding is interpreted as a difference between groups on the mean scores of one or more of the items that were constrained in the latest step. For the avoidant attachment model, a similar trend was identified regarding comparisons to the baseline ($\Delta \chi^2 = 93.064 \Delta df = 38, p < .001$) and the previously constrained models ($\Delta \chi^2 = 72.336 \Delta df = 11, p < .001$).

Closer investigation of these factors revealed the three observed composite items of the intrapersonal coping construct to be the source of this difference between the groups. The differences between the groups in means scores of the intrapersonal coping composite subscales in both models were significantly different from zero (see Table 9); for the secure model when compared with the model constrained at the factor loadings and paths, the change in chi square after the intrapersonal coping items were constrained was 39.614 with three degrees of freedom of making it statistically significant; for avoidant attachment, the chi square difference was 39.335 and three degrees of freedom.
Even more significant were the differences in intercept scores of the PTGI items across groups. Table 10 displays the model comparisons with the factor loadings, paths, and predictor intercepts all constrained and the same model with the addition of the constrained observed PTGI items. As shown in Table 10, appreciation for life, personal strength, and new possibilities were all found to have statistically significant differences in mean item scores across groups. However, the items of the new possibilities subscale were found to have the largest difference between the groups (secure model: $\Delta \chi^2 = 189.242 \Delta df = 4, p < .001$; avoidant model: $\Delta \chi^2 = 189.253 \Delta df = 5, p < .001$).

The indirect effects of secure and avoidant attachment were investigated. Table 11 shows the indirect effects of secure and avoidant attachment on the other variables in the model across groups. The indirect effects of attachment on PTG were generally small in magnitude and mostly consistent across groups. The one exception was the impact of secure attachment on PTGI scores for the control group, which were strongest. This same pattern was identified with the impact of attachment on the coping factors; the impact of secure attachment on COPE scores for the control group was strongest. The indirect effects of attachment were strongest on the MOS subscales. There was little difference in the influence of secure attachment on perceived support between groups, but the magnitude of association between avoidant attachment and the MOS subscales was consistently stronger within the trauma group.

Finally, a model was analyzed with both secure and avoidant attachment included in order to identify the unique contributions each made to reports of PTG and which was more influential. However, because of the number of parameters added to the complexity of the model when both types of attachment were included, it was not feasible to include these as latent variables based on the sample sizes of the two groups. Thus, the attachment variables were
included as observed composite scores (see Figures 20 & 21). As shown in Table 12, when included in the same model together, secure attachment was found to have the largest indirect effect on overall PTGI scores and PTGI subscale scores in the control group, but avoidant attachment was revealed to have a larger indirect influence on the various domains of the PTGI within the trauma group, though the difference were small in magnitude.
Chapter 6

Discussion

The methodological design of this study allowed for the examination of a theoretical model of posttraumatic growth as reported by two groups: a group of emerging adults who reported on a traumatic event that was experienced during adolescence (trauma group) and a matched group of emerging adults who reported on their transition from high school to college (control group). This allowed for an analysis of growth and the factors commonly associated with reports of growth across groups in order to better understand the differences between present-day growth that results from exposure to a traumatic event during adolescence and present-day growth that results from a life transition during later adolescence. Although only partial support was generated for the hypothesis that PTG scores would be higher in the trauma group, all other hypotheses regarding associations between PTG scores and the other factors of interest (attachment, support, coping) were supported. These initial findings justified the testing of a conceptual model of PTG with these variables across groups. The findings that resulted from this multigroup model analysis revealed some interesting similarities and differences that both support and expand the body of literature on posttraumatic growth.

The first goal of this study was to compare the levels of and types of reported growth between these two groups. Contrary to the first hypothesis, emerging adults who responded to survey items in regard to their transition from high school to college reported higher levels of overall growth compared with those emerging adults who reported on growth as an outcome related to their exposure to a traumatic event during adolescence. This difference in overall growth was found to be accounted for in the domains of new possibilities and relating to others, which support findings reported by Gottlieb and colleagues (2007) on their research with college
students. Although the scores of overall growth were contrary to the stated hypothesis, the higher scores reported by the control group in regards to the new possibilities and relating to others domains is not surprising. College is a time of intellectual and social growth, and thus, higher scores in these domains for those reporting on their transition to college should be expected. By taking classes, making new acquaintances, interacting with peers and professors, and exploring career interests, there is a wealth of new opportunities and social relations for college students to explore. Though not part of the rationale for this study, these findings may be useful in the development of new or modification of existing first year experience programs/orientations at colleges and universities.

Although the trauma group had also recently experienced the transition to college when this data was collected, they responded to survey questions in regard to their traumatic events. Because the individuals in the trauma group were not asked about their transition to college, it is unclear if the exposure to trauma may have an adverse effect in their ability/opportunity to recognize new possibilities, but this is an area worthy of further exploration. As such, exposure to a traumatic event during adolescence, which is a critical time of development, can potentially impede access to new opportunities if the event results in the essential need to refocus priorities away from development tasks to self-care. Dealing with the effects of a traumatic event, especially during a critical developmental stage such as adolescence, can interfere with developing new relationships, pursuing career interests, and other new opportunities that are commonly experienced during the transition from high school to college.

Despite these findings, partial support for hypothesis 1 was found. Trauma survivors did report greater levels of growth in the domain of appreciation for life. Wicks and Mitchell (2009) identified growth in the domain of appreciation for life as a common occurrence in
qualitative interviews with a small sample of emerging adults, and Ickovics et al. (2006) reported especially high levels of growth in their quantitative study with adolescents. As with the higher levels of growth reported by the control group in the domains of new possibilities and relating to others, this finding of higher levels of growth in the appreciation for life domain by the trauma group is not surprising when considering the context. Phrases such as “stop and smell the roses” and “don’t take life/people for granted” are commonly associated with surviving a life threatening event. Exposure to a traumatic event is more likely to also produce feelings of threat and fear of loss, and this exposure to potential loss is likely to result in a greater sense of appreciation for what one has following survival of and reflection on the traumatic event. There was only a weak correlation between perceived threat/fear and PTG within the trauma group, and there was no evidence of a curvilinear effect between perceived threat and PTG.

These findings challenge the theoretical discourse on PTG that suggests that PTG begins with a seismic event. Furthermore, schemas and worldviews during emerging adulthood are likely altered by college experiences and natural development. These initial findings support the earlier observation by Gottlieb at al. (2007) that certain types of growth, as operationalized in the PTGI domains, appear to be more commonly reported by emerging adults following life events that are not necessarily considered traumatic, and other types of growth (especially appreciation for life) are more commonly reported following exposure and adjustment to a traumatic event – in this case – experienced during adolescence. What carries particular weight when discussing potential clinical implications is not so much the greater level of appreciation for life reported by the trauma survivors, but rather the lower level of reported growth in the domain of new possibilities. Adolescent and emerging adult years are regarded as development stages of growth and exploration, and the fact that the trauma group scored so much lower than
the control group (this was the most significant mean difference reported between the groups) should inform and be a focal point of clinical approaches to working with young trauma survivors.

The only between-group differences found in regard to perceived support were with the domains of tangible and positive social interaction, which were both higher for the trauma group. The magnitude of these differences was not large, and the findings related to tangible support are not surprising. Depending on the nature of the traumatic event, trauma survivors may have a greater need for assistance, and support resources in their lives may be more accommodating to these needs during adolescence. However, college is a time of greater independence, and many college students are eager to embrace that role, and thus, they may be less likely to seek out assistance. In addition, being away from home and family, they are less likely to have immediate access to such instrumental support. Positive social interaction, on the other hand, is less easily explained. It would appear plausible that college students would have a greater network of peers with whom to socialize and have fun. However, it can also be argued that during the transition period from high school to college, students are leaving most of their high school friends and may not yet have made new friends at their college. Clearly, there is an adjustment period for students to become comfortable and make new friends; whereas, those in the trauma group reported on their exposure to a traumatic event during a time in their lives when there was more stability and less geographic mobility compared with those who reported on a time of transition.

Although no specific hypotheses were put forth regarding differences in attachment style across the groups, it is worthy to note that present-day avoidant attachment style was more commonly reported by the trauma survivors. This begs two questions: 1) does trauma exposure
have the transformative potential, at least during adolescence, to modify one’s attachment style and behavior? 2) Are individuals who score higher on measures of avoidant attachment more susceptible to trauma exposure? Although no causation can be inferred, and only prospective methodological approaches can answer these questions, the first question would suggest that exposure to a traumatic event during adolescence may have the potential to profoundly impact one’s sense of trust and comfort in others during a time when relationships are critical to the developmental process. Scholars have suggested that attachment styles are developed early in life and are relatively stable across the life span (Bowlby, 1988). However, data from the current study show that trauma survivors report higher levels of avoidant attachment style than a matched group of individuals who have not reported exposure to a trauma, suggesting that attachment styles, at least through late adolescence may still be malleable based on life events. Conversely, the second question would imply that there may be a common factor that is associated with both avoidant attachment and trauma exposure. For example, it may be that avoidant attachment may stem from living with an alcoholic parent, and alcoholism can lead to premature death which can be a traumatic experience for the adolescent child.

Perhaps the most telling findings regarding the mean group differences of the independent variables come from the analyses of the COPE domains. A clear pattern emerged in the types of coping strategies employed by the members of the two groups. Of the 14 subscales of the COPE measure, the trauma group scored significantly higher on five, and the control group scored higher on six. The three strategies which were not differentially endorsed across groups were use of emotional support, venting, and substance use (although substance use approached statistical significance with the trauma survivors scoring higher than the control group).
The fact that there were differences reported across groups in the coping strategies used was not surprising considering that coping strategies are likely to override coping styles based on the demands of the event and resources available to the individual (Carver et al., 1989). However, what is surprising is the drastic contrast in strategies used by group. The coping strategies that the survivors of traumatic events during adolescence engaged in more often can be labeled as indirect or avoidant. These include self-distraction, denial, behavioral disengagement, acceptance, and turning to religion. None of these strategies could be considered problem-focused, and none involve engaging the assistance of others. Based on these findings, it can be induced that adolescents coping with traumatic events are more likely to avoid dealing with the problem and less likely to seek the assistance of others. Although it is not uncommon for adolescents to feel a sense of isolation or alienation as they struggle with the physiological, social, and cognitive changes experienced during adolescence, when trauma exposure is added to these stressors to be managed, the resulting withdrawal can be potentially disruptive developmentally if the trauma is not managed appropriately in order to minimize the impact of the trauma on developmental tasks. Valuable implications arise from these findings in regard to clinical approaches to working with adolescents exposed to traumatic events. Focusing on mutable factors, such as active coping strategies when dealing with significant stressors, appears to be a critical area that can benefit adolescents.

Conversely, those emerging adults who did not report a traumatic event in their lives, but instead reported on their transition to college, scored higher on coping strategies that can generally be labeled as engaged or approach oriented. These include active coping, positive reframing, planning, and use of instrumental support. Use of humor and self-blame were also more highly endorsed by the control group but are less easily defined as engaged or approach
oriented strategies. Nonetheless, these findings suggest that individuals who are not focusing on a traumatic event but rather a change in life circumstances are more likely to engage in coping strategies that will better help them make use of available resources and manage the demands of transitioning to college. Coping with the transition to college was not investigated with the trauma group, but their reported experiences coping with their traumatic events revealed greatly different coping strategies. Although this is a comparison of two different events which occurred at two different periods during adolescence, it is valuable to understand how vastly different these approaches are which sheds some light on potential areas of intervention with survivors adolescent trauma including addressing mutable coping styles/strategies. This study, however, was unable to tease out whether these differences in coping are more strongly related to the events being coped with or the age and life stage of the individuals who experienced these events.

Another goal of this study was to analyze the correlation between PTG and present-day life satisfaction across groups. Overall reports of present-day life satisfaction did not differ between groups. At least to some degree, this can be explained by the fact that both groups are demographically similar, and both groups are made up of people attending the same university. The fact that these individuals have the functionality and resources to attend college suggests that other present-day factors may override any differences in retrospective reporting of the variables of interest in this study. Although reports of life satisfaction did not differ across groups, reports of posttraumatic growth were associated with reports of life satisfaction in both groups. This result provided support for the second hypothesis. However, the overall association between PTG and life satisfaction was small in magnitude, and this association was strongest within the trauma group when specifically looking at the PTGI domains of relating to others and
appreciation for life. Thus, for the trauma group, growth perceived in these domains was associated with reports of present-day life satisfaction, but the same levels of association were not found for the control group participants. Even though causal influences cannot be ascertained within the confines of a cross-sectional study, it appears that present-day quality of life for survivors of trauma exposure during adolescence (as measured via life satisfaction) may be, at least in part, dependent on perceived growth in personal relationships and the development of a greater appreciation for life, but experiencing growth in these domains appears to be less influential in reporting life satisfaction for those who have not experienced a traumatic event. Although small in magnitude, the one domain of the PTGI that was more strongly associated with life satisfaction for the control group was new possibilities. In comparison with the trauma group, realizing new opportunities and possibilities carried more weight in reports of overall life satisfaction for the control group members. Some prior research has also identified associations between PTG and life satisfaction in trauma survivors (Kim et al., 2008; Mols et al., 2009; Seitz et al., 2011), but others have not found such relationships (Cann et al., 2010; Park et al., 2010). This discrepancy, along with the small coefficients reported in the current study, suggest that PTG is unique from and not a particularly strong predictor of life satisfaction.

The final goal of this study was to examine the differential contributions that attachment, coping, and social support play in reports of PTG between the two groups. As predicted, both avoidant and secure styles of attachment were associated with reports of PTG. As with prior research with adult cancer survivors (Schmidt et al., 2012), the former was negatively related to PTG, and the latter was positively related to PTG. These relationships were especially salient in the domain of relating to others. These findings are understandable when considering that the key aspects of attachment styles are the levels of comfort and trust within
personal relationships (Bowlby, 1988). What is interesting is that the negative association between avoidant attachment and relating to others was significantly stronger in the trauma group. As mentioned earlier, scores on avoidant attachment were higher in the trauma group, and those in the trauma group also engaged in significantly more avoidant types of coping strategies. Thus, it is not surprising that the negative influence of avoidant styles of attachment on reports of growth would be stronger for the trauma group than for the control group. The sense of isolation and withdrawal along with the engagement in avoidance behaviors that can result from exposure to a traumatic event during adolescence can negatively impact existing relationships and impede opportunities for developing new relationships due to engagement in these behaviors of withdrawal and social isolation. Again, the implications here carry a lot of weight for clinical approaches to working with adolescents who have been exposed to a traumatic event. Active engagement, rather than avoidant behaviors, can help minimize the potential negative impacts that isolation and withdrawal can have on relationships.

As hypothesized, overall levels of perceived social support were positively associated with reports of posttraumatic growth. This is consistent with findings of other researchers (e.g., Cadell et al., 2003; Kinsinger et al., 2006; Leung et al., 2010; Love & Sabiston, 2011; Park et al., 1996; Weiss, 2004; Wilson & Boden, 2008). This finding was also most evident with the relating to others domain, which can be explained by considering that most social support originates from relationships with others (e.g., family members, friends, counselors, & professors). Sheikh (2008) suggests that positive perceptions of these support resources can foster more frequent interactions, which can result in more opportunities for cognitive processing of the traumatic event and the finding from this study support this theoretical perspective. To this end, support groups for adolescents may play significant roles as social recourses for
adolescents who may view their existing support networks/resources as unapproachable or unavailable to discuss feelings.

What is unique when delving into these findings related to perceived support is that within the trauma group, tangible support was more strongly associated with the relating to others domain of PTG compared with the control group; whereas, within the control group, affectionate support was more strongly associated with the new possibilities domain of PTG compared with the trauma group. The importance of tangible support for survivors of traumatic events during adolescence has already been discussed, but the between-groups differential influence of affectionate support on new possibilities has not. Within this group of college students, feeling cared about and loved appears to play a significant role in perceptions of growth in the domain of new possibilities, more so than for the trauma group. On the one hand, receiving affectionate support can foster confidence and self-esteem within people, which can further influence their motivations to realize and pursue new opportunities. On the other hand, the weaker association between affectionate support and growth in the domain of new possibilities for the trauma group may result from the avoidant laden responses to trauma exposure during adolescence. This would, as discussed earlier, have the potential to interfere with opportunities and abilities to receive affectionate support due to the nature of avoidant attachment which is marked by a lack of trust in others (Bowlby, 1988).

Several researchers (e.g., Bellizzi & Blank, 2006; Kinsinger et al., 2006; Wild & Paivio, 2003) have used factor analysis and conceptual and theoretical justifications for combining these into higher order coping strategies. A similar approach was used in the current study by combining positive reframing, active coping, and planning into an intrapersonal coping factor and the use of emotional and instrumental support as interpersonal coping. In support of the
final hypothesis, active coping, positive reframing, planning, and the use of instrumental and emotional support were all found to be positively associated with reports of PTG. These findings support what is already known about coping strategies and reports of posttraumatic growth. In fact, positive reframing (Loiselle et al., 2011; Morris et al., 2007; Park et al., 1996; Park & Fenster, 2004; Schmidt et al., 2012; Sears et al., 2003; Thornton & Perez, 2006; Urcuyo et al., 2004; Weiss, 2004) and use of support (Park & Fenster, 2004; Sheikh, 2004, Swickert & Hittner, 2009; Thornton & Perez, 2006) are two of the most consistently reported correlates with PTG.

The use of emotional and instrumental support strategies were most strongly associated with the relating to others domain across groups, but the other three coping strategies (active, positive reframing, & planning) were most significantly associated across groups with the new possibilities domain of the PTGI. This supports prior research that has also identified active and problem-focused coping strategies as associated with reports of greater growth in the domain of new possibilities (Wild & Paivio, 2003; Wolchik et al., 2008). There were no differences between the groups, and these latter findings suggest that some level of autonomous, independent effort, particularly a cognitive approach, is critical to recognizing new possibilities, regardless of the event under consideration. Overall, the positive correlations between the support and coping variables with PTGI scores support the literature on PTG and its antecedents and provide further evidence of the robustness of these variables as predictors of PTG among various age groups.

These bivariate findings were then used to define and test models that predicted PTG. Within these models, there were no significant differences in the weights of the loadings of the individual and composite items that were defined by each of the latent constructs, indicating that the meaning of these constructs did not differ across groups. Of the antecedents to PTG,
attachment style was most strongly related to perceived support, but intrapersonal coping was the strongest predictor of PTG within all models, which supports prior research on PTG (Prati & Pietrantoni, 2009). However, none of the weights of the paths to overall PTG differed significantly across models, suggesting that the processes to experiencing growth appear to be independent of the triggering events. What did differ, though, were the paths taken across groups. The trauma group had higher scores of perceived support; whereas, the control group had higher scores in the intrapersonal coping strategies. These differences in the mean scores of the individual and composite items confirmed the results previously reported via independent sample t-tests. In essence, the meaning of the constructs analyzed and the relationship among these constructs were consistent across groups, but the level of adherence to or use of the predictor variables and the resulting level of the outcome variables was different between the two groups.

More in depth examination revealed that scores of all three types of intrapersonal coping (active, positive reframing, planning) were significantly higher for the emerging adults who reported on their transition to college compared with the emerging adults who reported on a traumatic event that happened during their adolescent years. This suggests that taking responsibility and initiative in dealing with a significant life event differs based on the perception of the event (traumatic or not) or the timing of it (early or late adolescence) or both. It may be the independent nature of being a college student that fosters the use of these intrapersonal coping strategies. At the same time, although not included in the models, more avoidant-oriented coping strategies (e.g., behavioral disengagement) may be more common with younger adolescents who are beginning to separate from their parents, but may not yet be self-reliant or
cognitively developed enough to comprehensively cope with and process the meaning of the traumatic event.

Second, there were significant differences in scores on individual PTGI items between the groups. Deeper inspection revealed that the specific items with the largest magnitude of difference in which the trauma group scored highest were both from the appreciation for life domain: “I have a greater appreciation for the value of my own life” and “I can better appreciate each day.” Conversely, the items with the largest magnitude of difference in which the control group scored highest were both from the new possibilities domain: “New opportunities are available which wouldn't have been otherwise” and “I established a new path for my life.” In fact, the item “New opportunities are available which wouldn't have been otherwise” was not only the most strongly endorsed PTGI statement by the participants in the control group, it was also the least endorsed PTGI item by the trauma group members. This is telling information about the perceptions that survivors of trauma exposure during adolescence have regarding the opportunities, or lack of, that are available to them as a result of their traumatic experience. Whereas new opportunities such as career exploration are commonly pursued by high school and college students, such opportunities for this type of growth may be less commonly available for survivors of traumatic events experienced during adolescence.

Regarding the influence of attachment on PTG, secure attachment was found to have the strongest direct and indirect effects on PTG but only within the control group. Although positive and negative direction of the effect of secure and avoidant attachment on PTG for trauma groups in this study are in line with prior research, the lack of statistical significance in the models does not support prior findings in studies conducted with trauma survivors. The effects of secure attachment on PTG within the control group were stronger than the effects of
secure attachment on PTG in the model with the trauma survivors and the models with avoidant attachment on PTG with both the trauma survivors and control group. These findings held up when both types of attachment were included together in the same model; secure attachment was identified to be the overall strongest positive influence on PTG in the control group. However, the magnitude of the effect between secure attachment and PTG in the control group, despite being the largest of all models tested, was negligible. Based on this small magnitude, attachment style was found to play a small role in the reports of PTG.

Although there was a lack of empirical evidence for the effects of attachment on reports of posttraumatic growth in these models, there were some noteworthy findings related to the indirect effects of attachment on the coping and support variables as well as the domains of the PTGI. The negative influence that avoidant attachment had on the four domains of perceived support was more pronounced within the trauma group than the control group, suggesting that the avoidant traits associated with survivors of trauma during adolescence had a stronger impact on the perceptions of available support in the domains of emotional, instrumental, tangible, social, and affectionate support, which may have also had an indirect effect on their use of coping strategies. According to a theoretical perspective by Schaefer and Moos (1998), social support is likely to influence personal growth through greater use of adaptive coping strategies. Thus, an avoidant attachment style can lead to poorly perceived available support, and this process can potentially impede the use of adaptive coping strategies. Conversely, the positive influence that secure attachment had on the three aspects of intrapersonal coping was stronger for the control participants, supporting and expanding prior research (Alexander et al., 2001; Koopman et al., 2000; Mikulincer & Florian, 1995; Ognibene & Collins, 1998; Schmidt et al., 2012) that secure attachment may allow for greater use of intrapersonal coping strategies by
emerging adults who are transitioning from high school to college but not necessarily for emerging adult survivors of adolescent trauma.

When looking at the unique contributions that attachment made to reports of PTG, the data suggest that secure attachment style may have a more significant positive influence above and beyond the negative influence of insecure attachment styles for emerging adults transitioning into college, but not necessarily so for adolescents dealing with a traumatic event.

**Limitations**

The methodological design of this study has resulted in some valuable information to contribute to the body of literature on posttraumatic growth and highlighted some potential areas of clinical intervention when working with adolescent trauma survivors. However, these findings need to be evaluated with a critical lens and considered under the conditions of the study’s limitations. The primary limitations with this study are the timing of the events reported on and the failure to include a measure of perceived threat and fear with the control group. The trauma group reported on an event that happened during their years in high school (approximate ages 13-18); whereas, the control group reported on their transition from high school to college (approximate ages 18-19). Thus, there was a great deal more variability in time since event for the trauma group and only minimal overlap in the reported ages during which each event was experienced. This variability also meant that the trauma group was subjected to a greater potential for recall bias regarding the retrospective nature of the wording of the survey items, but more importantly, this time frame difference also includes a number of years in which cognitive development is still a significant process (adolescence). As a result, it is impossible to tease out in this study if the findings are a direct result of the differential nature of the events being
reported on or the different ages/developmental stages of the participants in which these events occurred.

Regarding the second major limitation, perceived threat and fear are critical aspects of the PTG theory, yet these factors were measured only with the trauma group. Measuring growth as operationalized by the PTGI, even in regard to an event not necessarily considered traumatic in nature, would have benefited from an inclusion of a measure of perceived threat and fear for all participants. These variables were not included with the control group because the transition from high school to college is not naturally considered to be a traumatic event, even though some students may perceive such a transition as threatening or fearful (e.g., leaving the safety and comfort of home). Nonetheless, the focus of this study was on the differing levels and types of growth following events considered a priori as traumatic or not traumatic based on diagnostic criteria. Future research, however, should include a measure of perceived threat and fear even when investigating growth that may be associated with events not necessarily regarded as traumatic.

A third limitation was that there was no evaluation of the variables of interest in regard to the trauma survivors’ transitions to college. In essence, both groups recently experienced the transition to college that the control group reported on, but the trauma group was never asked to report on their use of coping strategies or support resources in that regard. Although this information would have been interesting and potentially valuable, it may have also confounded the trauma participants’ responses to questions related to their trauma by introducing carryover effects.

Several other limitations also need to be disclosed. An important consideration of all cross-sectional studies is that they cannot identify causal relationships or explain the structural
pathways in a causal context. However, they are important first steps in identifying variables and relationships that are influential in explaining the variance in reporting levels of outcomes. Due to the ex-post-facto nature of this design, there may have been extraneous factors related to the participants in each group that accounted for the differences found. To some degree, this was evaluated by comparing demographic characteristics (e.g., gender, class year) between the two groups, but it is unknown whether some other trait could have influenced group assignment. For example, there may be extraneous factors that could potentially influence the reporting of a trauma or the susceptibility to trauma exposure that may also account for some degree of the findings in this study. There may have also been a confounding factor within the study design and delineation of the two groups that could have influenced responses to the survey items by group. For example, the simple wording of the items that members of the two groups were presented with could have had an unintended priming effect on how the items were perceived. The trauma group reported on a traumatic event; whereas, the control group responded to the wording transition to college. These simple differences in wording and tone have the potential to prime study participants to regard the items in a more or less negative context and subsequently influence their responses to the items.

Additionally, it should be recognized that the participants for this study were recruited from a major university campus. Because these individuals were enrolled in college, it is plausible that they have resources associated with college enrollment that others in the same age group but not enrolled in college do not have, and these resources may also be related to some of the variables of interest in this study, including what resources may have been available to the trauma group individuals at the time of their trauma and subsequently compared to what may be available to someone in a different family and school environment not focused on college.
Lastly, individuals willing to volunteer their time to participate in a psychological study may possess certain unique characteristics which may influence the reporting. Thus, generalization of these findings beyond the sample frame from which the participants were recruited is not possible. However, because the goal of this study was to evaluate the relationships among the variables of interest, the lack of generalizability actually allowed for a more focused evaluation of the variables within a relatively restricted and homogeneous sample.

Future research can address many of these limitations through prospective longitudinal designs. By collecting data throughout the four years of high school, the issues related to recall bias are minimized, and instead of transition to college, some other aspect of high school or adolescence (e.g., obtaining a driver’s license) can be used as a control event.

**Implications and Conclusion**

In recent years, research on PTG has grown, and great progress has been made in understanding the factors that can influence or impede PTG. However, this research has been mostly limited to adult populations; yet, traumas are experienced by younger individuals as well. To this end, this body of research needs to be expanded to include adolescent and emerging adult populations. This study adds to the literature on PTG in several ways. First, it is the first to investigate the role of attachment in reports of PTG in a sample of emerging adults. Second, it is the first to statistically analyze and compare reports of PTG (including a theoretical model that included attachment, coping, and support variables) in both a trauma and control group recruited from the same sample frame. Third, this design allowed for the analysis of the influence of PTG on reports of present-day life satisfaction for both groups, and this study has revealed some important findings in how adolescents and emerging adults respond to significant life events.
There was no evidence of differential meanings of growth across group, and the factors that correlated with reports of growth were relatively consistent across groups. However, the use of coping strategies that were associated with growth and the reported levels of types of growth experienced did vary across groups, highlighting two area of concern for clinicians working with adolescent and emerging adult survivors of trauma. There are opportunities from this study to better inform clinical approaches and future research aimed at understanding the transformative potential of mutable health behaviors (coping skills, use of support networks) that may foster growth. There is no question that, despite the limitations of this research design, there are clear difference in the coping processes related to traumatic experiences during adolescence compared with life transitions during emerging adulthood, and addressing comfort and trust associated with attachment styles and support networks may be a critical first component to engaging in the most effective coping strategies, which can foster some sense of growth following exposure to a traumatic event.

It is also evident, based on the finding in this study, that the types of growth reported varies by triggering event, early or late adolescence at the time of experiencing the event, or both. These findings highlight the differential types of growth experienced from traumatic versus non-traumatic events and/or at different periods during adolescence and emerging adulthood. Evidence from the current study indicates that growth in the PTGI domain of new possibilities appears to be common among individuals transitioning from high school to college, and trauma exposure during adolescence may attenuate the degree to which this growth is realized, but more research is needed to confirm these hypotheses.

This body of research can also be critical to understanding the interactive nature of trauma and transition across the lifespan. For example, this burgeoning body of literature has not
yet addressed how trauma exposure may differentially influence individual adjustment and development during various life stages (e.g., marriage, parenthood, retirement). Moreover, although there is some open debate about whether or not preadolescents have the cognitive ability to achieve and realize growth, this is an area largely underexplored.

In conclusion, this current study has revealed aspects of growth, as reported by emerging adults, that are more linked to trauma exposure (appreciation for life) and other aspects that can be realized through other, less distressing, though potentially still challenging, opportunities (new possibilities). However, at least for survivors of traumatic events experienced during adolescence, avoidant behaviors and poor perceptions of support resources can impede the use of appropriate coping strategies which are vital to a resilient outcome and even attaining some sense of growth. On the other hand, secure attachment is more likely to foster the use of more intrapersonal coping strategies which can result in realized PTG at least for emerging adults in regard to their transition to college. Thus, in line with theoretical perspectives on personal characteristics, coping, support and stressful events (Ognibene & Collins, 1998; Schaefer & Moos, 1998), perceptions of support resources and use of appropriate coping strategies when dealing with a life stressor or traumatic event may be dependent, at least in part, on one’s attachment style, the age/developmental stage of the individual, and the nature of the triggering event.
Table 1

Demographics of sample

<table>
<thead>
<tr>
<th></th>
<th>Overall (n=546)</th>
<th>Trauma (n=359)</th>
<th>Control (n=187)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>100</td>
<td>18.76%</td>
<td>62</td>
</tr>
<tr>
<td>Female</td>
<td>433</td>
<td>81.24%</td>
<td>289</td>
</tr>
<tr>
<td>Class year</td>
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<td></td>
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</tr>
<tr>
<td>Freshman</td>
<td>143</td>
<td>27.34%</td>
<td>94</td>
</tr>
<tr>
<td>Sophomore</td>
<td>129</td>
<td>24.67%</td>
<td>82</td>
</tr>
<tr>
<td>Junior</td>
<td>127</td>
<td>24.28%</td>
<td>84</td>
</tr>
<tr>
<td>Senior</td>
<td>124</td>
<td>23.71%</td>
<td>84</td>
</tr>
<tr>
<td>Race</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>403</td>
<td>75.61%</td>
<td>272</td>
</tr>
<tr>
<td>Asian</td>
<td>47</td>
<td>8.82%</td>
<td>24</td>
</tr>
<tr>
<td>Hispanic or Latino</td>
<td>36</td>
<td>6.75%</td>
<td>24</td>
</tr>
<tr>
<td>Black or African American</td>
<td>16</td>
<td>3.00%</td>
<td>12</td>
</tr>
<tr>
<td>Other</td>
<td>31</td>
<td>5.82%</td>
<td>20</td>
</tr>
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</table>
Table 2

**Means and standard deviations of study variables across groups**

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<tr>
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<th>Trauma (n = 359)</th>
<th>Control (n = 187)</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Posttraumatic Growth</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td>48.4  23.0</td>
<td>52.5  20.8</td>
<td>-2.080</td>
<td>.038</td>
</tr>
<tr>
<td>Relating to Others</td>
<td>15.1  9.1</td>
<td>15.8  8.6</td>
<td>-0.918</td>
<td>n.s.</td>
</tr>
<tr>
<td>New Possibilities</td>
<td>10.4  6.8</td>
<td>14.9  5.5</td>
<td>-8.414</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Personal Strength</td>
<td>11.2  5.5</td>
<td>11.6  4.6</td>
<td>-0.968</td>
<td>n.s.</td>
</tr>
<tr>
<td>Spiritual Change</td>
<td>2.9   3.2</td>
<td>2.4   2.8</td>
<td>-2.131</td>
<td>.034</td>
</tr>
<tr>
<td>Appreciation for Life</td>
<td>8.8   4.0</td>
<td>7.8   3.6</td>
<td>3.169</td>
<td>.002</td>
</tr>
<tr>
<td>Attachment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avoidance</td>
<td>11.3  3.6</td>
<td>10.6  3.3</td>
<td>2.192</td>
<td>.029</td>
</tr>
<tr>
<td>Ambivalence Worry</td>
<td>7.3   2.5</td>
<td>6.9   2.6</td>
<td>1.638</td>
<td>n.s.</td>
</tr>
<tr>
<td>Ambivalence Merger</td>
<td>6.4   2.2</td>
<td>6.8   2.1</td>
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<td>n.s.</td>
</tr>
<tr>
<td>Security</td>
<td>10.2  1.8</td>
<td>10.2  1.8</td>
<td>0.431</td>
<td>n.s.</td>
</tr>
<tr>
<td>Social Support</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Overall</td>
<td>71.3  16.4</td>
<td>68.6  17.4</td>
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<td>n.s.</td>
</tr>
<tr>
<td>Emotional/Instrumental</td>
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<td>27.7  8.3</td>
<td>0.287</td>
<td>n.s.</td>
</tr>
<tr>
<td>Tangible</td>
<td>15.5  4.7</td>
<td>14.3  4.7</td>
<td>2.840</td>
<td>.005</td>
</tr>
<tr>
<td>Positive Social Interaction</td>
<td>12.1  3.2</td>
<td>11.3  3.4</td>
<td>2.761</td>
<td>.006</td>
</tr>
<tr>
<td>Affection</td>
<td>15.9  3.6</td>
<td>15.3  4.1</td>
<td>1.472</td>
<td>n.s.</td>
</tr>
<tr>
<td>Coping</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Distraction</td>
<td>6.1   1.6</td>
<td>5.7   1.6</td>
<td>2.733</td>
<td>.006</td>
</tr>
<tr>
<td>Active Coping</td>
<td>5.0   1.8</td>
<td>5.6   1.4</td>
<td>-4.211</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Denial</td>
<td>3.7   1.9</td>
<td>3.3   1.7</td>
<td>2.349</td>
<td>.019</td>
</tr>
<tr>
<td>Substance Use</td>
<td>3.4   2.0</td>
<td>3.1   1.7</td>
<td>1.771</td>
<td>n.s.</td>
</tr>
<tr>
<td>Use of Emotional Support</td>
<td>5.3   1.9</td>
<td>5.2   2.0</td>
<td>.284</td>
<td>n.s.</td>
</tr>
<tr>
<td>Use of Instrumental Support</td>
<td>4.7   1.9</td>
<td>5.3   1.8</td>
<td>-3.040</td>
<td>.002</td>
</tr>
<tr>
<td>Behavioral Disengagement</td>
<td>3.8   1.8</td>
<td>3.4   1.6</td>
<td>2.129</td>
<td>.034</td>
</tr>
<tr>
<td>Venting</td>
<td>4.6   1.7</td>
<td>4.8   1.5</td>
<td>-.907</td>
<td>n.s.</td>
</tr>
<tr>
<td>Positive Reframing</td>
<td>4.7   1.9</td>
<td>5.3   1.6</td>
<td>-3.766</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Planning</td>
<td>4.8   1.9</td>
<td>5.7   1.6</td>
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</tr>
<tr>
<td>Humor</td>
<td>3.7   2.0</td>
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<td>&lt; .001</td>
</tr>
<tr>
<td>Acceptance</td>
<td>6.4   1.5</td>
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<td>4.499</td>
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</tr>
<tr>
<td>Religion</td>
<td>3.8   2.0</td>
<td>3.4   1.8</td>
<td>2.497</td>
<td>.013</td>
</tr>
<tr>
<td>Self-Blame</td>
<td>4.5   2.0</td>
<td>5.3   2.0</td>
<td>-4.075</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Satisfaction with Life</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td>22.8  6.6</td>
<td>23.3  6.9</td>
<td>-0.868</td>
<td>n.s.</td>
</tr>
</tbody>
</table>
Table 3

*Correlations between SWLS and PTGI domains*

<table>
<thead>
<tr>
<th></th>
<th>Satisfaction with Life</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Pooled</td>
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<tr>
<td>Posttraumatic Growth</td>
<td>.226 **</td>
</tr>
<tr>
<td>Relating to Others</td>
<td>.247 **</td>
</tr>
<tr>
<td>New Possibilities</td>
<td>.118 **</td>
</tr>
<tr>
<td>Personal Strength</td>
<td>.169 **</td>
</tr>
<tr>
<td>Spiritual Change</td>
<td>.105 *</td>
</tr>
<tr>
<td>Appreciation for Life</td>
<td>.220 **</td>
</tr>
</tbody>
</table>

**Correlation is significant at the 0.01 level (2-tailed).**

*Correlation is significant at the 0.05 level (2-tailed).*
### Table 4

**Correlations of study variables with PTGI domain**

<table>
<thead>
<tr>
<th>Pttraumatic Growth</th>
<th>Relating to Others</th>
<th>New Possibilities</th>
<th>Personal Strength</th>
<th>Spiritual Change</th>
<th>Appreciation for Life</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Attachment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avoidance</td>
<td>-.178 **</td>
<td>-.299 **</td>
<td>-.088 *</td>
<td>-.091 *</td>
<td>-.001</td>
</tr>
<tr>
<td>Ambivalence Worry</td>
<td>-.091 *</td>
<td>-.119 **</td>
<td>-.053</td>
<td>-.034</td>
<td>-.070</td>
</tr>
<tr>
<td>Ambivalence Merger</td>
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<td>-.042</td>
<td>.064</td>
<td>-.004</td>
<td>-.033</td>
</tr>
<tr>
<td>Security</td>
<td>.203 **</td>
<td>.262 **</td>
<td>.099 *</td>
<td>.135 **</td>
<td>.036</td>
</tr>
<tr>
<td><strong>Social Support</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Overall</td>
<td>.222 **</td>
<td>.317 **</td>
<td>.061</td>
<td>.138 **</td>
<td>.105 *</td>
</tr>
<tr>
<td>Emotional/Instrumental</td>
<td>.240 **</td>
<td>.340 **</td>
<td>.099 *</td>
<td>.142 **</td>
<td>.110 *</td>
</tr>
<tr>
<td>Tangible</td>
<td>.059</td>
<td>.138 **</td>
<td>-.065</td>
<td>.016</td>
<td>.055</td>
</tr>
<tr>
<td>Positive Social Interaction</td>
<td>.165 **</td>
<td>.222 **</td>
<td>.048</td>
<td>.085 *</td>
<td>.095 *</td>
</tr>
<tr>
<td>Affection</td>
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<td>.094 *</td>
<td>.206 **</td>
<td>.076</td>
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<tr>
<td><strong>Coping</strong></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Self-Distraction</td>
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<td>.153 **</td>
<td>.155 **</td>
<td>.221 **</td>
<td>.117 **</td>
</tr>
<tr>
<td>Active Coping</td>
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<td>.266 **</td>
<td>.388 **</td>
<td>.344 **</td>
<td>.183 **</td>
</tr>
<tr>
<td>Denial</td>
<td>.108 *</td>
<td>.117 **</td>
<td>.054</td>
<td>.025</td>
<td>.147 **</td>
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<tr>
<td>Substance Use</td>
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<td>.039</td>
<td>.097 *</td>
<td>.090 *</td>
<td>.009</td>
</tr>
<tr>
<td>Use of Emotional Support</td>
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<td>.193 **</td>
<td>.289 **</td>
<td>.160 **</td>
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<tr>
<td>Use of Instrumental Support</td>
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<td>.274 **</td>
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<td>.185 **</td>
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<td>.006</td>
<td>.014</td>
<td>.014</td>
<td>.083</td>
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<tr>
<td>Venting</td>
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<td>.267 **</td>
<td>.255 **</td>
<td>.266 **</td>
<td>.134 **</td>
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<tr>
<td>Positive Reframing</td>
<td>.388 **</td>
<td>.322 **</td>
<td>.356 **</td>
<td>.291 **</td>
<td>.263 **</td>
</tr>
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<td>Planning</td>
<td>.335 **</td>
<td>.263 **</td>
<td>.368 **</td>
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<td>.177 **</td>
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<td></td>
<td>Correlation Coefficient</td>
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<td>------------------</td>
<td>-------------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humor</td>
<td>0.122 ** 0.069 0.234 ** 0.103 * -0.031 0.026</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acceptance</td>
<td>0.194 ** 0.121 ** 0.104 * 0.247 ** 0.070 0.269 **</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Religion</td>
<td>0.340 ** 0.280 ** 0.180 ** 0.145 ** 0.705 ** 0.249 **</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Blame</td>
<td>0.082 0.040 0.173 ** 0.032 0.041 0.005</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Satisfaction with Life Overall</td>
<td><strong>Correlation is significant at the 0.01 level (2-tailed).</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>* Correlation is significant at the 0.05 level (2-tailed). **</td>
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<tr>
<td>Latent Construct</td>
<td>Subscale / Item</td>
<td>Secure Trauma</td>
<td>Secure Control</td>
<td>Avoidant Trauma</td>
<td>Avoidant Control</td>
</tr>
<tr>
<td>-----------------</td>
<td>--------------------------</td>
<td>---------------</td>
<td>----------------</td>
<td>-----------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Posttraumatic Growth</td>
<td>Relating to Others</td>
<td>0.69</td>
<td>0.78</td>
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<td>0.76</td>
</tr>
<tr>
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<td>New Possibilities</td>
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<td>Appreciation for Life</td>
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<tr>
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<td>Personal Strength</td>
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<td></td>
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<tr>
<td>Appreciation for Life</td>
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<td></td>
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<tr>
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<td>New Possibilities</td>
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<td>0.90</td>
<td>0.86</td>
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<td></td>
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<td>0.76</td>
<td>0.67</td>
<td>0.76</td>
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<td>Model</td>
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<td>-------------</td>
<td>-------------</td>
<td>-------------</td>
<td>-------------</td>
<td></td>
</tr>
<tr>
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<td>0.56</td>
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<td>0.78</td>
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<td>MAQ7</td>
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<td>0.67</td>
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<tr>
<td></td>
<td>MAQ14</td>
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<td></td>
<td>MAQ6</td>
<td></td>
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<td>0.50</td>
<td>0.35</td>
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<td></td>
<td>MAQ8</td>
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<tr>
<td></td>
<td>MAQ11</td>
<td></td>
<td></td>
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<td>0.70</td>
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<tr>
<td></td>
<td>MAQ13</td>
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Table 6

*Standardized Estimates of Paths between Latent Constructs*

<table>
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<tr>
<th>Latent Construct</th>
<th>Subscale / Item</th>
<th>Secure Trauma</th>
<th>Secure Control</th>
<th>Avoidant Trauma</th>
<th>Avoidant Control</th>
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</thead>
<tbody>
<tr>
<td>Attachment</td>
<td>Intrapersonal Coping</td>
<td>0.17</td>
<td>0.36</td>
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<td>-0.21</td>
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<tr>
<td>Attachment</td>
<td>Perceived Support</td>
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<td>0.37</td>
<td>-0.41</td>
<td>-0.31</td>
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<tr>
<td>Intrapersonal Coping</td>
<td>Posttraumatic Growth</td>
<td>0.51</td>
<td>0.42</td>
<td>0.51</td>
<td>0.40</td>
</tr>
<tr>
<td>Perceived Support</td>
<td>Posttraumatic Growth</td>
<td>0.12</td>
<td>0.17</td>
<td>0.10</td>
<td>0.17</td>
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Table 7

*Chi Square Test of Constraints for Model with Avoidant Attachment*

<table>
<thead>
<tr>
<th></th>
<th>$X^2$</th>
<th>$df$</th>
<th>CFI</th>
<th>RMSEA</th>
<th>PCLOSE</th>
<th>$\Delta X^2$</th>
<th>$\Delta df$</th>
<th>$p$</th>
<th>$\Delta X^2$</th>
<th>$\Delta df$</th>
<th>$\Delta p$</th>
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</thead>
<tbody>
<tr>
<td>Unconstrained (configural)</td>
<td>1052.186</td>
<td>616</td>
<td>.934</td>
<td>.036</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constrained</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Factor Loading</td>
<td>1072.362</td>
<td>639</td>
<td>.934</td>
<td>.035</td>
<td>1.000</td>
<td>20.176</td>
<td>23</td>
<td>n.s.</td>
<td></td>
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</tr>
<tr>
<td>Paths</td>
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<td>643</td>
<td>.935</td>
<td>.035</td>
<td>1.000</td>
<td>.552</td>
<td>4</td>
<td>n.s.</td>
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<tr>
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<td>1145.250</td>
<td>654</td>
<td>.925</td>
<td>.037</td>
<td>1.000</td>
<td>72.336</td>
<td>11</td>
<td>.000</td>
<td>93.064</td>
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<td>.000</td>
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<td>PTGI Intercepts</td>
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<td>670</td>
<td>.882</td>
<td>.046</td>
<td>.976</td>
<td>298.959</td>
<td>16</td>
<td>.000</td>
<td>392.023</td>
<td>54</td>
<td>.000</td>
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### Table 8

**Chi Square Test of Constraints for Model with Secure Attachment**

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<th>$X^2$</th>
<th>$df$</th>
<th>CFI</th>
<th>RMSEA</th>
<th>PCLOSE</th>
<th>$\Delta X^2$</th>
<th>$\Delta df$</th>
<th>$p$</th>
<th>$\Delta X^2$</th>
<th>$\Delta df$</th>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constrained</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factor Loading</td>
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<td>541</td>
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<td>.035</td>
<td>1.000</td>
<td>16.404</td>
<td>21</td>
<td>n.s.</td>
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<td>21</td>
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<td>n.s.</td>
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<td>555</td>
<td>.932</td>
<td>.037</td>
<td>1.000</td>
<td>57.345</td>
<td>10</td>
<td>.000</td>
<td>75.786</td>
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<td>PTGI Intercepts</td>
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<td>570</td>
<td>.885</td>
<td>.048</td>
<td>.877</td>
<td>299.885</td>
<td>15</td>
<td>.000</td>
<td>375.671</td>
<td>50</td>
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Table 9

Chi Square Test of Constraints for Brief COPE Subscales Compared with Model Constrained at the Factor Loadings Paths, and Predictor Intercept

<table>
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<tr>
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<th>Model with Secure Attachment</th>
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<tr>
<td></td>
<td>$X^2$</td>
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<td>Positive Reframing</td>
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<td>Planning</td>
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Table 10

**Chi Square Test of Constraints for PTGI Subscale Compared with Model Constrained at the Factor Loadings, Paths, and Predictor Intercept**

<table>
<thead>
<tr>
<th>Subscale</th>
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<td>df</td>
</tr>
<tr>
<td>Constrained</td>
<td>970.067</td>
<td>555</td>
</tr>
<tr>
<td>Relating to Others</td>
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<td>559</td>
</tr>
<tr>
<td>Appreciation for Life</td>
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</tr>
<tr>
<td>Personal Strength</td>
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<tr>
<td>New Possibilities</td>
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Table 11

*Standardized Indirect Effects of Secure and Avoidant Attachment Styles*

<table>
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<th>Control</th>
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<td>Secure Attachment</td>
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<td>PTGI Overall</td>
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<td></td>
<td>.214</td>
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<tr>
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<td>-.086</td>
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<tr>
<td></td>
<td>.167</td>
<td>-.104</td>
</tr>
<tr>
<td>Appreciation for Life</td>
<td>.107</td>
<td>-.107</td>
</tr>
<tr>
<td></td>
<td>.190</td>
<td>-.123</td>
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<td>New Possibilities</td>
<td>.119</td>
<td>-.121</td>
</tr>
<tr>
<td></td>
<td>.208</td>
<td>-.134</td>
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<td>Personal Strength</td>
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<tr>
<td></td>
<td>.215</td>
<td>-.139</td>
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<tr>
<td>Coping</td>
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<td>Active</td>
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<td></td>
<td>.285</td>
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<td>Reframing</td>
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<td>-.099</td>
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<td></td>
<td>.179</td>
<td>-.105</td>
</tr>
<tr>
<td>Planning</td>
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<td>-.132</td>
</tr>
<tr>
<td></td>
<td>.289</td>
<td>-.172</td>
</tr>
<tr>
<td>Support</td>
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<tr>
<td>Emotional/Instrumental</td>
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<td>-.273</td>
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<td>Social</td>
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<td></td>
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Table 12

**Standardized Indirect Effects of Secure and Avoidant Attachment by Group in the Same Model**

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<td>Secure Attachment</td>
<td>Avoidant Attachment</td>
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<tr>
<td>Overall PTGI</td>
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<tr>
<td>Appreciation for Life</td>
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</tr>
<tr>
<td>New Possibilities</td>
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<td>-.076</td>
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<tr>
<td>Personal Strength</td>
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</tr>
<tr>
<td>Relating to Others</td>
<td>.047</td>
<td>-.057</td>
</tr>
</tbody>
</table>
Figure 1. Conceptual model of attachment, problem-focused coping, support-seeking coping, perceived social support, and posttraumatic growth (and the five domains of PTG)
Figure 2. Associations between perceived threat and reports of overall posttraumatic growth and the five domains of PTG
Figure 3. Associations between perceived fear and reports of overall posttraumatic growth and the five domains of PTG
Figure 4. Original five-factor CFA model of the Posttraumatic Growth Inventory
Figure 5. Respecified four-factor CFA model of the Posttraumatic Growth Inventory
Figure 6. CFA model of the Measures of Attachment Quality Secure subscale
Figure 7. CFA model of the Measures of Attachment Quality Avoidant subscale
Figure 8. CFA model of the Medical Outcomes Study Social Support Survey
Figure 9. CFA model of the custom coping measures developed from the Brief COPE
Figure 10. Measurement model including secure attachment, interpersonal coping, intrapersonal coping, perceived support, and posttraumatic growth
Figure 11. Measurement model including avoidant attachment, interpersonal coping, intrapersonal coping, perceived support, and posttraumatic growth
Figure 12. Structural model including secure attachment, interpersonal coping, intrapersonal coping, perceived support, and posttraumatic growth
Figure 13. Structural model including avoidant attachment, interpersonal coping, intrapersonal coping, perceived support, and posttraumatic growth
Figure 14. Trimmed structural model including secure attachment, interpersonal coping, intrapersonal coping, perceived support, and posttraumatic growth
Figure 15. Trimmed structural model including avoidant attachment, interpersonal coping, intrapersonal coping, perceived support, and posttraumatic growth
Figure 16. Final secure attachment model as tested with trauma group
Figure 17. Final secure attachment model as tested with control group
Figure 18. Final avoidant attachment model as tested with trauma group
Figure 19. Final avoidant attachment model as tested with control group
Figure 20. Model tested with avoidant and secure attachment with trauma group
Figure 21. Model tested with avoidant and secure attachment with control group
References


contributes to the latter satisfaction with life?. *Quality of Life Research: An International Journal of Quality of Life Aspects of Treatment, Care & Rehabilitation, 20*, 225-236.


*Dissertation Abstracts International, 63*, 3948.
Appendix A

Recruitment Email

To: STUDENT_DAILY_DIGEST-L@listserv.uconn.edu

Subject: Volunteers wanted for a research study investigating how individuals respond to significant life events

Volunteers are being recruited for a survey-based research study on responses to major life events including experiencing a traumatic event as an adolescent and transitioning to college.

If you have not yet taken this survey and are between the ages of 18 and 23, you are eligible to participate in this study.

Completion of the research survey should take approximately 15 minutes.

Upon completion of the survey, you will have the option to enter your UConn email address into a drawing for one of three $10 gift cards to Starbucks.

To access the survey site, please click on this link or copy and paste this URL into your web browser: https://acsurvey.qualtrics.com/SE/?SID=SV_9vRxX2bxcqBTGQ

For additional information about this research study, contact steven.schmidt@uconn.edu. This research is being conducted under the direction of Thomas Blank, Ph.D. in the department of Human Development and Family Studies.

This research study was approved by the UConn IRB, protocol #X12-012.
Appendix B

Information Sheet for Participation in a Research Study

University of Connecticut

Principal Investigator: Thomas Blank, Ph.D.
Student Researcher: Steven Schmidt, MA
Study Title: Posttraumatic Growth in Young Adults: The Roles of Attachment, Support, and Coping

Introduction
You are invited to participate in a research study to investigate the roles of attachment style, social support, and coping strategies in the development of post traumatic growth in young adults. I am a graduate student at the University of Connecticut, and I am conducting this research study as my Doctoral dissertation. You are being asked to participate because you are an undergraduate college student and a young adult.

Why is this study being done?
The purpose of this research study is to better understand how coping strategies, social support, and attachment with significant others (e.g., parents, peers) influence the development of posttraumatic growth.

What are the study procedures? What will I be asked to do?
Your participation in this study is voluntary. You must be between the ages of 18 and 23 to participate in this study. If you agree to take part in this study, you will be asked to complete a series of questionnaires on an Internet website, which should take an estimated 20-30 minutes to complete. These questionnaires will focus on coping strategies you have engaged in, the social support available to you, your relationships with others, and changes you have experienced since either a traumatic event you experienced as an adolescent or your transition from high school to college. There will be no subsequent contacted in the future.

What are the risks or inconveniences of the study?
It is possible that answering questions about a traumatic event or your transition from high school to college may be upsetting. You are free to skip any questions in the survey that you do not want to answer.

One known inconvenience to you for participating in this study is the amount of time it takes to complete the survey questions.

There is a potential risk to confidentiality presented in this study. If you choose to enter into the incentive drawing for one of five $10 Starbucks cards (optional), you will be asked to provide your University email address. This risk associated with providing your email address will be controlled by storing your email address in a location that is separate from the survey data you
will be providing. There will be no identifying links between this consent form, the survey data, and your email address.

What are the benefits of the study?
You may not directly benefit from participating in this research study; however, your participation may impact society by helping increase knowledge about the positive psychological effects of experiencing a traumatic event as an adolescent.

Will I receive payment for participation? Are there costs to participate?
There are no costs to be in this study. You will have the option to submit your University email address for a chance to receive one of five $10 Starbucks cards. The drawing for these cards will happen during mid-April 2012 and winners will be notified via email.

How will my personal information be protected?
The following procedures will be used to protect the confidentiality of your data. Survey data collected will be maintained in a secure location on a password protected computer. Data will be entered into a statistical data analysis software program. Only the student researcher will have access to the password. Your email (if provided) will be kept in a separate database and will not be associated with any of the questionnaire data collected. The website hosting the survey questionnaires protect your data through adherence to industry standards. At the conclusion of this study, the researchers may publish their findings. Information will be presented in summary format and you will not be identified in any publications or presentations.

You should also know that the UConn Institutional Review Board (IRB) and the Office of Research Compliance may inspect study records as part of its auditing program, but these reviews will only focus on the researchers and not on your responses or involvement. The IRB is a group of people who review research studies to protect the rights and welfare of research participants.

Can I stop being in the study and what are my rights?
You do not have to be in this study if you do not want to. If you agree to be in the study, but later change your mind, you may drop out at any time. There are no penalties or consequences of any kind if you decide that you do not want to participate. You do not have to answer any question that you do not want to answer.

Whom do I contact if I have questions about the study?
Take as long as you like before you make a decision. We will be happy to answer any question you have about this study. If you have further questions about this study or if you have a research-related problem, you may contact me (Steven Schmidt at Steven.Schmidt@uconn.edu) or my advisor (Thomas Blank at 860-486-3819). If you have any questions concerning your rights as a research participant, you may contact the University of Connecticut Institutional Review Board (IRB) at 860-486-8802.

☐ I agree to participate

☐ I do not want to participate
Appendix C

Trauma / Threat / Fear

Did you experience any of the following events during the years that you were in high school?
   Yes
   No

• Diagnosed with a life-threatening health condition
• A life-threatening injury or accident
• The death of a close family member or friend
• Victim or witness of a violent crime or assault
• Victim or witness of physical or sexual abuse
• Loss of your home
• Terrorist attack
• Natural or man-made disaster
• Unexpected pregnancy or miscarriage

If you experienced more than one of the above events, please focus on the one that you believe has had the greatest impact on you for the remainder of this survey.

Please indicate the age at which that trauma was experienced. __________

To what extent did you perceive the experience as a threat of death or serious injury?
   1 = not at all
   2 = a little
   3 = somewhat
   4 = a lot
   5 = very much

Given your experience with the event, to what extent has your response to it ever involved intense fear or helplessness?
   1 = not at all
   2 = a little
   3 = somewhat
   4 = a lot
   5 = very much
Appendix D

Posttraumatic Growth Inventory

Indicate for each of the statements below the degree to which this change occurred in your life as a result of your traumatic event:

0 = I did not experience this change as a result of my traumatic event
1 = I experienced this change to a very small degree as a result of my traumatic event
2 = I experienced this change to a small degree as a result of my traumatic event
3 = I experienced this change to a moderate degree as a result of my traumatic event
4 = I experienced this change to a great degree as a result of my traumatic event
5 = I experienced this change to a very great degree as a result of my traumatic event

I changed my priorities about what is important in life.
I have a greater appreciation for the value of my own life.
I developed new interests.
I have a greater feeling of self-reliance.
I have a better understanding of spiritual matters.
I more clearly see that I can count on people in times of trouble.
I established a new path for my life.
I have a greater sense of closeness with others.
I am more willing to express my emotions.
I know better that I can handle difficulties.
I am able to do better things with my life.
I am better able to accept the way things work out.
I can better appreciate each day.
New opportunities are available which wouldn't have been otherwise.
I have more compassion for others.
I put more effort into my relationships.
I am more likely to try to change things which need changing.
I have a stronger religious faith.

I discovered that I'm stronger than I thought I was.

I learned a great deal about how wonderful people are.

I better accept needing others.
Appendix E

Measure of Attachment Qualities

Respond to each of the following statements by expressing how much you agree with it (if you do generally agree) or how much you disagree with it (if you generally disagree). Please be as accurate as you can be throughout, and try especially hard not to let your answer to any one item influence your answer to any other item. Treat each one as though it is completely unrelated to the others. There are no right or wrong answers, you are simply to express your own personal feelings and opinions.

1 = I disagree with the statement a lot
2 = I disagree with the statement a little
3 = I agree with the statement a little
4 = I agree with the statement a lot

When I'm close to someone, it gives me a sense of comfort about life in general.

I often worry that my partner (or close friends) doesn't really love me.

I have trouble getting others to be as close as I want them to be.

I find it easy to be close to others.

I often worry my partner (or close friends) will not want to stay with me.

Others want me to be more intimate than I feel comfortable being.

It feels relaxing and good to be close to someone.

I am very comfortable being close to others.

I don’t worry about others abandoning me.

My desire to merge sometimes scares people away.

I prefer not to be too close to others.

I find others are reluctant to get as close as I would like.

I get uncomfortable when someone wants to be very close.

Being close to someone gives me a source of strength for other activities.
Appendix F

Brief COPE

These items deal with ways you've been coping with the stress in your life since the traumatic event (or transition from high school to college). There are many ways to try to deal with problems. These items ask what you've done or have been doing to cope with this one. Obviously, different people deal with things in different ways, but I'm interested in how you've tried to deal with it. Each item says something about a particular way of coping. I want to know to what extent you've done or have been doing what the item says (how much or how frequently). Don't answer on the basis of whether it seems to be working or not—just whether or not you've done or are doing it. Use these response choices. Try to rate each item separately in your mind from the others. Make your answers as true FOR YOU as you can.

1 = I didn’t or don’t do this at all
2 = I’ve been doing or did do this a little bit
3 = I've been doing or did do this a medium amount
4 = I did or do this a lot

Turning to work or other activities to take my mind off things.

Concentrating my efforts on doing something about the situation I'm in.

Saying to myself "this isn't real."

Using alcohol or other drugs to make myself feel better.

Getting emotional support from others.

Giving up trying to deal with it.

Taking action to try to make the situation better.

Refusing to believe that it has happened.

Saying things to let my unpleasant feelings escape.

Getting help and advice from other people.

Using alcohol or other drugs to help me get through it.

Trying to see it in a different light, to make it seem more positive.

Criticizing myself.

Trying to come up with a strategy about what to do.
Getting comfort and understanding from someone.

Giving up the attempt to cope.

Looking for something good in what is happening.

Making jokes about it.

Doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.

Accepting the reality of the fact that it has happened.

Expressing my negative feelings.

Trying to find comfort in my religion or spiritual beliefs.

Trying to get advice or help from other people about what to do.

Learning to live with it.

Thinking hard about what steps to take.

Blaming myself for things that happened.

Praying or meditating.

Making fun of the situation.
Appendix G

Medical Outcomes Study – Social Support Survey

People sometimes look to others for companionship, assistance, or other types of support. How often has each of the following kinds of support been available to you if you need it since your traumatic event?

1 = None of the time
2 = A little of the time
3 = Some of the time
4 = Most of the time
5 = All of the time

Someone to give you information to help you understand a situation.

Someone to give you good advice about a crisis.

Someone to confide in or talk to about yourself or your problems.

Someone whose advice you really want.

Someone to share your most private worries and fears with.

Someone to turn to for suggestions about how to deal with a personal problem.

Someone who understands your problems.

Someone to help you if you were confined to bed.

Someone to take you to the doctor if you needed it.

Someone to prepare your meals if you were unable to do it yourself.

Someone to help with daily chores if you were sick.

Someone who shows you love and affection.

Someone to love and make you feel wanted.

Someone who hugs you.

Someone to have a good time with.

Someone to get together with for relaxation.

Someone to do something enjoyable with.
Someone to do things with to help you get your mind off things.
Appendix H

Satisfaction with Life Scale

Below are five statements with which you may agree or disagree. Using the 1-7 scale below, indicate your agreement with each item by clicking on the appropriate number below each statement. Please be open and honest in your responding.

1 = Strongly Disagree
2 = Disagree
3 = Slightly Disagree
4 = Neither Agree nor Disagree
5 = Slightly Agree
6 = Agree
7 = Strongly Agree

In most ways my life is close to ideal.

The conditions of my life are excellent.

I am satisfied with life.

So far I have gotten the important things I want in life.

If I could live my life over, I would change almost nothing.
Appendix I

Demographics

What is your current age? __________

Are you:
  Female
  Male

What race/ethnicity do you primarily identify with?
  American Indian or Alaska Native
  Asian
  Black or African American
  Hispanic or Latino
  Native Hawaiian or Other Pacific Islander
  White
  Other

What is your college major? __________

What is your class year?
  Freshman
  Sophomore
  Junior
  Senior
  Graduate