Meaning and Resilience as Predictors of Posttraumatic Growth Among College Students

Meredith Blackwell

University of Mississippi. Sally McDonnell Barksdale Honors College

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MEANING AND RESILIENCE AS PREDICTORS OF POSTTRAUMATIC GROWTH AMONG COLLEGE STUDENTS

by
Meredith A. Blackwell

A thesis submitted to the faculty of The University of Mississippi in partial fulfillment of the requirements of the Sally McDonnell Barksdale Honors College.

Oxford
May 2016

Approved by

Advisor: Professor Stefan Schulenberg

Reader: Professor Michael Allen

Reader: Doctor Debra Young
Meaning in life is related to such outcomes as resilience and the potential to experience posttraumatic growth among populations that have experienced a traumatic event. However, the literature is conflicted on the relationship between resilience and posttraumatic growth. The goal of this study is to further evaluate the relationship between meaning, resilience, and posttraumatic growth among a college student sample. Six-hundred and twelve participants, ages 18-26, completed self-report measures about their experience with potentially traumatic events (Life Events Checklist), their perceived purpose in life (Purpose in Life test – Short Form), resilience (Brief Resilience Scale), and posttraumatic growth (Posttraumatic Growth Inventory – Short Form). After data cleaning, five-hundred and thirteen participants indicated experiencing at least one potentially traumatic event. Using the Posttraumatic Stress Disorder Checklist – Civilian form (PCL-C), two subsamples of 99 and 414 participants who scored above and below the diagnostic threshold for posttraumatic stress disorder (PTSD), respectively, were used to calculate additional results. The hypotheses examined included the following: 1) meaning and resilience scores would be positively correlated; 2) meaning scores would be predictive of posttraumatic growth; 3) meaning would be a stronger predictor of posttraumatic growth scores than resilience; and 4) posttraumatic growth and posttraumatic stress scores would be positively correlated. The results supported these hypotheses. Meaning and resilience had a medium positive correlation ($r = .354$, $p < .001$) in the total sample, with similar scores in both subsamples. In the overall sample
\( F(1, 512) = 9.624, p < .01, R^2 = .018 \) and with individuals scoring below the diagnostic threshold for PTSD \( F(1, 413) = 3.586, p = .059, R^2 = .007 \), meaning played a small, significant role in predicting posttraumatic growth. Though in the portion of the sample that exceeded the diagnostic threshold for PTSD, that role was much larger \( F(1, 99) = 19.528, p < .001, R^2 = .165 \). Resilience had a slightly negative relationship with posttraumatic growth \( r = -.08, p < .035 \), but in the overall sample resilience enhanced the effect of meaning on posttraumatic growth \( F(2, 511) = 9.326, p < .001, R^2 = .035 \), nearly doubling it. Below the cutoff meaning was not significantly predictive of posttraumatic growth \( F(1, 413) = 3.568, p = .059, R^2 = .007 \) and resilience had a slightly positive relationship \( F(1, 98) = 3.878, p < .05, R^2 = .007 \) and made up .7% of the predictive value, but measured with resilience this increased to 1.9% \( F(2, 511) = 5.012, p < .01, R^2 = .019 \) Above the cutoff meaning and resilience measured together had the same result of 16.5% of the predictive value, which is identical to meaning measured independently \( F(2, 98) = 19.528, p < .001, R^2 = .165 \). Additionally, in the total sample there was a small and significant correlation between posttraumatic stress and posttraumatic growth \( r = .163, p < .001 \), but this became insignificant among the sample which exceeded the diagnostic threshold for PTSD on the PCL-C \( r = .006, p = .954 \). The results of this study suggest that meaning is related to both resilience and posttraumatic growth, and should be further studied to understand the role it may play in enhancing both. Implications of the study and future research directions are discussed.

**Keywords**: meaning in life; resilience; posttraumatic growth; trauma; positive psychology; protective factors
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Meaning and Resilience as Predictors of Posttraumatic Growth among College Students

The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) defines a traumatic event as an experience where one has “experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others” (APA, 2000, p. 467). Approximately 60% to 85% of college students have experienced a potentially traumatic event (Elhai et al., 2012; Frazier et al., 2009; Read, Oimette, White, Colder, & Farrow, 2011), such as the unexpected loss of a loved one, family violence in childhood, life threat to a loved one, natural disasters, motor vehicle or other accidents, and sexual victimization and interpersonal violence (O’Bryan, McLeash, Kraemer, & Fleming, 2014; Read et al., 2011; Shakespeare-Finch & Barrington, 2012).

While most individuals’ beliefs, or worldviews, promote their ability to effectively cope with day-to-day stressors, a traumatic event may call into question these perspectives, making it difficult to cope with the event (Janoff-Bulman, 1992; Steger & Park, 2012; Tedeschi, Calhoun, & Groleau, 2015). Consequently, when a potentially traumatic event calls into question one’s beliefs, an individual may experience negative psychological outcomes such as posttraumatic stress symptoms (PTSS) or disorder (PTSD; Bramsen, van der Ploeg, van der Kamp, & Ader, 2002; Edmunson et al., 2011; Horowitz, 1997; Janoff-Bulman, 1992; Lazarus, 1991), depression (Maguen, Neria, Conoscenti, & Litz, 2009), or anxiety-related disorders (McFarlane, van Hoof, & Goodhew, 2009).
Posttraumatic Stress Disorder (PTSD) is the topic most often studied with respect to mental health and trauma-related responses to threatening events. Around 8-9% of college students meet criteria for PTSD (Kessler et al., 1995; Marx & Sloan, 2005; McDevitt-Murphy, Weathers, Flood, Eakin, & Benson, 2007; Read et al., 2011; Smyth, Hockemeyer, Heron, Wonderlich, & Pennebaker, 2008). The event that most commonly contributes to PTSD among college students is sexual assault with women experiencing sexual assaults at much higher rates than do men (Read et al., 2011). Exposure to military combat, childhood abuse, accidents witnessing a death, natural disasters, and interpersonal violence are also highly associated with the development of PTSD, in both college students and the general population (Breslau et al., 1998; National Collaborating Center for Mental Health, 2005).

However, some can experience a potentially traumatic event and experience much less stress than another person who experienced the same event, or possibly not exhibit signs of stress at all. In other words, some people exhibit resilience following a trauma. Some recover with or without the aid of treatment (Aiena, Baczwaski, Schulenberg, & Buchanan, 2015; Aiena, Buchanan, Smith, & Schulenberg, in press; Bonanno, Brewin, Kaniasty, & La Greca, 2010; Read et al., 2011; Saakvitne, Tennen, & Affleck, 1998; Tedeschi & Calhoun, 1995). Even for people who have undergone the same traumatic event, stress responses often vary in severity (Stratta et al., 2015). Two people may experience the same event, but experience different outcomes; one person may experience maladaptive stress-related responses while the other person may experience adaptive stress-related outcomes.
Thus, there is interest in understanding the role of various protective factors which promote adaptive and effective coping and the minimization of negative outcomes, such as PTSD (Stratta et al., 2015). Three protective factors which encourage effective coping and recovery from psychological distress are social support (Keitel, Zevon, Rounds, Petrelli, & Karakousis, 1990; Kohli et al., 2015; Llabre et al., 2015), self-efficacy (Compton, 2013; Cummings & Swickert, 2010; Hall et al., 2010), and reflective rumination (Tripplett, Tedeschi, Cann, Calhoun, & Reeve, 2012; Weathers, Aiena, Blackwell, & Schulenberg, in press). Meta-analyses indicate that the perceived lack of availability of social support is one of the strongest predictors of PTSD following traumatic events (Ozer et al., 2003). People who feel secure in their social relationships are more likely to seek out support in times of distress, lowering their perceived stress (Mikulincer, Florian, & Weller, 1993). On the other hand, those who feel insecure are more likely to withdraw from their social network, which heightens distress levels (Frazier, Mortensen, & Steward, 2005). Additionally, self-efficacy, the belief that one is competent and can accomplish goals, serves as a buffer against stress; people with high levels of self-efficacy are more likely to believe that they can effectively deal with adverse circumstances that may come their way (Bosmans, van der Knaap, & van der Velden, 2016). For example, they may be more likely to disclose to a social group and return to their daily routine, and less likely to be overwhelmed by the feelings of hopelessness and helplessness that contribute to depression. Another protective factor, reflective rumination, is the intentional processing of a stressful event (Taku, Cann, Tedeschi, & Calhoun, 2009). Ruminating is thinking about an event repeatedly, often in a
negative or maladaptive fashion, while reflective rumination emphasizes processing the significance of an event, placing it in the broader context of one’s life (Tedeschi & Calhoun, 2004). When done with consideration and intention, it is viewed to be a constructive way to reduce distress by allowing one to review the experience, problem-solve in an adaptive manner, and ultimately aim to comprehend an event, rather than be overwhelmed by it (Taku et al., 2009). Rumination, when compulsive and unintentional, can be intrusive and psychologically harmful (Taku et al., 2009). But intentional rumination about the event can lead to desensitization to the feeling of threat associated with a memory (Christea, Matu, Tatar, & David, 2013). With posttraumatic stress, thoughts or reminders of an event can trigger the same hyperarousal as the actual threatening event, even in a safe context. For example, a person who has survived a natural disaster may find himself or herself experiencing intrusive rumination about the event, and feeling the same stress and panic felt at the time it occurred. By thinking reflectively outside of the context of a life threatening situation, that anxiety and stress associated with the memory of the event can be reduced. Additionally, reflective rumination enhances the perception of personal growth (Tedeschi & Calhoun, 1996).

Posttraumatic Growth

Some survivors of trauma report positive outcomes from their experience. In the research literature this idea has become known as posttraumatic growth. Specifically, posttraumatic growth is defined as the “…positive psychological change experienced as a result of the struggle with highly challenging life circumstances” (Tedeschi & Calhoun, 2004, p. 1). Thus, it is a concept that represents positive development following a
potentially traumatic event. For people to experience posttraumatic growth, they must have their respective worldviews jeopardized (Janoff-Bulman, 1992; Steger & Park, 2012; Tedeschi, Calhoun, & Groleau, 2015). For example, the feeling that people are generally good or the world is a safe place may be challenged. Following a traumatic event, some individuals are able to reconstruct their worldview and view of themselves in ways that are even better developed, or more adaptive, than they were previously. One important factor to remember is that while many people will go on to perceive or experience posttraumatic growth following a potentially traumatic event, the concept does not imply that these individuals do not experience any posttraumatic stress symptoms (Tedeschi & Calhoun, 2004). Rather, distress is a key component of posttraumatic growth; a traumatic experience must be significant enough to challenge one’s core beliefs for ruminative and appraisal processes to develop internal growth (Tedeschi & Calhoun, 2004). Consequently, a person who considers a potentially traumatic event’s positive outcomes may develop a healthy clarity about life goals and whether priorities have changed or should change (Triplett et al., 2012).

Overall, there are many facets of a person’s life that can contribute to growth following potentially traumatic events (Rajandram et al., 2011; Tedeschi & Calhoun, 1996). Many of these facets are included in the Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996). The PTGI assesses five facets of positive psychological change which include: relating to others, new possibilities, personal strength, spiritual
change, and appreciation of life (Calhoun & Tedeschi, 1999; Tedeschi & Calhoun, 2012; Weathers et al., in press).

One facet of posttraumatic growth is relating to others. Some people who experience a potentially traumatic event feel an enhanced closeness to others—an enhanced sense of relating to loved ones and to humanity (Calhoun & Tedeschi, 1999, 2004). For example, a survivor of a life-threatening experience may perceive the need to talk about the event as a way to process it. This self-disclosure and vulnerability enhances one’s feeling of emotional intimacy and one’s sense of social cohesion (Kaniasty, 2012). Disclosure also serves as a gradual exposure to the effects of the event, often assisting in the processing of the experience (Niederhoffer & Pennebaker, 2009; Zakour, 2012). With specific regard for studies of college students, undergraduates who report a stronger reliance on social support also report greater levels of posttraumatic growth (Leeman et al., 2015; Swickert & Hittner, 2009). When people who experience a potentially traumatic event receive active social support (e.g., by discussing the event with loved ones, by reaching out to their social group) as opposed to withdrawing and isolating, they are more likely to rate the event as less stressful (Lakey & Cohen, 2000). Thus, social support may lead to reinforced coping and problem-solving skills (Lakey & Cohen, 2000). Ultimately, survivors who rely on their respective social networks report greater levels of posttraumatic growth (Hobfoll et al., 2007; Kaniasty & Norris, 1995; Norris & Kaniasty, 1996; Vranceanu, Hobfoll, & Johnson, 2007).

\[\text{\textsuperscript{1}}\text{Oftentimes research studies only report the total posttraumatic growth (PTGI) score, even though each individual component can be considered in isolation in relation to other constructs. Thus, literature in the following paragraphs about posttraumatic growth components will be more focused on a few salient studies than literature in other sections.}\]
In addition to relating to others, people who report experiencing posttraumatic growth in response to a potentially traumatic event often perceive new possibilities as a positive outcome (Tedeschi & Calhoun, 1996, 2012). Traumatic events may challenge perspectives about one’s self and the world and may lead to psychological distress (Janoff-Bulman, 1992). But oftentimes, as people rebuild their worldviews, they find their lives are moving, or perceive that they can move, in a different direction than they were before. Sometimes people find that their new perspective, their new direction in life, is positive, in spite of the painful catalyst for change (Tedeschi & Calhoun, 2012). People who experience a potentially traumatic event may feel inspired to focus their time and energies on areas more in line with their values, such as spending more time with family, being more present in those moments, volunteering, or choosing a career path that provides a greater sense of calling. By way of example, and with specific regard for college students, resource loss following Hurricane Katrina has been associated with the perception of new possibilities. Moon (2013) reported that the more material loss people experienced as a result of the hurricane, the more likely they were to believe the event opened doors for them to focus on other important areas of their lives.

The third facet of posttraumatic growth represented in the PTGI is personal strength. In some cases, people who experience a potentially traumatic event perceive that the experience made them stronger (Bronstein & Tzivian, 2014; Calhoun & Tedeschi, 1999). It is positively correlated with conscientiousness and openness to new experiences (Karanci et al., 2016). Experiencing and adaptively responding to a painful event can create a sense of mastery that bolsters perceptions of competency and self-efficacy;
people learn they can endure and overcome adverse circumstances (Bryant, 2001; Calhoun & Tedeschi, 1999). Zoellner (2008) found that in survivors of potentially traumatic events which not have PTSD, they were more likely to exhibit personal strength than any of the other five facets. When survivors of a potentially traumatic event become aware of their personal strength it enhances their sense of internal control (Ball & Martin, 2012; Orchowski et al., 2008).

Many survivors who experience posttraumatic growth report experiencing spiritual growth (De Castella & Simmonds, 2013; Taku, Tedeschi, & Cann, 2015). This growth can include spirituality, defined as “the yearning within the human being for meaning, for that which is greater than the encapsulated individual”, or religiosity, which is defined as “a complex pattern of writings, rituals and ethical codes that are deemed necessary for spiritual fulfillment” (Thorne, 2001, p. 438). People who have undergone challenging circumstances often report that relying on their spirituality helped them to find meaning in the event, or gave them a sense of peace about the lack of apparent meaning in the event (Garlick et al., 2011; Tsai et al., 2013). Among college students, openness to religious and spiritual change is associated with posttraumatic growth following a potentially traumatic event (Calhoun, Cann, Tedeschi, & McMillan, 2000). Thus, those more willing to have evolving belief systems are more likely to feel their beliefs have grown. Spirituality may also help survivors reconcile worldviews that existed prior to the event with new, evolving post-trauma perspectives (De Castella & Simmonds, 2013). People often are left with questions, such as “How could this happen?”, “Was this random?”, “Is there a purpose in it?”, and “Does God care?” In attempting to answer
these and related questions, people may find solace and support, or they may come to doubt their pre-event beliefs (Exline, Park, Smyth, & Carey, 2011).

Finally, some people who experience a potentially traumatic event emerge with an enhanced appreciation of life. That is to say, they report that they cherish their daily experiences more, or try to make the most of their time. Referring to the previously mentioned study of college students who had experienced Hurricane Katrina, those who reported resource loss also reported perceiving a greater sense of appreciation of life (Moon, 2013). It may very well be the case that, for some people, the loss of material belongings may highlight a sense of perspective, an appreciation for what was not lost, a perception of what is truly important (e.g., loved ones, how one spends one’s moments, the nature and quality of life itself). Being confronted by the randomness and fragility of life through a potentially traumatic event often forces people to reevaluate whether they are fully experiencing and savoring life (Tedeschi & Calhoun, 1995). In response to a potentially traumatic event, some people aim for more purposeful and wiser living (Tedeschi & Calhoun, 2012), making efforts to get as much out of the time that they have as possible. Many people who have experienced a traumatic event report that they can apply their newfound appreciation to many areas of their lives (Calhoun & Tedeschi, 1990, 1999; Thomas, DiGuilio, & Sheehan, 1991), such as relationships, appreciating hobbies, etc.

Measured together, the five aspects of posttraumatic growth are negatively correlated with maladaptive responses to challenging circumstances, such as avoidance, maladaptive coping, and emotional numbing—(Rajandram, Jenewein, McGrath, &
Conversely, there are other adaptive coping mechanisms that are associated with a growth-response to a potentially traumatic event, such as hope, optimism, benefit finding, and positive reframing (Rajandram et al., 2011; Tedeschi & Calhoun, 2004). Posttraumatic growth also has support within college student samples (Leeman, Dispenza, & Chang, 2015; Lindstrom, Cann, Calhoun, & Tedeschi, 2013; Wild & Paivio, 2004). Leeman et al. (2015) found that many students enter college with pre-existing histories of trauma. Moreover, students with adaptive coping skills (e.g., cognitive processing, disclosure to a social group) and a strong dependence on social support are more likely to experience posttraumatic growth. Wild and Paivio (2004) similarly found that positive coping is associated with posttraumatic growth.

In spite of widespread self-reported change, there is research that casts doubt on the validity of posttraumatic growth. Some researchers posit that posttraumatic growth is illusory, that people who experience potentially traumatic events have a skewed perspective and simply want to believe something good can come out of something bad (Dursun, Steger, Bentele, & Schulenberg, in press; Frazier & Kaler, 2006; Frazier et al., 2009; Hobfoll et al., 2007; Lechner & Antoni, 2004; Linley & Joseph, 2004; Westphal & Bonanno, 2007; Zoellner & Maercker, 2006). Thus, there is a question as to whether self-reported posttraumatic growth reflects actual change or the perception of change. Frazier and colleagues (2009) had people complete their endorsement of the five facets of posttraumatic growth before and after experiencing a potentially traumatic event to determine whether change is actual or perceived. They found that participants’ answers were only higher after the potentially traumatic event in the area of spiritual growth, none
of the other four areas. Thus, they claimed that posttraumatic growth, at least four of its five facets, might only reflect the illusion of change in one’s life.

Despite this controversy in the posttraumatic growth literature, there are data that indicate that people who have undergone potentially traumatic events do experience at least some measurable changes. For instance, friends and family often notice growth in the individual following the event, indicating second-party support for growth and positive change (Shakespeare-Finch & Barrington, 2012). Additionally, individuals who cope adaptively, rely on emotional support, search for positive interpretations, and/or rely on emotional regulation tend to report greater levels of posttraumatic growth and fewer PTSD symptoms (Stasko & Ickovics, 2007), which is consistent with theories of growth. There are also data from multicultural studies that report the existence of posttraumatic growth in Western and non-Western cultures, suggesting the universality of the experience (Ho, Chu, & Yiu, 2008; Shakespeare-Finch & Copping, 2006; Splevins, Cohen, Bowley, & Joseph, 2010; Taku, 2013; Taku et al., 2009). Furthermore, Lim and DeSteno (2015, in press) conducted two studies that found that an increase in adversity in one’s life predicts both higher levels of empathy and an actual increase in behavioral compassion (i.e., charitable giving). This research suggests that while there is support for the idea that people report growth following adversity because they believe that they will, or are expected or encouraged to (Frazier et al., 2009), there is evidence that concrete and measurable change may in fact occur.

While some people do report experiencing posttraumatic growth—not everyone will. Some people may not experience much stress, and have no need to reevaluate their
values and directions in life. However, there are also potentially negative trajectories. A path leading to growth is not the default outcome of a traumatic experience, and often there are devastating outcomes. Avoidance strategies, not reaching out for social support, and other maladaptive cognitive processes and coping mechanisms are correlated with greater numbers of posttraumatic stress symptoms and lower, or nonexistent, levels of posttraumatic growth (Currier, Lisman, Harris, Tait, & Erbes, 2013; Maercker & Müller, 2004; Maercker, Povilonyte, Lianova, & Pohlmann, 2009; Mueller, Moergeli, & Maercker, 2008; Mueller, Orth, Wang, & Maercker, 2009; Rajandram, Jenewein, McGrath, & Zwahlen, 2011). Moreover, avoidance and negative coping processes are correlated with higher rates of depression (Currier, Lisman, Harris, Tait, & Erbes, 2013; Oquendo et al., 2005), emotional disengagement (D'Zurilla & Chang, 1995), drug and alcohol use (Bonn-Miller, Vujanovic, Twohig, Medina, & Huggins, 2010; Vujanovic, Bonn-Miller, & Marlett, 2011), aggression (Hampel & Petermann, 2006), inability to regulate emotions (Ullman, Peter-Hagene, & Reylea, 2014), hostility and withdrawal in close relationships, and decreases in motivation (Iversen, Sveaass, & Morken, 2014).

In contrast, adaptive coping is related to lower degrees of distress and fewer symptoms of depression (Currier, Lisman, Harris, Tait, & Erbes, 2013; Oquendo et al., 2005), as well as greater levels of posttraumatic growth (Rajandram, Jenewein, McGrath, & Zwahlen, 2011), as well as stress-related growth among college students (Armeli, Gunthert, & Cohen, 2001; Park & Helgeson, 2006). Those who rely on social support and positive mechanisms such as emotion regulation are more likely to believe they have grown and improved because of a potentially traumatic event rather than believing they
had only experienced negative outcomes because of the event. To develop posttraumatic growth, one must be able to rely on adaptive rather than maladaptive coping as a means of addressing trauma-related distress. Two methods of adaptive coping, and which are related to the concept of posttraumatic growth, are resilience and perceived meaning.

**Resilience**

In a broad sense, resilience is the ability to adapt to, weather, or bounce back from stressors, quickly restoring balance to one’s life after an adverse experience (Bonanno, 2004; Wagnild & Young, 1993). Resilience is positively correlated with well-being, optimism, self-esteem, gratitude, and positive affect (Arnetz et al., 2013; Baldwin, Jackson, Okoh, & Cannon, 2011; Christopher, 2000; Fredrickson, Tugade, Waugh, & Larkin, 2003; Nishi, Uehara, Kondo, & Matsuoka, 2010; Scali et al., 2012; Tugade & Fredrickson, 2004). Additionally, resilience is associated with lower levels of hopelessness, depression, and general distress (Bensimon, 2012; Gouzman et al., 2015; Mo, Lau, Yu, & Gu, 2014; Roberts, 2013; Wilson, Morris, & Chambers, 2014; Yu et al., 2014).

With respect to the relationship between resilience and posttraumatic growth, researchers have reported mixed results. These varied findings may be the result of resilience being defined in a number of different ways by researchers. According to Wong and Wong (2012), a resilient person is one who, after an experience of adversity, portrays an adaptive use of one’s available internal and environmental resources. Other researchers define resilience as maintaining a sense of well-being (Southwick, Bonanno, Masten, Panter-Brick, & Yehuda, 2014), or functioning at “normal” or routine levels
(Bonanno & Mancini, 2012), after an adverse event. As a result of these various definitions of resilience, some researchers have found that resilience is significantly and positively correlated with posttraumatic growth (Aiena et al., 2013; Bensimon, 2012; Mo, Lau, Yu, & Gu, 2014; Roberts, 2013; Wilson, Morris, & Chambers, 2014; Wu, Zhang, Liu, Zhou, & Wei, 2016; Xiao, Xin-Chun, & Jie-Ling, 2015; Yu et al., 2014) and other researchers have found an inverse relationship (Levine, Laufer, Stein, Hamama-Raz, & Solomon, 2009; Moore, Cerel, & Jobes, 2015; Westphal & Bonanno, 2007; Zerach et al., 2013).

These various definitions of resilience may account for the conflicting studies on posttraumatic growth. While resilience is sometimes defined by a lack of posttraumatic stress symptoms, posttraumatic growth requires a threshold of stress to occur (Stasko & Ickovics, 2007). But the most resilience measures score one’s perceived ability to cope with stressors well, not avoid it altogether. Perhaps by narrowing the definition of resilience to a lack of stress symptoms, some research overlooks how resilience helps to minimize stress in these more severe cases. For example, individuals who actively engage in their environment show greater degrees of posttraumatic growth and lower degrees of posttraumatic stress (Stasko & Ickovics, 2007). In this case, resilience may look like Wong and Wong’s definition (2012) of an adaptive use of internal and environmental resources to minimize stress. Other researchers assume resiliency is a component of posttraumatic growth (Konvisser, 2013; Tan, 2013). While resilience, “bouncing back,” and posttraumatic growth, “bouncing forward,” should not be equated to one another,
they are related processes of recovery. To experience both, research is pointing to another construct that may play a role in bolstering resilience and posttraumatic growth.

**Meaning**

Previous research has found that meaning enhances resilience’s ability to protect against posttraumatic stress symptoms (Aiena et al., in press). Quite possibly, meaning may augment or even account for the relationship between resilience and posttraumatic growth. Meaning is a perception of “significance or a sense of mattering to the world, of the goals or life missions individuals are striving to accomplish, and comprehensibility of one’s existence” (Halusic & King, 2013, p. 446). Purpose is a related construct thoroughly intertwined with meaning; while meaning connotes a sense of mattering to the world, purpose is a subset of meaning which indicates the presence of goals or intention to engage with the world (Bronk, 2014; Damon, 2008). For many research purposes, meaning refers to both a sense of meaning and purpose. Meaning is positively associated with hope, optimism, self-efficacy, positive coping, and general psychological well-being (Melton & Schulenberg, 2008; Reker, 1994; Ryff, 2000; Ryff & Singer, 1998a, 1998b; Savolaine & Granello, 2002; Schulenberg, Hutzell, Nassif, & Rogina, 2008; Spiegel & Fawzy, 2002; Zika & Chamberlain, 1992). Meaning appears to play a significant role in the development of the positive life areas one sees in posttraumatic growth (Weathers et al., in press). More specifically, meaning is linked to self-efficacy and personal strength (Aiena et al., 2015; Drescher et al., 2012; Schulenberg, Smith, Drescher, & Buchanan, in press), spirituality (Ivtzan, Chan, Gardner, & Prashar, 2013; Khumalo, Wissing, & Schutte, 2014; Park, 2012; Tsai et al., 2015), a more open and appreciative life (Bronk,
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2014; Drescher et al., 2012; Melton & Schulenberg, 2008; Schulenberg et al., 2008; Volkert, Schulz, Brütt, & Andreas, 2014; Wong, 2012), and enhanced sociality and sense of belonging (Lambert et al., 2013; Melton & Schulenberg, 2008; Steger, Mann, Michels, & Cooper, 2009). Additionally, reflective rumination with a positive orientation, which is an intentional processing of a past event and a by-product of the meaning-making process (Frankl, 1958, 1990; Lukas & Hirsch, 2002), has also been linked to posttraumatic growth (Tedeschi & Calhoun, 2004). Damon (2008) found that youths who responded resiliently to difficult situations had a greater sense of purpose and Bronk (2005) demonstrated that youth with a strong sense of purpose developed a sense of resiliency and were likely to overcome challenges.

One of the ways to achieve posttraumatic growth is by making sense of the event through cognitive processing, to ascribe to it a purpose or a meaning (Tedeschi & Calhoun, 2004). Meaning has also been shown to foster a path to posttraumatic growth and life satisfaction (Triplett, Tedeschi, Cann, Calhoun, & Reeve, 2012), and the extensive relationship between meaning and the factors which lead to posttraumatic growth indicates that the relationship is important to investigate to enhance adaptive coping and positive responses (Weathers et al., in press).

Despite meaning’s significant link to posttraumatic growth and adaptive responses, a few studies have linked the high levels of meaning to maladaptive coping. Meaning has been shown to be predictive of personal strength in a wide range of studies (e.g., Kim, Kjervik, Belvea, & Choi, 2011; Park, 2004), and while much of the research indicates that higher levels of meaning are associated with fewer symptoms of trauma
(Cromer & Smyth, 2010; Fontana & Roseheck, 2005; Lightsey & Sweeney, 2008; Schulenberg, Smith, Drescher, & Buchanan, in press), a few research groups have reported an inverse relationship between high levels of meaning and adaptive coping (e.g., Bonanno, Papa, Lalande, Zhang, & Noll, 2005; Davis, Nolen, Hoeksema, & Larson, 1998). This may be in part due to researchers using various definitions of meaning, methods of measuring meaning, and having differing correlational designs to study this relationship (Park, Edmondson, Fenster, & Blank, 2008). For example, some researchers note a distinction between presence and search for meaning: presence indicating one already having a sense of purpose or value in their lives, while search describes the motivation for a given individual to discover a sense of purpose (Dezutter et al., 2013; Dursun et al., in press). Presence of meaning consistently indicates higher psychological functioning and correlates with adaptive coping mechanisms discussed as essential for posttraumatic growth (as noted earlier), but search for meaning can be both adaptive and maladaptive (Dezutter et al., 2013; Dursun et al., in press). A person may be high in both presence and search, low in both, or high in one and low in the other, but without presence of meaning, people may experience maladaptive consequences that facilitate a search for meaning (Dezutter et al., 2013; Dezutter et al., 2014; Linley & Joseph, 2011; Reker, 1999; Schulenberg, Baczwaski, & Buchanan, 2014; Steger, Kashdan, Sullivan, & Lorentz, 2008). If a person is searching for purpose following an event, but sees the event as senseless, then that person is likely to respond in increasingly maladaptive ways in comparison to a person who is able to discern or ascribe a sense of meaning or purpose to the event.
Park (2010) posited a meaning-making model that suggests that people have broad, or global, belief systems that hold worldviews, goals in life, and values that provide a sense of purpose. Park posited that when potentially traumatic events challenge people’s worldviews, they may experience distress and seek to resolve the challenge either by minimizing the significance of the event, changing one’s global belief systems, or experiencing stress-related growth. Believing that one’s meaning in life still exists after a potentially traumatic event is associated with lower distress (Park, Edmondson, Fenster, & Blank, 2008) and a greater likelihood for stress-related growth (Steger, Owens, & Park, 2015). Thus, in trauma-related situations, research suggests that meaning is a pivotal component of posttraumatic growth, and may even serve as a catalyst for each of the facets which are conceptualized to comprise posttraumatic growth (Weathers et al., in press). Ultimately, research suggests a model where amongst those who have experienced a potentially traumatic event, meaning can foster resilience which in turn can facilitate posttraumatic growth. The current study seeks to better understand the interrelationships between meaning, resilience, and posttraumatic growth.

**The Present Study**

A significant number of research studies report that both meaning and resilience are positively associated with posttraumatic growth. However, studies investigating the relationship between resilience and posttraumatic growth have found varied results. The relationship between posttraumatic growth, resilience, and meaning in life is important to understand because it expands our knowledge-base with respect to how people respond to trauma, with clear implications for enhancing prevention and treatment efforts. Thus, the
current study developed hypotheses to better clarify how these variables are related, and perhaps predictive of one another, in a sample of college students.

The first hypothesis of the present study is that meaning and resilience will be significantly and positively correlated, as these concepts are often found to be correlated in the literature and are both considered to be aspects of adaptive coping (Bronk, 2005; Damon, 2018; Park, 2013; Steger & Park, 2012; Theron & Theron, 2014; Wagnild, 2009; Weathers et al., in press). Moreover, given meaning’s apparent utility in promoting resilience and resilience-related resources (Lightsey, 2006; Park, 2012; Theron & Theron, 2014), a positive, significant relationship between meaning and resilience is anticipated.

The second hypothesis is that among college students who have experienced a potentially traumatic event, identified through the Life Events Checklist as described in the Method section of this study, self-reports of meaning will predict posttraumatic growth. Past research has found that meaning is significantly related to posttraumatic growth (Aiena et al., in press; Drescher et al., 2012; Park, 2012; Schulenberg et al., 2008; Tsai et al., 2015; Triplett et al., 2012). Therefore, we hypothesize that the current research will yield results that are congruent with previous findings.

The third hypothesis of the present study is that meaning and resilience will predict posttraumatic growth, and of the two concepts, meaning will have the stronger relationship. Thus, we aim to clarify the disparate research findings with respect to the association of resilience and posttraumatic growth. More specifically, while both meaning and resilience have been shown to be related to posttraumatic growth (Aiena et al., 2013; Bensimon, 2012; Mo, Lau, Yu, & Gu, 2014; Roberts, 2013; Yu et al., 2014; Wilson,
Morris, & Chambers, 2014), resilience has a more uncertain relationship. Some researchers believe that, at least some of the time, resilience and posttraumatic growth are separate, exclusive processes (Levine, Laufer, Stein, Hamama-Raz, & Solomon, 2009; Westphal & Bonanno, 2007), or that resilience occurs when the traumatic event is not severe enough to stimulate growth (Stasko & Ickovics, 2007). Alternatively, meaning appears to have a more consistent relationship with posttraumatic growth, and many of the meaning-making processes directly contribute to posttraumatic growth outcomes (Frankl, 1958, 1990; Kim, Kiervik, Belvea, & Choi, 2011; Lukas & Hirsch, 2002; Park, 2004). Meaning may be an essential factor in enhancing the likelihood that individuals will not only “bounce back” after a trauma-related event, but will experience growth in spite of the circumstances.

Finally, it is hypothesized that symptoms of posttraumatic stress will be positively correlated with posttraumatic growth. Much of the criticism of posttraumatic growth lies in the fact that, while it sometimes correlates with fewer reported symptoms of posttraumatic stress (Stasko & Ickovics, 2007), researchers such as Lowe, Manove, and Rhodes (2014) and Westphal and Bonanno (2007) have shown that sometimes posttraumatic growth is directly correlated with posttraumatic stress symptoms. Because of research suggesting that significant stress must be experienced to facilitate posttraumatic growth, we predict that there will be a significant, positive relationship between posttraumatic growth and symptoms of posttraumatic stress.
Method

Participants

Participants in this study were undergraduate psychology students who received course credit or extra credit for participating in experimental studies. They were recruited from a medium-sized university located in the southern United States. Respondents participated in the study online through a recruitment and management system used by the psychology department. Originally, the sample consisted of 664 respondents, individuals who completed the measures of interest for the study. Because this study focused on factors leading to posttraumatic growth, the researchers included only those participants that reported experiencing at least one potentially traumatizing event. This standard resulted in a final sample comprised of 513 participants, including 154 males (30.0%) and 359 females (70.0%). The sample included 403 students identifying as White (78.6%), 71 students identifying as Black (13.8%), and 39 students (7.6%) who identified as Biracial, Asian, or Other. The average age of participants was 19.51 years, with a standard deviation of 1.34 (ages ranged from 18 to 26).

Measures

Posttraumatic Growth Inventory-Short Form (PTGI-SF; Cann et al., 2010). The PTGI-SF was used to assess participant levels of posttraumatic growth. The 10-item form assesses five aspects of posttraumatic growth: new possibilities, relating to others, personal strength, spiritual change, and appreciation of life. It was designed as a shortened version of the original Posttraumatic Growth Inventory developed by Tedeschi and Calhoun (1996). The PTGI-SF has an internal consistency reliability coefficient of .
86 according to Cann et al. (2010). Additionally, studies which have examined specific clinical samples such as survivors of acute leukemia, intimate partner violence, bereavement, and war trauma have documented promising levels of reliability and validity (Cann et al., 2010; Kaler, Erbes, Tedeschi, Arbisi, & Polusny, 2010). Among the original PTGI, confirmatory factor analysis verified the validity and distinctiveness of the five facets among a college sample (Hooper, Marotta, & Depuy, 2009). PTGI-SF scores range from 0 to 60, with higher scores indicating higher perceived levels of posttraumatic growth. Participants rate their agreement with each of the 10 items—such as “I know I can better handle difficulties” and “I have a greater sense of closeness with others”—on an anchor scale of 0 to 5, with 0 indicating the respondent did not experience a specific change as a result of a crisis and 5 indicating the respondent experienced that change to a “very great degree” as a result of a crisis. In this study, the internal consistency reliability coefficient of the PTGI-SF was calculated to be .96.

Brief Resilience Scale (BRS; Smith et al., 2008). The BRS measures one’s perceived ability to “bounce back” from stressful situations or other difficulties. Respondents rate the extent to which they agree with six items—such as “I tend to bounce back quickly after hard times”—on a 5-point Likert-type scale (1 = Strongly disagree to 5 = Strongly agree). Three of the six items are reverse scored. Average scores in student samples are slightly above 3.5 (Smith et al., 2008). For the current study, the internal consistency reliability coefficient of the BRS was calculated to be .81.

Purpose in Life Test-Short Form (PIL-SF; Schulenberg et al., 2011). The PIL-SF was used to assess participant perception of life meaning and purpose. Modified
from the original 20-item Purpose in Life test (PIL; Crumbaugh & Maholick, 1964), PIL scores are significantly and positively associated with high levels of life satisfaction, happiness, self-acceptance, and emotional stability, and significantly and negatively associated with depression and anxiety (Crumbaugh & Henrion, 1988; Hutzell, 1988; Melton & Schulenberg, 2008; Reker, 2000; Schulenberg, Schnetzer, & Buchanan, 2010). Developed on the basis of rigorous factor-analytic procedures, the short form has only four items. The short form has high levels of reliability and promising support for validity (Drescher et al., 2012; Schulenberg & Melton, 2010; Schnetzer, Schulenberg, & Buchanan, 2013; Schulenberg, Schnetzer, & Buchanan, 2011).

In terms of items and response format, individuals indicate their level of agreement with each statement through a 7-point Likert-type response format which ranges from 1 to 7 with varying anchors. For example, item four reads “my personal existence is:” and the anchors range from 1 — “utterly meaningless and without purpose” — to 7 — “very purposeful and meaningful”. Scores on the PIL-SF range from 4 to 28, with higher scores indicating greater perceived meaning in life. Among a university sample, an average score is around 22.5 with a standard deviation of around 3.5 (Schulenberg, Schnetzer, & Buchanan, 2010). For this study, the internal consistency reliability coefficient of the PIL-SF was calculated to be .86.

**Posttraumatic Stress Disorder Checklist-Civilian** (PCL-C; Weathers, Litz, Herman, Huska, & Keane, 1993). The PCL-C is a 17-item self-report scale designed to measure the DSM-IV symptoms suggestive of PTSD (i.e., symptoms of posttraumatic stress). In the civilian version, participants are asked to indicate to what extent they have
experienced these symptoms after a stressful life experience. Examples of symptoms include experiencing unwanted thoughts or images, feeling emotionally numb, or having trouble sleeping. Scores range from 17 to 85, with higher scores indicating a more severe reaction to stressful events. Because researchers have disagreed on an appropriate PCL cutoff score (Blanchard et al., 1996; Cook, Elhai, & Arean, 2005), the statistical analyses were conducted both with the lowest accepted cutoff score of 44 (Blanchard et al., 1996; Ruggiero et al., 2003; Hirschel & Schulenberg, 2009), that is, scored dichotomously, as well as with no cutoff score and used simply to correlate distress with posttraumatic growth (i.e., analyzed continuously).

Reliability and validity data for the PCL have been reported in a number of studies (e.g., Blanchard, Jones-Alexander, Buckley, & Forneris, 1996; Forbes, Creamer, & Biddle, 2001; Hirschel & Schulenberg, 2010; Weathers et al., 1993). Additionally, confirmatory factor analysis of college student data documented support for the validity of the civilian form (Stapleton, 2012). In the current study, the internal consistency reliability coefficient was calculated to be .94.

**Life Events Checklist** (LEC; Sarason, Johnson, & Siegel, 1978). The LEC is a self-report measure designed to identify traumatic events in one’s lifetime (Gray, Litz, Hsu, & Lombardo, 2004; Sarason et al., 1978). Developed at the National Center for Posttraumatic Stress Disorder, the LEC includes 16 potentially traumatic events, such as sexual assault, natural disaster, or homicide, and one “other” item to identify any categories not included. Respondents select to what extent they have experienced each event (Happened to me, Witnessed it, Learned about it, Not sure, Doesn’t Apply). The
final event category is “other”, and there is an option for the respondent to fill in a traumatic event. In our sample, many of the events participants described in the “Other” option also fell under an earlier category (Hurricane Katrina, death of a loved one, physical injury). Most of the other responses related to interpersonal stress, such as a parent’s divorce or an emotionally or physically abusive relationship. In this study, the LEC was used to exclude participants who reported not having experienced a traumatic event. The LEC has shown adequate temporal stability and demonstrated expected correlations with psychological distress and PTSD symptoms amongst both veteran and college student samples (Gray et al., 2004; Jobe-Shields, Parra, & Buckholdt, 2013).

Procedures

Students were informed they could receive class credit or extra credit by signing up for an online research system and participating in research projects. The SONA system used consists of measures and tests selected by faculty and which students may complete by using their online university account. The first research opportunity is mandatory before any other research can be completed through the SONA system. This initial research consists of a broad series of self-report measures selected by faculty and approved for their widespread use by the university’s Institutional Review Board (IRB). The measures analyzed in this paper were selected from the initial battery of questionnaires that all SONA participants complete. Participants who did not complete each of the measures of interest were not included in the statistical analyses, which were performed using SPSS software. Additionally, participants who had not reported experiencing a potentially traumatic event were also excluded. SPSS was also used to
complete the correlational and regression analyses, as well as to calculate descriptive statistics for the measures used.

**Results**

**Descriptives**

The descriptive results for the measures administered in the study are presented in Table 1. The mean for the PTGI-SF score for the total sample was a 35.48 out of a possible 60 (SD = 14.28). Scores ranged from a low of 10 to a high of 60. In the subsample of respondents scoring above the cutoff point for clinical significance for symptoms of posttraumatic stress (n = 99; subsample 1), that is, the participants who exceeded the clinical threshold score of 44 on the PCL-C, the mean PTGI-SF score was a 38.68 (SD = 11.78), with a range from 10 to 60. In the subsample of respondents scoring below the PCL-C cutoff point for clinical significance on this same measure of posttraumatic stress (n = 414; subsample 2), the mean PTGI-SF score was 34.89 (SD = 14.63), with a range from 10 to 60. Overall, the mean for the PIL-SF scores for the total sample was 22.53 (SD = 3.70), with a range from 9 to 28. In subsample 1, the mean for the PIL-SF total scores was 20.92 (SD = 4.44), with a range from 11 to 28. In subsample 2, PIL-SF scores ranged from 12 to 28 with a mean of 22.83 (SD = 3.47). With respect to BRS total scores for the overall sample, the mean was 20.42 with a standard deviation of 4.25 and a range of 8 to 30. For the portion of the sample scoring above the cutoff point for clinical significance for symptoms of posttraumatic stress (subsample 1), the mean for the BRS total score was 17.20 with a standard deviation of 3.44 and a range from 9 to 26. For the portion of the sample scoring below the cutoff point for the PCL-C (subsample
2), the BRS total score mean was 21.03, with a standard deviation of 4.12 and a range from 8 to 30. As for PCL-C scores, the mean for the total sample was 29.97, with a standard deviation of 12.31 and a range of 17 to 69. The PCL-C mean for subsample 1 was 52.56, with a standard deviation of 5.87 and a range of 44 to 69. For subsample 2, the mean was 25.77 (SD = 7.78) with a range from 17 to 43.

Employing the minimum score of 44 on the PCL-C as a threshold for clinical significance resulted in 99 participants scoring above the cutoff point, with 414 scoring below it. Of the potentially traumatic events reported on the LEC (see Table 2), the most common event experienced was a transportation accident. This finding was evident in the total sample (59.6%), subsample 1 (57.1%), and subsample 2 (60.1%). Natural disasters (53.3% of the total sample, 52.4% of subsample 1, 53.3% of subsample 2), and the sudden, unexpected death of a loved one (39.2% of the total sample, 47.6% of subsample 1, 53.5% of subsample 2) were also common experiences. It is worth noting that participants completed the PCL-C based on the experience that they felt impacted them the most. Thus, the nature of the event people were responding to with respect to the PCL-C remains unknown.

Correlations for the overall sample, as well as those respondents scoring above and below the threshold for clinical significance on the PCL-C (subsamples 1 and 2, respectively), are presented in Tables 3 and 4. Table 3 shows the correlational results for posttraumatic growth (PTGI-SF), meaning (PIL-SF), resilience (BRS), and posttraumatic stress (PCL-C) for the total sample. Table 4 shows the correlations for the same variables with respect to subsamples 1 and 2. The first hypothesis of the present study was that
meaning and resilience would be significantly and positively correlated, and the results confirmed this expectation. Correlational analysis revealed a significant and medium positive relationship between meaning and resilience \( (r = .354, p < .001) \) for the total sample. This relationship was marginally smaller, but still statistically significant in subsamples 1 \( (r = .259, p < .01) \) and 2 \( (r = .307, p < .001) \).

The second hypothesis was that meaning would be predictive of posttraumatic growth scores amongst those who had undergone a potentially traumatic event. Tables 5 (total sample), 6 (subsample 1), and 7 (subsample 2) show regression analysis results for three different models. The first model is meaning’s effect on posttraumatic growth, the second model is resilience’s effect on posttraumatic growth, and the third model is the combined effect of resilience and meaning on posttraumatic growth. In the total sample of 513 individuals who had experienced a potentially traumatic event, regression analysis (Table 5, model 1) revealed that meaning in life accounted for 1.8% of the variance in posttraumatic growth scores \( (F(1, 512) = 9.624, p < .01, R^2 = .018) \). When the 99 participants who scored a 44 or higher on the PCL-C were analyzed separately (subsample 1, Table 6, model 1), meaning accounted for 16.5% of the variance in posttraumatic growth scores \( (F(1, 99) = 19.528, p < .001, R^2 = .165) \). However, when the 414 participants who scored below the cutoff point on the PCL-C were analyzed (subsample 2, Table 7, model 1), meaning accounted for only 0.7% of the variance, and this result was not statistically significant \( (F(1, 413) = 3.586, p = .059, R^2 = .007) \). Thus, hypothesis 2 was largely supported, particularly with regard for those in subsample 1.

The third hypothesis was that meaning would be a stronger predictor of posttraumatic
growth than resilience. This hypothesis was examined via correlations and regression analyses. While meaning accounted for 1.8% of the variance in posttraumatic growth scores among the total sample and was significantly and positively correlated with posttraumatic growth \((r = .11, p < .001)\), resilience actually had a significant, negative relationship with posttraumatic growth \((r = -.09, p < .05)\). In subsample 1, the relationship varied markedly, with meaning and posttraumatic growth correlated at \(r = .38\) \((p < .001)\) and resilience and posttraumatic growth slightly positively correlated at \(r = .09\) \((p = .398)\), though this was not significant. In subsample 2, the magnitude of correlations was similar whether considering meaning and posttraumatic growth \((r = .08, p = .059)\) or resilience and posttraumatic growth \((r = -.09, p < .05)\). Thus, meaning has a much stronger association with posttraumatic growth in those individuals exceeding the clinical threshold for symptoms of posttraumatic stress as assessed by the PCL-C.

With further regard for hypothesis 3, regression analyses found that resilience accounted for 0.6% of the variance in posttraumatic growth, though this was not significant whether examined by the total sample \(F(1,512) = 3.314, p = 0.69, R^2 = .006\) (Table 5, model 2) or by subsample 1 \(F(1,99) = .760, p = .385, R^2 = .008\) (Table 6, model 2). As for subsample 2, resilience accounted for .7% of the variance in posttraumatic growth scores, with the finding being statistically significant \(F(1, 413) = 3.878, p = .49, R^2 = .007\) (Table 7, model 2). When both resilience and meaning in life were entered as independent variables (Table 5, model 3), regression analyses found a stronger predictive relationship than either resilience or meaning in life alone with regard for the total sample \(F(2, 511) = 9.326, p < .001, R^2 = .035\), with both variables together
accounting for 3.5% of the variance. Considering the data for subsample 1 (Table 6, model 3), though, adding resilience to the equation did not alter meaning’s original predictive value for posttraumatic growth scores. However, both variables still accounted for 16.5% of the variance \((F(2, 98) = 19.528, p < .01, R^2 = .165)\). Finally, with regard to subsample 2, while meaning and resilience’s effect alone failed to reach significance, meaning and resilience together accounted for 1.9% of the variance in posttraumatic growth scores \((F(2, 412) = 5.012, p < .01, R^2 = .019)\). Clearly, as noted in the presentation of correlations above, meaning is playing a significant role in the prediction of posttraumatic growth scores, more so than resilience, particularly as relates to individuals exceeding the clinical threshold on a measure of posttraumatic stress symptoms (PCL-C).

The fourth and final hypothesis was that symptoms of posttraumatic stress would be significantly and positively correlated with posttraumatic growth as assessed by the PTGI-SF. In the total sample, posttraumatic growth and posttraumatic stress were correlated at \(r = .16 \) \((p < .001)\). In subsample 1, the correlation was not statistically significant at \(r = .01 \) \((p = .954)\), approximating no relationship. However, in subsample 2, the correlation was statistically significant and positive at \(r = .16 \) \((p < .001)\). Thus, the relationship varies on the basis of whether respondents were above or below the threshold for clinical significance on the PCL-C.

**Discussion**

The intention of this study was to further elucidate the relationship between meaning, resilience, and posttraumatic growth. Support was found for each of the original hypotheses. The first hypothesis was that meaning and resilience were positively
correlated. Support was found for this relationship in all three samples, reflecting past research (Aiena et al., 2015). In the total sample and subsample 2 there was a medium correlational strength, and in subsample 1 the correlation was slightly weaker.

The second hypothesis was that meaning would be predictive of posttraumatic growth. In this study, meaning was predictive of posttraumatic growth scores in the total sample, but not significantly in subsample 2, below the threshold for clinical stress (Triplett, Tedeschi, Cann, Calhoun, & Reeve, 2012). Notably, among subsample 1, above the threshold for clinical stress, meaning played a substantial part in predicting posttraumatic growth scores.

The third hypothesis was that the relationship between meaning and posttraumatic growth, examined above, would be stronger than the relationship between resilience and posttraumatic growth. This was supported across all samples. Resilience had a marginally negative correlation with posttraumatic growth in the total sample and subsample 2, but in subsample 1 it was marginally positive. Notably, in the total sample, in spite of the slightly negative relationship to posttraumatic growth on its own, resilience doubled the predictive value of meaning for posttraumatic growth. Thus, when meaning and resilience were measured together, they strengthened the relationship to posttraumatic growth. Meaning and resilience also strengthened their predictive value for posttraumatic growth in subsample 2. This effect was not found in subsample 1; adding resilience had no impact on the role of meaning for posttraumatic growth. To put this into context, the results of this study suggest that resilience does not seem to have a relationship to posttraumatic growth on its own, and meaning is more strongly predictive
of posttraumatic growth, playing an especially important role in groups that have 
experienced posttraumatic stress symptoms. But meaning also is correlated with 
resilience, and when meaning bolsters resilience, they both enhance posttraumatic 
growth.

The fourth hypothesis, that posttraumatic stress and posttraumatic growth would 
be positively correlated, was supported in the total sample and in sample 3. In those 
samples, there was a small correlation, but there was no relationship found in sample 1, 
above the PCL-C cutoff. This supports the contention that stress is necessary to achieve 
growth and rebuild broken worldviews posited by other researches (Park, 2004; Tedeschi 
& Calhoun, 2004). But, at a certain level of stress, posttraumatic growth has no effect.

Prior research has had conflicted results when it comes to the relationship 
between meaning, resilience and PTG. While some researchers believe that resilience 
and posttraumatic growth are separate processes (Levine, Laufer, Stein, Hamama-Raz, & 
Solomon, 2009; Moore, Cerel, & Jobes, 2015; Westphal & Bonanno, 2007; Zerach et al., 
2013), other research indicates they are intertwined, that being resilient and “bouncing 
back” is necessary to “bounce forward” and experience growth (Aiena et al., 2013; 
Bensimon, 2012; Mo, Lau, Yu, & Gu, 2014; Roberts, 2013; Wilson, Morris, & Chambers, 
2014; Wu, Zhang, Liu, Zhou, & Wei, 2016; Xiao, Xin-Chun, & Jie-Ling, 2015; Yu et al., 
2014). In this study, depending on the stress levels of the sample used, results supported 
both models. Above the cutoff sample, results indicated that resilience and posttraumatic 
growth might be separate processes. Resilience was not substantially related to 
posttraumatic growth in that sample, and had no effect on meaning’s relationship with
posttraumatic growth when they were measured together. Conversely, in the total sample and subsample 2, results supported an intertwined model for meaning and resilience. While meaning in the total sample was correlated with both resilience and posttraumatic growth, resilience and posttraumatic growth were not substantially correlated. Yet resilience did enhance meaning’s effect on posttraumatic growth when measured with meaning. In fact, while below the threshold for stress meaning had an insignificant predictive value for posttraumatic growth, adding resilience made the relationship larger and significant. This suggests that, perhaps in some cases, when people have high levels of meaning, resilience and posttraumatic growth are co-occurring, rather than distinct, processes.

There are several limitations to this study. First, it was impossible to tell from the data collected when the traumatic event a participant experienced occurred. As posttraumatic stress symptoms tend to dissipate over time, a lack of standardized time frame may have confused the results. Second, this was a limited sample. Participants were mostly white and mostly female, collected from psychology classes at a single university, and while the PCL-C was used to ascertain trauma levels, results cannot be generalized to specific populations that have undergone traumatic experiences. Finally, because the statistical analyses used were correlations and regressions, it is impossible to make any sort of causal statement. Future research ought to use more advanced statistics and study designs, such as mediation models, or incorporating meaning and resilience bolstering treatment and a control group receiving treatment without a meaning or
resilience component in a sample seeking treatment for PTSD to establish the full nature of the relationship between meaning, resilience, and posttraumatic growth.

A major strength of this research is that it separates the sample by levels of traumatic stress. While prior research has looked at meaning, resilience, and posttraumatic growth in different samples, it has not also looked at specific stress levels of posttraumatic stress symptoms to compare results. When levels of stress are lower, resilience has a much stronger predictive value for posttraumatic growth, but when higher, resilience has very little predictive value while meaning plays a large role. The different results in different samples may help explain why past research has been mixed.

While the results of this study provide light as to why there may be support for both models in the literature, they do not answer the question of whether resilience and posttraumatic growth are separate or simultaneous processes. The reason for the mixed results within the study for the above cutoff and below cutoff/total sample is still unclear. But, the results do support a model of meaning as an overarching catalyst which fosters adaptive responses to traumatic events. Previous studies suggest that meaning helps to prompt the behaviors that make one more likely to recover quickly from a traumatic event (Melton & Schulenberg, 2008; Reker, 1994; Ryff, 2000; Ryff & Singer, 1998a, 1998b; Savolaine & Granello, 2002; Schulenberg, Hutzell, Nassif, & Rogina, 2008; Spiegel & Fawzy, 2002; Zika & Chamberlain, 1992). This new research adds that, whether a model of resilience and meaning as distinct or one in which they are independent is more accurate, in samples experiencing posttraumatic stress, meaning plays an important role in helping people grow from the experience. To help survivors of
potentially traumatic events bounce back and then bounce forward, meaning may be an important construct to bolster.
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determinants of posttraumatic stress disorder and posttraumatic growth among


Table 1

*Descriptive Statistics for the Total Sample and Subsamples*

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Mean</th>
<th>Standard Deviation</th>
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</thead>
<tbody>
<tr>
<td><strong>Total Sample (N = 513)</strong></td>
<td></td>
<td></td>
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<tr>
<td>Posttraumatic Growth</td>
<td>35.48</td>
<td>14.28</td>
<td>38.68</td>
<td>11.78</td>
<td>34.89</td>
<td>14.63</td>
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<td>Inventory-Short Form (PTGI-SF)</td>
<td>22.53</td>
<td>3.70</td>
<td>20.92</td>
<td>4.44</td>
<td>22.83</td>
<td>3.47</td>
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<td>Purpose in Life test – Short Form (PIL-SF)</td>
<td>20.42</td>
<td>4.25</td>
<td>17.20</td>
<td>3.44</td>
<td>21.03</td>
<td>4.12</td>
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<td>Brief Resilience Scale (BRS)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Posttraumatic Stress Disorder Checklist (PCL-C)</td>
<td>29.97</td>
<td>12.31</td>
<td>52.56</td>
<td>5.87</td>
<td>25.77</td>
<td>7.88</td>
</tr>
</tbody>
</table>

*Note:* The two subsamples were divided based on the total PCL-C scores. Participants exceeding the threshold for clinical significance for symptoms of posttraumatic stress (i.e., scores of 44 and above on the PCL-C) were assigned to subsample 1, while those scoring below the threshold for clinical significance (i.e., scores below 44 on the PCL-C) were assigned to subsample 2.
Table 2

*Prevalence Rates of Potentially Traumatic Events for the Total Sample and Subsamples*

<table>
<thead>
<tr>
<th>Potentially Traumatic Experience</th>
<th>Total Sample (N = 513) %</th>
<th>Subsample 1 (n = 99) %</th>
<th>Subsample 2 (n = 414) %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transportation Accident</td>
<td>59.6</td>
<td>57.1</td>
<td>60.1</td>
</tr>
<tr>
<td>Natural Disaster</td>
<td>53.3</td>
<td>52.4</td>
<td>53.5</td>
</tr>
<tr>
<td>Sudden Unexpected Death</td>
<td>39.2</td>
<td>47.6</td>
<td>37.6</td>
</tr>
<tr>
<td>Life Threatening Illness or Injury</td>
<td>32.2</td>
<td>35.2</td>
<td>31.7</td>
</tr>
<tr>
<td>Physical Assault</td>
<td>30.9</td>
<td>38.1</td>
<td>29.5</td>
</tr>
<tr>
<td>Serious Accident</td>
<td>26.4</td>
<td>37.2</td>
<td>24.3</td>
</tr>
<tr>
<td>Fire or Explosion</td>
<td>25.2</td>
<td>33.3</td>
<td>23.6</td>
</tr>
<tr>
<td>Unwanted Sexual Experience</td>
<td>15.1</td>
<td>25.7</td>
<td>13.1</td>
</tr>
<tr>
<td>Severe Human Suffering</td>
<td>13.0</td>
<td>20.0</td>
<td>11.6</td>
</tr>
<tr>
<td>Sudden Violent Death</td>
<td>11.3</td>
<td>20.0</td>
<td>9.7</td>
</tr>
<tr>
<td>Assault with a Weapon</td>
<td>8.9</td>
<td>10.5</td>
<td>8.6</td>
</tr>
<tr>
<td>Sexual Assault</td>
<td>8.6</td>
<td>17.1</td>
<td>7.0</td>
</tr>
<tr>
<td>Serious Injury Caused</td>
<td>6.6</td>
<td>9.5</td>
<td>6.1</td>
</tr>
<tr>
<td>Exposure to Toxic Substances</td>
<td>5.7</td>
<td>6.7</td>
<td>5.5</td>
</tr>
<tr>
<td>Kidnapping</td>
<td>1.8</td>
<td>3.8</td>
<td>1.4</td>
</tr>
<tr>
<td>Combat Exposure</td>
<td>2.0</td>
<td>1.0</td>
<td>2.1</td>
</tr>
<tr>
<td>Other</td>
<td>19.4</td>
<td>30.5</td>
<td>17.4</td>
</tr>
</tbody>
</table>

*Note:* The two subsamples were divided based on the total PCL-C scores. Participants exceeding the threshold for clinical significance for symptoms of posttraumatic stress (i.e., scores of 44 and above on the PCL-C) were assigned to subsample 1, while those scoring below the threshold for clinical significance (i.e., scores below 44 on the PCL-C) were assigned to subsample 2.
Table 3

Correlations for the Measures Administered, by Total Sample (N = 513)

<table>
<thead>
<tr>
<th></th>
<th>PTGI-SF</th>
<th>PIL-SF</th>
<th>BRS</th>
<th>PCL-C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Posttraumatic Growth (PTGI-SF)</td>
<td>--</td>
<td>0.107**</td>
<td>-0.094*</td>
<td>.163**</td>
</tr>
<tr>
<td>Meaning/Purpose in Life (PIL-SF)</td>
<td>--</td>
<td>.335**</td>
<td>-0.297**</td>
<td></td>
</tr>
<tr>
<td>Resilience (BRS)</td>
<td>--</td>
<td></td>
<td>-0.442**</td>
<td></td>
</tr>
<tr>
<td>Posttraumatic Stress Disorder Checklist (PCL-C)</td>
<td></td>
<td></td>
<td></td>
<td>--</td>
</tr>
</tbody>
</table>

Note. *p < .05. **p < .001.
The two subsamples were divided based on the total PCL-C scores. Participants exceeding the threshold for clinical significance for symptoms of posttraumatic stress (i.e., scores of 44 and above on the PCL-C) were assigned to subsample 1, while those scoring below the threshold for clinical significance (i.e., scores below 44 on the PCL-C) were assigned to subsample 2.

Table 4

*Correlations for the Measures Administered, By Subsample*

<table>
<thead>
<tr>
<th></th>
<th>Subsample 1 (n = 99)</th>
<th>Subsample 2 (n = 414)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTGI-SF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PIL-SF</td>
<td>0.381**</td>
<td>0.083</td>
</tr>
<tr>
<td>BRS</td>
<td>0.006</td>
<td>-0.086*</td>
</tr>
<tr>
<td>PCL-C</td>
<td>-0.107</td>
<td>-0.305**</td>
</tr>
<tr>
<td>PTGI-SF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PIL-SF</td>
<td>0.251*</td>
<td>0.307**</td>
</tr>
<tr>
<td>BRS</td>
<td>-0.052</td>
<td>-0.340**</td>
</tr>
<tr>
<td>PCL-C</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: *p < .05. **p < .001.
Table 5

Summary of Regression Analysis with Variables Meaning in Life and Resilience Predicting Posttraumatic Growth, By Total Sample (N = 513)

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th></th>
<th></th>
<th>Model 2</th>
<th></th>
<th></th>
<th>Model 3</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE B</td>
<td>β</td>
<td>B</td>
<td>SE B</td>
<td>β</td>
<td>B</td>
<td>SE B</td>
<td>β</td>
</tr>
<tr>
<td>Meaning in Life</td>
<td>0.116</td>
<td>0.062</td>
<td>0.107**</td>
<td>0.232</td>
<td>0.065</td>
<td>0.0151**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resilience</td>
<td>-0.189</td>
<td>-0.081</td>
<td>-0.094</td>
<td>-0.290</td>
<td>0.085</td>
<td>-0.145</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R²</td>
<td>0.018</td>
<td>0.006</td>
<td></td>
<td>0.035</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>9.624*</td>
<td>3.314</td>
<td></td>
<td>9.326**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. *p < .01. **p < .001.
Table 6

Summary of Regression Analysis with Variables Meaning in Life and Resilience Predicting Posttraumatic Growth, Subsample 1 (n = 99)

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE B</td>
<td>β</td>
</tr>
<tr>
<td>Meaning in Life</td>
<td>0.404</td>
<td>0.101</td>
<td>0.381**</td>
</tr>
<tr>
<td>Resilience</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R²</td>
<td>0.165</td>
<td>0.008</td>
<td>0.165</td>
</tr>
<tr>
<td>F</td>
<td>19.317**</td>
<td>0.760</td>
<td></td>
</tr>
</tbody>
</table>

Note. *p < .01. **p < .001. The two subsamples were divided based on the total PCL-C scores. Participants exceeding the threshold for clinical significance for symptoms of posttraumatic stress (i.e., scores of 44 and above on the PCL-C) were assigned to subsample 1, while those scoring below the threshold for clinical significance (i.e., scores below 44 on the PCL-C) were assigned to subsample 2.
Table 7

*Summary of Regression Analysis with Variables Meaning in Life and Resilience Predicting Posttraumatic Growth, Subsample 2 (n = 414)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE B</td>
<td>β</td>
</tr>
<tr>
<td>Meaning in Life</td>
<td>0.139</td>
<td>0.074</td>
<td>0.083</td>
</tr>
<tr>
<td>Resilience</td>
<td></td>
<td>-0.183</td>
<td>0.093</td>
</tr>
<tr>
<td>R²</td>
<td>0.007</td>
<td></td>
<td>-0.007</td>
</tr>
<tr>
<td>F</td>
<td>3.568</td>
<td></td>
<td>3.878*</td>
</tr>
</tbody>
</table>

Note. *p < .01. **p < .001. The two subsamples were divided based on the total PCL-C scores. Participants exceeding the threshold for clinical significance for symptoms of posttraumatic stress (i.e., scores of 44 and above on the PCL-C) were assigned to subsample 1, while those scoring below the threshold for clinical significance (i.e., scores below 44 on the PCL-C) were assigned to subsample 2.