

Characterization of Posttraumatic Stress Disorder and
Posttraumatic Growth: Common Determinants
And Associations

by

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Abstract

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The current study sought to examine common determinants of posttraumatic stress posttraumatic growth. Specifically, it sought to determine whether common factors may differentially predict PTS and PTG. A longitudinal examination of lung cancer patients was utilized, consisting of three time points. The factors examined included both stable (unmodifiable) and amenable predictors. It was found that while the stable predictors did not significantly predict either PTS or PTG, two of the amenable predictors did differentially predict PTS and PTG. These were the quality of one's primary source of social support and patients' cognitive appraisal of their illness. Specifically, the better the quality of one's primary social support the more likely they were to develop PTG, and the worse the quality of support the more likely they were to develop PTS. Also, greater cognitive appraisal of challenge resulted in greater development of PTG, while higher appraisal of harm/threat resulted in higher development of PTS.

Table of Contents

Acknowledgements	iii
Abstract	iv
List of Tables	vii
Chapter 1 Introduction.....	1
Posttraumatic Stress Disorder	3
Posttraumatic Growth	5
PTS, PTG, and QoL.....	7
Risk and Resiliency Factors	9
Prior Trauma.....	9
Disease Severity.....	11
Gender.....	12
Socioeconomic Status	14
Social Support	15
Cognitive Appraisal.....	17
Overview.....	19
Chapter 2 Methods & Results	22
Measures	22
Procedure	24
Results.....	24
Data Analysis.....	24
Data Screening.....	25
Statistical Results	25
Chapter 3 Discussion, Limitations & Future Directions.....	32
Discussion	32

Limitations.....	36
Conclusions and Future Directions.....	37
Appendix A Posttraumatic Stress Disorder Diagnosis.....	38
Appendix B Participant Characteristics.....	41
References.....	44
Biographical Information	62

List of Tables

Table 2.1 Models Predicting Posttraumatic Growth.....	27
Table 2.2 Models Predicting Posttraumatic Stress	30

Chapter 1

Introduction

A traumatic experience involves experiencing an event that is outside the normal range of human experience. Unfortunately, all too many individuals will be involved in some form of traumatic experience at some point in their lives. In the United States, it has been reported that between 7.8% (Kessler, Sonnega & Bromet, 1995) and 9.2% (Breslau, Davis, & Andreski, 1991) of the adult population experienced a traumatic event in their lifetimes with a startlingly high 12.3% for women (Resnick, Kilpatrick, & Dansky, 1993). While most people are resilient in the face of trauma, a significant minority experienced psychological sequelae which can develop into posttraumatic stress disorder and posttraumatic stress symptoms. Individuals who develop these are negatively impacted both physically (physical functioning, pain, vitality) and mentally (anxiety, depression, happiness; Schonfeld et al., 1997; Olatunji, Cisier & Tolin, 2007). This is reflected in the requirements of PTSD which are listed in the Diagnostic and Statistical Manual of Mental Disorder-5 (DSM-5); with a full diagnosis requiring threat of death or serious injury, intrusive thoughts about the event, avoiding similar situations to the event, negative alterations in cognitions and mood, and increased arousal. Some individuals are chronically negatively affected and develop posttraumatic stress (PTS) or disorder (PTSD) as a result of trauma, whereas others are able to have personal growth from their experiences, termed posttraumatic growth (PTG), and some experience both concurrently. Those that are able to develop PTG in spite of or instead of PTS and its harsh symptoms are able to more fully appreciate and enjoy life. Specifically, PTG includes growth across multiple domains; such as relating to others, new possibilities, personal strength, spiritual change, and a deeper appreciation for life (Tedeschi & Calhoun, 2004). Posttraumatic stress and PTG arise from the same antecedents and

develop concurrently; however, there is a paucity of research regarding the risk and resiliency factors that predict them. Therefore, determining the roles of these predictors is important because PTS may lead to poorer mental health while PTG may improve both physical health and disease outcomes (Dougall et al., Under Review). Based on this, the current study focused on determining the contributions of the factors which are amenable to change, because targeting modifiable risk and resiliency factors would improve treatment of PTS as well as foster PTG**Error! Reference source not found..**

This study examined a lung cancer population because it is a particularly trying and highly stressful experience due to the implications of diagnosis. First, one is told that they have a life-threatening disease, with a possibly very poor outlook and treatment options. Additionally, the treatment regimens offered can be very costly, with expenses for lung cancer going up to thousands of dollars per month depending one's treatment and insurance coverage (Ciprano et al., 2011). In addition, treatment has additional costs through physical and psychological tolls. Cancer treatment has been shown to often cause fatigue, burdening individuals and often negatively impacting patients' wellbeing and mobility (Brown, McMillan, & Milroy, 2004; Servaes, Verhagen, & Bleijenberg, 2002). Some patients experience high anxiety accompanying the poorer quality of life and physical functioning (Shufang, Wang, Shizhen, & Cao, 2012). Lung cancer is especially distressing and dangerous due to its survival outlook and etiology. In the United States, in 2013, there were an estimated 228,190 new cases of lung cancer and an estimated 159,480 deaths. The impact of lung cancer is staggering, with it accounting for an estimated 27% of cancer caused deaths in 2013, which is more than colon, breast, and prostate cancers combined. The average five-year survival rate for non-small cell lung cancer is 25%, with small cell lung cancer having only a 15% survival rate (American Cancer Society, 2013). This grave outlook is accompanied with the

knowledge that lung cancer is most often the result of one's chosen behaviors, such as smoking and tobacco use. Given this, a lung cancer diagnosis is an event that is traumatic enough to result in PTG due to the breaking of one's schema's and assumptive world. Due to the poor prognosis and grueling treatments it is no wonder that being diagnosed with lung cancer is a traumatic experience that can result in symptoms of PTS.

In order to address the risk and resiliency factors associated with the development of PTS and PTG, I describe the constructs of PTS and PTG before examining the common factors that lead to their development. Then I outline how I examined the modifiable and stable determinants in order to more fully understand the constructs, and more importantly inform future

Posttraumatic Stress Disorder

Posttraumatic stress disorder has been referred to in different forms and contexts for quite some time before reaching its current conceptualization. It is often associated with war trauma, and for good reason given the regular exposure to traumatic experiences. Veterans of modern warfare in the United States come home with an estimated PTSD rate of 20% or greater (Veterans Statistics, 2013). That war is traumatic is not a new concept as evidenced by Homer's Iliad, where soldiers are described as being withdrawn, feeling intense grief and guilt about fallen companions, and experiencing uncontrolled rage at times (Shay, 1991).

Interest and research concerning symptoms and development of PTSD was furthered largely as a result of the traumas returning war veterans had experienced. During WWI, returning veterans exhibited conditions such as emotional shock, flashbacks, and aggression issues, which were described as "shell-shock," by C.S. Meyers (1916). Shell shock may have been the result of trauma from the front lines of battle, but direct exposure to battle was not necessary and "any physical trauma or in

adjustable experience” was enough (Meyers, 2012, p. 26). Moving forward to the Second World War, PTSD was first operationalized as a result of these mental and physical sequelae experienced by veterans of WWII and the Korean War. The DSM-I first classified PTSD as “gross stress reaction” in 1952. This did not have an outlined, formal definition, but was used to diagnose times when individuals had undergone extreme stress, such as war or natural catastrophes. Upon the APA publishing the DSM-II in 1968, this classification was updated and “gross stress reaction” was replaced with “transient situational disturbance.” Again there was no operational definition and this was used to describe “transient disorders” whereby a victim has an “acute reaction to overwhelming environmental stress” (DSM-II, 1968). This open-ended and short-term characterization was found to be lacking, and when the DSM-III was published in 1980, the term “posttraumatic stress disorder” was finally created. In the DSM-III, PTSD was listed as a sub-category of anxiety disorders. The main aspect of PTSD was the “development of characteristic symptoms” after a traumatic event that was “outside the range of usual human experience.” The specific symptoms included re-experiencing the event in question, numbing or reduced involvement with the external world, and various physical or cognitive symptoms. Additionally, it could be acute or chronic. With the release of the DSM-III-R, PTSD was further refined, whereby one had to consistently re-experience the event in some way, avoid situations that one associated with the event, have persistent symptoms of increased arousal, and for the symptoms to last longer than one month. The DSM-IV continued this refinement, mostly regarding the actual events, whereby one had to experience or witness an event involving death, injury or physical threat compared to the more amorphous “event that is outside the range of usual human experience” (DSM-IV, 1994, Lamprecht & Sack, 2002). The criteria for PTSD in the DSM-IV includes A) experiencing a traumatic event, B) the traumatic event is persistently

re-experienced in one (or more) ways, C) persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness, D) persistent symptoms of increased arousal, E) the symptoms last more than one month, and F) the disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning (DSM-IV-TR, 2000). The full criteria for PTSD in the DSM-IV-TR can be viewed in Appendix I. Version V of the DSM was recently released, however it was not used in the current study.

Posttraumatic Growth

Experiencing a trauma results in some individuals suffering from chronic stress and anxiety, however the majority have no such long lasting negative effects and still others even find benefit and growth in life after the event, and for some both are present. Just as PTSD is not a new concept but a formal conceptualization of the lasting negative effects of trauma, the idea that one can grow and find benefit from hardship is not new. It is a concept present in religion, philosophy, existential psychology, and conventional wisdom. Christianity exhibits this in a number of instances, such as describing how suffering leads to perseverance, character, and ultimately hope (Romans 5:3-5, New International Version) and that suffering can “uncover untold depths of character and unknown strength for service” as well as “the depths that provide greater strength of purpose” (Graham, 2011, p. 11). So entwined is Christianity with the ideas of suffering producing wisdom and growth that it has even been proposed that it grew as a result of the process of PTG (McGrath, 2006). Suffering, anxiety, and hardship are also central tenets to the philosophy and teachings of Buddhism. The Noble Truths, which are the central doctrine of Buddhism, are based on the idea that suffering is an innate part of human existence. The Noble Truths examine how suffering and hardship is a natural part of life, how it is caused, overcome, and how it is accepted and understood (Siderits,

2014). Perhaps the most common reference to how suffering and hardship can produce growth and an eventual positive outcome is the now colloquial saying of “what does not kill me makes me stronger” (Nietzsche, 1889, p. 8). This does perhaps the best job of succinctly and appropriately summing the notion that suffering and hardship can result in a positive outcome. Given the religious views of suffering providing growth, wisdom, and purpose, it is unsurprising that trauma often results in one becoming more spiritual or religious, as religion and spirituality are often beneficial to individuals when trying to understand and cope with the aftermath of traumatic and trying experiences (Shaw, Joseph, & Lindley, 2005).

The area of study on positive changes after trauma has been of increasing interest, greatly expanding over the past two decades, and has garnered a number of labels. While collectively referred to as adversarial growth (Linley & Joseph, 2004) or finding benefit (Helgeson, Reynolds & Tomich, 2006), posttraumatic growth (Tedeschi & Calhoun, 1995) is the most common specific term for this benefit resulting from a trauma. The differences among these concepts are largely in the levels of event stress. The more transformative posttraumatic growth (PTG), as coined by Tedeschi and Calhoun (1995) is the term that refers to both the growth process and resultant growth and change that arise from experiencing traumatic events. These are the same events that are found to be traumatic enough to cause PTSD in some individuals. Just as PTSD is the formal study of a concept from philosophy, literature, and conventional wisdom, so is PTG the formal study of a concept from similar origins. Opposite of PTSD, individuals with PTG experience a time of personal improvement, growth, and new meaning.

Posttraumatic growth describes the positive experience that comes about when individuals develop in at least one of the five domains of PTG. These five domains include greater appreciation of life and new priorities, more intimate relationships, a

greater sense of personal strength, recognizing that there are new possibilities in one's life, and spiritual development. Tedeschi and Calhoun (2004) noted that PTG is different from the concepts of resilience, hardiness, and sense of coherence. Resilience is different because this trait allows one to move on without being greatly negatively affected in spite of trauma or hardship. Hardiness describes how victims view life as having challenges and believing that they can meet the challenges that life will give them. Lastly, if one has a strong sense of coherence, one is able to comprehend and cope with adverse events and even find meaning in them. Those who possess these traits are best able to cope with highly stressful events, and exposure to traumatic events will be less likely to break long-held schemas and world views. It is this breaking of one's foundational beliefs, in the event of a trauma that challenges and overcomes one's ability to cope so that their view of the world is not compatible with the traumatic event (Tedeschi & Calhoun, 2004). The need to reevaluate how one perceives the world and see things in a new light is what opens the door to PTG.

PTS, PTG, and QoL

While self-evident, quality of life (QoL) has been often negatively impacted when the person is diagnosed with a disorder such as PTSD. It has even been suggested that among anxiety disorders, PTSD may have the greatest influence on QoL (Hansson, 2002). For example, in a group of previously undiagnosed inpatients, those who were screened and found to have PTSD were negatively affected in every domain of QoL. This underscored the range of effects PTSD had on an individual, as domains such as vitality, physical functioning, bodily pain, general health perceptions, physical functioning, emotional functioning, social functioning, and mental health were negatively affected (Schonfeld et al., 1997). This showed how PTSD and quality of life were not only related, but suggested that PTSD affected all aspects of one's QoL. Further, the decrements in

QoL associated with PTS were substantial. In a sample of patients being treated for anxiety and depressive disorders, 59% of those with PTSD had QoL scores that were two standard deviations below that of a control group. In one of the most telling indications of the impact of PTSD on QoL, a meta-analysis (Olatunji, Cisier & Tolin, 2007) on the quality of life in those with anxiety disorders found that overall QoL was not significantly different among anxiety disorders, including PTSD. However, PTSD was found to be associated with larger effect sizes. Specifically, when compared to social phobia, generalized anxiety disorder, panic disorder, and obsessive-compulsive disorder, PTSD had a greater effect size on physical health, work, social, and home and family domains of QoL.

Although PTSD has had an established and somewhat self-evident negative effect on QoL, the relationship between PTG and QoL has seemed to be less direct. Some reviews of positive change and benefit finding (Linley & Joseph, 2004; Helgeson, Reynolds & Tomich, 2006) have failed to discover a relationship between benefit finding and quality of life. Additionally, a more recent examination (Dougall et al., under review) found that the experience of PTG predicted better physical QoL and outcomes. This supported the notion from Helgeson, Reynolds & Tomich (2006) that QoL should be examined through specific domains, as opposed to a global rating of QoL. Given the mixed findings, the relationship between QoL and PTG deserves further investigation as it may be that PTG only predicts specific domains of quality of life.

While it has been established that PTS and PTG have important effects on health and quality of life, as well as developing concurrently as a result of experiencing trauma, there is a paucity of research regarding the specific factors which lead to their concurrent development. Specifically, identification of modifiable and stable risk and resiliency factors that contribute to differential development of PTS and PTG could be used to

inform treatment and improve outcomes of those who experience trauma. It is this gap in knowledge that the current paper will seek to describe and address.

Risk and Resiliency Factors

There are key factors which contribute to whether or not one will develop PTSD and/or PTG after experiencing a trauma. One's personal characteristics, such as coping skills, personality, and socio-demographics all have been shown to affect the likelihood of one developing these after a trauma, so much so that non-event related variables may actually be more important than the event itself (Peleg & Shalev, 2006). It is important to examine the factors which affect and lead to the development of PTG and PTS, not only to better treatment of PTS and fostering of PTG but because of their important effects on QoL. The factors that predict these constructs can be unmodifiable and thus stable, or modifiable and thus amenable to change over time. While it is important to understand how unmodifiable variables lead to PTS and PTG, the opportunity to improve care and outcomes stems from the understanding of how the modifiable variables lead to PTS and PTG. It is through an understanding of both types of antecedents that a more complete of understanding of PTS and PTG be had and treatment be improved.

Prior Trauma

Having a history of prior trauma can greatly increase the likelihood of developing PTSD after subsequent trauma exposure, while seeming to also possibly cause a slight increase in the likelihood of developing PTG (Breslau, 2009). Prior trauma is in fact one of the greatest risk factors for developing PTSD after a highly stressful event. For example, veterans with a history of childhood physical abuse were far more likely to develop PTSD symptomatology as a result of combat (Bremner et al, 1993; Zaidi & Foy, 1994). Additionally, those who had been assaulted before entering combat were almost twice as likely to have PTSD compared to those who had not experienced an assault

prior to war (Smith et al., 2008). Sexual abuse during childhood, another form of violent physical trauma, has been found to be a risk factor for developing PTSD after a trauma as an adult. This pre-exposure not only affected children, but greatly increased the odds of one suffering from PTSD after experiencing a trauma later in life (Kilpatrick & Veonen, 1992; Rodriguez, Ryan, Vande Kemp, & Foy, 1997). In a telling nationally representative sample, females who were victims of physical abuse during childhood were found to be five times more likely to experience PTSD (Duncan, Saunders, Kilpatrick, Hanson & Resnick, 1999). Additionally the results of the National Comorbidity Survey found that both men and women who were victims of child sexual abuse were eight times more likely to have PTSD as an adult than those who had no such abuse (Molnar, Buka, & Kessler, 2001). While the link between prior trauma and PTSD has been shown to be firmly established, there has been little research shown to link PTG to prior trauma. Specifically, prior research has found little (Peterson, Park, D'Andrea & Seligman, 2008) to no (Linley, Joseph, & Goodfellow (2008) association between prior trauma and PTG development. Peterson, Park, D'Andrea and Seligman found a small effect for increased PTG regarding the number of prior trauma, whereby having experienced more trauma led to greater PTG. This underdeveloped relationship between PTG and prior trauma merits further research, given the relationship between prior trauma and PTSD.

For PTSD, the type of trauma can also have an effect, as demonstrated by Breslau et al. (1999) where those who experienced a previous assaultive trauma were the most likely to experience later diagnosis of PTSD. This suggests that violent crimes can be some of the greatest determinants regarding factors that influence the likelihood of individuals developing PTSD. Similarly, those who experienced prior combat and had combat stress reaction (CSR) were much more likely to experience CSR and PTSD after fighting in a subsequent war (Solomon, Oppenheimer, Elizur & Waysman, 1990.) As

such, this would partly explain the high rates of PTSD seen in combat veterans, who are repeatedly exposed to violence. There has also been a summative effect of trauma observed, in which risk of developing PTSD increased with additional assaultive traumatic events. In addition to prior trauma, the unmodifiable variable of gender is an important one, as men and women tend to have different rates of PTS and PTG. Since the current study is examining the same type of trauma for all participants, this provides the opportunity to examine the role of the stage of one's disease in the development of PTS and PTG.

Disease Severity

Cell type is of interest in the current study as this dictates mortality rates, and a higher mortality rate is what leads to greater stress, thus effecting PTS and PTG symptoms. For example, for women who have breast cancer at a later stage of disease, and thus have a poorer outlook, this poorer outlook has been found to be a significant predictor of more PTSD symptoms (Andrykowski & Cordova, 1998). Furthermore, greater disease severity has been found to be positively related to PTG in gynecologic cancer patients (Posluszny, Baum, Edwards & Dew, 2011) as well as in lung cancer patients (O'Connor, Wicker, & Germino, 1990; Thornton et al., 2012). This supports the need for an examination of the effects of cell type on the development and course of PTSD and PTG, as cell type strongly influences both mortality rates and spread of cancer. Specifically, small cell lung cancer has a five-year survival rate of only 6.6%, compared to non-small cell which has a survival rate of 21.7%. Compounding the grim outlook for small cell lung cancer is that it spreads very quickly and is often not diagnosed until it has already reached a later stage of disease (Howlader et al., 2013). It is for this reason that cell type is needed when examining the development of PTSD and PTG during stressful event of cancer diagnosis. In addition to the type of trauma and stage of

disease, another common stable characteristic that has been shown to effect PTS and PTG is gender, with women reporting higher rates and a number of proposed explanations for why this is. Other modifiable factors, such as one's cognitive biases, social economic status, and social support (or lack thereof), have affected the likelihood of a victim developing PTSD and PTG after a trauma.

Gender

Gender is of interest regarding the development of PTSD as rates have been found to be higher for women than men, even though men and women experienced the same number of traumatic events in their lifetime (Breslau et al., 1997). Similarly, Tedeschi & Calhoun's 1996 investigation using the PTG-Inventory found that women reported more PTG than men. There are a number of factors which have been suggested which may account for the gender discrepancy in PTSD, such as comorbid disorders, type of trauma (Johnson & Thompson, 2008), and history of prior trauma (Olf et al., 2007). Of these, the ones that have received the most support are differences in coping and peritraumatic dissociation, stronger perceptions of threat and loss, and the type of trauma experienced (Olf, Langeland, Draijer & Gerson, 2007). Similarly, the increase in levels of PTG for women may be due to the requirement that to develop PTG one go through an event that is stressful enough to cause one to reevaluate how they view the world and approach life. Because women have higher rates of PTSD (and PTG) than men and view events as more stressful and threatening, this provides a greater basis for the development of growth, possibly explaining the gender discrepancy in both PTG and PTSD.

The way individuals appraise and cope with trauma has been shown to play a role in the development of PTSD and PTS symptoms. Subjective interpretation of an event has been found to be a stronger predictor of PTSD than what happened objectively

(Brewin, Andrews, & Valentine, 2000). This, coupled with women being more likely to report an event as threatening than men (Mak, Blewitt, & Heaven, 2004) seem to contribute to women being more likely to perceive events as stressful and threatening, thus increasing likelihood of PTSD and PTS symptoms. Peritraumatic dissociation, or dissociation at the time of trauma, has been found to effect the likelihood of developing PTSD and PTS symptoms (Fullerton et al., 2001; Olf, Langeland, Draijer, & Gerson). Of importance is that women who experience peritraumatic dissociation are much more likely to develop PTSD and PTS symptoms than men with peritraumatic dissociation (Fullerton et al., 2001). This is consistent with the theory that women cope differently than men, being more passive and having more emotion based coping compared to men with more active coping (Miller & Kirsch, 1987). This avoidant, emotion based coping may be linked to dissociation during the trauma, which has again been linked to higher levels of PTSD and PTSD symptoms (Fullerton et al. 2001; Koopman, Classen, & Spiegel, 1994). While helping manage in the short term, it may be that this form of coping, which tends to be used more by women, may become chronic and lead to greater likelihood of PTSD (Olf, Langeland, Draijer & Gerson, 2007). If one does have a greater likelihood of PTSD, this also means that there is a greater likelihood of PTG development. Just as Tedeschi and Calhoun (2004) noted, if a person has more perceived threat then that person is more likely to have their assumptive world view challenged, thus increasing the likelihood of developing PTG. Other studies, however, have found no such link (Hooper, 2003) or even that males had higher PTG (Polatinsky & Espy, 2000). This again supports the importance of type of trauma when considering psychological sequelae, and that individual traumas be investigated for the possible unique roles of predictors.

Socioeconomic Status

Socioeconomic status (SES) has been found to play a role as a determinant of both PTSD and PTG. In the large-scale Detroit Area Survey, socioeconomic status was found to be associated the development of PTSD. While those that were of lower income and less education were not at a greater risk for being exposed to a trauma, they were found to be much more likely to be victims of assaultive violence and view trauma happening to others. Given that those who experience an assaultive trauma are more likely to develop PTSD, socioeconomic status may play a role in the development of PTSD as a result of increased exposure to this type of trauma (Breslau et al., 1996). In a compelling meta-analysis of the risk factors for PTSD (Brewin, Andrews, & Valentine, 2000), having a low SES was found to be a risk factor for PTSD. With an effect size ranging from $r = .01$ to $r = .38$, this suggests that SES is an important factor for PTSD, as it was found to be significant across a breadth of studies. On the other hand, the role of SES in the development of PTG seems somewhat more mixed. For example, in female gynecologic cancer patients SES was found to be negatively correlated with PTG, with those higher in SES reporting less PTG (Posluszny, Baum, Edwards & Dew, 2011). This is contrary to how most would view the relationship, as it has been proposed that PTG may be facilitated by availability of resources, and it is plausible that one of higher SES would have greater resources, thus increasing the likelihood of developing PTG. This theorized positive relationship between SES and PTG has been evidenced in highly stressful diseases, such as in breast cancer patients (Cordova et al., 2001) and HIV infection (Updergraff, Taylor, Kemeny & Wyatt, 2002; Milam, 2006). This discrepancy in findings suggests that the relationship may be related to type of trauma, indicating the need for examination within specific forms of trauma. While the resources a person has regarding socioeconomic status play a role in the development of PTS and PTG, the

availability and utilization of the resource of social support plays an important role in their development as well.

Social Support

Social support, or resources provided by others such as family and friends, has been found have a profound impact on the way in which we experience stress and trauma. Having ample social support and making use of said support has been linked to increases in PTG, whereas lacking or withdrawing from support leads to increased PTSD symptoms without concurrently fostering PTG (Brewin, Andrews, & Valentine, 2000; Gunter, 2006). For example, in addition to the contribution of SES, the meta-analysis by Brewin, Andrews, & Valentine found that a lack of social support was also found to have an impact on PTSD in 11 studies. Here, there was an effect size was as high as $r = .54$, showing how much of an impact social support can have. For example, Andrews, Brewin, & Rose (2003) found that in victims of assault with PTSD, inadequate social support predicted an increased likelihood of PTSD development. Further, this was evidenced by a number of studies that have found a link between PTSD and social support whereby social support was either lacking for or being spurned by individuals who develop PTSD. This increase in PTSD resulting from lack of social support is actually the opposite in regard to PTG development, whereby PTG is fostered in the presence of adequate social support. For example, in bereaved HIV/AIDS caregivers it was found that social support had a significant influence on the development of PTG and that the more social support one had, the greater the level of PTG (Cadell, Regehr, & Hemsworth, 2003). In addition to having social support affecting one's ability to grow, the quality and satisfaction one has with their social support has been found to influence stress-related growth. College students who had the greatest levels of satisfaction with their social support systems had improvements in stress-related growth (Park, Cohen, &

Murch, 1996). Those diagnosed with a solid cancerous tumor were also found to benefit from greater levels of social support, such that as long as one had social support they were more likely to develop growth, even if they did not have much disclosure resulting from this support (Dunn et al., 2011).

The presence of social support plays a critical role in the development of PTSD and PTG, however their development also depends on one's use of their social support resources. Davidson et al. (1991) examined a community sample to reveal a significant link between social support and PTSD due to subjects' lower subjective reports of social support. There was no difference in size of social network between those who had developed PTSD and the non-PTSD control group. This suggested, and was corroborated with other findings, that the influence of social support is complex and it was not always that individuals did not have adequate social support, but that trauma victims pull away from and do not use the support that they have. Withdrawing from one's available social support is characteristic of PTSD, and has been more prevalent among victims of rape and physical assault. Additionally, PTSD increased and decreased partly as a function of social support, with social withdrawal leading to an increase in PTSD symptoms and utilizing social support coping strategies providing a decrease in PTSD symptoms (Gunter et al., 2006). The important role of social support, including whether a victim is using his or her support system, causes the need for examining not only levels of social support but also the extent to which victims utilize their support and the role this plays in the concurrent development of PTSD and PTG. While the social support resources, and how one uses them, play an important role in the development of PTSD and PTG, how one interprets a traumatic event can also play an important role in how they develop.

Cognitive Appraisal

One's cognitive biases describe how one thinks about and perceives the world and how one makes judgments about situations that arise. Those who develop PTSD are more likely to have a cognitive bias, or view, that makes them perceive their environment as a threat, while those who develop PTG have a world view that is more likely to facilitate growth. Victims with PTSD have been found to over-estimate the threat of a given situation and view situations in a negative manner. For example, a person who experiences a trauma and does not develop PTSD might perceive the event as a fluke or something that rarely happens. This is compared to a person who perceives the event as highly threatening, causing them to have a sense of constant threat, thinking that "the next disaster will strike soon" or see danger and disaster in everyday situations, thus leading to the development of PTS symptoms (Ehlers & Clark, 2000). It is thought that this persistent negative appraisal may occur as a result of a trauma being too much and not fitting with a person's prior world views and assumptions, thus being more than they are able to cope with. This would result in an individual having trouble actively incorporating the new harsh experience of the trauma into how they viewed the same situation prior to the trauma. It is this challenging of one's assumptive world and assumptions that acts as a causal factor of PTSD, while at the same time creating the opportunity for growth. Tedeschi and Calhoun (2004) liken this to an earthquake, whereby the trauma acts as a "psychologically seismic event" that can damage or destroy many of a victim's ways in which they view and interpret the world. The traumatic event both damages one's schema of the world, and at the same time leaves the possibility of growing one's schemas and world views. For example, if one views their home as a safe place, and is robbed or assaulted in their home, this may be more than they can take, breaking their world view and resulting in them viewing nowhere as safe. Another

example would be if one believed other drivers were bad and a crash was inevitable. In this situation, if one got into an accident it would just reinforce and strengthen an already negative appraisal style, possibly resulting in a compounded distrust of others and any public situations (Agar, Kennedy, & King, 2006; Ehlers & Steil, 1995). In support of this, those who rated higher perceived threat after a car accident were more likely to have symptoms of PTS (Ehlers, Mayou, & Bryant, 1998). Having intrusive thoughts about a stressful life event may be a technique evolved to prepare us for future similar events (Price, 2007), however it is when intrusive thoughts lead to constant rumination when problems may arise. If intrusive thoughts about the trauma continue and affect one's daily life, this has been shown to be related to PTSD symptomatology (Clohessy & Ehlers, 1999; Michael, Halligan, Clark, & Ehlers, 2007). While intrusive thoughts are a symptom of PTSD, one can react in different ways to these thoughts such as how they are interpreted (positively or negatively), attempting to suppress them, dissociating from or ruminating on them as mentioned above. If one continues to ruminate on thoughts regarding the event and the circumstances during which it happened, one will not be as likely to fully process what happened and integrate that experience into how they see the world, and move on from it. If one is unable to move past the event, continually thinking about it, then it will eventually come to define them and how they act. This lack of integration and continual dwelling upon the event is what can lead to PTSD, while integrating the event as one rebuilds their schematic structures is what can lead to PTG in the face of PTSD. How one appraises a situation largely dictates how they feel and cope with a situation. In addition to perceiving a situation as threatening, one may view a traumatic event as a challenge. This appraisal of challenge leads to a more proactive form of coping, whereby one takes initiative and views an event as something that can provide benefit (Schwarzer & Taubert, 2002). Those that develop PTG view a traumatic

event as threatening and have their world view heavily challenged. However, it is possible that if one concurrently views an event as not just threatening, but as a challenge, then it is possible that this thinking could foster the development of PTG. Since PTG requires that one's schemas and previously held beliefs be deeply challenged in order to make way for growth, it is possible that concurrently perceiving an event as highly threatening, while also to some degree challenging, will provide an opportunity for the development of PTG and not just PTS.

Overview

While most people are resilient in the face of trauma, a significant minority experience negative and/or positive changes. While some individuals are chronically negatively affected and develop PTSD as a result of trauma, others are able to grow from their experiences and report positive views of the world. Those that are able to develop PTG in spite of experiencing PTSD and its harsh symptoms are able to more fully appreciate and enjoy life.

The current paper proposed to build upon literature investigating the nature and development of PTS and PTG. The examination of the roles of PTS and PTG into both physical and mental QoL has revealed not only that those who had greater PTS had lower mental and physical QoL, but that those who had greater PTG had better physical QoL as well as longer survival. This underscores the important effects that PTG can have for those who are experiencing a life-altering diagnosis, but there is a need for an examination of the etiology of PTG in this population. For this reason, the current paper sought to examine the characteristics, development, and modifiable and stable determinants of both PTG and PTSD in patients diagnosed with lung cancer. This paper attempted to better characterize the experience of PTG and PTSD, such that how these develop for those affected by lung cancer is more fully understood as well as the nature

of PTG and PTSD. The factors used for examination were prior trauma, cancer type, gender, socioeconomic status, perceived social support, utilization of social support, primary social support, cognitive appraisal of harm/threat, cognitive appraisal of challenge, cognitive appraisal as benign, and how these affect one's likelihood to develop PTG, PTSD, or both. These analyses not only shed light on the course of PTG and PTSD for those with lung cancer, but provide information for treatment regarding modifiable factors that can help lessen PTSD and build PTG.

In order to build upon previous findings that PTS was related to lower mental health QoL and PTG was related to better physical QoL (Dougall et al., Under Review), the current paper sought to examine the determinants of these constructs in the same sample population. The first hypothesis was that experiencing both PTS and PTG would be predicted by the stable, unmodifiable predictors of gender, prior trauma, and type of cancer. Specifically, it was hypothesized that women would report both higher PTS as well as PTG than men. Previous literature has found that women report more PTS symptomatology (Resnick, Kilpatrick, & Dansky, 1993) as well as PTG (Vishevsky et al., 2010) so it was thought that this will be true in the current sample population as well. Additionally, it was thought that the having small cell cancer would lead to higher reporting of PTS and lower reporting of PTG. Small cell cancer has a more grave outlook than non-small cell cancer, so it was thought to be more likely to overcome one's ability to cope, thus leading to more PTS symptoms and less reported PTG. It was also thought that previous traumatic experiences and lower SES would result in higher levels of PTS and lower levels of PTG.

Secondly, it was hypothesized that PTS and PTG would be predicted over and above the unmodifiable predictors by the modifiable predictors of cognitive appraisal of threat and challenge, perceived social support, primary social support, and utilization of

social support. Specifically, it was predicted that PTS and PTG would be differentially predicted, with higher perceived social support, greater social support use and higher ratings of satisfaction with primary social support predicting higher PTG and less PTS. Additionally, it was predicted that higher perceived threat would predict greater PTS and less PTG while higher perceived challenge would predict greater PTG and less PTS. In short, just as PTS and PTG are found to co-occur, it was thought that these predictors would also co-occur.

Chapter 2

Methods & Results

Measures

Symptoms of PTSD were measured using the PTSD Checklist-Specific version (PCL-S; Weathers, Litz, Herman, Huska, & Keane, 1993). This measure required participants to indicate how often they experienced the 17 symptoms of PTSD (DSM-IV) during the prior month. Participants were told to answer the questions in regard to “being told you have lung cancer.” The total score was used for analyses (Cronbach’s alphas = .91-.93)

Posttraumatic growth was examined via the Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996). Participants were directed to indicate their agreement with amount of change they had experienced on 21 items measuring the five domains of PTG (relating to others, new possibilities, personal strength, spiritual change, appreciation of life) as a result of their lung cancer diagnosis. Each item listed a type of change, and participants indicated “the degree to which this change had occurred” in their life as a result of lung cancer, with items on a Likert scale ranging from 0 (not experiencing any change) to 5 (experiencing a very great degree of change). The total score was be used for analyses (Cronbach’s alphas = .94-.96).

Social support was measured in a number of ways, with the current study utilizing three of them. These were the Interpersonal Support Evaluation List (Cohen & Hoberman, 1983; Cohen, Mermelstein, Kamarck, & Hoberman, 1985) which consisted of 40 questions and evaluated one’s perceived availability of tangible, appraisal, self-esteem, and belonging support. Each item gave a situation in which social support could be used, and participants indicated how much they agreed with the statement using a Likert scale ranging from 1 (definitely false) to 4 (definitely true; Cronbach’s alphas = .88-

.90). Second was the Primary Relationship Questionnaire (Redinbaugh, 2000), which consisted of 17 questions establishing patients' primary source of support and satisfaction rating of how supportive relationship was. Third was the Patient Profile Questionnaire (Henderson, Davidson, Pennebaker, Gatchel, & Baum, 2002) which asked participants about the degree to which they talked about their disease with friends, family members, and health-care professionals in order to assess utilization of social support. The items assessing utilization of social support asked participants to rate their agreement with how often they did those items on a Likert scale from 0 (not applicable) to 4 (very often).

Cognitive appraisal was measured via the Cognitive Appraisal of Health Scale's (Kessler, 2008) measurement of the primary stress appraisals of threat/harm, challenge, and benign. These were measured by 20 items assessing patients' cognitive appraisal of health events. Patients were asked to respond to each item based on how they appraised their health status, and each item was on a Likert scale from 1 (strongly disagree) to 5 (strongly agree; Chronbach's alphas = .72-.88).

Gender and family income were taken in the demographics portion of the questionnaire. Cancer type was assessed by asking the participants and was confirmed with the data from their medical charts and from the University of Pittsburgh Medical Center Cancer Registry.

Lastly, prior trauma was assessed by a modified version of the Traumatic Stress Schedule (Norris, 1990). This measured information about potentially traumatic events, and included 12 close-ended questions that inspected dimensions of "loss, scope, threat to life and physical injury, blame, and familiarity." The measure allowed for assessment of up to ten separate potentially traumatic events, such as a motor vehicle accident, war, or interpersonal violence (National Center for PTSD, 2014).

Procedure

The current paper and analyses utilized data already collected as part of another, larger project that has since been completed by Dr. Angela Liegey Dougall. The participants in this study were those listed in the Cancer Research Registry Protocol, University of Pittsburgh Cancer Institute #03-038. All patients who were identified as eligible were contacted either in person or via phone by a member of the research team who discussed participating in the study. Individuals who chose to participate made an appointment with a member of the research team at the cancer clinic in order to sign the informed consent document and fill out the questionnaires. Those who were not able to physically attend an appointment at the cancer clinic were mailed an envelope with the informed consent, questionnaires, and a self-addressed, stamped envelope so that they could be mailed back once completed. Participants were able to call the investigators if they had any questions, concerns, or wished to withdraw from the study. Additionally, information regarding diagnosis, treatment, and prognosis was taken from each participant's medical chart. The sessions took approximately 30 minutes to complete and participants were compensated \$30 for their time after each assessment. There were a total of three assessments made, one after the initial medical visit at the cancer clinic and then at two and four months later.

Results

Data Analysis

The data were analyzed via Statistical Package for the Social Science (SPSS). A literature review revealed that a sample of three observations at level one nested within individuals at level two has been previously performed and found to be adequate (Ntoumanis, 2014). Additionally, a minimum of three observations at level-1 is needed to detect a linear trend, which was met with the sample being used (Ntoumanis, 2004).

Thus, the sample utilized for this study consisting of three observations at level-1 nested within individuals ($n = 93$) at level-2 was adequate for analyses. Multilevel modeling was utilized for analysis as it has noted advantages compared to repeated measures MANOVA. Specific to the proposed study, MLM was advantageous because it took into account individual growth, and accounted for missing data and different spacing in observations (Van Der Leeden, 1998).

Longitudinal data can have missing data that may be missing in an informative or useful manner. In order to account for this, Little (1995) popularized pattern mixture modeling, which allows researchers to identify informative missing data patterns. This method was used in a previous examination of the data (Dougall et al., under review), and missingness was not at random due to deaths. Given this, whether or not participants completed the study was used as a missing data pattern.

Data Screening

The raw data were examined via frequencies, descriptive statistics, and distributions in order to assess distributions. Skewness, kurtosis, and histograms with normality plots were used to assess normality. It was found that one variable (Interpersonal Support Evaluation List, ISEL) required transformation to ascertain normality, and as such was squared which resulted in acceptable normality.

Statistical Results

Analyses of hypotheses 1 and 2 were conducted by multilevel modeling via the mixed models procedure in SPSS. Hypothesis 1 was that the stable variables of gender, socioeconomic status, prior trauma, and cancer type would differentially predict PTG and PTS. Hypothesis 2 was that the amenable predictors of social support network, disclosure of cancer to social support, one's primary relationship quality, and cognitive appraisal of cancer as a challenge, harm/threat or benign, would predict PTS and PTG

over and above the stable predictors. The covariates used were based on the literature and included age and time, as well as whether participants completed the third time-point or not. The full Models were tested against previous models via a change in X2 in order to determine if subsequent models made an improvement. Additionally, all continuous variables were mean centered.

The assessment of PTG was started with a base model with no predictors (intercept only) and then building on this by adding in the stable and then finally amenable predictors. The base model with intercepts only can be viewed in Table 1. The second model included the stable variables, set as fixed factors, and provided a significant improvement in prediction of PTG over the base model (Table 1). This analysis revealed that gender significantly predicted PTG. Specifically, women ($M = 62.18$, $SE = 3.78$) had higher rates of PTG than did men ($M = 52.25$, $SE = 3.29$). Higher levels of posttraumatic stress also predicted higher levels of PTG. No other stable factors significantly predicted PTG. Next, the full model was run, which included the amenable variables in addition to the stable variables, and all amenable variables were set as fixed.

Table 2.1 Models Predicting Posttraumatic Growth

	Total Parameters	-2LL	X2***	df	F	p
Model 1	2	1961.22		1		
Intercept Only					1381.86	< .001**
Model 2	12	1580.38	380.84**	10		
CVs & Stable Factors						
Time					.20	.82
Gender					5.95	.02*
NSCLC					3.44	.07
T3 Completion					.13	.88
PTS					16.74	<.001**
Age					2.74	.10
Income					.36	.55
Trauma History					.008	.930
Model 3	18	1269.07	311.31**	6		
CVs, Stable Factors & Amenable Factors						
Time					.08	.92
Gender					3.15	.08
NSCLC					.07	.80
T3 Completion					.56	.57

Table 2.1 Continued

PTS	24.98	<.001**
Age	2.05	.15
Income	.78	.38
Trauma History	.008	.93
Social Support † Disclosure to SS	1.33	.25
Primary Relationship	.000	.99
Challenge Appraisal	7.57	.007*
Harm/Threat Appraisal	10.40	.002*
Benign Appraisal	1.00	.32
	1.12	.29

*p < .01; **p < .001; ***Model 2 compared to Model 1 and Model 3 compared to Model 2; † variable was square transformed. Note: interactions between Time and all predictors were tested, with none being significant.

This model with the amenable factors provided an improvement in the prediction of PTG over that of the model with just the stable predictors (Table 1). After including the amenable factors, gender no longer significantly predicted PTG, indicating it does not significantly account for variance in PTG when the model was expanded to include the amenable factors. However, higher PTS was a significant predictor of higher PTG. Additionally, two amenable factors significantly predicted PTG, which were the quality of one's primary relationship and cognitive appraisal of challenge. Specifically, higher levels of both of these factors predicted an increase in PTG. So after all relevant variables were

included in the model, the only variables that significantly predicted PTG were PTS, quality of one's primary social support, and cognitive appraisal of challenge.

The assessment of PTS was started with a base model with no predictors (intercept only) and then building on this by adding in the stable and then finally amenable predictors. The base model with intercepts only can be viewed in Table 2. The second model included the stable variables, set as fixed, and provided a significant improvement in prediction of PTS over the base model (Table 2). This analysis revealed that cancer type predicted levels of PTS. Specifically, those with small-cell cancer and mesothelioma ($M = 37.81$, $SE = 2.07$) had higher levels of PTS than those with non-small cell cancer ($M = 29.36$, $SE = 1.27$). Additionally, higher PTG predicted higher PTS. None of the other stable factors significantly predicted PTS. Lastly, the third and final model was run which added the amenable factors to the stable factors, and these were set as fixed. This model with the amenable factors predicted PTS significantly better than the model with just stable factors (Table 2). The analysis revealed that quality of one's primary social support and cognitive appraisal of harm/threat significantly predicted PTS. Specifically, lower ratings of one's primary social support quality and higher appraisal of harm/threat predicted greater levels of PTS.

. Table 2.2 Models Predicting Posttraumatic Stress

	Total Parameters	-2LL	X ² ***	df	F	p
Model 1	2	1623.16		1		
Intercept Only					1543.55	<.001**
Model 2	12	1311.43	311.73**	10		
CVs & Stable Factors						
Time					.46	.63
Gender					.54	.46
NSCLC					15.48	<.001**
T3 Completion					1.53	.22
PTG					16.74	<.001**
Age					1.35	.25
Income					.003	.96
Trauma History					1.26	.26
Model 3	18	1001.73	309.7**	6		
CVs, Stable Factors & Amenable Factors						
Time					1.57	.21
Gender					.50	.48
NSCLC					1.67	.20

Table 2.2 Continued.

T3 Completion	.40	.67
PTG	24.98	<.001**
Age	.06	.81
Income	.34	.56
Trauma History	.33	.57
Social Support † Disclosure to SS	.20	.66
	.61	.44
Primary Relationship	5.86	.017*
Challenge Appraisal	1.27	.26
Harm/Threat Appraisal	33.09	<.001**
Benign Appraisal	.50	.48

*p < .01; **p < .001; ***Model 2 compared to Model 1 and Model 3 compared to Model 2; † variable was square transformed. Note: interactions between Time and all predictors were tested, with none being significant.

Chapter 3

Discussion, Limitations & Future Directions

Discussion

The current study sought to examine factors for the possibility of differentially predicting posttraumatic growth and posttraumatic stress. Specifically, it examined whether stable or amenable variables may uniquely predict whether lung cancer patients develop PTG or PTS as a result of their diagnosis and experience. Regarding the stable factors, hypothesis 1 predicted that having small-cell lung cancer, lower socioeconomic status, and having experienced a greater amount of traumatic events in the past would lead to greater levels of PTS and lower levels of PTG, and that being female would lead to higher levels of both PTS and PTG. In contrast, it predicted non small-cell lung cancer, higher SES, and less prior trauma would result in greater levels of PTG and lower levels of PTS. Additionally, hypothesis 2 stated higher levels of the amenable factors of social support, primary social support, disclosure about one's cancer to others, and perceiving cancer as a challenge would result in greater PTG and less PTS. Conversely, it predicted that lower levels of these variables as well as perceiving cancer as threatening or causing harm would result in greater PTS and less PTG. It was found that while the stable variables did not predict PTG or PTS after the amenable variables were included into the model, both PTG and PTS were predicted by contrasting levels of cognitive appraisal of one's cancer and the quality of one's primary support.

Hypothesis 1 did not receive any support, as the stable predictors did not predict any change in either posttraumatic growth or posttraumatic stress. This is of interest because it indicates that in lung cancer patients PTG and PTS develop regardless of the uncontrollable factors of gender, cancer type, SES, and previous traumatic events, which stands in contrast to much previous research. For example, being female has been

linked to both higher PTG (Tedeschi & Calhoun, 1997) and higher PTS (Breslau et al., 1997). Similarly, SES (Cordova et al., 2001) and cancer stage (Posluszny, Baum, Edwards & Dew, 2011) have been linked to developing greater levels of PTG, with trauma history (Breslau, 2009) being linked to higher levels of PTS. Given this, if there were differences based on stable factors such as gender and cancer type, then treatment and advising of patients might be more beneficial for certain individuals. Since this is not the case, the benefit here is that the support found for hypothesis 2 (discussed below) applies to all individuals, regardless of gender, cancer type, SES, and trauma history. This is especially beneficial regarding trauma history, as physicians do not assess for this and thus would not know if certain individuals were more at risk due to their trauma history.

Hypothesis 2 had partial support, as it was discovered that the key determinants of PTS and PTG are cognitive appraisal and primary social support, such that being on one end of the spectrum (challenge appraisal and ample support) for these variables leads to growth, and being on the other end of the spectrum (harm appraisal and lacking support) leads to greater PTS. The importance here is that the variables are amenable and they differentially predict PTG and PTS, even though they are positively related. In regard to appraisal, this supports the work of Ehlers and Clark (2000), which states that if one interprets their stressor as highly threatening, that will play a large part in determining whether one develops PTS. Lack of support also corroborates prior findings (Andrews, Brewin, & Rose, 2003; Davidson et al., 1991), whereby those who lack or do not utilize their support are more likely to develop PTS. In this instance, the benefit for patients is that these are factors that are amenable to change. Appraisal of harm/threat is tied to the cognitive appraisal of challenge, such that as perceived threat/harm increases individuals will likely have lower levels of perceived challenge, and vice versa (Schwarzer, 2002). If

it is possible to ameliorate patient's feelings of threat and harm in order to lessen PTS, then this would also likely increase feelings of challenge. Then by increasing one's interpretation of challenge, this can in turn help foster growth. The same pendulum type relationship exists for primary social support, whereby as the quality of one's primary social support increases so does PTG, and if the support is as good, this leads to greater PTS.

Because individuals were more likely to develop posttraumatic growth due to viewing their illness as a challenge, this supports previous findings that appraisal and how one interprets their situation can drive how they feel about it (Schwarzer, 2002; Ehlers & Clark, 2000); which is a very important factor in the current examination of lung cancer and PTG. Given this, patients may greatly benefit from their physicians very thoroughly explaining their illness and how their behavior may have an impact on their cancer progression. If patients better understand the need for their adherence to treatment, and view it as a challenge that they can work against, then they may develop PTG as a result. Additionally, patients may benefit from some basic therapy, such as cognitive behavioral therapy. CBT may be especially beneficial in the development of PTG for cancer patients because this style of therapy has patients critically review their thoughts, behaviors, and feelings (Beck, 1995). If individuals are able to review their feelings toward their diagnosis and reappraise it as a challenge, then this may help facilitate growth.

That only perceived harm predicted the development of PTS may be indicative of the stress caused by a lung cancer diagnosis. The results with the current sample indicate that lung cancer patients are likely to develop PTS irrespective of their gender, financial means, prior trauma, type of cancer, disclosure of their illness, and the social support that they receive. That the diagnosis of lung cancer, and the prognosis that it

brings, is enough to cause PTS symptoms is very indicative of the gravity and impact that the illness has. Factors that have been shown to produce less PTS symptoms for victims of other trauma, such as higher SES (Breslau et al., 1996) and better disease outlook (Andrykowski & Cordova, 2008) were found not to have an impact on the stress caused by a lung cancer diagnosis, and may be due, in part, to cancer being a chronic stressor as opposed to an acute event that threatens one's life. A trauma such as a motor vehicle accident, while causing PTS symptoms (Fullerton et al., 2001) is acute and affords victims the opportunity to work through the experience over time. This may be different than a lung cancer diagnosis, which is chronic, as patients have the diagnosis, treatment, impending likelihood of death, and often knowledge that one's behaviors are a cause of the illness. Compounded together this may be enough to negate factors that might otherwise differentially predict PTG and PTS in other traumas.

Similar to cognitive appraisal of challenge, the importance of one's social support leading to growth was found to support previous findings (Brewin, Andrews & Valentine, 2000; Cadell, Regehr, & Hemsworth, 2003) that the two are connected. This is important because it may be more amenable than other sources of support, and there has been little done examining this specific type of support. One advantage is that patient's primary support is already established, so one does not need to seek out contact to expand one's support network. Additionally, many individuals' primary source of social support is a family member, which has been found to be a very helpful source of support for cancer patients (Arora, Rutten, Gustafson, Moser & Hawkins, 2007). If one's extended support network was found to be beneficial, then patients with a poor support system would need to expand their network to develop growth. Putting forth effort to expand their network during a time as stressful and draining as cancer treatment would be fairly unlikely for patients. With primary social support the relationship is already

established, and just needs to be effectively utilized. Knowing of this importance, physicians may be able to prompt patients to communicate with and rely on their social support, and let patients know that doing so can help them navigate their illness. To do this, it is important for physicians to not only fully explain illness and treatment to patients, but to their caregivers as well, given that caregivers are often under a great deal of stress during this time and often do not feel they have been adequately informed about patients' illness (Echlin & Rees, 2002; Eriksson & Lauri, 2000). Physicians may also be able to communicate with patients' primary support, often significant others or best friends, and inform them of the importance of using and not withdrawing from their support. As one may expect, physicians have been found to provide more support regarding information and decision making than emotional support (Arora, Rutten, Gustafson, Moser & Hawkins, 2007), but they may be able to prompt patients' loved ones that it can be especially helpful if they provide emotional support during this trying time, or even refer them to therapists. However, if patients have trouble communicating with and relying on their main support, then that may be another instance where seeing a therapist may be beneficial.

Limitations

The current study did have some limitations to note. The sample, while diverse in regard to gender, SES, and education, was homogenous in regard to racial and ethnic diversity. Also, as this was an initial investigation as to whether there were differences based on the predictors, no intervention took place to examine the impact of improving those factors. Last, due to the nature of the population used, not all patients were able to complete the last time point due to deaths, so pattern mixture modeling was used to account for this.

Conclusions and Future Directions

The purpose of the current paper was to examine if a number of stable and amenable factors differentially predicted posttraumatic stress and posttraumatic growth in lung cancer patients. It was found that while the stable predictors did not significantly predict the development of either of these, patients' quality of primary social support and cognitive appraisal of their situation significantly differentially predicted both PTG and PTS, despite these two constructs being related. Specifically, cognitive appraisal of challenge and greater rating of primary social support predicted greater development of PTG while cognitive appraisal of threat/harm and poorer primary social support predicted PTS. Thus, in lung cancer patients, it seems that the primary determinant of PTG and PTS is how one interprets their illness and the support they receive. Given this, future studies may find benefit by developing short-term interventions tailored toward helping patients view their illness as much of a challenge as possible, as opposed to threatening and harmful. For instance, interventions may involve elements such as thorough explanations from physicians regarding how their behavior could impact disease outcomes as well as briefing their primary support on their importance. Forms of cognitive behavioral therapy may be especially beneficial in this instance, as that type of therapy helps patients evaluate and change their thoughts and attitudes. In the future if short-term interventions prove effective and plausible, improvements in how patients view their illness and rely on their primary support would not only improve their psychological quality of life, but improve illness outcomes as well.

Appendix A

Posttraumatic Stress Disorder Diagnosis

The person has been exposed to a traumatic event in which both of the following were present:

(1) The person 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.

(2) The person's response involved intense fear, helplessness, or horror. Note: In children, this may be expressed instead by disorganized or agitated behavior.

The traumatic event is persistently re-experienced in one (or more) of the following ways:

(3) Recurrent and intrusive distressing recollections of the event, including images, thoughts, or perceptions. Note: In young children, repetitive play may occur in which themes or aspects of the trauma are expressed.

(4) Recurrent distressing dreams of the event. Note: In children, there may be frightening dreams without recognizable content.

(5) Acting or feeling as if the traumatic event were recurring (includes a sense of reliving the experience; illusions, hallucinations, and dissociative flashback episodes, including those that occur on awakening or when intoxicated). Note: In young children, trauma-specific reenactment may occur.

(6) Intense psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event.

(7) Physiological reactivity on exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event.

Persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness (not present before the trauma), as indicated by three (or more) of the following:

(8) Efforts to avoid thoughts, feelings, or conversations associated with the trauma

(9) Efforts to avoid activities, places, or people that arouse recollections of the trauma

(10) Inability to recall an important aspect of the trauma

(11) Markedly diminished interest or participation in significant activities

(12) Feeling of detachment or estrangement from others

(13) Restricted range of affect (e.g., unable to have loving feelings)

(14) Sense of a foreshortened future (e.g., does not expect to have a career, marriage, children, or a normal lifespan)

D. Persistent symptoms of increased arousal (not present before the trauma), as indicated by two (or more) of the following:

(1) Difficulty falling or staying asleep

(2) Irritability or outbursts of anger

(3) Difficulty concentrating

(4) Hypervigilance

(5) Exaggerated startle response

Duration of the disturbance (symptoms in Criteria B, C, and D) is more than 1 month.

The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.

Appendix B

Participant Characteristics

	M	SD	Range
Age	63.94	10.9	35-88
		n	%
Gender			
Male		57	57.6
Female		42	42.4
Race			
Asian		1	.6
Black		3	1.9
White (Non-Hispanic)		95	96
Education			
Some HS or Less		15	15.3
HS Graduate		36	36.7
Some College or Advanced Vocational Training		29	29.6
College Degree		8	8.2
Some Graduate Work		3	3.1
Graduate Degree		7	7.1
Marital Status			
Never Married/Not Living With Partner		1	1
Married & Living Together		61	61.5
Married Not Living Together		1	1
Married, Previously Divorced		6	6.1
Living With Partner		4	4
Widowed		16	16.2

Divorced	10	10.1
Employment Status		
Currently Employed	29	29.6
Not Currently Employed	69	79.4
Total Yearly Family Income		
<= 20,000	19	21.3
20,001-40,000	38	42.7
40,001-70,000	19	21.4
70,001+	13	14.6

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