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Investigation of Posttraumatic Growth on Health Behaviors with Self-efficacy as a Mediator

Annissa Pellicano
Walden University

Walden University

College of Social and Behavioral Sciences

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Annissa D. Pellicano

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Dr. Donna Heretick, Committee Member, Psychology Faculty
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Eric Riedel, Ph.D.

Walden University
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Abstract

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by

Annissa D. Pellicano

MBA, Kaplan University, 2011

BA, New Mexico State University, 2005

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Health Psychology

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Abstract

Research has been accumulating on the positive outcomes that people may experience following trauma. However, scholarly literature is deficient in the area of investigating the association among centrality of event (CE), posttraumatic growth (PTG), and health behaviors of women with histories of sexual trauma. The purpose of this quantitative cross-sectional study was to (a) determine the extent of the relationship between CE and PTG, (b) explore the relationship between PTG and health behaviors (i.e., drug, alcohol, and tobacco use, and physical activity), and (c) to determine whether general self-efficacy (SE) mediated these relationships. The theoretical frameworks used to inform this study were the theories of PTG and SE. A sample of 123 women with histories of sexual violence completed the Posttraumatic Growth Inventory, the Centrality of Events Scale – SF, the New General Self-Efficacy Scale, the Drug Abuse Screening Test–10, and health behavior questions from the Behavioral Risk Factor Surveillance System. The majority of participants reported that their experiences were highly central. Simple regression analysis indicated a marginal relationship between CE and PTG as well as a significant relationship between PTG and SE. PTG was not directly related to the health behaviors in this study. However, a bootstrap mediation analysis indicated that SE significantly mediated the relationship between PTG and physical activity. This study contributes to positive social change by helping women understand how their cognitions influence their SE and behaviors. Likewise, this study can inform practitioners on developing interventions through a lens of positive psychology to promote beneficial health behaviors.

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Dedication

First and foremost, I dedicate this research study to God who has always provided for me the inspiration, perseverance, and commitment to see this task completed. I dedicate this study to the women who have the courage and strength to move forward after their suffering. Thank you for sharing your experiences with me and helping me to accomplish this study. I am humbled and honored to witness a piece of your indominable spirit.

To my husband, Gino Pellicano: I thank you for your love and support for all of my goals. You have seen me through triumphs, tears, sleepless nights, and all of my doubts and fears. Words can never express my love and gratitude for you always letting me know that you are on my side and that you are proud of me regardless of the outcome. To my two little miracles that I was blessed with during this journey, Cataleya and Desmond. If there is one thing that I can teach you it would be to 'see the gold within the cracks'. Life will present you with hard times that may break your beautiful 'vase', but piece it back together by lining the cracks with gold. It may not look the same as it once was, but it will be no less beautiful from what it has endured. I love you deeply and never forget that you two are my greatest achievements. To my family: Thank you for your support and patience for all the times I brought my work with me to family events. To Dr. Diana Jeffery: Thank you for being with me on this long journey. I could not have had a better chair than you. You are a true mentor and confidant who let me crawl when my life got in the way of my educational goals. No words can convey my gratitude for your encouragement, insight, and expertise. To Jacqueline Myers, my sounding board and

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Chapter 1: Introduction to the Study

The last two decades have shown a paradigm shift in trauma research and recovery, from one that was problem-oriented to one that seeks to nurture the survivor's strengths (Ulloa, Guzman, Salazar, & Cala, 2016; Zoellner & Maercker, 2006). Rooted in positive psychology, researchers have begun to examine the beneficial changes that may arise as a result of experiencing challenging life events (e.g., bereavement, automobile accidents, assault), termed as posttraumatic growth (PTG; Tedeschi & Calhoun, 1989). Through the cognitive and emotional struggles following the trauma, individuals can achieve growth in several areas of their lives (e.g., relationship with others) that can lead to well-being despite the presence of distress (Tedeschi & Calhoun, 2004). Also understood is the negative impact trauma can have on psychological (e.g., posttraumatic stress disorder [PTSD], depression, anxiety), behavioral (e.g., alcohol abuse, drug use, tobacco use, poor nutrition), and health outcomes (e.g., high cholesterol, overweight/obesity, diabetes), specifically in regards to individuals who have experienced sexual trauma (Black, Basile, Breiding, & Ryan, 2014; Monnat & Chandler, 2015; Santaularia et al., 2014). What is lacking in research is an understanding of how PTG might be related to health behaviors.

To address this research gap, in this dissertation, I examined the association between PTG and health behaviors among women who experienced sexual trauma including sexual assault (SA) or child sexual abuse (CSA), using the PTG model and definition provided by Tedeschi and Calhoun (2004) and Calhoun, Cann, and Tedeschi (2010). Although there are alternative terms describing growth after trauma (e.g., *benefit*

finding, stress-related growth, perceived benefits, positive adjustment; Cho & Park, 2013), Tedeschi and Calhoun's definition is widely adopted and their Posttraumatic Growth Inventory (PTGI) measure (Tedeschi & Calhoun, 1996) has been validated and used in researching various traumas (Johnson & Boals, 2014; Ulloa et al., 2016). Furthermore, some survivors of a highly stressful event may perceive it as traumatic or an integral threat to their assumptive worldviews and identity (Groleau, Calhoun, Cann, & Tedeschi, 2013; Johnson & Boals, 2014). Recently, research has indicated that directly assessing the centrality of the trauma event helps to refine PTGI scores because it allows more accurate reflection of self-rated significant events (Groleau et al., 2013; Johnson & Boals, 2014; Lancaster, Kloep, Rodriguez, & Weston, 2013). Thus, this study assesses the centrality of events (CE) to distinguish perceived significant events. Additionally, self-efficacy (SE) appears to play a substantial role in health promotion behaviors (Barz et al., 2016; Cupertino et al., 2012; Choo & Kang, 2015). However, SE is not included as a construct in studies of PTG's role and health behaviors. Therefore, the study presented here uses SE as a mediating variable (see Figure 1).

Positive Social Change

Sexual violence has negative individual and community-wide consequences with an estimated cost of $127 billion annually as a result of negative effects on physical health, mental health, and lost work productivity (Black et al., 2014; Jina & Thomas, 2013; Martin, Macy, & Young, 2011; Monnat & Chandler, 2015). Continued research on ways to assist in nurturing survivors' strengths to alleviate deleterious effects of their trauma is important to build survivor empowerment. Roepke's (2015) meta-analysis

indicated that although traditional interventions do not specifically target areas of growth among trauma survivors, participants reported modest gains throughout studies that employed rigorous control trials. This information suggests the possibility of greater advances if interventions are carefully designed to promote PTG. Lahav, Solomon, and Levin (2016) reported a significant association between PTG and negative appraisals of health. This latter study did not assess the connection between participants' health behaviors (e.g., tobacco use, drug use, alcohol use, nutrition, and exercise) and PTG and how specific behaviors might have affected perceptions of health. In the present study, I sought to fill the gap in literature on the relationship between PTG and health behaviors in a sample of women with histories of sexual trauma who are assumed to be at high risk for negative health behaviors that may influence lifetime health outcomes. Results of this study may promote positive social change by informing psychologists and other behavioral health specialists on the possible relationship between PTG and positive or negative health behaviors. The following sections of this chapter provide the background, problem statement, and purpose of this study. Subsequently presented are the research questions, hypotheses, definitions of terms, and the theoretical framework. Finally, this chapter identifies the scope, assumptions, and limitations of this study.

Background

Researchers have shown there is a significant relationship between sexual violence and adverse health behaviors, such as smoking, excessive alcohol use, poor nutrition, poor sleeping habits, and lower physical activity (Monnat & Chandler, 2015; Santaularia et al., 2014; Smith & Breiding, 2011). Likewise, there is an association

between this form of violence and poor health conditions, such as being overweight or obese, high cholesterol, and a greater likelihood of stroke, heart attack, and heart disease (Monnat & Chandler, 2015; Santaularia et al., 2014; Smith & Breiding, 2011). Furthermore, psychological health can be compromised as a result of the trauma, promoting negative conditions such as PTSD, depression, anxiety, and disordered eating, which may further foster negative health behaviors (Monnat & Chandler, 2015; Smith & Breiding, 2011).

Researchers have investigated PTG have been explored in a variety of traumas such as life threating illnesses (Danhauer et al., 2013; Klosky et al., 2014), war veterans (Staugaard, Johannessen, Thomsen, Bertelsen, & Berntsen, 2015; Tedeschi & McNally, 2011), bereavement (Currier, Mallot, Martinez, Sandy, & Neimeyer, 2013; Taku, Tedeschi, & Cann, 2015), and automobile accidents (Shakespeare-Finch & Armstrong, 2010). These investigations indicate that, in comparison to other forms of trauma (e.g., bereavement, automobile accident), survivors of sexual violence reported moderate PTG. Specifically, sexual violence survivors reported growing in their relationships with others, their perceptions of personal strength, and greater life appreciation (Shakerspeare-Finch & Armstrong, 2010). However, they also reported higher levels of PTSD symptomology of avoidance, intrusive thoughts, and hyperarousal (Shakespeare-Finch & Armstrong, 2010). This information also indicates the greater susceptibility to negative psychological outcomes sustained by sexual violence.

Findings on PTG among survivors of sexual violence have been inconsistent (Ulloa et al., 2016). Thus, evaluating CE along with PTG may assist in strengthening

associations with other variables such as physical health (Boals, Steward, & Schuettler, 2010). The consideration of CE may help determine the extent to which participants construed the trauma as a part of their identity which, in turn, may influence perceptions of PTG (Johnson & Boals, 2014). Furthermore, even though there is substantial research on the association between negative posttrauma sequelae and negative health behaviors, there is limited literature on the relationship between PTG and health behaviors (Crawford, Vallance, Holt, & Courneya, 2015; Shakespeare-Finch & Barrington, 2012; Shakespeare-Finch & Enders, 2008; Shen et al., 2015). Likewise, literature on this association is lacking in a population characterized by having experienced sexual violence. Intervening variables may also explain the relationship between health behavior constructs, such as internal locus of control, social support, or personality traits. Numerous research findings have demonstrated significant relationships between SE and weight loss efforts, positive nutrition changes, physical activity behaviors (Cupertino et al., 2012; Choo & Kang, 2015; Fisher & Kridli, 2014; Marr & Wilcox, 2015), smoking cessation (Cupertino et al., 2012), and alcohol cessation (Perkins, Parzynski, Mercincavage, Conklin, & Fonte, 2012; Zullig et al., 2014). In contrast, there is limited research on the relationship of SE in promoting PTG in survivors of SA. There is also a gap in research on the role SE may have in the relationship between PTG and health behavior outcomes. Thus, in this study, I evaluated SE as a mediating variable between PTG and health behaviors. Additionally, in this study, I considered the relationship between negative psychological outcomes and increased propensity for risky health behaviors described in individuals who have experienced sexual traumas. The

information uncovered in this study may assist practitioners in their treatment efforts with these individuals as well as potentially promote further scholarly exploration.

Problem Statement

There is limited information on the relationship between growth and health behavior changes, specifically among women with a history of sexual trauma. Examination of posttraumatic stress and health issues has been extensive, with analyses revealing a significant relationship between sexual trauma, negative health behaviors (e.g., smoking, heavy drinking, poor food choices), and poor health outcomes such as high cholesterol, heart disease, stroke, disability (Monnat & Chandler, 2015; Santualaria et al., 2014; Smith & Breiding, 2011). Smith and Breiding's (2011) investigation exposed positive associations between nonconsensual sexual experiences and high cholesterol, excessive alcohol use, tobacco use, and risky HIV behaviors amongst both men and women. Additionally, for women, Smith and Breiding found a significant relationship between nonconsensual sexual experiences and being overweight or obese in a national sample. Smith and Breiding (2011) posited that though sexual trauma occurs more frequently during the periods of childhood to young adulthood, the long-term health consequences often arise later in life. Cook, Dinnen, and O'Donnell's (2011) review supports this finding, highlighting that older women with a history of sexual or physical violence present more negative physical (e.g., arthritis) and psychological (e.g., depression, feelings of isolation and shame, posttraumatic stress indicators) symptoms than older women without such histories. Concurrently, research is amassing on PTG in trauma survivors. PTG occurs when survivors are able to rebuild their beliefs and their

assumptive worlds, which positively influences five domains: New Possibilities, Relating to Others, Personal Strength, Spiritual Change, and Appreciation of Life (Ramos & Leal, 2013; Triplett, Tedeschi, Cann, Calhoun, & Reeve, 2012). This manifestation of growth can lead to a sense of well-being (Ramos & Leal, 2013; Triplett et al., 2012). However, a thorough review of the literature shows there are few studies on health behaviors and PTG.

Among these few studies, PTG research has inconsistent findings, weak correlations, and small effect sizes (Boals et al., 2010; Elderton, Berry, & Chan, 2017; Ulloa et al., 2016). A key issue may be that the survivor may not perceive a sexual trauma as significant and life-altering. The event may not be substantial enough to shatter core beliefs and influence self-perceptions necessary for PTG processes to occur (Boals et al., 2010; Groleau et al., 2013). Thus, studies which fail to assess CE may be incorporating events that, though defined as a trauma, are not perceived by the individual as crucial to his or her worldviews (Boals et al., 2010). Moreover, there are few studies that focus on PTG in female sexual violence survivors (Ulloa et al., 2016), and those that are available do not consider the subjective nature of the trauma (e.g., CE) and the possible relationship to health behaviors.

Shakespeare-Finch and Barrington (2012) conclude that for PTG to be authentic, it must be accompanied by behavioral changes. For example, if individuals report that they have experienced growth in their ability to relate to others, their actions would complement those perceptions (e.g., more openness to loved ones). These authors found that many survivors who reported growth in the domains of New Possibilities and

Personal Strength also reported an increase in physical activity such as playing sports and/or exercising. Additionally, health promotion efforts often seek to strengthen SE in patients in order to support and maintain positive behavioral changes (e.g., increase exercise, healthy eating) assumed to improve health outcomes (Holloway & Watson, 2002; Mosher et al., 2013). Read, Radomski, and Borsari (2015) provided evidence that interventions that focus on SE helped to decrease excessive alcohol use in a college sample with posttraumatic stress. Empirical evidence on health behaviors of women with a history of sexual trauma may assist in providing direction for existing health programs that capitalize on the strengths of those with a history of sexual trauma. Exploration of the influence of PTG that is high in event centrality on health behaviors is the logical next step in PTG research

Purpose of the Study

The aim of this quantitative study is to determine if there was an association between CE and PTG in a sample of women with a history of sexual trauma. The second aim is to explore the relationship between PTG and four areas of health behaviors, namely, tobacco use, alcohol use, drug use, and physical activity. The third aim is to determine whether SE mediates the relationship between PTG and the aforementioned health behaviors. The predictor variables in this study are the participant's centrality of event scale (CES) score and PTGI score. The criterion variables were health behaviors, and the mediating variable was SE.

Research Questions and Hypotheses

Research Question 1: Is there a relationship between CE (as measured by the CES) and PTG (as measured by the PTGI) scores amongst women who have experienced sexual trauma as determined by the 2007 Behavioral Risk Factor Surveillance System (BRFSS)?

Null Hypothesis 1: There is no statistically significant relationship between CE and PTG.

Alternative Hypothesis 1: There is a statistically significant relationship between CE and PTG.

Research Question 2: Is there a significant relationship between PTG (as measured by the PTGI) and health behaviors of tobacco use, alcohol use, physical activity (as measured by selected questions from the 2015 BRFSS), and drug use (as measured by the DAST-10) amongst women who have experienced sexual trauma (as determined by the 2007 BRFSS)?

Null Hypothesis 2: There is no statistically significant relationship between PTG and health behaviors tobacco use, alcohol use, drug use, and physical activity amongst sexual trauma survivors.

Alternative Hypothesis 2: There is a statistically significant relationship between PTG and health behaviors tobacco use, alcohol use, drug use, and physical activity amongst sexual trauma survivors.

Research Question 3: Is there a significant relationship between PTG (as measured by the PTGI) and SE as measured by the New General Self-Efficacy Scale

(NGSES; Chen, Gully, & Eden, 2001) amongst women who have experienced sexual trauma (as determined by the 2007 BRFSS)?

Null Hypothesis 3: There is no statistically significant relationship between PTG and SE amongst sexual trauma survivors.

Alternative Hypothesis 3: There is a statistically significant relationship between PTG and SE amongst sexual trauma survivors.

Research Question 4: Is there as statistically significant relationship between health behaviors of tobacco use, alcohol use, physical activity (as measured by questions selected from the 2015 BRFSS), and drug abuse (as measured by the DAST-10) and SE (as measured by the NGSES) amongst women who have experienced sexual trauma (as determined by the 2007 BRFSS)?

Null Hypothesis 4: There is no statistically significant relationship between health behaviors tobacco use, alcohol use, and physical activity and SE.

Alternative Hypothesis 4: There is a statistically significant relationship between health behaviors tobacco use, alcohol use, and physical activity and SE.

Research Question 5: Does SE (as measured by the NGSES) mediate the relationship between PTG (as measured by the PTGI) and health behaviors of tobacco use, alcohol use, physical activity (as measured by questions selected from the 2015 BRFSS), and drug abuse (as measured by the DAST-10) amongst women who have experienced sexual trauma (as determined by the 2007 BRFSS)?

Null Hypothesis 5: SE does not significantly mediate the relationship between PTG and health behaviors of tobacco use, alcohol use, drug use, and physical activity.

Alternative Hypothesis 5: SE significantly mediates the relationship between PTG and health behaviors tobacco use, alcohol use, drug use, and physical activity.

Theoretical Framework

The theoretical framework for this study is Tedeschi and Calhoun's (2004) theory of PTG. Tedeschi and Calhoun theorized that growth occurs in one or more of five domains: (a) an increased appreciation for life, (b) meaningful relationships with others, (c) increased sense of personal strength, (d) new possibilities, and (e) spiritual and existential matters (Tedeschi & Calhoun, 2004). This theory builds upon Janoff-Bulman's assertion (1992) that individuals have fundamental assumptions about the world and their place in it. These assumptions help to interpret environmental information, guide actions, and understand why events occur. Tedeschi and Calhoun (2004) posit that significant traumatic events may shatter the person's fundamental assumptions causing substantial emotional distress. Through the deliberate emotional and cognitive struggle, the individual begins to rebuild his or her fundamental assumptions that reflect his or her acceptance of his or her changed world which leads to growth, a more complex personal narrative, well-being, and adjustment. Tedeschi and Calhoun emphasized that the profound psychological struggle following the trauma event enables the individual to clearly delineate a before and after the ordeal in his or her personal narrative and to appreciate the beneficial lessons he or she learned. Therefore, it is not the trauma itself that promotes growth; it is the cognitive processes used to adapt after the trauma that are important.

Additionally, Berntsen and Rubin's (2006; 2007) concept of event centrality may be a vital construct in evaluating PTG. These authors suggest that memories of traumatic events are central when they become a personal reference point for the survivor and serve as a guide to thoughts and behaviors and validate beliefs and feelings. These memories become turning points for the individual and a part of a personal narrative (Berntsen & Rubin, 2006; 2007). Additionally, studies suggest a significant association between events high in centrality and PTG (Boals & Schuettler, 2011; Groleau et al., 2013). Thus, assumptions under these theories suggest highly central traumatic events, such as sexual violence, may promote a challenge to core beliefs and struggle necessary to foster growth and well-being. Chapter 2 provides a detailed description of the theoretical framework.

Nature of the Study

In this cross-sectional, quantitative study, I explored the relationship between CE, PTG, and health behaviors of among women with history of sexual violence. I used the CES (Berntsen & Rubin, 2006; 2007), the NGSES (Chen et al., 2001), and the PTGI (Tedeschi & Calhoun, 1996) to operationalize the constructs under research. Health behaviors were assessed using questions from the 2015 BRFSS (CDC, 2016a) specific to exercise, tobacco use, and alcohol consumption, and the Drug Abuse Screening Test – 10 (DAST-10; Skinner, 1982) to evaluate drug use. I used the 2007 BRFSS questions to determine the type of sexual trauma, frequency, relationship to perpetrator, and age of event occurrence. This study included adult women, age 18 or older, who self-reported as having experienced SA or CSA. Using convenience sampling, I collected data by means of surveys through the social media network Facebook. Data were analyzed using

Statistical Package for the Social Sciences (SPSS) Version 24 software. The predictor variables in this study were the participants' PTGI and CES scores, criterion variables were health behaviors, and the mediating variable was SE (see Figure 1). Separate mediation models were conducted for each other the health behaviors. Demographic questions included participants' age range, race/ethnicity, household income, the highest level of education obtained, and marital status. Regression and bootstrap analyses were used to test the hypotheses. A fuller description of the methodology is provided in Chapter 3.

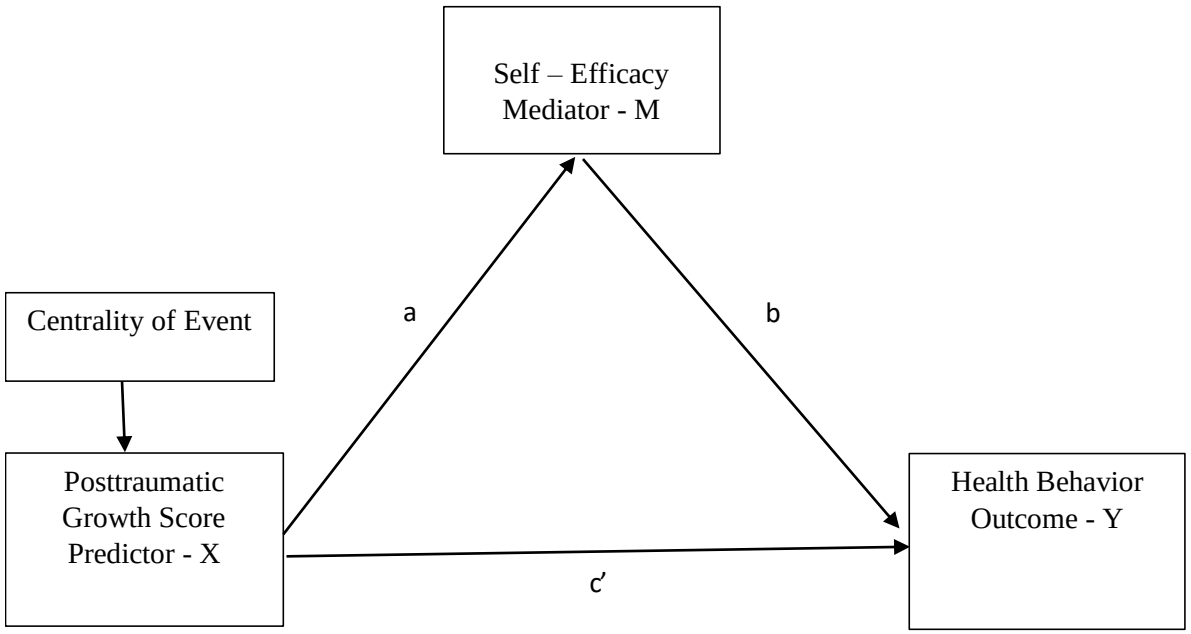

Figure 1. Mediation model being tested.

Definition of Terms

Centrality of event: CE is the degree in which a person views his or her trauma as part of their identity (Barton, Boals, & Knowles, 2013; Groleau et al., 2013). In this study, terms CE and event centrality are used interchangeably.

Child sexual abuse: Child sexual abuse is the coercion or manipulation of a child by an adult or older child to engage in any type of sexual activity (Finkelhor, Shattuck, Turner, & Hamby, 2014).

Posttraumatic depreciation: Posttraumatic depreciation is the opposite of PTG in which psychological adjustment is impaired or reduced (Barrington & Shakespeare-Finch, 2013; Cann, Calhoun, Tedeschi, & Solomon, 2010).

Posttraumatic growth: PTG is the positive psychological changes resulting from the cognitive and emotional effort to rebuild an individual's assumptive world after a significant traumatic event (Tedeschi & Calhoun, 2004).

Resilience: Resilience is the ability to return to the state of functioning an individual had prior to the trauma (Tedeschi, Calhoun, & Cann, 2007).

Self-efficacy: SE is an individual's belief in his or her ability to engage in the appropriate behaviors to complete goals (Bandura, 1982).

Sexual violence: Sexual violence is any nonconsensual sexual experience committed or attempted against a person, whether drug/alcohol facilitated or not. Acts include but are not limited to completed or attempted penetration (e.g., penis, hands, object) into any part of the victim (e.g. vagina, anus, mouth), forced sexual acts in which the victim is made to penetrate the perpetrator or someone else, physical or verbal

coercion to have sex, and noncontact sexual acts such as harassment, voyeurism, and being made to view pornographic material (Basile et al., 2014).

Assumptions

Certain assumptions informed the design of this study. I assumed that participants were in a safe environment and able to respond truthfully to the measures provided. The online data collection format provided anonymity that could have assisted in participants' perception of privacy, which may have helped facilitate honest and candid responses. Likewise, participant self-selection for taking the survey suggested a willingness to be honest. Also, I assumed that the measures chosen for PTG, SE, CE, and health behaviors were reliable and valid.

Scope and Delimitations

The scope of this study was restricted to theory of PTG (Tedeschi & Calhoun, 2004), CE (Berntsen & Rubin, 2006) and general SE (Chen et al., 2001). Alternative definitions of growth, such as perceived benefits and positive adjustment (Cho & Park, 2013) were not used in this study because Tedeschi and Calhoun's (2004) definition has been widely adopted and their measure of PTG has been validated in research on various traumas. Other models of health behavior such as the transactional model of stress and coping, the theory of planned behavior, and the health belief model were not used because they did not accurately reflect the concept of personal growth after trauma in relation to health behaviors. For this study, I recruited adult women who were at least 18 years old, were able to read English, had a history of sexual trauma, and utilized the social media tool Facebook. Different factors influence individuals' decisions to opt into

studies that are highly personal in nature, such as demographics, personality traits, psychological distress, mental abilities, and physical abilities. Therefore, this study's conclusions were restricted to this sampling's parameters and the measures used to operationalize the variables.

Limitations

There are several limitations in this study. First, this was a convenience sample recruited through the social media network Facebook. Inherently, online survey methods limited survey application to those with access to a computer and the Internet. Also, research that employed cross-sectional design cannot inform on the causation effects of the variables. Furthermore, the survey language limited participation, and thus generalizability, to participants who speak English. Lastly, current media coverage of SA might have served as triggers for memories and emotional distress in women who had experienced sexual trauma and might have influenced self-reports in this study. Using the CES might have assisted in refining self-reports of growth because it evaluated the individual's perceptions of how integral the experience was to their identity. Theoretically, in PTG, the individual can distinguish the events as a life marker that had a subsequent influence on their perceptions of their past, present, and future. The use of validated measures and rigorous data collection procedures made this a viable study.

Significance

Research on trauma recovery indicates that the rehabilitation process must go beyond medical diagnosis or focus on repairing what is damaged (Moran & Nemec, 2013). The path to rehabilitation is highly subjective as individuals develop an

understanding of their trauma experience and determine the significance it will have on how they interpret their sense of self and their subsequent experiences and behaviors (Moran & Nemec, 2013). Thus, rehabilitation efforts must take a holistic approach and strive to promote individuals' strengths and potential for growth rather than focusing on alleviating pathology (Moran & Nemec, 2013). Shakespeare-Finch and Barrington (2012) argue that the key aspect of meaning in PTG is not exclusively cognitive in nature; rather meaning must facilitate actions that reestablish the survivors' perception of control in their lives. Evaluating PTG and health behavior may contribute to literature on the construct's functional application of growth and actions in consideration of trauma and recovery (Shakespeare-Finch & Barrington, 2012).

Summary

The purpose of this quantitative cross-sectional study was to explore the relationship between PTG, CE, and SE on health behaviors of female survivors of sexual violence. Research within this population illuminated the deleterious psychological and health posttraumatic effects of sexual trauma. Moreover, there is increased research interest in potential positive outcomes of trauma. Thus, an investigation to understand possible health behaviors was the next logical step in examining PTG. This study used PTG theory defined by Tedeschi and Calhoun (2004), CE defined by Berntsen and Rubin (2006; 2007), and SE defined by Bandera (1982). This chapter provided a brief orientation to this research project including the nature of the study, significance, assumptions, and limitations. Chapter 2 provides a detailed description of the theories in the field of sexual violence, though literature is limited. Subsequently, Chapter 3 provides

a detailed account of this project's design, research questions, assessment measures, participant demographics, statistical procedures, and statistical software. Chapter 4 provides a description of the results from the statistical analyses and the subsequent post hoc analyses. Lastly, Chapter 5 provides a comprehensive discussion of the results, study limitations, future research recommendations, and potential for social change.

Chapter 2: Literature Review

Introduction

The purpose of this study was to investigate the relationship between PTG and health behavior changes of tobacco use, drug use, alcohol use, and physical activity, and whether SE mediated these relationships, amongst women with histories of CSA and SA. This chapter begins with a description of PTG theory popularized by Tedeschi and Calhoun (1996, 2004) followed by a discussion of research on survivors of CSA and SA, PTG, and health behaviors and limitations within these studies. Subsequently, the theory of CE is described in its relationship to an individual's trauma and posttraumatic outcomes. Thirdly, SE is described along with a brief review of literature on its role in health behavior changes (Bandera, 1986, 1997; Swartzer & Renner, 2009), specifically tobacco use, alcohol use, drug use, and physical activity. This chapter culminates with a review of common measures utilized in PTG research, general observations on population sampling characteristics, and a discussion on how this study will extend current literature.

Literature Search Strategy

I used the following databases to search peer-reviewed literature: PubMed, CINAHAL, ProQuest Central, ProQuest Dissertations and Theses Global, PsycARTICLES, PsycINFO, and ScienceDirect. I also used references within sources and articles by the same author(s), when relevant. Furthermore, literature was restricted to quantitative studies and systematic reviews. Literature searches for PTG were restricted to Tedeschi and Calhoun's definition of the term and use of the PTGI. Key

terms used in the searches were *sexual assault, rape, child sexual abuse, sexual violence, posttraumatic growth, centrality of event, trauma, self-efficacy,* and *health behaviors* (specifically, tobacco use, drug use, alcohol use, and physical activity, separately). Date restrictions of literature searches on *posttraumatic growth, child sexual abuse,* and *sexual assault* collectively were set for the last 12 years (2005 to present) in consideration of the limited research available for this population. Literature that pertained to seminal research (e.g., Bandera, 1986, 1997; Tedeschi and Calhoun, 1995) was not date restricted. All other searches were limited to the last 7 years (2010 to present).

Prevalence of Sexual Violence

Sexual violence is a worldwide epidemic that can have deleterious effects on psychological, physical, and behavioral outcomes. Public health issues arise not only from the immediate harms sustained during the event, but also from long-term ramifications to the survivor, family members, and the community (Breiding et al., 2014). According to the National Intimate Partner and Sexual Violence Survey of 2011 (Breiding et al., 2014), in the United States it is estimated that 19.3% of women (greater than 23 million) have reported being raped in their lifetime and approximately 11.5% of women were raped within the year prior to taking the survey. Moreover, nearly 44% of women have experienced alternative forms of sexual violence (e.g., uncompleted SA, sexual coercion, unwanted sexual contact such as kissing or fondling) in their lifetime and 5.5% within the prior year (Breiding et al., 2014). Sexual violence is estimated to cost $127 billion annually as a result of the damage it can bring on health, well-being,

and work productivity and is considered to be the costliest of all violent crimes (Delsis, 2010; Jina & Thomas, 2013).

Research has focused on consequences of this form of violence, such as sexually transmitted infections and disease, reproductive and bodily trauma, gastrointestinal dysfunction (Jina & Thomas, 2013), PTSD, anxiety, and depression (Mason & Lodrick, 2013). Likewise, authors have indicated that survivors of CSA and ASA are at increased risks for engaging in unhealthy behaviors such as multiple sexual partners, hazardous drinking, illegal drug use (Haller & Chassin, 2014; Jina & Thomas, 2013; Littleton et al., 2013; Nayak et al., 2012; Smith & Breiding, 2011), smoking (Amstader et al., 2009; Smith & Breiding, 2011), abuse of prescription medication (Jina & Thomas, 2013), lower levels of exercise (Zen, Whooley, Zhao, & Cohen, 2012), and poor food choices (Hirth, Rahman, & Berenson, 2011; Smith & Breiding, 2011; Talbot, Maguen, Epel, Metzler, & Neylan, 2013). These behaviors may generate or exacerbate health conditions.

Even though researchers have uncovered relationships between health status and SA, many questions remain. In the past few decades, a paradigm shift has occurred in trauma research from a problem-focused approach to one that seeks to nurture the survivor's strengths (Zoellner & Maercker, 2004). Tedeschi and Calhoun (2004) wrote that many survivors report PTG despite their negative trauma outcomes. The understanding that individuals can experience significant changes in the aftermath of a traumatic event is not a new concept. Areas of research utilizing the PTG model include life-threatening illnesses (Danhauer et al., 2013; Phipps et al., 2014), injury (Martin, Byrnes, McGarry, Rea, & Wood, 2017), loss of a loved one (Curries et al., 2013;

Komarnicka-Jedrzeiewska, Walczak, & Jedrzeiewski, 2015; Patrick & Henrie, 2016; Taku et al., 2015), surviving military combat (Tedeschi & McNally, 2011), and natural disasters (Marshall, Frazier, Frankfurt, & Kuijer, 2015). Nevertheless, there is limited literature on PTG in survivors of sexual violence, and what is available provides conflicting results (Grubaugh & Resick, 2007; Ullman, 2014; Ulloa et al., 2016). New discoveries on CE, discussed in this chapter, may shed light on individual differences of PTG development among survivors of sexual violence in comparison to other trauma types. Likewise, research is lacking on the relationship between PTG and health behavior changes and whether SE influences that relationship.

Purpose of the Study

There were three aims in this quantitative study. The first aim was to explore the relationship between CE and PTG among women with histories of sexual trauma. The second aim was to explore the relationship between PTG and health behaviors, specifically, tobacco use, alcohol use, drug use, and physical activity. The third aim was to determine whether SE mediated the relationship between PTG and the aforementioned health behaviors among female CSA and SA survivors. Outcomes of this study can contribute to positive social change because the findings may assist psychologists and other behavioral health specialists by providing empirical evidence to support or modify primary treatments and health promotion endeavors. Practitioners who have a PTG perspective can integrate concepts of personal growth with health promotion strategies to assist health behavior change, facilitating a mentality that “I was capable of experiencing growth from my trauma; therefore, I am capable of engaging in healthy activities.”

Subsequently, information from this study may inform women on how their behaviors influence their health.

Theoretical Foundation: Posttraumatic Growth

Background of Posttraumatic Growth

Prior to the increasing popularity of PTG as a research construct, Janoff-Bulman (1989) proposed that traumatic events disrupt the individual's assumptive world. In her writing, she explained that assumptive worlds are a strong set of expectations through which individuals conceptualize their world and their place in it. These expectations are the means through which one engages with his or her environment (Janoff-Bulman, 1989). For instance, children learn early in life a sense of safety if they have nurturing parents or caregivers. As they age, they develop almost an implicit understanding that the world is overall safe and though bad things can happen they are invincible. They have high expectations of the world being just and meaningful and events being controllable. Basic assumptions are categorized as beliefs in compassion and meaningfulness in the world, and beliefs of self-worth (Janoff-Bulman, 1989).

Janoff-Bulman (1989) elaborated on assumptive world theory by proposing that assumptions can be thought of as cognitive schema, which are rules used to interpret information. When new information or stimuli are perceived, it is are compared to the information established within the existing schema. People have a tendency to want to conserve existing schemas and are biased towards new information. When the new information is compatible, it is easier to assimilate into prevailing schemas. Incongruent information is thus disregarded or individuals change their current schemas to

accommodate it, though the stronger inclination is to persevere in the effort to maintain. Schemas are necessary for the ability to function in a complex world. Assumptive worldviews can be considered as schema, thus resistance to schema changes equates to resistance to changing assumptions (Janoff-Bulman, 1989).

Furthermore, fundamental assumptions provide a foundation for an individual's narrative identity (McAdams & McLean, 2015). McAdams and McLean (2015) highlighted that narrative identity is the linguistic interpretation of personal stories. When individuals communicate who they are to themselves and to others through accounts of their past, they do so by synthesizing memories of autobiographical information and goals they have for the imagined future (McAdams & McLean, 2015). This ability gives their identity temporal consistency that is perceived through their assumptive world views, which provides meaning to their experiences (McAdams & McLean, 2015). Traumatic events may present new information that can significantly challenge fundamental schema and shatter the assumptive world because survivors can no longer identify with previous deeply held views (Tedeschi & Calhoun, 2004). Narrative identity is disrupted as individuals struggle to come to terms with the trauma they experienced and what it may mean for their pasts and their possible futures (McAdams & McLean, 2015; Tedeschi & Calhoun, 2004).

The Theoretical Process of Posttraumatic Growth

In their most recent model of PTG, Calhoun and Tedeschi (2013) (see Figure 2) conceptualized PTG as a dynamic and ongoing process. Initially, an individual exists in their pretrauma state consistent with their assumptive world beliefs that have been

developed throughout their life. A significant traumatic event (e.g., life threating illness, automobile accident, the death of a loved one, assault) occurs that challenges deeply held beliefs and produces a substantial amount of emotional distress (Calhoun & Tedeschi, 2013). It is important to note the event itself is not the key factor of the growth process. Rather, the person's interpretations of the event and the considerable internal disorganization caused by these perceptions are the primary emphasis as beliefs are shattered (Meichbaum, 2006; Tedeschi & Calhoun, 2004).

The onslaught of the trauma against beliefs and emotions may trigger ruminative processes (Tedeschi & Calhoun, 2004). Ruminative thinking involves conscious thoughts centered on a major theme (Tedeschi & Calhoun, 2004). This type of thinking is considered intrusive, because it does not require environmental cues to occur, and is recurring (Tedeschi & Calhoun, 2004). In the immediate aftermath of the trauma, the individual may experience negative ruminations characterized as brooding and involuntary as they begin to cognitively process the event and worry about current and future outcomes (Tedeschi & Calhoun, 2004). Stockton, Hunt, and Joseph (2011) explained negative rumination as passive process during which the individual focuses on the obstacles and inability to achieve a standard.

In due course, as individuals attempt to manage undesirable emotions and thoughts, they may allow for self-analysis of their current situation and potential future and begin to convert the brooding, intrusive rumination into deliberate and constructive rumination (Tedeschi & Calhoun, 2004; 2013). Stockton et al.'s (2011) study on the relationship between rumination type and PTG (n = 188) revealed that deliberate

ruminations were positively correlated with growth in addition to being correlated to both positive and negative outlook changes, whereas scores of intrusive ruminations were only positively associated with negative outlook changes. Furthermore, multiple regression analysis indicated that deliberate rumination was the only variable that significantly predicted PTG. These findings support the hypothesis that ruminative thoughts can be both positive and negative, that they can coexist, and that actively engaging in processing information from the trauma may promote PTG.

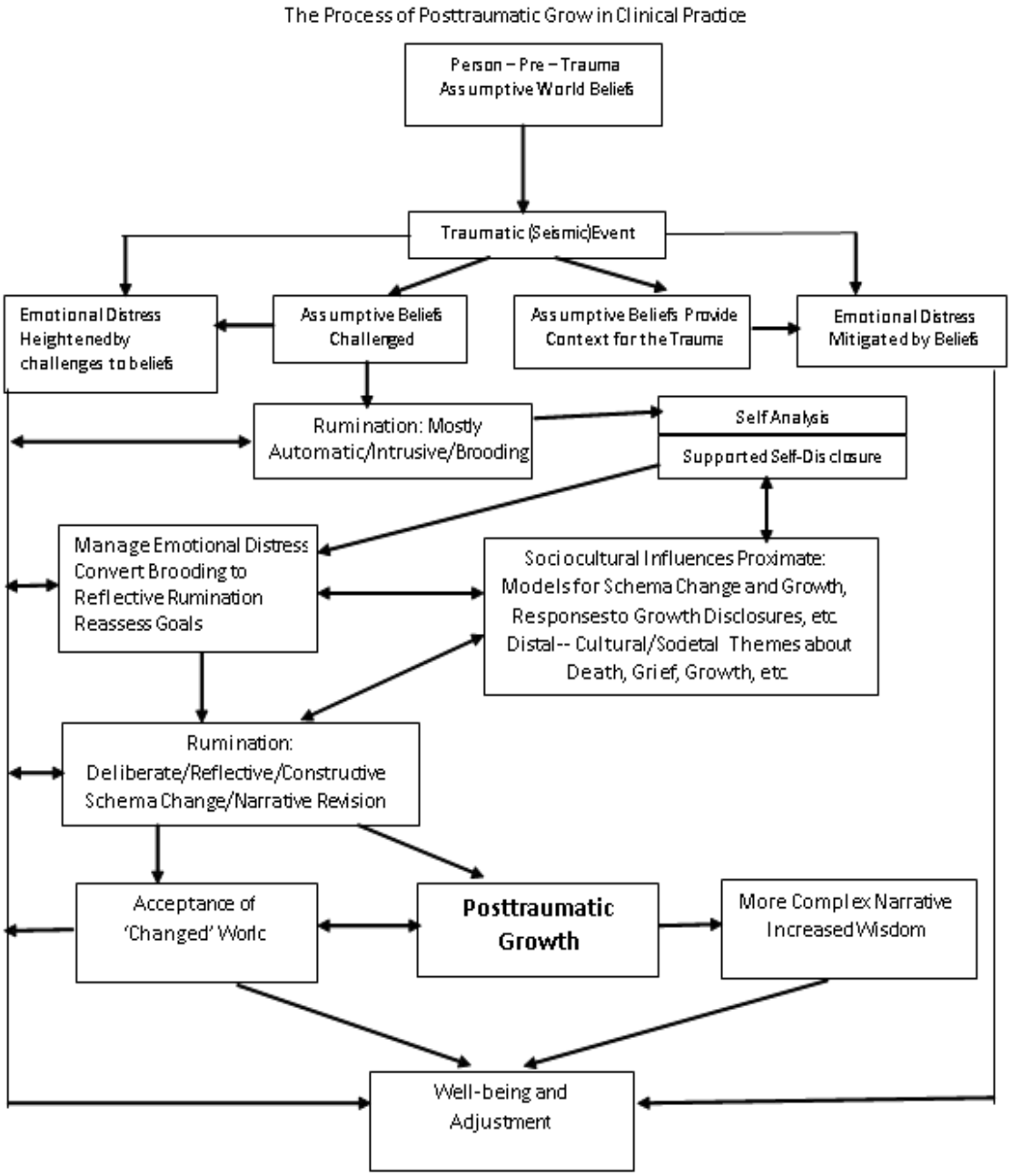

Figure 2: A Model of Posttraumatic Growth.
Note. Adapted with permission from "Posttraumatic Growth in Clinical Practice," by Calhoun, L. G. & Tedeschi, R. G., 2013, Routledge: New York, p. 17.

Deliberate rumination is thought to be constructive and reflective as individuals begin to distinguish the significance of the event in their lives and they develop a sense of meaning (Shakespeare-Finch & Barrington, 2012; Taku, Cann, Tedeschi, & Calhoun, 2008; Tedeschi & Calhoun, 2004). Essentially, individuals start to reconstruct their beliefs and life narratives to include the new information gained through the trauma. Contrary to Zoellner and Maercker's (2006) view that PTG has an illusory quality that is used to cope with the trauma, Tedeschi and Calhoun (2004; 2007) argued that in the deliberation that leads to significant growth from which individuals are able to acknowledge how the trauma has influenced their lives as they incorporate the new information into their life narrative. These authors explained that survivors can develop identities where they perceive their narratives in a before and after the trauma context. They have come to accept their changed world assumptions and can reflect on how the trauma has produced something positive in their lives (Tedeschi & Calhoun, 2004). Though they have experienced a significant negative event that has shattered what they believe about the world and their place in it, they have accepted that they can adapt and live their lives effectively (Tedeschi & Calhoun, 2004; Shakespeare-Finch & Barrington, 2012). It is the complex and interactive process of cognitive and emotional challenges that lead to PTG, the development of a more complex life narrative, and subsequent well-being and adjustment (Tedeschi & Calhoun, 2004).

External factors that influence growth include supported self-disclosure and sociocultural dynamics (Tedeschi & Calhoun, 2004, 2013; Ullman, 2014). Lindstrom, Cann, Calhoun, and Tedeschi (2013) elucidated the positive benefits of self-disclosure of

trauma and developing higher levels of PTG. These benefits may occur because self-disclosure it is necessary to put the trauma experience into words, engage in deliberate rumination, and linguistically reorganize personal narratives to incorporate new information received from their experience (Lindstrom et al., 2013; Muldoon, Taylor, & Norma, 2015; Neimeyer, 2006). Likewise, disclosure to others who have had similar experiences and gaining feedback and support can also facilitate the restructuring of schemas (Janoff-Bulman, 2006; Lindstrom et al., 2013; Neimeyer, 2006). Lindstrom et al. (2013) divided their sample of individuals who had reported experiencing highly stressful events (n = 129) into two groups, those who disclosed their struggle with the trauma and whether they discussed positive or negative consequences. Individuals who reported more positive consequences reported less stress soon after the event and more deliberate rumination.

Neimeyer (2006) further elaborated that narratives consist of three facets: personal, interpersonal, and sociocultural. At the personal level, self-narratives provide principal cognitive, affective, and behavioral structures that serve as guidelines for one's thoughts, emotions, goals, and performance within one's environment. Individuals segment their experiences into vivid episodes with themes, in-depth characters, and goals, creating micro-narratives of events that in turn become consolidated with their macro-narratives of broad, self-understanding. At an interpersonal level, sharing narratives with others can assist in facilitating recovery as trauma survivors process and find meaning in the new trauma information. (Cho & Park, 2013; Neimeyer, 2006). Sharing narratives may allow survivors to integrate the knowledge and transcend the experience as

supportive others provide validation and a means to linguistically metabolize the negative cognitive and emotional effects of the trauma (Neimeyer, 2006). Supportive others may be able to provide the survivor with encouragement as well as their own personal narratives for comparison and aid in bringing to a halt contra-factual and negative thinking (Meichenbaum, 2006).

Social level narratives can provide context for more than the individual(s) because the shared stories, beliefs, and meaning of events can extend throughout the community (Neimeyer, 2006) (e.g., a sense of patriotism after the terrorists' attacks on the Twin Towers in 2001). Previously mentioned in this chapter, Tedeschi and Calhoun's (2010) model of PTG indicates that proximate (e.g., how significant others respond to trauma disclosure, significant others who can provide examples of traumatic growth) and distal (i.e. societal and cultural PTG themes, societal stigma beliefs of trauma, media) sociocultural factors may have significant influences on trauma survivors' distress management and rumination changes. Likewise, cultural themes of growth from trauma are postulated to contribute to PTG experiences (Lindstrom et al., 2013).

Muldoon et al. (2015) pointed out that in cases of sexual violence, legal systems differentiate severity of trauma from "minor" (e.g., sexual harassment, groping, pressing genitals against another person) to "serious" assaults (e.g., forced penetration, multiple assailants) in efforts to manage finite resources for reprisals. These authors argued that despite the varying levels of these events, SA delivers a shock to the survivor's citizen identity because there is a betrayal of trust as a citizen and the trauma can compromise

personal philosophies of safety and justice. Loss of trust in social support and self-imposed isolation can amplify the betrayal of citizen trust.

A subsequent study by Dietz, Williams, Rife, and Cantrell (2015) sought to examine the relationship between cultural, social, and self-stigma and SA trauma symptom severity amongst women (n = 223). Cultural stereotypes and beliefs on female SA have been thoroughly documented. Examples include the victim provokes and enjoys being assaulted, the victim lying about being assaulted, spouses cannot sexually assault their wives, blaming the victim for the assault (e.g., she was in the wrong place, she should not have worn specific clothing, she got drunk and acted promiscuously). Individuals experience public stigma when they encounter negative treatment from others based on those beliefs (Dietz et al., 2015). Dietz et al. (2015) elucidated that self-stigma occurs when the individuals internalize public beliefs and in turn may experience negative emotions (e.g., shame, humiliation).

The outcomes of Dietz et al. (2015) and Lindstrom et al. (2013) studies suggest that although themes of growth and stereotypes surrounding sexual trauma are present in culture, self-stigma may play a distinct and vital role in trauma symptom severity. Dietz et al. (2015) wrote that internalization of negative public perceptions and treatment, and the belief of being abnormal or damaged as a result of trauma may lead to decreased self-esteem and greater risk of mental illness. In short, knowledge of stereotypes and public stigma is not enough to negatively impact the SA survivor. Rather, the extent to which individuals accept as true the stereotypes and negative stigmas is key because these philosophies may become central to their identity and personal narratives (Dietz et al.,

2015). The relationship of CES to trauma, identity, and PTG will be discussed later in this chapter.

Collectively, these studies provide evidence that support PTG theory. Following the extensive struggle of rebuilding assumptive beliefs through the dynamic interactions of cognitive rumination changes, self-analysis, emotional distress management, and sociocultural influences, the trauma survivor may come to the acceptance that their world has changed (Dietz et al., 2015; Lindstrom et al., 2013; Muldoon et al., 2015; Neimeyer, 2013; Stockton et al., 2011). An important feature of this theory is how the trauma influences individuals' identity, personal narrative, and their perceptions of their past, present, and future (Dietz et al., 2015; Lindstrom et al., 2013; Muldoon et al., 2015; Neimeyer, 2013). Tedeschi and Calhoun (2010) wrote that with acceptance, individuals may form a more complex personal narrative as they develop a before-and-after perception of the trauma that incorporates their new beliefs and newly gained wisdom that may influence their sense of well-being. Apparently, the literature is silent on how PTG is related to health behaviors. Theoretically, if the outcomes of the complex process of PTG are wisdom, well-being, and adjustment, as the model suggests, then such outcomes may have a strong association with the individual's subsequent actions (Shakespeare-Finch & Barrington, 2012).

Domains of Growth

Tedeschi and Calhoun (2004) wrote that positive psychological changes resulting from the cognitive and emotional effort to rebuild an individual's assumptive world after a significant traumatic event can be observed in several areas. Factor analyses of the

PTGI (Purc-Stephensen, 2014) produced five domains: “increased appreciation for life, increase intimacy in relationships, increased personal strength, personal identification of new possibilities in life, and spiritual and existential growth” (p. 14), supporting Tedeschi and Calhoun’s theory (1996, 2004). An essential aspect of these domains is that they occur within a paradox that out of loss and suffering can come gain, triumph, and comfort (Tedeschi & Calhoun, 2004). However, growth in any of the domains does not mean the absence of distress; rather, despite the distress individuals can move forward and acknowledge beneficial outcomes from their experience (Tedeschi & Calhoun, 2004).

Increased appreciation for life. In this domain, individuals often report a sense of changed priorities and a shift in how they experience life (Tedeschi & Calhoun, 2004). For instance, survivors may take more time to spend with a child and enjoy the little things they would not have considered prior to their trauma. Likewise, they may come to recognize their vulnerabilities and the unpredictable nature of life, which may lead them to a greater appreciation for what they currently possess (Ramos & Leal, 2013; Tedeschi & Calhoun, 2004).

Closer, more intimate relationships. During the aftermath of the trauma as survivors engage in the dynamic struggle of rebuilding their assumptive worlds, they may disclose their experience to a friend or family member. If disclosure produces positive and supportive reactions from the other individual, this may increase a sense of intimacy in the relationship. Likewise, during this difficult time, the survivor may come to realize other relationships that are not beneficial and decide to terminate the association. By the same token, the survivor may feel a deeper sense of compassion and connection with

others who are going through painful experiences, especially if those experiences are similar to their own (Ramos & Leal, 2013; Tedeschi & Calhoun, 2004).

Increased personal strength. Another domain of growth is the self-recognition that the individual possesses the strength to overcome the adversity, which can be applied to future dilemmas as they begin to think, "I was capable of surviving this suffering, I can overcome other ordeals." The individual has a clear understanding of their vulnerabilities, and how significantly distressing events can negative influence their lives. However, they are able to perceive their new-found strengths and skills they gained explicitly as a result of their difficult experience (Lindstrom et al. 2013; Ramos & Leal, 2013; Tedeschi & Calhoun, 2004). The increase in strength may also influence the survivor to change specific situations in their lives (Shakespeare-Finch & Barrington, 2012).

Personal identification of new possibilities in life. As assumptive worlds change, and individuals adjust psychologically, emotionally, and physically to their new sense of "normal," they may be more open to new possibilities for their life (Tedeschi & Calhoun, 2004). For example, a SA survivor may become an advocate against women's sexual violence as a result of new philosophies, compassion, and new-found strengths.

Spiritual and existential growth (does not necessarily pertain to religion). Significant traumas have the ability to make those who suffer question their religious or spiritual beliefs (Tedeschi & Calhoun, 2004). Depending on individuals' beliefs in a higher religious entity, and causal attributions, new beliefs in a higher power may develop or increase as a result of the trauma and their efforts to cope with the distress (Ramos & Leal, 2013). Moreover, if individuals are nonreligious, they may engage in

existential questioning as they determine their value and meaning of their life (Tedeschi & Calhoun, 2004).

Posttraumatic Growth and Health Behavior

A number of studies on growth evaluate the phenomena as an outcome variable to trauma and the complex relationship between core beliefs disruption, purposeful cognitive processing, distress, social support, and coping strategies (Dekel, Ein-Dor, & Solomon, 2012; Kaye-Tzadok & Davidson-Arad; 2016; Simon, Smith, Fava & Feiring, 2015; Ullman, 2014). While these studies have provided valuable insight, behavioral components that may occur as a result PTG has been neglected. Hobfoll et al. (2007) article argued that growth is accompanied by behavioral changes. An examination of the literature revealed four studies that evaluated behavioral change in conjunction with participants' self-reports of PTG (Arpawong et al., 2015; Shakespeare-Finch & Barrington, 2012; Shakespeare-Finch & Enders, 2008; Weiss, 2002). Recruiting a mixed trauma sample (n = 88) Shakespeare-Finch and Barrington (2012) found that individuals who had reported behavioral changes had significantly higher PTGI scores than those who did not report behavioral changes in the domains of New Possibilities, Relating to others, Spiritual Changes, and Appreciation for Life. The participants' significant others corroborated these reports. Commonly reported behavior changes were spending more time with family and friends, increased communication with greater disclosure, willingness to help others, and deeper spiritual beliefs. Important to this study, in the two domains of personal strengths and new possibilities, individuals reported increases in physical activity by joining gyms and taking up new sports or returning to old ones.

A fourth, longitudinal study utilizing a sample of high school students found that higher PTGI scores related to lower rates of alcohol and substance abuse at a two-year follow-up (Arpawong et al., 2015). Notably, these studies demonstrate that there is a relationship between growth and behavior change. Nevertheless, there has not been a study that has evaluated the influences of PTG on specific health behaviors in a population of SA survivors.

Sexual Violence and Posttraumatic Growth

In comparison to other traumas (e.g., automobile accidents, physical assault, military combat, natural disasters), sexual violence is unique because of the feelings of shame, self-blame, and humiliation that the event may generate. Likewise, perpetrator identity, perceptions of control after the trauma, perceived stigmas, negative or positive social responses, and whether there are post-trauma resources available, may have distinct influences on PTG outcomes (Ulloa et al., 2016) that differ from other traumas. Though literature is increasing, research specifically on sexual violence and PTG remain relatively scarce (Ulloa et al., 2016).

A recent systematic review of 17 research articles on sexual violence and growth which using Tedeschi and Calhoun's (2004) definition of PTG, found that across all the studies participants reported some level of growth which was evaluated by a variety of measures as well as participant trauma time frames (Ulloa et al., 2016). Further comparison of the articles in Ulloa et al. (2016) review revealed several contradictory findings. In three of the studies, authors reported a negative correlation between PTG and distress, whereas other authors' results indicated that growth was independent of

depression and PTSD (Grubaugh & Resick, 2007). Two studies' (Kleim & Ehlers, 2009; Kunst, 2010) results discovered a curvilinear relationship that suggests an optimal level of distress may lead to growth. Likewise, older age in one study moderated growth (Ullman, 2014) whereas younger age in another study influenced growth (Grubaugh & Resick, 2007). Interestingly, less education and being non-Caucasian appeared to have a positive influence on reports of growth (Grubaugh & Resick, 2007; Ullman, 2014).

Relevant research to mention in this review is Ullman's (2014) large scale study (N = 1863) that examined preassault (e.g., drinking alcohol prior to the event, child sexual abuse history), assault (i.e., perceptions of life being threatened), and postassault (i.e., social reactions to disclosure, coping strategies, self-blame) components of PTG in female SA survivors. Interestingly, child sexual abuse history was not significantly related to growth. However, this result must be received with caution because participant eligibility criteria stated unwanted sexual experience at the age of 14 or older (Ullman, 2014), which most likely hindered data collection from survivors with child sexual abuse histories. I recruited participants with histories of sexual trauma regardless of age.

Contrary to Ullman's (2014) findings, survivors of child sexual abuse can experience PTG (Simon et al., 2015; Vloet et al., 2014). A vital aspect that may complicate research on PTG in CSA survivors is that, differing from SA, CSA trauma occurs during a period where the survivor's beliefs and worldviews are still developing. However, a similar component between both SA and CSA survivors is that cognitive strategies, disclosure of trauma, coping behaviors (i.e. emotional regulation), and seeking mental health treatment are key factors in promoting PTG (Hassija & Turchik, 2016;

Kaye-Tzadok & Davidson-Arad, 2016; Walker-Williams, van Eeden, & van der Merwe, 2013). Simon et al. (2015) postulated that meanings made of the trauma experienced might influence well-being, expectations, and interpersonal behavior. The framework described by Janus-Bulman (1995), and expanded on by Tedeschi and Calhoun (2004), is built on the premise that the individual's pre-trauma assumptions were stable, which may not apply to CSA survivors because their traumas occur while their assumptions are still forming. However, Shakespeare-Finch and de Dassel (2009) study of female survivors of CSA reported themes of growth in strength, relationships, and not placing the blame on one's self even in light of negative posttrauma symptoms. These authors, evaluating the relationship of each domain of the PTGI with PTSD criteria of "hyperarousal, intrusion, and avoidance" (Shakespeare-Finch & de Dassel, 2009, p.632) operationalized using the Impact of Event Scale (IES-R). They found moderate yet significant relationships between individual factors of the PTGI and individual subscales of the IES-R even though there was a nonsignificant relationship between the total scores of the two measures (Shakespeare-Finch & de Dassel, 2009). These findings indicate that certain aspects of PTSD indicators may influence the development of growth in specific domains even though PTGI and PTSD symptomology are not related in this population. Simon et al. (2015) sampled 118 children and adolescents recruited from child protective services with confirmed cases of sexual abuse between the ages 8 and 15. At 6 years posttrauma, participants (ages 15–23) were interviewed using a combination of semi-structured and structured interviews in addition to computer-assisted surveys to evaluate healthy adjustment indicators, (e.g., self-esteem, emotional support, communication styles, and

abuse narrative changes) and adjustment problems (e.g., stigmatization, dating aggression, PTSD, depression, and sexual functioning). Results indicated that positive changes were associated with lower perceived stigmatization, positive communication with significant romantic other, and better adjustment. Conversely, negative changes were related to dating aggression, sexual dysfunction, depression, and PTSD. Most importantly, negative changes appeared to moderate the association between positive changes and better psychosocial adjustment. Vloet et al.'s (2014) study indicated that adolescent participants with histories of child abuse indicated greater levels of PTG after psychotherapeutic treatment in comparison to other traumas experienced by the sample (e.g., exposure to violence, serious accidents, and fire incidents). There appears to be no reported studies that evaluate health behaviors using PTG as a predictor variable in a sample of women who have survived SA or CSA. Positive or negative health behaviors may promote or restrain PTG as a result of the reciprocal relationship cognitive appraisals may have with these actions.

Centrality of Event

A principal difficulty in assessing PTG from a specific trauma is that the participant must assess their former standing in a particular domain of PTG, assess their current standing, and assess to what degree any changes can be attributed to the traumatic event (Johnson & Boals, 2014). Moreover, if the event is not perceived as a crucial facet of one's life, it may not be deemed as a significant life marker, and it may not have the connotation that the event divides the individual's life narrative into a before and after trauma (Aspinwall & Tedeschi, 2010) that has been previously discussed in this chapter.

The CES was designed to assess the subjective influence of a traumatic event on the individual (Berntsen & Rubin, 2006). These authors (Berntsen & Rubin, 2006) posit that negative and emotionally salient events have the potential to become a focal point in the individual's perception of their identity, how they construe their life narrative, and how they make meaning of the world. For instance, if a survivor of SA reports higher ratings of CE, it would indicate that he or she has incorporated the experience as a core part of their identity that can influence them psychologically, emotionally, socially, and behaviorally. CE is hypothesized to be the extent to which the individual believes the trauma is a core part of their identity, and as such, a critical component to personal narratives and worldviews (Berntsen & Rubin, 2006).

Over the past decade, research on CE has revealed that CES scores are positively correlated to PTSD symptomology, depression (Berntsen & Rubin, 2006; Boals, 2010; Boals & Schuettler, 2011), and negative physical health outcomes (i.e. sick days, illness-related health-care visits, and restricted days due to poor health) (Boals, 2010). Furthermore, women were more likely to perceive negative events as central to identity than males (Boals, 2010) and had a greater association with negative psychological sequelae than being exposed to the trauma itself (Bernard, Whittles, Kertz, & Burke, 2015). This occurrence may be an important element that can assist in understanding individual differences in recovery because people develop different meanings of their trauma that may subsequently influence behavior.

Currently, research on CE in SA and child sexual abuse populations is sparse. A search of the literature without date restrictions produced two studies that focused on CE

in SA survivors (Knowles, 2012) and child sexual abuse survivors (Robinaugh & McNally, 2011). Knowles' (2012) study found a positive correlation between CES and PTSD symptoms among a female undergraduate sample who reported various forms of trauma (*n* = 141 out of 350 reported SA or trauma of a sexual nature). Additionally, Knowles' (2012) found reports of self-objectification significantly mediated the relationship between sexual versus non-sexual traumas and CE. Self-objectification is the extent to which an individual view himself or herself as a sexual object as a result of unwanted sexual experiences (i.e. sexual harassment, media messages of beauty, sexual trauma) fostering shame, low self-esteem, low relationship satisfaction, anxiety, and depression about one's body. This data indicates that SA survivors may incorporate the objectification into their identities and self-appraisals.

Robinaugh and McNally's (2011) study using female adult survivors of CSA (*n* = 102) found CES scores had a positive relationship with PTSD, depression, and dissociation. Conversely, CES had a negative association with self-esteem. Furthermore, after controlling for self-esteem, intelligence, depression, and dissociation in a linear regression model, CES remained a significant predictor of PTSD symptoms. Research on the relationship between CE and PTG is amassing. Boals et al. (2010) highlighted the inconsistent findings between growth and negative psychological outcomes (i.e. depression, PTSD, anxiety). They posited that studies might be including inappropriate trauma events because, even though an event meets the criteria of the Diagnostic and Statistical Manual of Mental Disorders (DSM), the survivor may not be traumatized (Boals et al., 2010). Survivors may not have had their assumptive worldviews, core

beliefs, and narrative identity profoundly challenged, which is theoretically a prerequisite for PTG (Tedeschi & Calhoun, 2004). Boals et al. (2010) study using university students (N = 2,321) found that when limiting reports of PTG to those with high CE, relationships between PTGI scores and measures of psychological and physical health became stronger with larger effect sizes. For instance, the correlations between global distress and growth went from nonsignificant to significant when considering scores high in CE. Likewise, and important to this study, negative physical health symptoms went from a positive nonsignificant relationship to a significant negative relationship, indicating that CE may have influence on physical health outcomes.

Subsequent research found that CE was positively related to both PTSD symptoms and PTGI scores even after controlling several variables such as depression, coping styles, cognitive processing (Boals & Schuettler, 2011). Likewise, it was the strongest predictor of both PTSD symptoms and PTGI scores (Barton et al., 2013; Boals & Schuettler, 2011; Schuettler & Boals, 2011). Schuettler and Boals' (2011) study (N = 2,434) utilized 19 measures to examine over two dozen predictor variables' relationship with PTSD symptoms and PTG outcomes. Final models of their analysis revealed CE, problem-focused coping, and positive perspectives significantly predicted PTG. Additionally, CE, avoidant coping, feeling sweaty and butterflies, and negative perspective taking significantly predicted PTSD symptoms. This data suggests that although CE may play a crucial role in both PTSD and PTG, individuals' style of coping and their perspective of the trauma is an important aspect of positive and negative posttrauma outcomes. Barton et al. (2013) suggested that posttrauma cognitions and CE

have a reciprocal relationship in which they feed into each other causing the individual to incorporate the trauma as a significant part of their identity. Furthermore, identity has been shown to influence attitudes and perceived behavioral control in decision-making processes in health areas (e.g., diet, exercise, binge drinking) (Hagger, Anderson, Kyriakaki, & Darkings, 2007). Thus, considering the relationships between growth, CE, personal narratives, identity, and other such variables, the next step in PTG research is to explore how this construct may influence health behaviors in trauma survivors. It is well established in literature that health behaviors often have reciprocal relationships with psychological, emotional, and overall well-being (Czekierda, Banik, Park, & Luszczynsha, 2017; Dark-Freudeman & West, 2016; Davids, Roman, & Leach, 2014; Hinkley et al., 2017; Howell, Kern, & Lyubromirsky, 2007; Kelly et al., 2018).

Self-Efficacy and Health Behavior

Previously discussed in this chapter, authors have indicated that survivors of sexual violence are at increased risks for engaging in unhealthy behaviors such as multiple sexual partners, hazardous drinking, illegal drug use (Haller & Chassin, 2014; Jina & Thomas, 2013; Littleton et al., 2013; Nayak et al., 2012; Smith & Breiding, 2011), smoking (Amstader et al., 2009; Smith & Breiding, 2011), lower levels of exercise and physical activity (Zen et al., 2012), and poor food choices (Hirth, Rahman, & Berenson, 2011; Smith & Breiding, 2011; Talbot et al., 2013). These behaviors may generate or exacerbate psychological and physical health conditions.

SE, originally expounded upon by Bandera's (1986) social cognitive theory, suggests that behaviors are organized into courses of action through processes of

generating strategies and alternatives if approaches fail to attain or maintain goals. Over the last 30 years, SE has been incorporated into numerous areas of research and practice (e.g., education, business, health, and psychology), and has been tested in relation to several behavioral health models (e.g., health belief model, theory of planned behavior, and the transtheorectical model). Specific to this study, SE has been found to play a significant role in health promotion behaviors of healthy diet choices and exercise in participants who were overweight or obese (Barz et al., 2016; Choo & Hang, 2015; Fisher & Kridli, 2014; Teixera et al., 2010). Likewise, SE was shown to have a crucial role in smoking cessation (Berg et al., 2012; Scholz, Nagy, Gohner, Luszczynska, & Kliegel, 2009; Luszczynska, Stadler, Knoll, Hornung, & Scholz, 2014), and limiting alcohol use (Stein, Zane, & Grella, 2012). To date, there has been limited research on health behavior changes in a population of survivors of sexual violence, nor have there been studies that evaluated SE's possible interaction with PTG and health behaviors. However, studies involving participants with histories of cancer have indicated a significant association between general SE and PTG (Yu et al., 2014) as well as associations between PTG and health behavior changes (e.g., physical activity; Hawkes, Patrao, Baabe, Lynch, & Courneya, 2015; Morris, Shakespeare-Finch & Scott, 2012). Considering the increased risks for negative health behaviors witnessed in this specific population, research on the positive outcomes of trauma and the possible reciprocal relationship it may have on positive health behaviors is essential.

Summary

This chapter provided a detailed discussion of the foundations and development of PTG theory, describing how trauma, though devastating as it challenges and damages an individual's world, can be a catalyst for personal growth and well-being beyond resilience (e.g., returning to pretrauma conditions). Likewise, literature reveals that PTG can occur in conjunction with posttraumatic depreciation, distress, and PTSD symptoms, which suggests that growth and depreciation, distress, and PTSD are separate constructs rather than being on opposite ends of a spectrum (Baker et al., 2008). Focus on growth may assist in reducing damaging traumas outcomes**.**

The relatively new construct of CE has provided additional insight into growth and distress. CE is the degree to which an individual view the trauma as an essential part of their lives and incorporates into their personal life narrative and their identity (Bernsten & Rubin, 2006)**.** Authors have argued that the inconsistent findings in posttraumatic research are the result of the potential illusory nature of growth (Zoellner & Maercker, 2006). The CES (Berntsen & Rubin, 2006) assists in measuring the subjective influence of the traumatic event on the individual, based on the theory that events that are highly emotional and that are able to shatter core beliefs can become a life-marker and individuals will likely perceive the event as a part of their temporal identity. Thus, events that are reported as high in centrality had higher PTGI scores and a greater relationship with PTSD symptomology (Berntsen & Rubin, 2006; Boals et al., 2010; Johnson & Boals, 2014; Knowles, 2012; Robinaugh & McNally, 2011). Although research is growing in the area of PTG, few studies have focused on survivors of CSA and SA, and

the results are conflicting. CE may be an important element in researching growth in survivors of sexual violence because not every trauma is perceived as a core part of identity. Furthermore, research has provided a wide array of information on the negative health effects of sexual trauma (Black et al., 2014; Monnat & Chandler, 2015; Santaularis et al., 2014) as well as the influence of SE in health promoting behaviors (Barz et al., 2016; Berg et al., 2012; Choo & Hang, 2015). Thus, the next step is to explore the relationship between psychological growth, SE, and health behaviors (i.e., exercise, tobacco use, drug use, alcohol use) among women with a history of sexual violence. Chapter 3 includes descriptions of the research design and rationale, sample recruitment and data collection, measures, and data analysis plan. Additionally, Chapter 3 addresses threats to validity and ethical procedures for participant and data treatment.

Chapter 3: Research Design

Introduction

The aim of this study was to determine the extent of the relationship between PTG and the health behaviors of alcohol abuse, drug use, tobacco use, and physical activity in a sample of women with histories of sexual trauma. The second aim was to determine the extent to which SE mediated the aforementioned relationships. Moreover, the literature indicates that accessing the centrality of the trauma event helps to refine PTGI scores because it assists the participants in their reflection of the event's significance (Groleau et al., 2013; Johnson & Boals, 2014). Thus, the third aim was to determine the extent of the relationship between CE and PTG in a sample of women with histories of sexual trauma. The literature is replete with research on the negative psychological, behavioral, and health outcomes following trauma experiences, specifically in regards to individuals with histories of sexual trauma (Black et al., 2014; Monnat & Chandler, 2015; Santaularia et al., 2014). However, through effortful cognitive and emotional processes following trauma, individuals can experience personal growth that can lead to well-being (Tedeschi & Calhoun, 1989; Ulloa et al., 2016). Additional research indicates a positive relationship between PTG and health behavior changes in samples that have experienced life-threatening illnesses, automobile accidents, and deaths of loved ones (Arpawong et al., 2015; Shakespeare-Finch & Barrington, 2012). Likewise, literature on SE indicates a positive relationship with health promoting behaviors (Barz et al., 2016; Berg et al., 2012; Choo & Hang, 2015).

Researchers have not addressed the relationship between PTG and health behaviors of women who have experienced sexual trauma. This gap in the literature needs to be filled because the repercussions of sexual violence are evident at many levels of society, including public health (Jina & Thomas, 2013). Even so, sexual trauma may have lifelong consequences that may negatively affect individuals, their family, and their community as a result of deleterious health behaviors and health outcomes that are prompted or exacerbated by their trauma (Monnat & Chandler, 2015; Santaularia et al., 2014; Smith & Breiding, 2011). It is essential to research mechanisms that may influence positive psychological and behavioral outcomes for individuals with this trauma history. Calhoun and Tedeschi (2006) elaborated that PTG is a perspective clinicians can take as they act as expert companions to support clients' navigation through the emotional, cognitive, and social processes of their trauma depicted in the PTG model. As experts, clinicians can help identify areas of growth which may empower clients to continue to heal and potentially gain wisdom from their effortful cognitive and emotional struggles (Calhoun & Tedeschi, 2006).

Identifying the relationship between PTG and health behaviors may help impart social change. The results of this study can be used to inform clinicians and health practitioners as they develop treatment interventions and community health initiatives for women with histories of sexual violence. Practitioners who use a PTG perspective can integrate concepts of personal growth with health promotion strategies to assist health behavior change, facilitating a mentality that "I was capable of experiencing growth from my trauma, therefore I am capable of engaging in healthy activities." Generalizing

perceived growth to promote positive health behaviors can foster social change because it may assist in empowering women with sexual violence histories to adopt healthy behaviors that in turn may alleviate some of the health risk evident in this population.

Theories of PTG, CE, and SE were used to inform this study. This chapter includes descriptions of the research design and rationale, sample recruitment and data collection, measures, and data analysis plan. Additionally, this chapter addresses threats to validity and ethical procedures for participant and data treatment.

Research Design and Rationale

For this study, I used a quantitative, cross-sectional design, which was appropriate to address the research questions for several reasons. First, this study used psychometrically sound measures to investigate the role of general SE (mediator variable) in the relationship between PTG (predictor variable) and health behaviors (criterion variables). Covariates in this study were age, race, and education, which had been shown to be predictors of PTG (Ullman, 2014). Research on the relationship between PTG and health behaviors was lacking. Thus, quantitative analysis was needed to determine whether there were indeed significant positive or negative connections between the variables, which in turn could provide advanced knowledge in the discipline. I used the NGSES (Chen et al., 2001) because there appeared to be a lack of reliable, well-validated health-specific measures for each of the behaviors included in this study. To draw accurate inferences from data, it was important to use measures that are shown to be reliable and valid among different populations (Drost, 2011). A cross-sectional study was appropriate because there was no manipulation of variables or testing of

different forms of treatment (Tabachnick & Fidell, 2013). Likewise, cross-sectional was a one-time assessment, which was sufficient to initially test the theoretical framework. This study's research questions involved examining relationships between variables measured at a single point in time. This study used linear and logistic regression to investigate the relationship between this study's constructs. Following regression analyses to determine if there are significant relationships between the constructs, I conducted bias-corrected bootstrap mediation analyses (Hayes, 2013; Preacher & Hayes, 2004) between the variables. Although Baron and Kenny's (1986) method is frequently used in mediation research, authors (Fritz & MacKinnon, 2007; Hayes & Scharkow, 2013; Mallinckrodt, Abraham, Wei, & Russell, 2006; Preacher & Hayes, 2004; Zhao, Lynch, & Chen, 2010) have written that bias-corrected bootstrap analysis had greater statistical power to detect direct and indirect effects. Moreover, Zhao et al. (2010) argued, contrary to Baron and Kenny's (1986) method, that the size of the indirect effect was more important than the lack of a direct effect in determining mediation, and the only requirement of meditation was that the product of paths a and b be significant. Focusing on fulfilling each of Baron and Kenny's (1986) steps might have caused the mediation to be overlooked (Zhao et al., 2010).

Several published studies indicated the benefits of using self-reported measures as a means to collect data from participants (Christensen, Ekholm, Glumer, & Jeul, 2013; Diaz de Rada, Arino, & Blasco, 2016; Gnambs & Kasper, 2015). Gnambs and Kaspar's (2015) meta-analysis of self-reported measures revealed that computerized survey methods led to significantly more self-disclosure of sensitive behaviors (e.g., substance

use, sexuality, and victimization) than paper and pencil formats or when the interviewer was present (i.e., personal interviews, telephone interviews). The perception of anonymity, which can reduce the fear of negative social responses or legal reprisal, can lead to greater likelihood of self-disclosure (Gnambs & Kasper, 2015). Additionally, dissemination of surveys through online social networks, such as Facebook, can provide a wide geographic reach and greater access to individuals in target populations (Diaz de Rada et al., 2016) in addition to being time-efficient and cost-effective (Christensen et al., 2013; Diaz et al., 2016). A wider reach may increase the generalizability of the study's findings (Diaz et al., 2016).

Time and resource constraints. I conducted this study during 1 calendar year, using SPSS 24.0 and SurveyMonkey (http://www.surveymonkey.com) during that period for data collection and data analysis. The use of pre-existing subject pools and public access measures mitigated the costs of this study. I selected demographic, sexual violence characteristics, physical activity, and alcohol and tobacco use questions from the BRFSS), which did not require a user agreement or monetary cost. Likewise, the NGSES, CES, and the DAST-10 were in the public domain. The PTGI (see Appendix D) was also available without cost.

Methodology

Population Sampling Strategy

Sampling strategy. I used a nonprobability, convenience sample for this study. Convenience sampling was an appropriate sampling strategy to use because probability sampling (e.g., simple random sampling) was not feasible for the study population. A

random sample would have required that all members of the population had an equal probability of being selected to participate. Because the population parameters of all women with a history of sexual trauma is unknown, a nonrandomized, convenience sample was appropriate.

This study drew a convenience sample by inviting individuals from Facebook. According to Kalmakis and Banning (2012), three out of five adult Americans used the internet to research health-related topics. Likewise, exclusively using Facebook advertising directed at women ages 18 through 49, Kapp, Peters, and Oliver (2013) found that advertisements for their health survey had a reach of over 374 thousand women. I used Facebook advertising and a public page to target potential participants. Additionally, I requested to post an invitation in Facebook support and information groups (e.g., National Sexual Violence Resource Center and the Rape, Assault, Incest National Network) as well as community groups.

Inclusion criteria. Inclusion to this study required that participants be female, 18 years of age or older, be fluent in reading English in order to understand the surveys, and be legally eligible to give consent. Furthermore, participants must have indicated that they experienced sexual violence in their lifetime. A set of screening questions was presented at the beginning of the survey to ensure that participants met these criteria. Individuals who did not meet these criteria were not be able to proceed past the screening questions.

Sample size justification. The sample size required to obtain statistically valid results was determined based on Fritz and MacKinnon's (2007) empirical estimates of

sample sizes required to achieve .80 power for mediation analyses. For the purpose of the sample size estimation, a medium effect size was assumed. It was appropriate to use a power of .80 and a medium effect size given previous literature or theory provided no information on assumed effect size (Ellis, 2010). Fritz and MacKinnon (2007) indicated that a mediation analysis of one predictor variable, one criterion variable, and one mediating variable, using bootstrapping, and assuming a medium effect size required a minimum of 78 participants. Several quantitative, cross-sectional studies that have evaluated PTG in this population recruited samples sizes ranging from 115 participants to 204 (Ulloa et al., 2016). Therefore, I needed to recruit a minimum of 78 participants, and no more than 204 participants, for this study. Additionally, using G*Power for an a priori power analysis of a fixed model linear multiple regression, R^2 increase, with a medium effect size, .80 power setting, .05 alpha, and one test predictor suggested a minimum sample size of 55.

Procedure for Recruitment, Participation, and Data Collection

Following approval by Walden University's Institutional Review Board (IRB), I invited participants via Facebook, an online social networking platform, using a study-specific public access Facebook page with the study's description and link to SurveyMonkey, a secure, data encrypted platform (SurveyMonkey, 2017). Requests to post an invitation for participation was sent to sexual violence organizations' Facebook pages as well to local community Facebook bulletin pages. All invitations provided an explanation of the study, a description of inclusion requirements, and a link to the survey on SurveyMonkey (see Appendix E). I presented the informed consent information on the

first page of the survey, and individuals answered an item at the bottom of the page to indicate whether they were willing or unwilling to participate. Participants who gave their consent were then directed to the next section of the survey containing the demographic and sexual violence screening questions. Participants who passed the screening questions continued to the remaining sections of the survey containing the DAST-10, PTGI, CES, and the NGSES. Before participants began their contribution, I informed participants they could withdraw from the survey at any time by closing the web-browser window. Additional to the informed consent, contact information for the National Sexual Assault Hotline (NSAH; 800.656.[HOPE]4673) was provided before and after taking the survey if participants became distressed and need assistance. After completing all of the instruments, participants were directed to a page informing them that their participation was complete and thanking them for their time.

Instrumentation and Operationalization of Constructs

Demographics, Health Behavior, and Sexual Violence Questions

Behavioral Risk Factor Surveillance System (BRFSS). The BRFSS is a national cross-sectional survey established in 1984 to track the health-related topics of the population (Centers for Diseases Control and Prevention [CDC], 2014). An expert panel of statisticians, methodologists, and operational experts developed the BRFSS, and its questions have undergone extensive evaluation and psychometric testing over the last 30 years (CDC, 2014; Pierannunzi, Hu, & Balluz, 2013). The BRFSS is administered annually to more than 400,000 adults in all 50 states, the District of Columbia, and several U.S. territories (CDC, 2014). As of 2014, the BRFSS is the largest continuously

conducted health survey system in the world (CDC, 2014), and literature reviews have found that questions on the survey were at least moderately to highly reliable and valid (Li et al., 2012; Nelson, Holtzman, Bolen, Stanwyck & Mack, 2001; Pierannunzi et al., 2013). Peirannunzi, Hu, and Balluz's (2013) systematic review of BRFSS reliability and validity literature (n = 32) indicated moderate to high reliability and validity for physical activity measures with Kappa statistics ranging from .35 to .90 and intraclass correlation coefficients ranging from .39 to .59. Moreover, Peirannunzi et al. (2013) did not find a significant difference between confidence intervals of the BRFSS and the National Health Interview Study questions regarding tobacco and alcohol use, [20.3 to 21.6 and 4.2 to 4.9; respectively]. Demographic questions from the BRFSS were modified for the proposed study to use in a web-based survey. Responses from demographic questions were used to determine inclusion eligibility criteria. Furthermore, demographic information was used for descriptive purposes and to determine if socio-demographic variables had a significant relationship with the variables in this study. Appendix A presented the demographic questions.

Several studies have used the BRFSS to estimate the prevalence of sexual violence and chronic disease and their relations with health outcomes (Martin et al., 2008; Santaularia et al., 2014; Smith & Breiding, 2011). For the proposed study, the 2007 BRFSS module 17 was used to assess sexual violence with additional questions about the age the trauma occurred, the frequency of the trauma, and the relationship to the perpetrator. These latter questions were used to classify the sexual violence experiences as 1) CSA, 2) SA, or 3) both CSA and SA. See Appendix C for sexual violence

questions. Selected BRFSS health questions included one positive health behavior, physical activity, and two negative health behaviors, alcohol consumption, and tobacco use. According to the CDC (2016b) and the National Institute on Alcohol Abuse and Alcoholism (2017), moderate-risk drinking for women is defined as one alcoholic beverage per day, binge drinking equals four or more beverages in the same occasion, and heavy drinking is five or more binge drinking episodes in 1 month. For this study, alcohol use was categorized as 1 (*less than one drink per day*), 2 (*moderate drinkers*), 3 (*binge drinkers*), 4 (*heavy drinkers*) (see Appendix I). Moreover, the Office of Disease Prevention and Health Promotion (ODPHP; 2017) stated adults should engage in at least 600 minutes per month of moderate-intensity (e.g., 30 minutes of walking five times a week) or 300 minutes per month of vigorous-intensity aerobic physical activity (e.g. approximately 40 minutes of kickboxing twice a week). Pierannunzi et al. (2013) review indicated that though assessing the reliability of responses to categorized vigorous-intensity activities was robust, moderate-level categorization was not as strong. These variations may be the result of participants' differing perceptions on what low and moderate-level physical activities are in comparison to vigorous activities such as running or aerobics. Consequently, BRFSS questions utilized in this study was calculated to provide number of minutes per month of physical activity based on the guidelines of the ODPHP. The simple equation for calculation of physical activity was x*y = moderate-level physical activity where x = minutes per activity and y = number of days per month. Vigorous-level activity was calculated as (x/2)*y to make it equivalent to moderate-level activity (see Appendix H). Responses to smoking were categorized a)

never smoked, b) former smoker, c) current smoker without attempts to quit, and d) current smoker with attempts to quit (see Appendix G). Additionally, general health and healthy-related quality of life questions were used to assess participants' overall perceived health status. This study presented selected BRFSS questions in Appendix C.

Drug abuse screening test (DAST-10). Currently, the BRFSS does not include questions on drug abuse. Therefore the DAST-10 was used to assess negative health behaviors of illicit and prescription drug abuse in this study. The DAST-10, a modified version of the DAST-20, developed by Skinner (1982), was created to be a brief screening tool to detect the degree of substance abuse problems not including tobacco and alcohol use. Since its development over 30 years ago, a large number of study populations have used the DAST including psychiatric patients (Cocco & Carey, 1998; Giguère & Potvin, 2017; Yudko, Lozhkina, & Fouts, 2007), adult and adolescent heroin users (Evren et al., 2013), community settings (French, Roebuck, McGeary, Chitwood, & McCoy, 2001), undergraduate students (McCabe, Boyd, Cranford, Morales, & Slayden, 2006), and women with substance abuse disorders (Diehl, da Silva, & Laranjeira, 2013; Nydegger, Ames, Stacy, & Grenard, 2014). The DAST-10 is in the public domain and permission is granted for research purposes.

The DAST-10 has shown to have "good internal consistency (Cronbach's $\alpha = .86$ to .94), temporal stability (test-retest intraclass correlation coefficient = .71)" (McCabe et al., 2006, pg. 299), and is highly correlated with the DAST-20 and DAST-28 versions (McCabe et al., 2006; Yudko et al., 2007). Furthermore, the construct validity of the DAST-10 has shown significant correlations with other measures such as the Beck

Depression Inventory (r = .25) and the Addiction Severity Index – Psychiatric Composite Score (r = .40), as well as being related to interpersonal problems, anxiety, paranoia, and somatization (Yudko et al., 2007). Giguere and Potvin's (2017) recent study utilizing the DAST-10 in a psychiatric population (n = 912) indicates that the measure has high internal consistency (Cronbach's α = .88) as well as test-retest reliability (interclass correlation = .85) similar to previous studies. Overall, the DAST-10 has excellent psychometric properties and is well-validated.

Instructions inform participants that the term *drug* refers to illicit drugs, such as marijuana, cocaine, ecstasy, and others, or use of prescription medication in excess of the directions or for non-medical use within the last 12 months. Each item of the DAST-10 has a "*yes* = 0" or "*no* = 1" response except for item 3 where "*no* = 0" and "*yes* = 1". The responses are tallied from 0 to 10 to indicate the degree of problems from drug abuse. A score of 0 = *no problem*, 1-2 = *low level*, 3-5 = *moderate level*, 6-8 = *substantial level*, and 9-10 = *severe level*. Table 1 lists the DAST-10 items used in this study.

Table 1

DAST-10 items

Number	Question
1	Have you used drugs other than those required for medical reasons?
2	Have you used more than one drug at a time?
3	Are you always able to stop using drugs when you want to?
4	Have you had blackouts or flashbacks as a result of drug use?
5	Have you ever felt bad or guilty about your drug use?
6	Have family members ever complained about your involvement with drugs?
7	Have you stayed away from your family because of your drug use?
8	Have you engaged in illegal activities to obtain drugs?
9	Have you ever experienced withdrawal symptoms (felt sick) when you stopped taking drugs?
10	Have you had medical problems as a result of your drug use (e.g. memory loss, hepatitis, convulsions, and bleeding)?

Note: Adapted from "The Drug Abuse Screening Test," by Skinner, H. A., 1982, *Addictive Behavior*, *7*(4),363–371

Supplemental Health Behavior Questions. It is important to note that the health behavior questions included in this study instructed participants to refer to the last 30 days or the last 12 months. For this study, there were no time constraints placed on when the participant experienced sexual violence, only that it had occurred in their lifetime. Therefore, to supplement the existing health behavior questions, participants were asked the following:

1. Since your trauma do you drink alcohol more or less?
2. Since your trauma do you use tobacco products more or less?
3. Since your trauma do you use drugs more or less?
4. Since your trauma do you exercise more or less?

Responses to each question comprised of a Likert-type scale of 0 to 4 and reflect their specific health behavior: 0 = *I did not smoke before or after*, 1 = *I stopped smoking*, 2 = *I smoke less*, 3 = *I smoke about the same*, and 4 = *I smoke more*.

Posttraumatic Growth Inventory

PTG is defined as the extent to which a person perceives positive psychological changes resulting from the struggle with traumatic events (Tedeschi & Calhoun, 1996). The PTGI was developed by Tedeschi and Calhoun (1996) using three studies for item development, reliability, and construct validity. The first and second studies used the same undergraduate participants (n = 604) from a large university. Principal component analysis in the first study indicated a five-factor model using the 21 items in the current version of the PTGI (see Table 2). The five factors were 1) growth in personal strength, 2) openness to new possibilities, 3) relation to others, 4) changed priorities and appreciation for life, and 5) spirituality. Subsequent studies have confirmed the five-factor model in trauma populations and participants with nonlife-threatening chronic illnesses (Horswill, Desgagne, Parkerson, Carleton, & Asmundson, 2016; Purc-Stephinson, 2014; Taku et al., 2008). In their second study, Tedeschi and Calhoun (1996) established PTGI discriminant validity through correlational analyses that indicated significant positive relationships with optimism, religious participation, and personality. Furthermore, this analysis showed the total PTGI scores were not related to social desirability and the neurotic personality trait. Study 3 (n = 117) examined construct validity in a 2 x 2 analysis of variance (ANOVA) design that compared gender by trauma

vs. non-trauma experience (Tedeschi & Calhoun, 1996). Results showed significant different between those who experienced trauma compared to those who did not.

A number of studies have used the PTGI to assess general trauma experiences (e.g. automobile accidents, physical assault, abuse) (Barrington & Shakespeare-Finch, 2013), chronic illness (Weiss, 2002; Yu, Tang, Chen, Li, & Wang, 2014), and sexual violence (Arpawong et al., 2015; Kaye-Tzadok & Davidson, 2016; Ullman, 2014; Ulloa et al., 2016). The PTGI was an appropriate measure for this study because it measured the perceived outcomes of personal growth after adjusting to life after trauma. In comparison, the construct of resilience suggests a person's return to their previous state prior to the trauma (Tedeschi et al., 2007). The authors granted permission to use the PTGI via email (see Appendix D).

Tedeschi and Calhoun (1996) reported the PTGI has high internal consistency with Cronbach's $\alpha = .90$. Using the corrected item-total correlations method, PTGI items were moderately correlated with the remaining items ranging from $r = .35$ to $r = .63$. Likewise, the five factors' internal correlations ranged from $\alpha = .67$ to $\alpha = .85$ and moderate to strong correlations with the PTGI ranging from $r = .62$ to $r = .83$. The PTGI's test-retest reliability over a two-month period was $r = .71$.

The PTGI contains 21 items which are rated on a 6-point Likert-type scale. Participants were instructed to reference their most stressful or traumatic event and rated the items which range from "I did not experience this change as a result of my crisis" (scored 0) to "I experienced this change to a very great degree as a result of my crisis" (scored 5). This study instructed participants to answer the instrument in reference to the

sexual violence they experienced. The scale was scored by averaging all the responses. See Table 2 for PTGI scale factors and items.

Table 2

PTGI Factors and Items

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

Note. Adapted with permission from "The posttraumatic growth inventory: Measuring the positive legacy of trauma," by Tedeschi, R. G. & Calhoun, L. G., 1996, *Journal of Traumatic Stress, 9*(3), p. 445-471.

Centrality of Event Scale

This study defined event centrality as the extent to which a stressful or traumatic memory formed a reference point for personal identity and how a person attributed

meaning to other life experiences (Berntsen & Rubin, 2006). Published by Berntsen and Rubin (2006), the C is designed to measure the theoretical themes of event centrality. Previous research shows that CES is correlated with negative psychological outcomes of traumas such as depression, PTSD symptomology, and anxiety (Barton et al., 2013; Berntsen & Rubin, 2006) as well as positive outcomes such as gratitude, growth in relationships, satisfaction and meaning life, and PTG (Johnson & Boals, 2014; Lancaster et al., 2013). The relationship to both positive and negative psychological outcomes may be attributable to the ability of the CES to measure the extent of the disruption to one's core beliefs, which is an important element in PTG theory (Boals et al., 2010). This scale is in the public domain and authors indicated their consent for use in research purposes in the appendix of their article (Berntsen & Rubin, 2006, p. 229). Normative data was drawn from undergraduate students from four large North American universities (n = 707) using the 20-item CES and shown to have high reliability (Berntsen & Rubin, 2006). The subsequent 7-item CES was tested in an additional sample of university undergraduates (n = 216) and shown to be strongly correlated with the 20-item CES (r = .96), and principle factor analyses of both scales suggest a one-factor solution (Berntsen & Rubin, 2006). Likewise, Cronbach's α = .88 on the 7-item scale. Similar Cronbach α levels were found in other studies (Barton et al., 2013; Bernard et al., 2015; Lancaster et al., 2013). Researchers have utilized the CES with a number of trauma types (e.g., sexual violence, emotional abuse, life-threatening illnesses, witnessing a violent death) with both male and female participants (Barton, Bowles, & Knowles, 2013; Johnson & Boals, 2014). Accordingly, this study used the 7-item CES and referred to it as the CES.

The CES instructs participants to reference their most stressful or traumatic event, and rate the items on a 5-point Likert-type scale from *totally disagree* (1) to *totally agree* (5) (Berntsen & Rubin, 2006). Scores are tallied to provide a total score. Table 3 presents the 7-item CES with the respective theoretical themes.

Table 3

Centrality of Event Scale – SF; 7-item version

Theoretical areas: Whether the event (or series of events) …	Item
…had become a reference point for the generation of expectations and attribution of meaning to other events in the person's life.	This event (or series of events) has colored the way I think and feel about other experiences.
	I often think about the effects this event (or series of events) will have on my future.
…was perceived as a central component of personal identity.	I feel that this event (or series of events) has become a part of my identity.
	This event (or series of events) has become a reference point for the way I understand myself and the world.
…was regarded as a turning point in the person's life story.	I feel that this event (or series of events) has become a central part of my life story.
	This event (or series of events) has permanently changed my life.
	This event (or series of events) was a turning point in my life.

Note. Adapted from "The Centrality of event scale: A measure of integrating a trauma into one's identity and its relation to post-traumatic stress disorder symptoms," by Berntsen, D. & Rubin, D. C., 2006, *Behaviour Research and Therapy, 44*, p. 223 & 229-230.

New General Self-Efficacy Scale

SE is a construct well researched in social psychology. Defined by Bandura (1986), SE is the person's belief in their ability to organize motivational, cognitive, and behavioral resources to accomplish situational demands. General SE is the extent of one's belief in their ability to perform successfully across a variety of contexts and is considered to be resistant to temporary influences (Chen et al., 2001). Chen et al. (2001) theorize that accumulation of lifetime successes and positive psycho-social factors enhance GSE and, in turn, GSE positively influences task-specific SE (Chen et al., 2001). Chen et al. developed the NGSES following their criticisms of the general self-efficacy scale, developed by Sherer et al. (1982), found to have low content and discriminant validity.

The normative data the NGSES consisted of two studies that sampled 316 and 323 college students, respectively, and a third study that sampled 54 college students from an Israeli university (Chen et al., 2001). In the first study, the authors (Chen et al., 2001) disseminated the test measures at the beginning, middle, and end of the class semester, and in the two subsequent studies tests were administered the measures two weeks apart. Principal component analyses from all three studies indicated that the NGSES is a unidimensional scale that measures the construct GSE and is independent of other constructs such as self-esteem, occupational tasks SE, and leadership SE (Chen et al., 2001). In comparison, principle factor analysis indicated the Sherer et al. (1982) scale has three dimensions reflecting self-perceptions of behavior initiation, effort, and persistence. Chen et al. (2001) suggested the three-factor solution are consequences of

GSE and may not accurately reflect the conceptualization of GSE. Since its creation, the NGSES has been used in a number of study populations including individuals with histories of cancer (Wagland, Fenon, Tarrant, Howard-Jones, & Richardson, 2015), emergency medical dispatchers' PTG (Shakespeare-Finch, Rees, & Armstrong, 2015), and weight-loss initiatives (Nabi & Thomas, 2013). Studies have not used the NGSES specifically with women who have histories of sexual trauma. However, this measure appeared to correspond with the construct of SE proposed in this study. The NGSES is in the public domain and permission is granted for research purposes.

In the three studies (Chen et al., 2001) previously mentioned, the NGSES demonstrated high internal consistency ranging from $\alpha = .85$ to .90. Likewise, the measure's test-retest coefficient was stable ranging from $r = .65$ to .67. The authors (Chen et al., 2001) provided content validity panels, established in the first and third studies, with the definition of GSE and self-esteem. These panels sorted 87% to 98% of the NGSES items into the GSE category, which suggests the NGSES is consistent with GSE construct. Scherbaum, Cohen-Charash, and Kern (2006) analyzed three GSE measures (Chen et al., 2001; Schwarzer & Jerusalem, 1995; Sheerer et al.,1982) using item response theory which measured each item's characteristics as well as test-taker characteristics at different levels of GSE (Scherbaum, Cohen-Charash, & Kern, 2006). Results indicated the NGSES outperformed the two other scales regarding item discrimination and test efficiency (Scherbaum et al., 2006).

The NGSES contains 8 items that are scored on a "5-point Likert-type scale from *strongly disagree* (1) to *strongly agree* (5)" (Chen et al., 2001, p. 68). Points for each

item are summed for scores ranging from 8 to 40. Greater the scores indicate higher levels of GSE. Participants were provided definitions of GSE (how confident she was that she could have effectively performed across a variety of situations) and self-esteem (the evaluation of one's worth) prior to taking this survey (Chen et al., 2001). See Table 4 for NGSES items.

Table 4

New General Self-Efficacy Scale items

Number	Question
1	I will be able to achieve most of the goals I have set for myself.
2	When facing difficult tasks, I am certain that I will accomplish them.
3	In general, I think that I can obtain outcomes that are important to me.
4	I believe I can succeed at most any endeavor to which I set my mind.
5	I will be able to successfully overcome many challenges.
6	I am confident that I can perform effectively on many different tasks.
7	Compared to other people, I can do most tasks very well.
8	Even when things are tough, I can perform quite well.

Note. Adapted from "Validation of a New General Self-Efficacy Scale," by Chen, G., Gully, S. M., & Eden, D., 2001, *Organizational Research Methods, 4*(1), p. 79.

Data Analysis Plan

Software and Data Cleaning and Screening

For data analysis, data collected through SurveyMonkey was entered into IBM SPSS (Version 24). The data was checked for extreme scores (outliers) prior to analysis. Extreme scores, which could have increased the risk of having Type I or Type II errors (Osborne, 2010), were data points that fell outside of the normal distribution of the sample's scores. For this study, data was examined for missing values, outliers, and abnormal patterns by determining whether data entry was accurate, browsing data tables

and graphical tools such as scatter plots, and evaluating frequency distributions and summary statistics (Osborne, 2010; Stevens, 2009; Van den Broeck, Cunningham, Eeckels, & Herbst, 2005). Outliers for continuous variables were truncated to the next highest non-outlying value. Missing values were checked for non-random patterns. Missing item-level data was corrected using the Multiple imputation command in SPSS. The method for handling aberrant data was determined after the data was received. Likewise, if there was considerable skewing, a log transformation was used to normalize the results.

Research Questions and Hypotheses

Research Question 1: Is there a relationship between CE (as measured by the CES) and PTG (as measured by the PTGI) scores amongst women who have experienced sexual trauma (as determined by the 2007 BRFSS)?

Null Hypothesis 1: There is no statistically significant relationship between CE and PTG.

Alternative Hypothesis 1: There is a statistically significant relationship between CE and PTG.

Research Question 2: Is there a significant relationship between PTG (as measured by the PTGI) and health behaviors of tobacco use, alcohol use, physical activity (as measured by selected questions from the 2015 BRFSS), and drug use (as measured by the DAST-10) amongst women who have experienced sexual trauma (as determined by the 2007 BRFSS)?

Null Hypothesis 2: There is no statistically significant relationship between PTG and health behaviors tobacco use, alcohol use, drug use, and physical activity amongst sexual trauma survivors.

Alternative Hypothesis 2: There is a statistically significant relationship between PTG and health behaviors tobacco use, alcohol use, drug use, and physical activity amongst sexual trauma survivors.

Research Question 3: Is there a significant relationship between PTG (as measured by the PTGI) and SE (as measured by the NGSES) amongst women who have experienced sexual trauma (as determined by the 2007 BRFSS)?

Null Hypothesis 3: There is no statistically significant relationship between PTG and SE amongst female sexual trauma survivors.

Alternative Hypothesis 3: There is a statistically significant relationship between PTG and SE amongst female sexual trauma survivors.

Research Question 4: Is there as statistically significant relationship between health behaviors of tobacco use, alcohol use, physical activity (as measured by questions selected from the 2015 BRFSS), and drug abuse (as measured by the DAST-10) and SE (as measured by the NGSES) amongst women who have experienced sexual trauma (as determined by the 2007 BRFSS)?

Null Hypothesis 4: There is no statistically significant relationship between health behaviors tobacco use, alcohol use, and physical activity and SE.

Alternative Hypothesis 4: There is a statistically significant relationship between health behaviors tobacco use, alcohol use, and physical activity and SE.

Research Question 5: Does SE (as measured by the NGSES) mediate the relationship between PTG (as measured by the PTGI) and health behaviors of tobacco use, alcohol use, physical activity (as measured by questions selected from the 2015 BRFSS), and drug abuse (as measured by the DAST-10) amongst women who have experienced sexual trauma (as determined by the 2007 BRFSS)?

Null Hypothesis 5: SE does not significantly mediate the relationship between PTG and health behaviors of tobacco use, alcohol use, drug use, and physical activity.

Alternative Hypothesis 5: SE significantly mediates the relationship between PTG and health behaviors tobacco use, alcohol use, drug use, and physical activity.

Analysis Plan

Descriptive statistics of the sample's demographics will consist of frequencies of categorical data (e.g. age, race/ethnicity, employment status, income level, sexual trauma type) and mean and standard deviation of discrete data (e.g. number of children). Covariates age, race, and education, which had shown to have an influence on self-reports of PTG (Ullman, 2014).

In order to address Research Question 1, a simple linear regression was conducted. A simple linear regression analysis was appropriate when the research question involved determining if a significant relationship existed between one predictor variable and one criterion variable (Field, 2013). The predictor variable in this analysis was CES score. The criterion variable was PTGI score. The *F* test was used to test the significance of the simple linear regression. Statistical significance was evaluated at a significance level of .05. Before interpreting the results of the regression, the assumptions

of normality and homoscedasticity were tested. In order for normality to be met, the regression residuals must have followed a normal distribution. Normaility was tested by examination of a normal P-P plot. In order for homoscedasticity to be met, the data must have been equally distributed around the regression line. Homoscedasity was tested by examination of a scatterplot of residuals versus predicted values.

In order to address Research Question 2, a series of simple linear and logistic regressions were conducted. The predictor variable in this analysis was PTGI score. The criterion variables were the health behaviors of tobacco use, alcohol use, physical activity, and drug use. Physical activity was defined as a continuous variable, and alcohol use, tobacco use, and drug use were defined as categorical variables for this study. A separate regression was conducted for each criterion variable. The *F* test was used to test the significance of each simple linear regression. Statistical significance was evaluated at a significance level of .05. Before interpreting the results of the regression, the assumptions of normality and homoscedasticity was tested in the same manner as the previous analysis. The Wald statistic was used to test the significance of each logistic regression. Before interpreting the results of the logistic regressions, assumptions of linearity, no multicollinearity, and independence of errors was tested (Field, 2013).

In order to address Research Question 3, another simple linear regression was conducted. The predictor variable in this analysis was PTGI score. The criterion variable was SE score. The *F* test was used to test the significance of the simple linear regression. Statistical significance was evaluated at a significance level of .05. Before interpreting

the results of the regression, the assumptions of normality and homoscedasticity was tested in the same manner as the previous analysis.

In order to address Research Question 4, another a series of simple linear and logistic regressions was conducted. The predictor variable in this analysis was SE score. The criterion variables were the health behaviors of tobacco use, alcohol use, physical activity, and drug use, previously defined in the procedure to address Research Question 2. A separate regression was conducted for each criterion variable. The *F* test was used to test the significance of each simple linear regression. The Chi-squared statistic was used to test the significance of each logistic regression. Statistical significance was evaluated at a significance level of .05. Bonferroni correction was conducted to reduce chance of Type I error owing to multiple comparisons with Chi squares that might have created false positives. In the same manner as the previous analysis, before interpreting the results of the linear regression, the assumptions of normality and homoscedasticity were tested, and for logistic regressions assumptions of linearity, no multicollinearity, and independence of errors were tested.

Finally, in order to address Research Question 5, a mediation analysis was conducted using the Hayes (2013) bias-corrected bootstrapping method. The predictor variable in this analysis was PTGI score. The mediator was SE score. The criterion variables were the health behaviors of tobacco use, alcohol use, physical activity, and drug use. A separate mediation analysis was conducted for each criterion variable. The Hayes (2013) method involves using a customized macro for SPSS that calculates confidence intervals for mediating effects using bootstrapping for criterion variables with

categorical data. For this analysis, 10,000 bootstrapped samples were used to estimate the indirect (mediating) effect (Hayes, 2013). “The significance of the mediation is determined by calculating the 95% confidence interval for the indirect effect. If the confidence interval does not contain zero, the indirect effect is significant, and mediation is supported” (Zhao et al., 2010, p. 202).

Threats to Validity

Validity in social science research addresses the meaningfulness of the research components (Drost, 2011). This section discusses three areas of validity: internal validity, construct validity, and external validity. Internal validity refers to the research design and potential biases that can influence causal conclusions (Drost, 2011). Different factors influence individuals from opting into studies such as demographics, personality traits, mental abilities, and physical abilities. Utilizing the online social media of Facebook might have helped to recruit a diverse enough sample to minimize this threat. Secondly, mortality and differential attrition posed another threat to internal validity (Drost, 2011). To confront the issue of mortality, it was necessary to determine causes of attrition, such as research design features, or if there were differences between those who completed the questionnaires and those who did not to ascertain other explanations. Additionally, the online survey was designed to be visually appealing to encourage participants to complete all of the measures. Thirdly, psychological changes during the survey may have occurred (Drost, 2011). Questions about sexual trauma might have provoked distress in participants that might have influenced subsequent responses to remaining questions.

Moreover, clearly describing the contents of the questions prior to participants' consent was necessary to prepare them for any potential distress.

The concepts of PTG, CE, and SE are thoroughly evaluated in the research literature, previously discussed in chapter 2. To minimize threats for this study, measures were chosen that reflect the constructs being tested. Likewise, these measures were selected based on studies that support criterion-related validity.

The primary threat to external validity was the participant recruitment method and the selection criteria. Recruiting a sample from an online social media platform such as Facebook limited participation to those who have access computers, or other internet capable devices, and the ability to utilize this tool. Moreover, selection criteria of being female, at least 18 years old, able to read English, and had a history of sexual trauma was a targeted population. Consequently, to minimize risks to external validity, statistical inferences will not be generalized beyond this target population

Ethical Procedures

Approval was obtained from the Walden University (IRB) prior to collecting data. IRB reference number is: 10-30-17-0267996. Before being granted access to the study, participants were informed of the study's purpose, confidentiality of their responses and identity, their right to discontinue the survey at any time, and the lack of compensation for their involvement. No deception was used in the data collection process. As previously stated in this chapter, contact information for the NSAH (800.656.[HOPE]4673) was provided before and after taking the survey should participants become distressed and need assistance. NSAH is an organization that can

provide confidential information, services, and support for people with histories of sexual violence. Likewise, the NASH can provide contact information local agencies in the participant's area. To ensure participant confidentiality I enabled the anonymous response feature provided by SurveyMonkey (2017) that deactivated the collection of data of email addresses, IP addresses, and other personal information. All data collected in SurveyMonkey were encrypted and password protected. Data was exported to a laptop only to use for research purposes and backup information stored on an external hard drive, both of which were password protected. All printed data, along with the external hard drive, is stored in a locked fireproof safe for a minimum of five years. Contact information for this researcher was provided at the completion of the survey should the participants have any questions or if they desire to know the results of the study. Additionally, participants were notified of the study's results through the Facebook page they were recruited from.

Summary

This chapter described a quantitative, cross-sectional methodology that utilized online social media to recruit a non-probability sample of participants with histories of sexual violence. The first aim of this study was to determine the extent of the relationship between CE and PTG in this sample. The second aim was to determine the extent of the relationship between PTG and the health behaviors of alcohol abuse, drug use, tobacco use, and physical activity. The third aim was to determine the extent to which SE mediated the aforementioned relationships. Instruments used to operationalize the constructs in this study were the CES, the PTGI, the NGSES, the DAST-10, and select

questions from the 2016, 2015, and 2007 BRFSS. Research questions were evaluated through a series of regression analyses and bootstrap mediation analyses. Results from the data analyses are presented in Chapter 4.

Chapter 4: Results

Introduction

The purpose of this study was to determine the extent of the relationship between PTG and the health behaviors of alcohol abuse, drug use, tobacco use, and physical activity in a female sample with histories of sexual trauma, and to determine the extent to which SE mediates the aforementioned relationships. This chapter contains details of the data collection and characteristics of the sample. Subsequently presented is the results of the data analyses performed to address the research questions and hypotheses. The research questions and hypotheses are presented along with the findings from their respective analyses. Finally, this chapter ends with a summary of the findings.

Data Collection

Data were collected from 162 respondents between December 2017 and January 2018. I recruited participants by using a public Facebook page and posting a digital flyer in 58 Facebook community groups with a large number of members, ranging from 1,000 to 48,000. The recruitment procedure also included snowballing, in which I asked group members to pass this study's information to other potential participants. I excluded any participant responses that were more than 50% incomplete. One respondent reported not experiencing sexual trauma in her lifetime, two respondents reported being male, and two additional respondents did not complete one or more of the measures included in the survey; these five respondents were excluded from the final sample. For the remaining participants (n = 123), missing data for the items pertaining to the predictor, criterion, and mediating variables were imputed five times using the Multiple Imputation command in

SPSS. I chose multiple imputation to handle item-level missing data because several authors have suggested that this method was superior to traditional methods such as listwise deletion and mean substitution, which might have diminished statistical power or introduced bias (Acock, 2005; Enders, 2017; Manly & Wells, 2015). I examined values of continuous variables for outliers by calculating standardized scores. Two outliers for physical activity score were identified; these outliers were truncated to the next highest non-outlying value present in the data. Furthermore, categorization of the behaviors smoking, drinking, and physical activity from responses to BRFSS questions were defined in Appendix A, B, and C.

Descriptive statistics for the final sample are presented in Tables 5 and 6. Most of the participants were between 25 and 44 years old (n = 74, 60.2%) and most participants indicated their race as White non-Hispanic (n = 95, 77.2%). The largest proportion of participants had 1 to 3 years of college education (n = 46, 37.4%). The majority of participants were married (n = 64, 52.0%), and the largest proportion of participants did not have any children (n = 56, 45.5%). Participants were most commonly employed for wages (n = 52, 42.3%) and had a household income of less than $25,000 ($n$ = 41, 33.3%).

Table 5

Frequencies and Percentages for Categorical Variables

Variable	Frequency	Percent
Age		
18 to 24	20	16.3
25 to 34	37	30.1
35 to 44	37	30.1
45 to 54	19	15.4
55 to 64	7	5.7
65 to 74	2	1.6
Missing/No response	1	0.8
Race/Ethnicity		
White Non-Hispanic	95	77.2
Hispanic, Latina, Spanish	12	9.8
Black or African American	10	8.1
American Indian or Alaska Native	2	1.6
Other	3	2.4
Missing/No response	1	0.8
Education		
Grades 1 through 8 (Elementary)	1	0.8
Grades 9 through 11 (Some High School)	5	4.1
Grade 12 or GED (High School Graduate)	26	21.1
College 1 year to 3 years (Some College or technical school)	46	37.4
College 4 years or more (College graduate)	23	18.7
Master's Degree	17	13.8
Ph.D., law, or medical degree	3	2.4
Missing/No response	2	1.6
Marital status		
Single (never married)	34	27.6
Married	64	52.0
Separated	3	2.4
Widowed	2	1.6
Divorced	18	14.6
Missing/No response	2	1.6

(*table continues*)

Variable	Frequency	Percent
Number of children		
None	56	45.5
1	30	24.4
2	18	14.6
3	10	8.1
4	3	2.4
More than 4	5	4.1
Missing/No response	1	0.8
Employment		
Employed for wages	52	42.3
Self-Employed	11	8.9
Out of work for 1 year or more	7	5.7
Out of work for less than 1 year	9	7.3
A homemaker	22	17.9
A student	6	4.9
Unable to work	15	12.2
Missing/No response	1	0.8
Household Income		
Less than $25,000	41	33.3
$25,000 to $34,999	24	19.5
$35,000 to $49,999	19	15.4
$50,000 to $74,999	14	11.4
$75,000 and up	24	19.5
Missing/No response	1	0.8
Lifetime experience of nonconsensual sexual touch		
Yes	118	95.9
No	5	4.1
Nonconsensual sexual touching age		
Did not occur	5	4.1
Childhood age 1 to 15	35	28.5
Young adult age 16 to 25	11	8.9
Adult age 26 and older	6	4.9
Childhood and young adult	47	38.2
Childhood, young adult, and adult	15	12.2
Young adult and adult	2	1.6
Childhood and adult	2	1.6

(*table continues*)

Variable	Frequency	Percent
Past 12 months nonconsensual sexual touch		
Yes	21	17.1
No	102	82.9
Past 12 months exposure to unwanted sexual situations without physical touching		
Yes	25	20.3
No	98	79.7
Lifetime nonconsensual sex		
Yes	112	91.1
No	11	8.9
Nonconsensual sex age		
Did not occur	11	8.9
Childhood age 1 to 15	29	23.6
Young Adult age 16 to 25	36	29.3
Adult age 26 and older	9	7.3
Childhood and young adult	24	19.5
Childhood, young adult, and adult	6	4.9
Young adult and adult	4	3.3
Childhood and adult	4	3.3
Past 12 months nonconsensual sex		
Yes	11	8.9
No	112	91.1
Lifetime experience of attempted non-consensual sex		
Yes	89	72.4
No	34	27.6
Past 12 months attempted nonconsensual sex		
Yes	12	9.8
No	111	90.2

(*table continues*)

Variable	Frequency	Percent
Nonconsensual attempted sex age		
Did not occur	34	27.6
Childhood age 1 to 15	20	16.3
Young adult age 16 to 25	28	22.8
Adult age 26 and older	14	11.4
Childhood and young adult	14	11.4
Childhood, young adult, and adult	5	4.1
Young adult and adult	7	5.7
Missing/No response	1	0.8
General health		
Excellent	4	3.3
Very good	26	21.1
Good	41	33.3
Fair	34	27.6
Poor	18	14.6
Tobacco use category		
Never	37	30.1
Former	40	32.5
Current smoker, attempting to quit	22	17.9
Current smoker, not attempting to quit	24	19.5
Alcohol use category		
No drink	42	34.1
Occasional	46	37.4
Moderate	6	4.9
Binge	15	12.2
Heavy	12	9.8
Missing/No response	2	1.6
Drug use category		
No problem	54	43.9
Low	26	21.1
Moderate	16	13.0
Substantial	20	16.3
Severe	7	5.7

(*table continues*)

Variable	Frequency	Percent
Since your trauma do you drink alcohol more or less?		
I did not drink alcohol before or after	40	32.5
I stopped drinking alcohol	11	8.9
I drank less alcohol	12	9.8
I drank about the same amount of alcohol	17	13.8
I drink more alcohol	41	33.3
Missing or no response	2	1.6
Since your trauma do you use tobacco more or less?		
I did not use tobacco before or after	51	41.5
I stopped using tobacco	19	15.6
I used less tobacco	4	3.3
I use about the same amount of tobacco	11	8.9
I used more tobacco	37	30.1
Missing or no response	1	.8
Since your trauma do you exercise more or less?		
I did not exercise before or after	29	23.6
I stopped exercising	24	19.5
I exercise less	30	24.4
I exercise about the same	24	19.5
I exercise more	15	12.2
Missing or no response	1	.8
Since your trauma do you use drugs more or less?		
I did not use drugs before or after	58	47.5
I stopped using drugs	15	12.2
I use less drugs	9	7.3
I use about the same amount of drugs	11	8.9
I use more drugs	29	23.9
Missing or no response	1	.8

Table 6

Means and Standard Deviations for Continuous Variables

Variable	Mean[a]	Standard deviation[b]
Centrality of event	3.93	0.93
Posttraumatic growth	2.04	1.12
Self-efficacy	3.50	1.05
DAST score	2.53	3.18
Physical activity score	154.85	195.51

Notes. [a]Pooled means across 5 imputed datasets. [b]Average of standard deviations across 5 imputed datasets.

Most participants experienced nonconsensual sexual touch in their lifetime (i.e., molestation, groping, fondling without consent; *n* = 118, 95.9%) and the most common age at which this occurred was childhood and young adulthood (*n* = 47, 38.2%). The majority of participants indicated that they did not experience nonconsensual sexual touch (*n* = 102, 82.9%) or unwanted sexual situations without physical touching (*n* = 112, 91.1%) in the past 12 months. Of these individuals, most indicated they experienced nonconsensual sex in their lifetime (i.e., completed rape; drug-, alcohol-, or coercion-facilitated sexual experience) (*n* = 112, 91.1%) and the most common age at which this occurred was between the ages of 16 to 25 (*n* = 36, 29.3%). Most participants had experienced attempted nonconsensual sex (i.e., sexual violence without penetration) in their lifetime (*n* = 89, 72.4%) and the most common age at which this occurred was between the ages of 16 to 25 (*n* = 28, 22.8%). The majority of participants indicated that they had not experienced nonconsensual sex (*n* = 112, 91.1%) or attempted nonconsensual sex (*n* = 111, 90.2%) in the past 12 months.

The majority of the participants indicated that their general health was good (*n* = 41, 33.3%). In terms of tobacco, alcohol, and drug use, participants were most commonly classified as former tobacco users (*n* = 40, 32.5%), occasional drinkers (*n* = 46, 37.4%), and no problem drug users (*n* = 54, 43.9%). For changes in health behaviors after their trauma, the majority of participants report that they did not use tobacco before or after (*n* = 51, 41.5%), that they exercised less (*n* = 30, 24.4%), that they did not use drugs before or after (*n* = 58, 47.5%), and that they drink more alcohol (*n* = 41, 33.3%).

Results

Research Question 1

Is there a relationship between CE (as measured by the CES) and PTG (as measured by the PTGI) scores amongst women who have experienced sexual trauma (as determined by the 2007 BRFSS)?

Null Hypothesis 1: There is no statistically significant relationship between CE and PTG.

Alternative Hypothesis 1: There is a statistically significant relationship between CE and PTG.

I conducted a simple linear regression to address Research Question 1. The predictor variable in the analysis was CE. The criterion variable was PTG. Prior to interpreting the analysis, the assumptions of normality and homoscedasticity were assessed by visual examination of normal P-P plots and scatterplots of residuals versus predicted values. Visual inspection of the plots revealed that both assumptions were met. The overall regression model was not significant (all imputed *p* values > .05). The

average R^2 value across imputed datasets was .03. Results of the pooled regression model are presented in Table 7. CE was a marginally significant predictor in the pooled model (p = .063). Null Hypothesis 1 was marginally rejected.

Table 7

Simple Linear Regression Predicting Posttraumatic Growth

Variable	*B*	SE	*T*	Sig.
Centrality of event	0.20	0.11	1.86	.063

Note. Results pooled across 5 imputed datasets.

Research Question 2

Is there a significant relationship between PTG (as measured by the PTGI) and health behaviors of tobacco use, alcohol use, physical activity (as measured by selected questions from the 2015 BRFSS), and drug use (as measured by the DAST-10) amongst women who have experienced sexual trauma (as determined by the 2007 BRFSS)?

Null Hypothesis 2: There is no statistically significant relationship between PTG and health behaviors tobacco use, alcohol use, drug use, and physical activity amongst sexual trauma survivors.

Alternative Hypothesis 2: There is a statistically significant relationship between PTG and health behaviors tobacco use, alcohol use, drug use, and physical activity amongst sexual trauma survivors.

I conducted a series of simple linear and ordinal logistic regressions to address Research Question 2. The predictor variable in the analysis was PTGI score. The criterion

variables were physical activity score (simple linear regression) and the classifications of tobacco, alcohol, and drug use (ordinal logistic regressions). Prior to interpreting the simple linear regression analysis, the assumptions of normality and homoscedasticity were assessed by visual examination of normal P-P plots and scatterplots of residuals versus predicted values. Visual inspection of the plots revealed that the residuals deviated from a normal distribution. However, *F* and *t* tests are considered robust towards deviations from normality when sample sizes are high (Stevens, 2009), so the analysis was continued. The assumption of homoscedasticity was met. For the ordinal logistic regressions, tests of parallel lines were conducted to test the assumption that the relationship between the predictor and criterion variables was the same across all levels of the criterion variable. Across all imputations, only one test recorded a *p* value less than .05 ($p = .048$), so this assumption was reasonably met.

The overall regression model for physical activity score was not significant (all imputed *p* values > .05). The average R^2 value across imputed datasets was .01. PTG was not a significant predictor in the pooled model ($p = .245$). The overall regression model for tobacco use was not significant (all imputed *p* values > .05). PTG was not a significant predictor in the pooled model ($p = .207$). The overall regression model for alcohol use was not significant (all imputed *p* values > .05). PTG was not a significant predictor in the pooled model ($p = .536$). The overall regression model for drug use was not significant (all imputed *p* values > .05). PTG was not a significant predictor in the pooled model ($p = .793$). Results of the pooled regression models are presented in Table 8. Null Hypothesis 2 was not rejected.

Table 8

Simple Linear and Ordinal Logistic Regressions of Posttraumatic Growth Predicting Health Behaviors

Criterion variable	*B*	SE	*T*	Sig.
Physical activity score	18.40	15.83	1.16	.245
Tobacco use	0.19	0.15	*	.207
Alcohol use	0.10	0.15	*	.536
Drug use	-0.04	0.15	*	.793

Notes. Results pooled across 5 imputed datasets. *Pooled Wald could not be computed.

Research Question 3

Is there a significant relationship between PTG (as measured by the PTGI) and SE (as measured by the NGSES) amongst women who have experienced sexual trauma (as determined by the 2007 BRFSS)?

Null Hypothesis 3: There is no statistically significant relationship between PTG and SE amongst sexual trauma survivors.

Alternative Hypothesis 3: There is a statistically significant relationship between PTG and SE amongst sexual trauma survivors.

A simple linear regression was conducted to address Research Question 3. The predictor variable in the analysis was PTGI score. The criterion variable was SE. Prior to interpreting the analysis, the assumptions of normality and homoscedasticity were assessed by visual examination of normal P-P plots and scatterplots of residuals versus predicted values. Visual inspection of the plots revealed that both assumptions were met. The overall regression model was significant (all imputed p values < .05). The average R^2

value across imputed datasets was .07. Results of the pooled regression model are presented in Table 9. PTG was a significant positive predictor in the pooled model (p = .003), indicating that participants with higher PTG tended to have higher SE. Null Hypothesis 3 was rejected.

Table 9

Simple Linear Regression Predicting Self-Efficacy

Variable	*B*	SE	*T*	Sig.
Posttraumatic growth	0.25	0.08	3.00	.003

Note. Results pooled across 5 imputed datasets.

Research Question 4

Is there as statistically significant relationship between health behaviors of tobacco use, alcohol use, physical activity (as measured by questions selected from the 2015 BRFSS), and drug abuse (as measured by the DAST-10) and SE (as measured by the NGSES) amongst women who have experienced sexual trauma (as determined by the 2007 BRFSS)?

Null Hypothesis 4: There is no statistically significant relationship between health behaviors tobacco use, alcohol use, and physical activity and SE.

Alternative Hypothesis 4: There is a statistically significant relationship between health behaviors tobacco use, alcohol use, and physical activity and SE.

A series of simple linear and ordinal logistic regressions were conducted to address specific health behaviors as listed in Research Question 4. The predictor variable

in the analysis was SE. Separate models were conducted for each of the criterion variables, namely, physical activity score (simple linear regression) and the classifications of tobacco, alcohol, and drug use (ordinal logistic regressions). Prior to interpreting the simple linear regression analysis, the assumptions of normality and homoscedasticity were assessed by visual examination of normal P-P plots and scatterplots of residuals versus predicted values. Visual inspection of the plots revealed that the residuals deviated from a normal distribution. However, *F* and *t* tests are considered robust towards deviations from normality when sample sizes are high (Stevens, 2009), so the analysis was continued. The assumption of homoscedasticity was met. For the ordinal logistic regressions, tests of parallel lines were conducted to test the assumption that the relationship between the predictor and criterion variables was the same across all levels of the criterion variable. The assumption was met for the regressions predicting drug use and alcohol use (all imputed p values > .05). For the regression predicting tobacco use, four of the five imputations recorded a significant result (p values < .05), indicating that the assumption might not have been met for this regression. The results should be interpreted with caution.

The overall regression model for physical activity score was significant (all imputed p values < .05). The average R^2 value across imputed datasets was .04. SE was a significant positive predictor in the pooled model (p = .020), indicating that participants with higher SE tended to have higher physical activity scores. The overall regression model for tobacco use was not significant (all imputed p values > .05). SE was not a significant predictor in the pooled model (p = .059). The overall regression model for

alcohol use was not significant (all imputed *p* values > .05). SE was not a significant predictor in the pooled model (*p* = .656). The overall regression model for drug use was significant (all imputed *p* values < .05). SE was a significant negative predictor in the pooled model (*p* = .007), indicating that participants with higher SE were less likely to be in a higher category of drug use. Results of the pooled regression models are presented in Table 10. Null Hypothesis 4 was partially rejected.

Table 10

Simple Linear and Ordinal Logistic Regressions of Self-Efficacy Predicting Health Behaviors

Criterion variable	*B*	SE	*T*	Sig.
Physical activity score	38.49	16.61	2.32	.020
Tobacco use	-0.30	0.16	*	.059
Alcohol use	0.07	0.16	*	.656
Drug use	-0.43	0.16	*	.007

Notes. Results pooled across 5 imputed datasets. *Pooled Wald could not be computed.

Research Question 5

Does SE (as measured by the NGSES) mediate the relationship between PTG (as measured by the PTGI) and health behaviors of tobacco use, alcohol use, physical activity (as measured by questions selected from the 2015 BRFSS), and drug abuse (as measured by the DAST-10) amongst women who have experienced sexual trauma (as determined by the 2007 BRFSS)?

Null Hypothesis 5: SE does not significantly mediate the relationship between PTG and health behaviors of tobacco use, alcohol use, drug use, and physical activity.

Alternative Hypothesis 5: SE significantly mediates the relationship between PTG and health behaviors tobacco use, alcohol use, drug use, and physical activity.

Mediation analyses using the Hayes (2013) bias-corrected bootstrapping method was conducted to address Research Question 5. The predictor variable in this series of analysis was PTG. The criterion variables were physical activity score and the classifications of tobacco, alcohol, and drug use. The mediating variable for each model was SE. Covariates included in the analysis were age, race, and education level. As the results of the mediation analysis cannot be pooled across imputed datasets, this analysis was conducted on the first imputation only. Confidence intervals (CIs) of the indirect effect of PTG through SE on each criterion variable are presented in Table 11. The CI for physical activity score did not contain zero, demonstrating that SE significantly mediated the relationship between PTG and physical activity score. All other CIs contained zero, indicating that SE did not mediate the relationship between PTG and tobacco use, alcohol use, and drug use. Null Hypothesis 5 was partially rejected.

Table 11

Confidence Intervals of Indirect Effects of Posttraumatic Growth Through Self-Efficacy

Criterion Variable	95% CI Indirect Effect
Physical activity score	[3.08, 23.89]
Tobacco use	[-0.12, 0.02]
Alcohol use	[-0.07, 0.10]
Drug use	[-0.16, 0.01]

Post Hoc Analyses

Research by Barton et al. (2013), Boals et al. (2010), and Johnson and Boals (2014) suggests that the PTGI can more accurately reflect growth when evaluated in reference to event centrality. These authors explained that events that receive high scores on the CES (means scores greater than 3.57) are perceived as more subjectively traumatic and thus have a greater influence on the individual's identity. Based on Barton et al. (2013) criteria, the relationship between CES and PTGI was evaluated as a function of high and low CES scores (see Table 12). For the participants in this current study, CES was not significantly related to PTGI as a function of high ($p = 0.67$) and low ($p = 0.24$) CES scores.

Table 12

Simple Linear Regression Predicting PTGI as a Function of High/Low CES

High/Low CES	*n*	CES Mean	CES SD	PTGI Mean	PTGI SD	*B*	SE	*t*	Sig.
Low CES < 3.43	33	2.98	.62	1.77	.99	.34	.28	1.20	0.24
High CES > 3.57	90	4.39	.48	2.13	1.15	.11	.25	.43	0.67

Note. Results pooled across 5 imputed datasets.

Subsequently, as a result of the mediation analysis of Question 5 indicating that SE significantly mediated the relationship between PTG and physical activity, additional analyses were conducted. The first analysis sought to determine which PTGI Factors significantly predicted exercise scores. Factor V: Appreciation for life was a significant predictor of exercise scores in the pooled model ($p = .03$) (see Table 13). Furthermore,

analyses of PTGI Factors with SE as a mediator (see Table 14) indicated that SE had an indirect effect between Factors II, III, and V (New Possibilities, Personal Strength, and Appreciation of Life, respectively) and exercise scores. Thus, an additional mediation analysis was conducted that showed SE had an indirect effect on the relationship between PTGI scores and perceived health behavior changes of exercise since the trauma (see Table 15).

Table 13

Simple Linear Regression PTGI Factors Predicting Exercise Score

Variable	*B*	SE	*T*	Sig.
Factor I: Relating to others	4.96	15.33	0.32	0.75
Factor II: New Possibilities	13.76	12.37	1.11	0.27
Factor III: Personal Strength	15.18	12.20	1.25	0.213
Factor IV: Spiritual Change	-3.18	9.20	-0.35	0.73
Factor V: Appreciation of Life	21.95	10.27	2.14	0.03

Note. Results pooled across 5 imputed datasets.

Table 14

Confidence Intervals of Indirect Effects of PTGI Factors on Exercise Through Self-Efficacy

Criterion Variable	95% CI Indirect Effect
Factor I: Relating to others	[-5.76, 9.53]
Factor II: New Possibilities	[1.24, 25.11]
Factor III: Personal Strength	[2.76, 22.10]
Factor IV: Spiritual Change	[-0.68, 8.48]
Factor V: Appreciation of Life	[0.49, 14.39]

Table 15

Confidence Intervals of Indirect Effects of PTGI Scores on Perceived Behavior Change Through Self-Efficacy

Criterion Variable	95% CI Indirect Effect
Since your trauma do you drink alcohol more or less?	[-0.09, 0.12]
Since your trauma do you use tobacco more or less?	[-0.19, 0.02]
Since your trauma do you exercise more or less?	[0.04, 0.25]
Since your trauma do you use drugs more or less?	[-0.15, 0.15]

Summary

Research Question 1 was addressed using a simple linear regression. The results showed that CE was marginally significantly related to PTG. Therefore, Null Hypothesis 1 was not completely rejected. Research Question 2 was addressed using a series of simple linear and ordinal logistic regressions. The results showed that PTG was not significantly related to physical activity, tobacco use, alcohol use, or drug use. Therefore, Null Hypothesis 2 was not rejected. Research Question 3 was addressed using a simple linear regression. The results showed that PTG was significantly related to SE. Therefore, Null Hypothesis 3 was rejected. Research Question 4 was addressed using a series of simple linear and ordinal logistic regressions. The results showed that SE was significantly related to physical activity and drug use, but SE was not significantly related to tobacco use or alcohol use. Therefore, Null Hypothesis 4 was partially rejected. Finally, Research Question 5 was addressed using a mediation analysis. The results showed that SE significantly mediated the relationship between PTG and physical activity, but SE did not significantly mediate the relationship between PTG and tobacco use, alcohol use, or drug use. Therefore, Null Hypothesis 5 was partially rejected.

Following the results that indicated a significant mediation model between PTGI score and exercise scores with SE as a mediator, additional post hoc analyses were conducted to determine the specific PTGI Factors that contributed to the model. Chapter 5 will contain a discussion of these findings and recommendations for future research and practice.

Chapter 5: Discussion

Introduction

Purpose and Nature of the Study

The peer-reviewed literature was replete with research on the adverse effects of sexual trauma (Haller & Chassin, 2014; Jina & Thomas, 2013). Equally, research is amassing on the positive outcomes that people may experience after cognitive and emotional struggle induced by their trauma (e.g., vehicle accidents, military combat) labeled as PTG (Tedeschi & Calhoun, 1996). One research area that would benefit from further exploration is the associations between CE and PTG on health behaviors of women who have experienced sexual violence. This study addressed this gap and explored how SE mediated that relationship. This study was quantitative and cross-sectional in nature. Its first objective was to determine whether there was an association between CE and PTG using the CES (Berntsen & Rubin, 2006; 2007) and the PTGI (Tedeschi & Calhoun, 1996). The 2009 BRFSS (CDC, 2016a) questions were used to assess sexual trauma categories. The second objective was to explore the relationship between PTG and four areas of health behaviors: tobacco use, alcohol use, drug use, and physical activity. I assessed health behaviors using questions from the 2015 BRFSS (CDC, 2016a) specific to exercise, tobacco use, and alcohol consumption. The DAST-10 (Skinner, 1982) was used to assess participant drug use. The third objective was to determine whether SE, using the NGSES (Chen et al., 2001), mediated the relationship between PTG and the aforementioned health behaviors. A series of simple linear and ordinal logistic regressions were used to determine whether there were significant

relationships between (a) CE and PTG, (b) PTG and health behaviors, (c) PTG and general SE, and (d) general SE and health behaviors. I used Hayes's (2013) biased-corrected bootstrapping method to test whether general SE mediated the relationship between PTG and each of the health behaviors of this study.

A total of 123 female respondents completed an anonymous online survey for this study. The majority of the participants were White non-Hispanic, between 25 and 44 years old, and married. The largest portion of participants did not have children, were employed for wages, had 1 to 3 years of college experience, and had a household income of less than $25,000. All participants experienced a form of sexual violence (i.e., nonconsensual sexual touch, nonconsensual attempted sex, or nonconsensual sex) in their lifetime with the majority having experienced more than one of the trauma categories. The most frequent age categories reported for these experiences were during "*childhood and adulthood*" and "*young adulthood*".

The results of this study indicated that event centrality was marginally related to PTG ($p = 0.063$) although the majority reported high event centrality. Similarly, self-reported PTG was not directly related to health behaviors. The lack of a significant relationship between PTG and health behaviors did not change when evaluating it as a function of high versus low CES scores. Nevertheless, PTG had a positive relationship with general SE, which in turn had a direct positive relationship to physical activity and a direct negative relationship to drug use. Additionally, general SE mediated the relationship between PTG and physical activity. Similarly, general SE mediated the

relationship between physical activity and PTG factors of (a) appreciation for life, (b) personal strength, and (c) new possibilities.

Interpretation of the Findings

Centrality of Event and Posttraumatic Growth

Participants in this study all reported that their sexual traumas were, to some degree, central to their identities, with the majority experiencing high centrality as determined by Barton et al.'s (2013) categorization of CES high/low score estimates. However, CE reached a marginally significant relationship with PTG ($p = 0.063$) among this sample of women even when the relationship was evaluated as a function of high versus low centrality. These findings appear somewhat contrary to the theoretical work of Barton et al. (2013), Boals and Schuettler (2011), and Boals et al. (2010), as discussed in Chapters 1 and 2.

As discussed in Chapters 1 and 2, event centrality is hypothesized to be the extent to which individuals believe an event to be an essential aspect of their identity and a critical element to their personal narrative and worldview (Berntsen & Rubin, 2006). Studies by Scherman, Salgado, Shao, and Berntsen (2015), Wantanabe (2017), and Yamamoto (2015) support this conjecture for both positive and negative events. Schuettler and Boals (2011), using simple correlations and stepwise multiple regression analysis, found that CES, in combination with problem-focused coping and positive perspectives of the event, predicted PTG, whereas CES with avoidant coping and negative perspectives predicted PTSD. Furthermore, Barton et al. (2013), Boals et al. (2010), and Johnson and Boals (2014) showed positive relationships between CES and

PTG. Likewise, the relationship of PTG with other constructs, such as life satisfaction and depression, were stronger in expected positive and negative directions when evaluated as a function of high and low centrality (Barton et al., 2013). All of the studies mentioned here involved participants with mixed trauma histories (i.e., automobile accidents, death of a loved one) and, thus, may not be considered direct comparisons with a study exclusive to women with a history of sexual trauma.

Three studies on CE that focused on sexual trauma include Barton et al.'s (2013), Knowles's (2012), and Robinaugh and McNally's (2011) research. Knowles (2012) found that perceptions of self-objectification (i.e., an individual believing that he or she is a sexual object) mediated the relationship between CES and trauma type. Moreover, Robinaugh and McNally documented that in a sample of women with histories of CSA, CES had a positive relationship with PTSD, dissociation, and depression and a negative relationship with self-esteem. In the second study, Barton et al. restricted their sample to women with histories of sexual or physical abuse. The correlation between CES and PTGI was nonsignificant, and CES did not independently predict PTGI, findings which are supported by this dissertation study.

Two articles that have been published since the initiation of the present study are worth noting. Wamser-Nanney, Howell, Schwartz, and Hasselle's (2017) research showed that CES was significantly related to PTGI in a sample of college students, However, trauma type (i.e., sexual trauma, serious illness/injury, violent trauma, and death of a loved one) did not moderate the relationship between the two variables. Conversely, Keshet, Foa, and Gilboa-Schechtman's (2018) study found that, for their

female participants, CES and SA trauma were significantly related to self-esteem and intimacy self-evaluations in comparison to women who reported bereavement and motor vehicle accidents as their most traumatic experience.

Taken together, the results suggest that for this presented study's sample of women, CE alone might not have been enough to promote significant perceptions of PTG. Sexual trauma differs from other traumas because it is interpersonal in nature, often with the perpetrator being someone who is known to the survivor (Shakespeare-Finch & Armstrong, 2010). Furthermore, in this sample, the majority of the participants experienced more than one type of sexual trauma in multiple periods of their lives, and often during developmental periods when they would have been forming their identities (i.e., childhood, adolescence, young adulthood). Shakespeare-Finch and de Dassel (2009) wrote that the idea of restoring shattered assumptions of safety, positive self-perception, and a meaningful world view is irrelevant when those assumptions were not present subsequent to sexual abuse early in life. The results of this study may indicate that even though these events are an important part of this sample of women's identities, the respondents might have been able to compartmentalize their trauma experience in their personal narratives while still experiencing varying levels of growth.

Additional areas that may have influenced the relationship between CE and PTG in this sample are perceptions of control over the events and trauma-specific attributions. Caston and Frazier (2013) explain that perceptions of control are temporal and can be divided into three types: past control, present control, and future control. Past control over trauma or stressful life events refers to one's perceptions of what he or she could

have done in the situation, whereas present and future control refers to what he or she believes they can do now and, in the future, respectively (Caston & Frazier, 2013). Caston and Frazier (2013) found that perceptions of past control were negatively associated with growth when the event itself was uncontrollable. Moreover, self-blame attributions may also have been an influencing element in the relationship between centrality and PTG. Peter-Hagene and Ullman (2018) elucidate that behavioral self-blame is beliefs about actions taken within a situation, in contrast to characterological self-blame, which is beliefs that cause is related to one's character. These researchers found in a sample of adults with histories of SA that character self-blame, rather than behavioral self-blame, increased PTSD symptomology (Peter-Hagene & Ullman, 2018). In relation to this presented study, beliefs of controllability and self-blame may have had an effect on how the event was encoded into their personal narratives, subsequently affecting event centrality and PTG. For instance, individuals who have experienced sexual trauma (an uncontrollable trauma) may believe that they had some control over the event and that they are to blame for its occurrence. Further research is needed in this area.

Other factors that might have influenced the relationship between CES and PTG in this sample were PTSD symptoms and cognitions, self-perceptions, coping style, social support, age, time since trauma, and the impact of multiple traumas. Additionally, this study took place during the 2017-2018 #MeToo movement, a large-scale social media movement to combat SA and sexual misconduct nationwide (MeToo, 2018). This movement has reached across numerous arenas from acting to politics and is highly publicized. Being inundated with news headlines of sexual violence allegations may have

triggered memories and emotions of participants, and may have influenced their responses.

Posttraumatic Growth and General Self-Efficacy

In this study, PTG had a significant positive relationship with general SE. This might have been the result of the perception "I was able to grow because of this trauma therefore I can succeed in other areas as well." To my knowledge, SE had not been researched as an outcome of PTG. The limited literature available looked at general SE as a possible predictor variable. For instance, Schuettler and Boals (2011) indicated that general SE did not predict PTG in a mix trauma sample. These authors suggested that if someone perceived high SE in overcoming obstacles, the ability to engage and persevere in the tasks necessary to meet their desired outcomes, then there will be the struggle required to promote PTG. Conversely, Yu et al. (2014) found that SE predicted PTG in a sample of cancer survivors in a hierarchical regression model. Neither of these studies evaluated how SE might have developed as a product of PTG.

Bandura (1982, 1986) suggests key methods to promote SE: a) accomplishing tasks that positively influence self-perceptions of mastery, b) learning from other's similar experiences or examples, c) other's encouragement and constructive feedback, and d) positive physiological states, such as confidence or excitement. Concurrently, the theoretical model of PTG (Tedeschi & Calhoun, 1996, 2004) illustrates that a number of factors contribute to growth outcomes such as self-analysis, supported self-disclosure, sociocultural influences, and converting brooding into reflective rumination. The struggle endured throughout the PTG process may also present opportunities to develop mastery,

learn from others, and gain reassurance (i.e., reporting sexual trauma to a supportive friend who has had a similar experience and who can provide encouragement). Thus, the relationship between PTG and SE in this study might have reflected a possible overlap between these two theories.

General Self-Efficacy as a Mediator Between Posttraumatic Growth and Health Behaviors

Results in this study indicated general SE was positively related to physical activity and negatively related to drug use in this sample. This finding corresponded with past studies that showed SE's significant role in promoting healthy behaviors, specifically increasing exercise (Barz et al., 2016) and decreasing substance abuse (Chavarria, Stevens, Jason, & Ferrari, 2012; Taylor & Williams-Salisbury, 2015). However, total PTGI score did not directly predict the four health behaviors of this study. This outcome conflicted with previous, albeit sparse, literature. Shakespeare-Finch and Barrington (2012) study, using a mixed trauma sample, showed that reports of PTG were positively related to behavioral changes such as exercising and engaging in sports. These self-reports were substantiated by the participants' significant others or close friends.

Subsequent analysis indicated that general SE mediated the relationship between PTG and physical activity scores. Moreover, general SE mediated the relationship between three PTGI factors (Appreciation of Life, Personal Strength, and New Possibilities) and physical activity scores. Similarly, Shakespeare-Finch and Barrington (2012) found that those who reported high levels of growth on the PTGI factors of New Possibilities and Personal Strength also reported behavior changes in physical activity.

These findings in this study suggest that as a result of the cognitive and emotional struggle induced by the trauma, the PTG that may develop may also have a significant role in developing SE, which in turn can be a link to behavioral changes in physical activity.

Limitations of the Study

The first limitation, inherent to cross-sectional quantitative research, is that causality cannot be drawn between the variables' relationships. Longitudinal data is necessary to be able to draw conclusions of causality amongst a sample. Likewise, this study was powered to find moderate correlations, thus it is probable that with a larger sample size significance would have been reached. Moreover, the specific sample in this study were all female, 18 years or older, knew English, and had access to the internet and Facebook. Data from the Pew Research Center (Smith & Anderson, 2018) estimates that 68% of Americans use Facebook with people over the age of 65 being the smallest group. Additionally, participants were recruited from Facebook community groups and a Facebook page designed for this study.

Furthermore, the data was collected during the months of December and January, which was a holiday period that might have influenced participants' health behaviors during that time (i.e., consuming more alcohol at holiday parties or decreasing exercise in lieu of social events). Likewise, the #MeToo movement and the publicity of sexual misconduct of political leaders, previously discussed, might have promoted or diminished interest in taking the survey for this study. Personality traits are another factor that might have influenced participants' motivation to volunteer (Rife, Cate, Kosinski, & Stillwell,

2016; Seidman, 2013). Seidman (2013) found that conscientiousness, extroversion, self-disclosure, and neuroticism motivated whether or not a person would express his or her actual-self verses their ideal-self during their Facebook interactions with others. Therefore, data interpretation is limited to this sample.

Social desirability response bias might have been another aspect that shaped participants' responses. Social desirability bias is the propensity to under report behaviors and attitudes that are considered to be socially adverse and overreport socially positive activities (Larkin, Edwards, Davey-Rothwell, & Tobin, 2017). For instance, Brenner and DeLamater's (2014) research focusing on exercise behaviors suggests that survey questions may prompt an internal dialog where participants determine the importance of the action is to their identity (whether they view themselves as exercisers) and how they want to present themselves. Similarly, Latkin et al. (2017) found that social desirability response bias was associated with drug use and stigma toward drug users. This study, the questions about sexual trauma and health behaviors might have produced moods and emotions that might have biased participants' survey-taking experience. Because of the sensitive nature of this study, providing the participants with the rational for the study and their role in it, using clear and simple instructions, and providing anonymity was imperative and might have lessened the inherent bias of self-reports. Thus, results from this study might have been limited by the sample and response bias.

Recommendations for Future Research

Future studies on PTG and health behavior outcomes after sexual trauma is imperative to deepen practitioners' understanding on how, and possibly why, this type of

experience differs from others trauma types. This study utilized the questions from the BRFSS (CDC, 2016a) to determine sexual trauma type, age category of trauma, physical activity time, alcohol consumption, and tobacco use. Although the BRFSS is used nationwide to assess public health behaviors, potential studies can benefit from using measures about sexual development including specific sexual traumas. Precise measures are necessary because a number of participants experience more than one type of sexual trauma during more than one period of their lives. Furthermore, future research needs to evaluate the relationship between sexual trauma types with specific health self-efficacy scales (Sheer, 2014) and specific health behavior scales to facilitate more clarity on these variables' associations. Likewise, perceptions of control and self-blame attributions need to be explored in relation to CE and PTG, previously discussed in this chapter.

Additional factors that should be evaluated in multiple mediation research between PTG and health behaviors as well as CES and PTG include mental health functioning (i.e., depression, PTSD symptomology), sexual orientation, social support, trauma disclosure, time since trauma, personality traits, personal closure, and coping behaviors. Likewise, comparing gender differences would contribute to future literature as well.

Secondly, future research would benefit from longitudinal studies in this area. This type of research design would extend literature on the complex nature of personal growth and sexual trauma by providing evidence of possible causal direction between the variables. Likewise, it would inform practitioners on areas needing attention among clients struggling to engage in positive health behaviors. Possible approaches to

strengthen the connection between PTG, SE, and health behaviors are motivational interviewing and health coaching. Motivational interviewing in therapy is a direct approach to resolving a client's ambivalence to changing behaviors (Copeland, McNamara, Kelson, & Simpson, 2015). Practitioners work collaboratively with clients to verbally elicit their perceptions of barriers, motivations, and goals about their sought-after behavior change (Copeland et al., 2015; Goddard & Marrow, 2015). Copeland et al.'s (2015) systematic review of literature showed that motivational interviewing strengthened clients' sense of self-control, SE, and commitment to health behavior changes. To my knowledge, there is no published literature on motivational interviewing of women with a history of sexual trauma.

Health coaching is a form of mentoring relationship that also focuses on the client and their motivation with the addition of focusing on their daily lives, accountability, and helping to plan step by step means to succeed in health endeavors (Finn & Watson, 2017). Heath coaching, also known by other titles such as Co-Active Life Coaching (Goddard & Marrow, 2015), utilizes motivational interviewing in their repertoire of behavioral strategies as they focus on educating and supporting their clients (Finn & Watson, 2017). These types of approaches need to be evaluated to determine their effectiveness in assisting women with histories of sexual trauma develop positive health behaviors because practitioners can help them build their SE by integrating the growth they experienced from their trauma.

Implications

Positive Social Change

The results of this study highlight the complex nature of sexual trauma. A vital question arises: How can practitioners assist women, using the lens of positive psychology, put the experience into context that will allow them to experience growth and move forward in a positive manner? The lack of statistical significance between CE and PTG in this study differs from other types of trauma reported in other studies, as previously discussed. This implies that it is essential to give women the opportunity to converse about their trauma histories and their growth in order to determine the extent of its influence on their health behaviors. Positive social change can occur by understanding how their cognitions influence of their SE and behaviors and developing interventions to help them to engage or sustain positive behaviors long term, thus, possibly lowering the negative health outcomes that is prevalent among those who have experienced sexual trauma (Black et al., 2014; Monnat & Chandler, 2015; Santaularia et al., 2014).

Theoretical Implications

This study offers a novel perspective on the possible relationship between PTG and health behaviors among women who have experienced sexual trauma. In previous research, several authors argue that PTG is accompanied by behavioral changes (Arpawong et al., 2015; Hobfoll et al., 2007; Shakespeare-Finch & Barrington, 2012). The findings of this study extend PTG theory by providing evidence of the role SE can play between growth and exercise behaviors. Likewise, this study provides evidence of the uniqueness of sexual trauma in comparison to other traumas in previous examinations

of PTG (Barton et al., 2013; Boals et al., 2010; Johnson & Boals, 2014), which highlights the need for further investigations as to the causes of these variations. Trauma type may be a key aspect in the development of PTG **(**Wamser-Nanney et al., 2017). Forming theory based on sexual trauma and growth is vital in understanding the mind-body-behavior connection of this population as well as to promote future research and interventions to alleviate negative health outcomes.

Recommendations for Practice

Clients can benefit from clinicians who have a thorough understanding of how the interpersonal nature of sexual trauma may influence perceptions of event centrality and PTG differently than other trauma types. Likewise, length of time for which the trauma occurred in cases of sexual abuse early in life, time since trauma, and experiencing more than one type of sexual trauma over a lifetime may influence the relationship as well. This understanding can enable them to assist clients in positively reframing their trauma, recognizing areas of growth, and fostering SE to promote exercise behaviors.

Conclusion

There were three main goals in this study using a female sample with histories of sexual trauma: a) to determine if there was a relationship between CE and PTG, b) to investigate the extent of the relationship between PTG and the health behaviors of tobacco use, alcohol use, drug use, and exercise, and c) to determine if SE mediated the relationships between PTG and the four health behaviors. Trauma research has evolved from a disease-model to a wellness-model that seeks to promote people's strengths (Ulloa et al., 2016; Zoellner & Maercker, 2006) and autonomy in their health behaviors

(Bandera, 2004). Previously discussed in Chapter 2, literature on PTG, the benefits resulting from the effortful cognitive and emotional struggle after experiencing trauma (Tedeschi & Calhoun, 2004), has increased in a number of areas such as bereavement (Taku et al., 2015), combat (Stuagaard et al., 2015), and automobile accidents (Shakespeare-Finch & Armstrong, 2010). However, research has been lacking on the relationship between PTG and health behaviors. I sought to fill in this gap.

For this study, 123 women with histories of sexual trauma were recruited to participate in an online survey. Through a number of regression analyses, I found that even though the majority reported that their traumas were centrality to their identities and that they experienced some growth as a result of their experiences, the relationship was only marginally significant (p = .063) between the two constructs. This outcome could be attributed to most of participants experiencing multiple sexual trauma types during multiple periods of their lives. Likewise, study outcome differences from previous research may have been brought about from the fact that sexual trauma differ from other traumas (e.g., automobile accidents, bereavement) in that it is interpersonal in nature and a form of violence that is objectifying and degrading. Furthermore, this study found that PTG was not significantly associated with the evaluate health behaviors. Nevertheless, PTG had a significant relationship with SE and SE was significantly positively related to physical activity scores and negatively related to drug use. Mediation analysis indicated that SE mediated the relationship between PTG and physical activity. This may be due to the development of SE in one area which, in turn, may assist in promoting SE in other areas (e.g., “I was able to grow from this trauma, therefore I can engage in beneficial

physical activities"). Further research is necessary to understand trauma-type differences in the relationships between CE and PTG. Likewise, additional research that focuses on specific sexual traumas, and uses specific, well validated measure of SE and health behaviors can help to provide clarity that practitioners can utilize for developing client-centered interventions. Positive social change can occur by providing the opportunity to reframe sexual trauma through the lens of positive psychology in order for women to understand how their cognitions influence their SE and subsequently their health behaviors in a beneficial way.

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Appendix A: Demographic Questions

Question	Response
Are you female?	Yes/No
What is your age?	• 18 to 24 years • 25 to 34 years • 35 to 44 years • 45 to 54 years • 55 to 64 years • 65 or older
What Is Your Race/Ethnicity?	• White Non-Hispanic • Hispanic, Latina, Spanish • Black or African American • American Indian or Alaska Native • Asian • Pacific Islander • Other
What is the highest degree or level of education you have completed?	• Never attended school or only attended kindergarten • Grades 1 through 8 (Elementary) • Grades 9 through 11 (Some High school) • Grade 12 or GED (High School Graduate) • College 1 year to 3 years (Some College or technical school) • College 4 years or more (College graduate) • Master's Degree • Ph.D., law, or medical degree
What is your marital status?	• Single (never married) • Married • Separated • Widowed • Divorced
How many children less than 18 years of age live in your household?	• Specify: 0 to x
Employment: Are you currently…?	• Employed for wages • Self-employed • Out of work for 1 year or more

table continues

Question	Response
	• Out of work for less than 1 year • A homemaker • A student • Unable to work
What was your total household income before taxes during the past 12 months?	• Less than $25,000 • $25,000 to $34,999 • $35,000 to $49,999 • $50,000 to $74,999 • $75,000 and up

Appendix B: 2007 BRFSS Module 17: Sexual Violence Questions

2007 BRFSS Module 17: Sexual Violence

Instructions	Question	Response Options
The first questions are about unwanted sexual experiences you may have had.	In the past 12 months, has anyone touched sexual parts of your body after you said or showed that you didn't want them to, or without your consent (for example being groped or fondled)?	Yes/No
	** Has anyone **EVER** touched sexual parts of your body after you said or showed that you didn't want them to, or without your consent (for example being groped or fondled)?	Yes/No
	** ***If yes***, at what age?	__ Age
	** ***If yes,*** many times?	1 2 – 4 5 – 10 More than 10
	*** What was that person's relationship to you?	Current boyfriend/girlfriend Former boyfriend/girlfriend Fiancé Spouse or live-in partner Former spouse or former live-in partner Someone you were dating First Date Friend Acquaintance A person known for less than 24 hours Complete stranger Parent Step-parent Parent's partner Parent in-law

table continues

Instructions	Question	Response Options
		Other relative Neighbor Co-worker Other non-relative Multiple perpetrators
	*** Was the person who did this male or female?	Male or Female
	In the past 12 months, has anyone exposed you to unwanted sexual situations that did not involve physical touching? Examples include things like sexual harassment, someone exposing sexual parts of their body to you, being seen by a peeping Tom, or someone making you look at sexual photos or movies?	Yes/No
Now, I am going to ask you questions about unwanted sex. Unwanted sex includes things like putting anything into your vagina, anus, or mouth or making you do these things to them after you said or showed that you didn't want to. Note: It includes times when you were unable to consent, for example, you were drunk or asleep, or you thought you would be hurt or punished if you refused.	Has anyone EVER had sex with you after you said or showed that you didn't want them to or without your consent?	Yes/No
	** ***If yes***, at what age?	__ Age
	** ***If yes,*** many times?	1 2 – 4 5 – 10 More than 10
	*** What was that person's relationship to you?	Current boyfriend/girlfriend Former boyfriend/girlfriend

table continues

Instructions	Question	Response Options
		Fiancé Spouse or live-in partner Former spouse or former live-in partner Someone you were dating First Date Friend Acquaintance A person known for less than 24 hours Complete stranger Parent Step-parent Parent's partner Parent in-law Other relative Neighbor Co-worker Other non-relative Multiple perpetrators
	*** Was the person who did this male or female?	Male or Female
	Has this happened in the past 12 months?	Yes/No
	Has anyone EVER ATTEMPTED to have sex with you after you said or showed that you didn't want to or without your consent, BUT SEX DID NOT OCCUR?	Yes/No
	** ***If yes***, at what are?	__ Age
	Has this happened in the past 12 months	Yes/No
	Think about the time of the most recent incident involving a person who had sex with you –or- attempted to have sex with you after	Current boyfriend/girlfriend Former boyfriend/girlfriend Fiancé

table continues

Instructions	Question	Response Options
	you said or showed that you didn't want to or without your consent. What was that person's relationship to you?	Spouse or live-in partner Former spouse or former live-in partner Someone you were dating First Date Friend Acquaintance A person known for less than 24 hours Complete stranger Parent Step-parent Parent's partner Parent in-law Other relative Neighbor Co-worker Other non-relative Multiple perpetrators
	Was the person who did this male or female?	Male or Female

*Note: ** indicates researcher added questions, *** indicates repeated module 17 questions.*

Appendix C: Selected BRFSS Health Questions

BEHAVIOR	YEAR AND SECTION	QUESTION	RESPONSE OPTIONS
HEALTH	2016 – 1.1	Would you say that in general your health is:	1. Excellent 2. Very good 3. Good 4. Fair 5. Poor
HEALTHY DAYS	2016 – 2.1	Now thinking about your physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good?	___ Number of Days
	2016 – 2.2	Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?	___ Number of Days
	2016 – 2.3	During the past 30 days, for about how many days did poor physical or mental health keep you from doing your usual activities, such as self-care, work, or recreation?	___ Number of Days
EXERCISE/ PHYSICAL ACTIVITY	2015 – 11.1	During the past month, other than your regular job, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise?	Yes/No
	2015 – 11.2	What type of physical activity or exercise did you spend the most time doing during the past month?	
	2015 – 11.3	How many times per week or per month did you take part in this activity during the past month?	___Week ___ Month

table continues

BEHAVIOR	YEAR AND SECTION	QUESTION	RESPONSE OPTIONS
	2015 – 11.4	And when you took part in this activity, for how many minutes or hours did you usually keep at it?	__:__ Hours and minutes
	2015 – 11.5	What other type of physical activity gave you the next most exercise during the past month?	____(Specify) No other activity
	2015 – 11.6	How many times per week or per month did you take part in this activity during the past month?	___Week ___ Month
	2015 – 11.7	And when you took part in this activity, for how many minutes or hours did you usually keep at it?	__:__ Hours and minutes
	2015 – 11.8	During the past month, how many times per week or per month did you do physical activities or exercises to STRENGTHEN your muscles? Do NOT count aerobic activities like walking, running, or bicycling. Count activities using your own body weight like yoga, sit-ups or push-ups and those using weight machines, free weights, or elastic bands.	___Week ___ Month Never
TOBACCO USE	2016 - 9.1	Have you smoked at least 100 cigarettes in your entire life? **5 packs = 100 cigarettes**	Yes/No
	2016 – 9.2	Do you now smoke cigarettes every day, some days, or not at all?	Every day Some days Not at all
	2016 – 9.3	During the past 12 months, have you stopped smoking for one day or longer because you were trying to quit smoking?	Yes/No
		How long has it been since you last smoked a cigarette, even one or two puffs?	1. Within the past month (less than 1 month ago) 2. Within the past

table continues

BEHAVIOR	YEAR AND SECTION	QUESTION	RESPONSE OPTIONS
			3 months (1 month but less than 3 months ago) 3. Within the past 6 months (3 months but less than 6 months ago) 4. Within the past year (6 months but less than 1 year ago) 5. Within the past 5 years (1 year but less than 5 years ago) 6. Within the past 10 years (5 years but less than 10 years ago) 7. 10 years or more 8. Never smoked regularly
	2016 – 9.4	Do you currently use chewing tobacco, snuff, or snus every day, some days, or not at all?	Everyday Some days Not at all
ALCOHOL CONSUMPTION	2016 – 11.1	During the past 30 days, how many days per week or per month did you have at least one drink of any alcoholic beverage such as beer, wine, a malt beverage or liquor?	___Days per week ___Days in past 30 days No drinks in past 30 days
	2016 – 11.2	One drink is equivalent to a 12-ounce beer, a 5-ounce glass of wine, or a drink with one shot of liquor. During the past 30 days, on the days when you drank, about how many drinks did you drink on the average? *NOTE: A 40-ounce beer would count as 3 drinks, or a cocktail drink with 2 shots would count as 2 drinks.*	___ Number of drinks
	2016 – 11.3	Considering all types of alcoholic beverages, how many times during	___Number of times None

table continues

BEHAVIOR	YEAR AND SECTION	QUESTION	RESPONSE OPTIONS
		the past 30 days did you have 4 or more drinks on an occasion?	
	2016 – 11.4	During the past 30 days, what is the largest number of drinks you had on any occasion?	___Number of drinks None

Appendix D: Permission to Use PTG Model and PTGI

Gmail by Google

Annissa Pellicano <annissa.pellicano@waldenu.edu>

Re: Permission request to use the Posttraumatic Growth Inventory
2 messages

Posttraumatic Growth <posttraumaticgrowth@uncc.edu> Wed, Aug 31, 2016 at 11:49 AM

Hello Ms. Pellicano,

You have our permission to reproduce each of the tables once in your dissertation, with complete and appropriate citations. The scales you requested are attached as well.

Thank you for your interest, and for taking the time to write to us!

Warm regards,

Posttraumatic Growth Research Center
UNC Charlotte
Department of Psychology
9201 University City Blvd
Charlotte, NC 28223-0001 USA
Lawrence G. Calhoun (lcalhnjr@uncc.edu)
Richard G. Tedeschi (rtedesch@uncc.edu)
Arnie Cann (acann@uncc.edu)
www.ptgi.uncc.edu
http://www.routledgementalhealth.com/books/details/9780415645300/.

PTGI and Other Scales for Distribution.doc
130K

Annissa Pellicano <annissa.pellicano@waldenu.edu> Thu, Sep 1, 2016 at 1:06 AM
To: Posttraumatic Growth <posttraumaticgrowth@uncc.edu>

Thank you very much. Your research and assistance is much appreciated.

Best Regards,

Annissa D. Pellicano

Appendix E: Participant Invitation

Research Volunteers Needed

You are invited to take part in an **ANONYMOUS** research study about personal growth and health behaviors after sexual trauma.

Eligibility Requirements:

- The researcher invites all women,
- age 18 or older,
- who have experienced sexual trauma (e.g. sexual assault, rape, sexual abuse, child sexual abuse),
- and who can read English.

Benefits of Being in the Study:
The results of this study may help women with histories of sexual trauma understand how their thoughts and health behaviors fit together. This information may provide motivation to start, or maintain, helpful health activities.

Procedures:
If you agree to be in this study, you will be asked to:

- Complete an **ANONYMOUS** secure online survey hosted through an online website called Survey Monkey, that will take roughly 25-30 minutes of your time.
- Answer **ANONYMOUS** questions about
  - Your trauma experience,
  - How you feel that areas in your life have changed because of your experience
  - Your health activities.

Voluntary Nature of the Study:
This study is unpaid and there will be no payment for participation.

For more information please click the link below:

Researcher Contact Information:
Annissa Pellicano
Doctoral Candidate, Walden University

Institutional Review Board approval
#10-30-17-0267996
or on Facebook at

Appendix F: Tobacco Use Categorization

Behavior categorization based on BRFSS smoking item responses:

1. Never smoked =
    - Smoked cigarettes = no
    - Current smoking = not at all
    - Stop smoking attempts = no
    - Last cigarette = never smoked regularly
    - Tobacco use change = I did not use tobacco before or after
2. Former smoker =
    - Smoked cigarettes = Yes
    - Current smoking = not at all
    - Last cigarette = anything other then " never smoked regularly"
    - Tobacco use change = I stopped using tobacco
3. Current smoker **with** attempts to quit =
    - Smoked cigarettes = yes
    - Current smoker = everyday or somedays
    - Stop smoking Attempts = yes
4. Current smoker **without** attempts to quit =
    - Smoked cigarettes = Yes
    - Current smoking = everyday or someday
    - Stop smoking attempts = No

Appendix G: Physical Activity Categorization

Behavior categorization based on BRFSS physical activity item responses:

1. No activities

2. Moderate activities:
    - Calisthenics
    - Golf
    - Hiking
    - Pilates
    - Walking
    - Weighting
    - Yoga
    - Other

3. Vigorous activities:
    - Bicycling
    - Boxing
    - Dancing
    - Mountain climbing
    - Rock climbing
    - Running
    - Team sports
    - Swimming
    - Water sports
    - Jogging
    - Rowing machine

Appendix H: Alcohol Use Categorization

Behavior categorization based on BRFSS alcohol use item responses:

1. Did not drink =
   Alcohol use in the last 30 days = 0

2. Occasional Drinker =
   Alcohol use in the last 30 days = less than 20 days **and/or**
   Four or more drinks in a single occasion = 0 or 1

3. Moderate Drinker =
   Alcohol use in the last 30 days = 27 to 30 days
   Four or more drinks in a single occasion = 0

4. Binge Drinker =
   Alcohol use in the last 30 days = anytime **and**
   Four or more drinks in a single occasion = >2 but <5 episodes

5. Heavy Drinker =
   Four or more drinks in a single occasion = Greater or equal to 5 episodes

Appendix I: List of Abbreviations

BRFSS – Behavioral Risk Factor Surveillance System

CE – Centrality of event

CES – Centrality of Event Scale

CSA – Childhood sexual abuse

DAST – Drug Abuse Screening Test

PTG – Posttraumatic growth

PTGI – Posttraumatic Growth Inventory

PTSD – Posttraumatic Stress Disorder

SA – Sexual assault

SE – Self-efficacy

NGSES – New General Self-Efficacy Scale