POSTTRAUMATIC GROWTH FOLLOWING CANCER: THE INFLUENCE OF
EMOTIONAL INTELLIGENCE, MANAGEMENT OF INTRUSIVE RUMINATION, AND
GOAL DISENGAGEMENT AS MEDIATED BY DELIBERATE RUMINATION

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KATIE A. RIDER MUNDEY

DISSERTATION ADVISOR: DR. DONALD R. NICHOLAS

BALL STATE UNIVERSITY

MUNCIE, INDIANA

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Posttraumatic Growth Following Cancer: The Influence of Emotional Intelligence, Management of Intrusive Rumination, and Goal Disengagement as Mediated by Deliberate Rumination

“Every adversity, every failure, every heartache carries with it the seed of a greater benefit.” – Napoleon Hill

As reported by the U.S. Department of Health and Human Services (2015), an estimated 1,658,370 new cases of cancer were diagnosed in the United States in the year 2015 alone. Further, nearly 40% of the United States population will receive a cancer diagnosis at some point during their lifetime (U.S. Department of Health and Human Services, 2015). As such, it is not surprising that interest in how individuals might procure benefit from the cancer experience has proliferated in recent years. In the field of psychology, this research has focused primarily on a specific form of adversity induced growth known as posttraumatic growth (PTG), a term that refers to “positive psychological change experienced as the result of the struggle with highly challenging life circumstances” (Tedeschi & Calhoun, 2004, p. 1). As it is most commonly understood, PTG involves positive change in three distinct domains—perception of self, relationships with others, and philosophy of life (Calhoun & Tedeschi, 2006).

Evidence suggests that PTG is in fact a distinct possibility for those forced to endure the harrowing, and potentially traumatic, ordeal that is cancer (Jansen, Hoffmeister, Change-Claude, Brenner, & Arndt, 2011; Kolokotroni, Anagnostopoulos, & Tsikkinis, 2014; Schroevers & Teo, 2008; Sim, Lee, Kim, & Kim, 2015). Moreover, researchers have determined that deliberate rumination, an adaptive cognitive activity involving purposeful reflection on and re-examination of a trauma, serves as one of the foremost precursors to PTG (Bosson, Kelley, & Jones, 2012; Cann et al., 2011; Hallam & Morris, 2014; Morris et al., 2014; Morris & Shakespeare-Finch, 2011; Stockton, Hunt, & Joseph, 2011; Taku, Calhoun, Cann, & Tedeschi, 2008; Taku, Cann,

Tedeschi, & Calhoun, 2015; Taku & Oshio, 2015; Triplett, Tedeschi, Cann, Calhoun, & Reeve, 2012; Zhang, Yan, Du, & Liu, 2013). In contrast to intrusive rumination—a maladaptive form of rumination characterized by automatic, unwanted thoughts that is generally discussed in relation to symptoms of posttraumatic stress disorder (PTSD)—deliberate rumination is active rather than passive and is undertaken intentionally for purposes of resolving the confusion incited by a trauma and deriving meaning from the trauma experience (Morris & Shakespeare-Finch, 2011; Su & Chen 2015). Across studies, deliberate rumination has been found to account for more variance in PTG than any other variable, particularly when measured two months or longer after the experience of the traumatic event, rather than in its immediate aftermath (Cann, Calhoun, Tedeschi, & Solomon, 2010; Taku, Cann, Tedeschi, & Calhoun, 2009). In fact, emergence of deliberate rumination as a leading predictor of PTG has proven so consistent, Taku et al. (2008) concluded that deliberate rumination plays an indispensable role in “laying the foundation for PTG” (p. 442).

Accordingly, logic would dictate that interventions designed to enhance cancer survivors’ chances of realizing PTG should be targeted at promoting deliberate rumination (Hallam & Morris, 2014). Indeed, a number of leading voices in the PTG field have highlighted deliberate rumination as the most worthwhile target for interventions aimed at fostering PTG (Hallam & Morris, 2014; Kolokotroni et al., 2014; Morris & Shakespeare-Finch, 2011; Taku et al., 2009; Zhang et al., 2013). Curiously, however, despite overt calls to investigate the factors that facilitate engagement in deliberate rumination (Kolokotroni et al., 2014; Taku et al., 2008; Taku et al., 2015), research on the topic is sparse at best, leaving clinicians who desire to enhance cancer survivors’ chances of realizing PTG by promoting engagement in deliberate rumination with little to guide their efforts. This study attempted to fill this gap in the literature and, in turn,

to procure information with potential for informing the development of potent PTG interventions for cancer survivors, by exploring the following three factors theoretically proposed to promote deliberate rumination in the PTG process: reduction of emotional distress, management of intrusive rumination, and goal disengagement (Calhoun & Tedeschi, 2006; Tedeschi & Calhoun, 2004). To provide context for how these three factors were selected as the most probable deliberate rumination precursors, I will now describe the basic tenets of the functional-descriptive model of PTG, the model undergirding the current study.

Theoretical Framework: The Functional-Descriptive Model

Perhaps the most well-known and comprehensive model of PTG, and the one that has been applied most frequently to the study of PTG among cancer survivors, is Tedeschi and Calhoun's (2004) functional-descriptive model. Based on the work of Janoff-Bulman (1992), who argued that meaning making following a traumatic experience depends largely on appraisal processes, the functional-descriptive model is a fundamentally cognitive model that regards PTG as the result of individuals' internal struggle with their new post-trauma reality (Tedeschi & Calhoun, 2004). In other words, from the perspective of the functional-descriptive model, PTG is not a certainty following the experience of a traumatic event such as cancer. Rather, PTG develops only when individuals are willing to wrestle significantly with the trauma on an internal level in its aftermath. More specifically, the model contends that PTG begins with the experience of a traumatic event so seismic that one's pre-trauma schema is shattered. That is, as a consequence of the trauma experience, individuals' prior goals and beliefs become extinct and their standard distress management strategies no longer work. Accordingly, cognitive processes become overwhelmed by ruminative activity as individuals strive to make sense of the trauma and manage their intense emotional reactions (Calhoun & Tedeschi, 2006). At this point, the

ruminative activity individuals experience is of the intrusive variety, meaning that it is automatic and disruptive and resembles the re-experiencing symptoms associated with PTSD.

Per the functional-descriptive model, some individuals stagnate at the stage of intrusive rumination, failing to gain any benefit from the trauma and, in certain cases, developing lasting PTSD symptomology (Tedeschi & Calhoun, 2004). Fortunately, others slowly transition from intrusive to deliberate rumination, such that their cognitive processing becomes more purposeful and less disruptive. It is then from this deliberate rumination, the model purports, that adaptive schema change and narrative development ensue, ultimately fomenting the emergence of PTG. Also incorporated into the model is social support, which Tedeschi and Calhoun (2004) postulated contributes to PTG by facilitating self-disclosure that aids in the crafting of narratives about the changes that have occurred. Further, the model recognizes that social support is useful in the PTG process in that other people offer fresh perspectives that can be integrated into schema change.

An additional facet of the functional-descriptive model that has been largely overlooked in both research and clinical domains concerns the critical intervening step between intrusive rumination and deliberate rumination (Calhoun & Tedeschi, 2006). In particular, the model proposes that the following three processes serve to shift intrusive rumination to deliberate rumination: reduction of emotional distress, management of intrusive rumination, and disengagement from goals. In regards to the first process, reduction of emotional distress, Tedeschi and Calhoun (2004) explained, “The person facing a major life crisis must find ways of managing initial distress, which can often be debilitating. This is necessary to allow some degree of constructive cognitive processing to occur, producing schema changes that will contribute to the experience of posttraumatic growth” (p. 8). That is, per the model, before individuals can

engage in the deliberate rumination upon which PTG depends, they must first succeed in reducing the emotional distress wrought by their trauma exposure. Otherwise, the emotional distress will almost inevitably impede the reflective, purposeful cognitive processing of which deliberate rumination is made (Morris & Shakespeare-Finch, 2011).

The second process—management of intrusive rumination—involves management of the automatic, disruptive cognitive processes that typically arise in the immediate aftermath of the experience of a traumatic event (Calhoun & Tedeschi, 2006). As noted previously, this form of rumination closely resembles the re-experiencing symptoms associated with PTSD (Su & Chen, 2015). Accordingly, intrusive rumination and deliberate rumination are best regarded as opposites, which implies they cannot occur simultaneously. Therefore, it follows that intrusive rumination must be largely resolved before deliberate rumination can proceed. Finally, the third process—goal disengagement—refers to relinquishment of any pre-trauma goals the trauma has made untenable (Tedeschi & Calhoun, 2004). As Tedeschi and Calhoun (2004) reasoned, this disengagement occurs as “it becomes clear [one’s] old way of living is no longer appropriate” (p. 8) in the radically changed circumstances beget by the trauma and proves profitable in that it enables individuals to make space for the new, more situationally compatible goals the deliberate rumination process will inevitably engender.

To summarize, the functional-descriptive model purports that PTG begins with the experience of a traumatic event sufficiently seismic that it operates to challenge one’s long-held assumptive world (Tedeschi & Calhoun, 2004). This, in turn, induces automatic rumination as individuals contend cognitively with the confusion incited by the challenge to their assumptive world. For those who succeed in realizing PTG, intrusive rumination eventually gives way to deliberate rumination through means of reduction of emotional distress, management of intrusive

rumination, and goal disengagement. Subsequently, as a consequence of the schema change and narrative development that deliberate rumination instigates, PTG materializes.

The functional-descriptive model has been the subject of extensive empirical investigation, such that many of the elements in the model have been shown empirically to be involved in the PTG process, including the seismicity of the traumatic event (Su & Chen, 2015), intrusive rumination (Stockton et al., 2011), deliberate rumination (Morris & Shakespeare-Finch, 2011), and social support (McDonough, Sabiston, & Wrosch, 2014). Moreover, research has demonstrated that, when compared to alternative PTG models (e.g., Schaefer and Moos's [1998] life crises model) in medical samples (e.g., caregivers of stroke survivors), the functional-descriptive model accounts for significantly more variance in PTG than do alternative models (Hallam & Morris, 2014). Consequently, confidence in the model as an explanatory framework for the PTG process as it unfolds among cancer survivors seems warranted. Accordingly, the functional-descriptive model was employed as the foundation of the current study. That is, the factors that were examined as potential precursors to the deliberate rumination upon which PTG depends are those highlighted by the model—namely, reduction of emotional distress, management of intrusive rumination, and goal disengagement (Tedeschi & Calhoun, 2004). To further set the stage for this examination, the extant literature concerning the relationships among the primary study variables will now be reviewed.

The Three Precursors to Deliberate Rumination

Reduction of Emotional Distress

The limited research that exists relevant to the first factor identified by the functional-descriptive model as a precursor to deliberate rumination—reduction of emotional distress—broadly surrounds a psychological construct referred to as emotional intelligence. Relatively new

to the psychology scene, emotional intelligence is most commonly defined as the ability to “perceive emotion, integrate emotion to facilitate thought, understand emotions, and regulate emotions to promote personal growth” (Salovey, Mayer, Caruso, & Lopes, 2003, p. 251). Thus, the construct’s title is somewhat misleading, for emotional intelligence is less an ingrained personality trait and more a learned ability (Mayer, Caruso, & Salovey, 1999). Indeed, several studies have demonstrated that emotional intelligence is amenable to enhancement via emotional intelligence training (Schutte, Malouff, & Thorsteinsson, 2013).

Reliance on emotional intelligence as a means of capturing the reduction of emotional distress facet of the functional-descriptive model is defensible on several counts. Perhaps most obviously, reduction of emotional distress constitutes one form of emotion regulation, which is a key element of the emotional intelligence construct (Salovey et al., 2003). Furthermore, as Salovey et al.’s (2003) definition indicates, emotional intelligence involves the integration of emotion to facilitate thought. Likewise, according to the functional-descriptive model, the chief function of the process of reduction of emotional distress is to facilitate deliberate rumination—a form of thought (Tedeschi & Calhoun, 2004). Accordingly, for purposes of the current study, emotional intelligence was regarded as a fundamental component of reduction of emotional distress. Therefore, it can be assumed that whenever the term emotional intelligence is used in the absence of mention of reduction of emotional distress, the term is being used to capture the reduction of emotional distress facet of the functional-descriptive model of PTG.

At present, only two studies aimed at distinguishing the role of emotional intelligence in PTG have been executed (Li, Cao, Cao, & Liu, 2015; Linley, Felus, Gillett, & Joseph, 2011). First, Linley et al. (2011) examined emotional intelligence as a moderator of the association between emotional expression and PTG among a sample of 148 British college students and

found that emotional intelligence acted as a moderator of emotional expression for male participants, but not for female participants. The authors postulated that because women generally report higher levels of emotional intelligence than men, it is possible the majority of the women in their study evidenced relatively high levels of emotional intelligence—hence the absence of a discernible moderation effect of emotional intelligence among the female participants.

Relatedly, Li et al. (2015) explored the association between emotional intelligence and PTG using correlational analyses. Data analyses revealed a curvilinear relationship between emotional intelligence and PTG. Specifically, participants with moderate levels of emotional intelligence demonstrated the greatest PTG, as compared to participants with low or high levels of emotional intelligence. Li et al. explained this somewhat curious finding by postulating that low levels of emotional intelligence impede PTG by way of inadequate emotion regulation skills, whereas high levels of emotional intelligence impede PTG by diminishing the extent to which traumatic events are experienced as distressing. In other words, highly emotionally intelligent individuals may be so emotionally adept that they suffer less from confronting traumas, which would imply they are less likely to experience PTG following trauma exposure. For as Li et al. explained, research has established that PTG “occurs only if the trauma has been sufficiently upsetting to drive the survivor to (positive) meaning-making of the negative event” (p. 330).

Taken together, these two studies suggest emotional intelligence may be involved in the PTG process (Li et al., 2015; Linley et al., 2011). Nevertheless, not only do the studies provide a less than coherent picture of the nature of this involvement, but, in contrast to the functional-descriptive model, they did not consider the relationship between emotional intelligence and PTG in the context of deliberate rumination. Moreover, both studies are characterized by a

number of concerning limitations—most notably cross-sectional research designs and small convenience samples composed of college students. Thus, the degree to which the findings can be extrapolated to the cancer survivor population is unclear.

Management of Intrusive Rumination

Research with relevance to management of intrusive rumination—the second process demarcated by the functional-descriptive model as a precursor to deliberate rumination—although by no means plentiful, is more widely available than that associated with the first process. Generally speaking, this research falls into two categories, that which has uncovered a positive association between intrusive rumination that occurs immediately after experience of a traumatic event and PTG, and that which has uncovered a negative association between intrusive rumination that persists beyond the immediate aftermath of a traumatic event and PTG. That is, it appears that the nature of the association between intrusive rumination and PTG depends on the timing of the rumination (Cann et al., 2010).

In regards to the first body of findings, several studies have determined that intrusive rumination, when measured in the immediate aftermath of a traumatic event, is positively predictive of later PTG (Cann et al., 2010; Hallam & Morris, 2014; Taku et al., 2009; Taku et al., 2015). Per Taku et al. (2009), such findings are consistent with the functional-descriptive model (Tedeschi & Calhoun, 2004). As they explained, “intrusive rumination in the aftermath of a traumatic event can be regarded as an indication that the event had a significant impact” (Taku et al., 2009, p. 130), which is a prerequisite for PTG according to the functional-descriptive model. The absence of intrusive rumination directly following a traumatic event, on the other hand, likely indicates that the event did not prove sufficiently disruptive to one’s pre-trauma schema to

incite the need to engage in the meaning-making and schema reshaping that constitute the core of the PTG process (Cann et al., 2010; Cann et al., 2011).

Conversely, researchers also have demonstrated that intrusive rumination that occurs some time (i.e., two months or longer) after experience of a traumatic event, as opposed to in the event's immediate aftermath, is negatively associated with PTG (Cann et al., 2010; Stockton et al., 2011; Zhang et al., 2013), as well as positively associated with distress (Cann et al., 2010; Cann et al., 2011; Kolokotroni et al., 2014; Taku et al., 2008; Triplett et al., 2012; Zhang et al., 2013). In other words, when intrusive rumination is still detectable long after the traumatic event has passed, lower levels of PTG and higher levels of distress can be expected. Again, this is congruent with the functional-descriptive model, which purports that the intrusive rumination that inevitably arises immediately following experience of a traumatic event must ultimately be managed so that the deliberate rumination from which PTG ensues can commence (Tedeschi & Calhoun, 2004). As such, it is now widely understood that enduring intrusive rumination is best regarded as evidence of a failure to “deal constructively with the challenges brought on by the traumatic experience” (Cann et al. 2010, p. 163) via deliberate rumination.

When regarded in tandem, these two bodies of literature indicate that management of intrusive rumination is an essential element in the PTG process. After all, if intrusive rumination immediately following experience of a traumatic event is positively associated with later PTG, while intrusive rumination that persists beyond the immediate aftermath of a traumatic event is negatively associated with PTG, this would imply that the largely unavoidable intrusive rumination that occurs immediately after a traumatic event must be managed if PTG is to be realized. This concept has not been directly examined, however, nor has it been explored in the context of deliberate rumination, which, per the functional-descriptive model, is the mechanism

that management of intrusive rumination immediately facilitates. Furthermore, the literature pertaining to the management of intrusive rumination-PTG association is not without limitation. For instance, the vast majority of the studies have been cross-sectional in nature, thereby precluding detection of potential causal relationships. Additionally, retrospective measurement of the intrusive rumination that occurs in the immediate aftermath of the traumatic event has been the norm, as has been reliance on convenience, rather than cancer survivor, samples. Lastly, the time frames used to delineate immediate and enduring intrusive rumination vary widely across studies, calling into question exactly how these two variations of intrusive rumination are best defined.

Goal Disengagement

As with emotional intelligence, research on goal disengagement—the third and final process recognized by the functional-descriptive model as a precursor to deliberate rumination—is notably limited (Tedeschi & Calhoun, 2004). In fact, my review of the relevant literature uncovered only three empirical studies with any degree of relevance to this process. First, in an effort to distinguish the extent to which goal change contributes to the onset of PTG, Ransom, Sheldon, and Jacobsen (2008) explored goal change among individuals with Stages 0-III breast or prostate cancer. Data analyses revealed that between the beginning and end of radiotherapy, participants “showed an actual shift toward a more intrinsic goal orientation” (Ransom et al., 2008, p. 815), as well as that change in goal orientation significantly predicted PTG. For instance, by the conclusion of treatment, participants’ endorsement of goals related to personal development, relationship building, and community enhancement increased, while their endorsement of goals related to wealth, popularity, and beauty decreased.

Correspondingly, both Tedeschi and Calhoun (1996) and Purc-Stephenson (2014) factor analyzed the Post Traumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996)—a theoretically grounded self-report instrument that is generally regarded as the gold standard of PTG assessment (Purc-Stephenson, 2014)—and uncovered five primary factors, one of which they titled New Possibilities. Review of the items that load on this factor reveal that the factor primarily taps the goal changes presumed to accompany PTG. Moreover, Purc-Stephenson (2014) determined that, of the five factors that comprise the PTGI, New Possibilities was the second most powerful.

Overall, Ransom et al.'s (2008), Tedeschi and Calhoun's (1996), and Purc-Stephenson's (2014) studies suggest that goal change is an element of PTG. Accordingly, given that goal disengagement is integral to goal change (Wrosch, Scheier, Miller, Schulz, & Carver, 2003), it seems reasonable to conclude that goal disengagement is likely involved in the PTG process as well. Nonetheless, as should be apparent, the role of goal disengagement in the PTG process has not been investigated directly, nor has it been investigated in the context of deliberate rumination, as the functional-descriptive model would suggest is appropriate. Furthermore, each of the three studies outlined above evidence substantial limitations, including use of small, non-diverse convenience samples, a disproportionate number of female participants, and, in the case of Ransom et al. (2008), failure to incorporate a non-cancer control group as part of the research design.

Summary of Precursors to Deliberate Rumination

In sum, limited research is available on the association between emotional intelligence, management of intrusive rumination, goal disengagement, and PTG and, generally speaking, this research indicates that all three variables are involved in the process of PTG (Li et al., 2015;

Linley et al., 2011; Purc-Stephenson, 2014; Ransom et al., 2008; Stockton et al., 2011; Tedeschi & Calhoun, 1996). Nevertheless, far more research is needed to explore the specific relationships among and processes of these variables. Not only is the minimal research that is available characterized by a range of limitations, but also—perhaps even more importantly—none of the proposed precursors have been studied in the context of deliberate rumination. In other words, although the functional-descriptive model presumes that emotional intelligence, management of intrusive rumination, and goal disengagement exert their influence on PTG through means of deliberate rumination (Tedeschi & Calhoun, 2004), this connection has been entirely overlooked thus far in the research arena. It was this oversight I set out to address in the current study.

The Current Study

The primary aim of the current study was to provide a greater depth of understanding of the PTG process as it transpires among cancer survivors by exploring the three factors distinguished by the functional-descriptive model as precursors to the deliberate rumination upon which PTG depends (Tedeschi & Calhoun, 2004). Following from the functional-descriptive model and the research outlined above, the following hypotheses were proposed:

1. Higher levels of deliberate rumination, emotional intelligence, management of intrusive rumination, and goal disengagement would be associated with higher levels of PTG among cancer survivors.
2. Higher levels of emotional intelligence, management of intrusive rumination, and goal disengagement would be associated with higher levels of deliberate rumination among cancer survivors.

3. Deliberate rumination would partially mediate the associations between emotional intelligence and PTG, management of intrusive rumination and PTG, and goal disengagement and PTG among cancer survivors.

To investigate these hypotheses, the models depicted in Figures 1 and 2 were tested.

Figure 1. The proposed unmediated model of associations between deliberate rumination and posttraumatic growth (PTG), emotional intelligence and PTG, management of intrusive rumination and PTG, and goal disengagement and PTG.

Figure 2. The proposed mediated model of associations between emotional intelligence and posttraumatic growth (PTG), management of intrusive rumination and PTG, and goal disengagement and PTG as partially mediated by deliberate rumination.

Method

Participants

Two-hundred and twenty-one cancer survivors—55 male (24.9%) and 165 female (74.7%)—were recruited through the Indiana University (IU) Health Ball Memorial Cancer Center cancer registry and the Internet. Kline (2016) suggested that a sample size of 10-20 participants per variable is required when using structural equation modeling techniques. Accordingly, given that the present study included five variables, a minimum of 100 participants was needed. Inclusion criteria were as follows: 1) received treatment for cancer of any type, 2) completion of all cancer treatment (except hormone treatments like tamoxifen or letrozole) a minimum of two months and a maximum of five years prior to study participation, and 3) 18 years of age or older. Although no consensus has been reached in regards to the amount of time required post-trauma for PTG to emerge, there is evidence to suggest a minimum of two months is necessary (Su & Chen, 2015). As such, this minimum time frame was selected in an effort to

ensure that participants had sufficient time to transition from the state of amplified emotional distress and disruptive cognitive processing typical in the immediate aftermath of a traumatic event like cancer to the state of purposeful, reflective meaning-making of which PTG is made. A maximum time frame, on the other hand, was selected to ensure that the cancer experience was salient enough for participants at time of study completion that the PTG process remained relevant. Five years was chosen as a time frame within which the salience of events should remain and as a timeframe consistent with the National Cancer Institute's (NCI; 2014) 5-year survival rates, used as a metric for predicting survival rates.

Age of participants ranged from 23 to 85 years, with a mean age of 56 ($SD = 13.78$). The preponderance of participants identified as Caucasian ($n = 203$; 91.9%), 5 identified as Hispanic/Latino/Latina (2.3%), 5 identified as "other" (2.3%), 3 identified as American Indian/Alaska Native (1.4%), and 2 identified as Asian and Black, respectively (0.9%). Most participants described their relationship status as married or a committed domestic partnership ($n = 158$; 71.5%), 26 noted that they were divorced (11.8%), 19 noted that they were widowed (8.6%), and 16 noted that they had never married (7.2%). The sample was well-educated, with 19.9% having completed a bachelor's degree ($n = 44$), 15.8% a master's degree ($n = 35$), 11.8% an associate's degree ($n = 26$), 3.6% a professional degree ($n = 8$), and 3.2% a doctorate degree ($n = 7$). Seventeen percent of the participants described their highest level of education as a high school diploma ($n = 38$) and 2.7% indicated that they did not graduate from high school ($n = 6$). Regarding employment status, close to half of the sample was employed for wages ($n = 96$; 43.4%) and nearly 30% was retired ($n = 64$). Additionally, 16 participants identified as a homemaker (7.2%), 13 were out of work (5.9%), and one identified as a student (0.5%). A summary of participant demographic information is presented in Table 1.

Approximately 45% of participants completed their cancer treatment between 2 months and 1 year prior to study participation ($n = 100$), with the remainder of participants completing their treatment between 2 and 5 years prior to participating in the study ($n = 121$). The most frequently occurring diagnoses were breast ($n = 48$; 21.7%), thyroid ($n = 31$; 14.0%), colon/rectum ($n = 21$; 9.5%), ovarian ($n = 21$; 9.5%), and prostate ($n = 17$; 7.7%). Stage I was the most common stage at time of diagnosis ($n = 64$; 29.0%), followed by Stage III ($n = 50$; 22.6%), Stage II ($n = 42$; 19.0%), and Stage IV ($n = 26$; 11.8%). Nearly 83% of participants had undergone surgery as part of the cancer treatment process ($n = 182$). Likewise, 53.4% reported undergoing chemotherapy ($n = 118$), 49.3% radiation ($n = 109$), and 19.5% hormone therapy ($n = 43$). At time of assessment, 163 participants considered themselves to be cancer-free (73.8%), 30 indicated they were in remission (13.6%), 12 were unsure of their current cancer status (5.4%), 11 were experiencing recurrence (5.0%), and 5 had metastatic disease (2.3%). A summary of participant disease demographic information is presented in Table 2.

Procedure

After gaining institutional review board (IRB) approval from both the Ball State University IRB and the IU Health Ball Memorial IRB, a list of the names and addresses of all cancer survivors listed in the IU Health Ball Memorial Cancer Center cancer registry who satisfied the study inclusion criteria was compiled by Cancer Center personnel via a computer-based search and reviewed by Cancer Center medical staff. Any survivors identified by medical staff as not in a position to participate were removed from the list and, thereby, excluded from the study. The revised list was then provided to the researcher and 400 individuals were randomly selected to receive a letter of invitation by way of the United States Postal Services (USPS). This letter included a brief description of the study, a URL for the website at which all

study questionnaires could be completed, and details of a random drawing for 10 \$25 Visa gift cards in which all who elected to participate could choose to be entered. Additionally, the letter contained instructions for obtaining a paper copy of the study questionnaires for those without Internet access or those who preferred to complete the questionnaires by hand. Forty-five individuals notified the researcher that they would like to participate by completing a paper copy. These individuals received a packet of materials in the mail that included an informed consent document, the study questionnaires presented in counterbalanced order, a debriefing statement, and a postage paid envelope for returning the completed questionnaires to the researcher. Twenty-eight completed packets were returned. All individuals who completed and returned paper copies of the questionnaires were entered into the gift card drawing.

Following the methodology set forth by Dillman, Smyth, and Christian (2014), three follow-up mailings were completed. The first, which Dillman et al. referred to as the “thank-you reminder” (p. 375), consisted of a brief letter thanking those who had already participated for their participation and encouraging those who had not yet done so to take part. This letter was sent approximately one week subsequent to dispatch of the letter of invitation. The second follow-up, the “follow-up reminder” (Dillman et al., 2014, p. 378), was mailed two weeks after the thank-you reminder. This mailing consisted of a letter reminding survivors of the purpose of the study and, once again, inviting their participation. Finally, two weeks after mailing of the follow-up reminder, a “final reminder” (Dillman et al., 2014, p. 379) letter was sent. This letter expressed gratitude to those who had participated and encouraged those who had not to participate at their earliest convenience. Also included in this letter was a URL that interested individuals could visit at a later date to learn about the study outcomes. Each mailing was sent to

all 400 randomly selected survivors on the revised list, and between 30 and 45 letters were returned to the researcher each time as undeliverable.

A second group of individuals was recruited through email and several social media platforms. Specifically, an email invitation that included a link to the study website was sent to all of the email addresses in the Delaware County American Society Association Relay for Life email database, and a call for participants that contained a link to the study website was posted on Facebook and Instagram. Regarding Facebook, the call was posted on the author's personal page on two occasions. Additionally, the phrase "cancer survivor" was entered into the Facebook search function to identify cancer survivor Facebook groups where the call for participants could be posted. Requests to join the first 20 groups returned by the search were then sent. Fifteen of the requests were granted and the call for participants was posted on the Facebook page of each of these groups on two occasions. Regarding Instagram, much like the methodology employed with Facebook, the call for participants was posted on the author's personal Instagram page twice. Those individuals who chose to participate in the study, either by clicking the link contained in the email or social media post or by typing the URL contained in the letter of invitation into their web browser, were redirected to a screen that contained a basic description of the study, as well as a list of the study inclusion criteria. Individuals were asked to indicate whether they satisfied the inclusion criteria by clicking either a "Yes" or a "No" button at the bottom of the page. Only those individuals who clicked the "Yes" button were given access to the study.

Once inside the study, participants were invited to read an informed consent statement and signal their consent by clicking an "I Agree" button. All who clicked the "I Agree" button were granted entrée to the survey measures. The measures were presented in a counterbalanced

order and participants were permitted to progress through the questionnaires at their own pace. Further, participants were permitted to close out of the survey and return later to complete their responses. Prior to submitting their responses, participants were given the option of reviewing and changing their answers. Upon submission of the questionnaires, a debriefing form appeared on the screen automatically. This form contained a URL that interested individuals could visit at a later date to learn about the study outcomes. Participants who wished to enter themselves into the gift card drawing were invited to record their email address in a box at the bottom of the debriefing screen. Five-hundred and seventeen individuals entered the study website, 257 indicated that they satisfied the study inclusion criteria and consented to participate (49.7%), and 194 provided complete responses (37.5%). Complete responses only were retained for analysis. The survey software tool Qualtrics was used to collect participant responses.

Once data collection was complete, 10 participants were randomly selected to receive a \$25 Visa gift card. Those whose names were selected were informed through means of a letter (if they completed paper copies of the questionnaires) or email (if they completed the questionnaires via Qualtrics). Winners were given the option of either picking up the gift card at the Cancer Center or having the gift card shipped directly to their home, and were asked to indicate their preferred method of obtainment by calling or emailing the researcher.

Instruments

Demographic and disease-related information. A range of demographic and disease-related information was collected. In regards to demographic information, participants were asked to provide their gender, age, educational level, marital status, and employment status. The cancer-related information that was sought included cancer type, stage of cancer at time of diagnosis, type(s) of cancer treatment received (i.e., chemotherapy, hormonal therapy,

radiotherapy, and/or surgery), amount of time elapsed since treatment conclusion, and understanding of current cancer status (i.e., in remission versus no evidence of disease).

Posttraumatic Growth (PTG). PTG was measured using the PTGI (Tedeschi & Calhoun, 1996)—a 21-item self-report measure designed to assess the extent to which individuals perceive they have grown positively as a consequence of the struggle with a traumatic experience. Each item represents a different potential area of growth and is rated on a 6-point Likert scale ranging from 0 (*I did not experience this change as a result of my crisis*) to 5 (*I experienced this change to a very great degree as a result of my crisis*). To achieve the total scale score (range 0-105), individual item responses are summed, with higher total scores indicative of a greater degree of perceived PTG. In addition to the total scale score, five subscale scores are generated: Relating to Others (e.g., “I have a greater sense of closeness with others”), New Possibilities (e.g., “I established a new path for my life”), Personal Strength (e.g., “I’ve discovered that I’m stronger than I thought I was”), Spiritual Change (e.g., “I have a better understanding of spiritual matters”), and Appreciation of Life (e.g., “I can better appreciate each day”). Although the subscales have been verified via confirmatory factor analyses (Taku, Cann, Calhoun, & Tedeschi, 2008; Tedeschi & Calhoun, 1996), several researchers have recently demonstrated that a factor structure consisting of a single higher-order factor fits the instrument equally as well as does the five-factor structure (Lee, Luxton, Reger, & Gahm, 2010; Linley, Andrews, & Joseph, 2007; Palmer, Graca, & Occhietti, 2012). As such, in the context of the current study PTG was assessed as a unitary construct, meaning that the total scale score only was used.

The full PTGI has been shown to have good internal consistency (Cronbach’s $\alpha = .90$) among both undergraduate students (Tedeschi & Calhoun, 1996) and cancer survivor (Brunet,

McDonough, Hadd, Crocker, & Sabiston, 2010) samples, as well as acceptable construct validity (Tedeschi & Calhoun, 1996). Two-month test-retest reliability is also acceptable ($r = .71$; Tedeschi & Calhoun, 1996). Polatinsky and Esprey (2000) determined that responses to the PTGI are not significantly correlated with responses to a measure of social desirability. In the present study, internal reliability for the total scale score of the PTGI was 0.946.

Deliberate rumination and management of intrusive rumination. Deliberate rumination and management of intrusive rumination was measured using the Event Related Rumination Inventory (ERRI; Cann et al., 2011). A 20-item self-report measure of the cognitive processing that occurs in the aftermath of the experience of a traumatic event, the ERRI is composed of two 10-item subscales—the Intrusive Rumination subscale and the Deliberate Rumination subscale. Items are rated on a 4-point Likert scale (0 = *not at all* to 3 = *often*) and responses to individual subscale items are summed to create two subscale scores ranging from 0 to 30. Higher scores on the subscales reflect greater reported rumination.

To measure deliberate rumination, in particular, the Deliberate Rumination subscale of the ERRI was used. This subscale assesses the extent to which trauma survivors have “intentionally reflected and thought about the [traumatic] event” (Triplett et al., 2012, p. 403) since its occurrence. Example Deliberate Rumination items include, “I forced myself to think about my feelings about my experience” and “I thought about whether I have learned anything as a result of my experience.” The original ERRI was designed to measure intrusive and deliberate rumination at two different time points (“during the weeks immediately after the event” and “in the last few weeks” at the time of survey completion). In the context of the current study, the second option only was employed when measuring deliberate rumination congruent with the evidence that suggests recent deliberate rumination—that is, that which has occurred in the last

few weeks immediately prior to survey completion—is the best predictor of PTG (Cann et al., 2010; Taku et al., 2009).

Conversely, management of intrusive rumination was measured using the Intrusive Rumination subscale of the ERRI (Cann et al., 2011). As Triplett et al. (2012) described, the 10 items of this subscale specifically assess the extent to which trauma survivors have had “thoughts about the [traumatic] event when they did not mean to or want to” (p. 403) since the event’s occurrence. Example Intrusive Rumination items include, “Thoughts about the event came to mind and I could not stop thinking about them” and “I could not keep images or thoughts about the event from entering my mind.” In the context of the current study, both time frame options provided by the ERRI were employed when measuring intrusive rumination. That is, participants were asked to respond to all 10 Intrusive Rumination items in two different time frames—“during the weeks immediately after the event” and “in the last few weeks” at time of survey completion (Cann et al., 2011). To capture management of intrusive rumination, a difference score was then obtained by subtracting recent Intrusive Rumination (i.e., “in the last few weeks”) total scores from immediate Intrusive Rumination (i.e., “during the weeks immediately after the event”) total scores, with larger positive differences indicative of greater management of intrusive rumination.

No prior studies have attempted to measure *management* of intrusive rumination. Therefore, the difference score approach was developed for purposes of this study to ensure that the construct was measured in a manner consistent with the functional-descriptive model of PTG. According to the model, intrusive rumination immediately following experience of a traumatic event is a necessary precursor to PTG (Tedeschi & Calhoun, 2004). It suggests that the traumatic event had a “significant impact” (Taku et al., 2009, p. 130), thus necessitating engagement in the

schema reshaping that lies at the core of the PTG process. Alternatively, absence of intrusive rumination in the immediate aftermath of a traumatic event suggests the event did not prove particularly traumatic, in which case PTG would not be expected (Tedeschi & Calhoun, 2004). Several researchers have uncovered support for these theoretical propositions, demonstrating that intrusive rumination, when measured in the immediate aftermath of a traumatic event, is positively predictive of later PTG (Cann et al., 2010; Hallam & Morris, 2014; Taku et al., 2009; Taku et al., 2015). Accordingly, in the context of the present study, measurement of recent intrusive rumination without consideration of the intrusive rumination participants did—or did not—experience immediately following receipt of their cancer diagnosis had the potential to engender misleading results. A low recent Intrusive Rumination subscale score could reflect successful management of intrusive rumination, but it could also indicate that intrusive rumination was never experienced in the first place. Following the functional-descriptive model, PTG is a distinct possibility in the first instance and highly unlikely in the second (Tedeschi & Calhoun, 2004). Therefore, to prevent misinterpretation of recent Intrusive Rumination subscale scores and ensure that *management* of intrusive rumination—as opposed to its simple presence or absence—was captured, intrusive rumination was measured in both time frames (i.e., immediate and recent) and difference scores were calculated.

Both the Intrusive and Deliberate Rumination subscales of the ERRI have been shown to have high internal consistency (Cronbach's α 's = .96 and .90, respectively), along with adequate construct validity (Cann et al., 2011). Additionally, the two-factor structure of the instrument has been substantiated via exploratory and confirmatory factor analyses (Cann et al., 2011). For the current study, internal consistency for the Deliberate Rumination subscale was 0.947, while

internal consistency for the Intrusive Rumination subscale was 0.972 and 0.970 at the first and second time points, respectively.

Emotional intelligence. Emotional intelligence was measured using the Emotional Intelligence Scale (EIS; Schutte et al., 1998). Based on the Salovey and Mayer (1989) model of emotional intelligence, the EIS is a 33-item self-report instrument designed to appraise the four major facets of emotional intelligence—emotional perception, emotional expression, and emotional management of self and others (Schutte et al., 1998). Sample items include, “Emotions are one of the things that make my life worth living” and “I easily recognize my emotions as I experience them.” Respondents indicate their degree of agreement with each item using a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). To score the instrument, individual item responses are summed to create a total score, with a potential range of 33 to 165. Higher total scores are presumed to reflect greater emotional intelligence.

Research suggests that the EIS is a psychometrically sound instrument (Schutte et al., 1998). Specifically, internal consistency is high (Cronbach’s α ’s = .87-.90) and two-week test-retest reliability is good ($r = .78$). Moreover, Schutte et al. (1998) demonstrated that the EIS possesses adequate predictive validity, as well as strong discriminant and convergent validity. In regards to convergent validity, Schutte et al. found that EIS scores were related to eight of nine measures of theoretically-related constructs, such as awareness of emotion, outlook on life, depressed mood, ability to regulate emotions, and impulsivity. In the present study, internal consistency for the EIS was 0.887.

Goal disengagement. Goal disengagement was measured using the Goal Disengagement subscale of the Goal Adjustment Scale (GAS; Wrosch et al., 2003). Originally developed to examine the contribution of goal adjustment to the process of self-regulation, the GAS includes

10 items, four of which comprise the Goal Disengagement subscale and six of which comprise the Goal Reengagement subscale. Items are rated on a 5-point Likert scale (1 = *almost never true* to 5 = *almost always true*) and responses to individual subscale items are summed to create two subscale scores—the Goal Disengagement subscale score (range 4-20) and the Goal Reengagement subscale score (range 6-30). Higher subscale scores are presumed to reflect more of the associated variety of goal adjustment. According to Neter, Litvak, and Miller (2009), the distinct function of the Goal Disengagement subscale is to assess the ease with which individuals are “able to reduce effort and relinquish commitment towards unattainable goals” (p. 178). Sample Goal Disengagement items include, “It’s easy for me to reduce my effort toward the goal” and “It’s easy for me to stop thinking about the goal and let it go.”

The GAS has been applied to general (Wrosch et al., 2003) as well as cancer survivor (Castonguay, Wrosch, & Sabiston, 2014; Schroevers, Kraaij, & Garnefski, 2011; Zhu et al., 2015) samples and has been shown to have good internal consistency (Cronbach’s α ’s = .81-.87) in both instances. Moreover, Schroevers et al. (2011) demonstrated that the construct validity of the instrument is adequate. Although responses to the Goal Disengagement subscale items only were analyzed, the entire GAS was given to ensure preservation of the instrument’s psychometric properties. In the present study, internal consistency for the Goal Disengagement subscale was 0.724.

Data Analyses

Preliminary analyses. After 63 cases were removed due to missing data, preliminary analyses were conducted on the remaining 221 cases. Specifically, scale means, standard deviations, reliability, and intercorrelations were calculated using the Statistical Package for the Social Sciences (SPSS, version 24.0). Next, the extent to which the obtained data met the

statistical assumptions associated with proper application of path analysis was checked to ensure appropriate application of the technique (Streiner, 2005). The first assumption, which states that the relationships among the variables included in the model must be linear, was assessed via visual inspection of scatterplots depicting the relationship between each pair of study variables. Second, the assumption which states that there should be a lack of multicollinearity among the variables was appraised by examining the correlations among model variables. This assumption was assumed to have been met so long as the correlation between any two model variables presumed to measure different constructs did not exceed $r = .85$. Satisfaction of this assumption is critical because when multicollinearity between two variables included in a model is present, it suggests one of the variables is redundant and, therefore, extraneous. Third, the skewness and kurtosis coefficients of all endogenous variables were inspected to ensure that they fell between the standard cutoffs of -1 and 1. Finally, the assumption that states that covariances among disturbance terms should ideally be zero was assessed via visual inspection of a residuals plot and examination of the Durbin-Watson statistic. Consistent with standard practice, a Durbin-Watson value nearing two was regarded as evidence of a lack of correlation among residuals (Durbin & Watson, 1951).

Path analysis. Once it was determined that the assumptions associated with path analysis were sufficiently satisfied, all three aforementioned hypotheses were tested using path analytic procedures via Analysis of Moment Structures (AMOS, version 24.0) software. Put simply, path analysis is a somewhat less complex variant of SEM—a sophisticated statistical technique employed to determine the extent to which observed data fit a proposed model (Kline, 2016). Generally, SEM is preferred over path analysis because it makes use of multiple indicators and, therefore, is less susceptible to measurement error. However, in the case of the present study,

multiple indicators were not available for several of the key study variables (e.g., deliberate rumination, management of intrusive rumination, and goal disengagement). Furthermore, SEM is a large sample technique, meaning that a sizable number of participants (i.e., a minimum of 200) is required in order for the technique to prove viable, which was of concern for this study given the challenge of securing participants who satisfied the precise inclusion criteria. As such, path analysis was selected as the most practicable means of assessing the above-outlined hypotheses.

Accordingly, the models depicted in Figures 1 and 2 (presented above) were estimated using Maximum Likelihood Estimation (MLE). MLE was selected as the estimation method of choice as it is a widely employed and respected, efficient, and unbiased method of model estimation (Mueller, 1997). Additionally, MLE assumes multivariate normality in the sample for purposes of maximizing the likelihood that the observed data is drawn from the population (Kline, 2016). The first model, which is unmediated, includes four exogenous variables—deliberate rumination, emotional intelligence, management of intrusive rumination, and goal disengagement—and one endogenous variable—PTG. The second model, which is partially mediated, includes three exogenous variables—emotional intelligence, management of intrusive rumination, and goal disengagement—and two endogenous variables—deliberate rumination and PTG. The second model is partially, rather than fully mediated, because emotional intelligence, management of intrusive rumination, and goal disengagement are portrayed as influencing PTG directly and through the mechanism of deliberate rumination.

To test this study's three hypotheses, the directionality and significance of each parameter included in the proposed models was examined. More specifically, standardized parameter values (i.e., beta weights) as well as p-values were inspected for all direct and indirect effects (Kline, 2016). Likewise, the overall fit of the proposed models with the obtained data was

assessed using four fit indices—chi-square (χ^2), the comparative fit index (CFI; Bentler, 1990), the Tucker-Lewis index (Tucker & Lewis, 1973), and the root mean square error of approximation (RMSEA; Steiger, 1990). When interpreting these fit indices, the criteria for good fit proposed by Kline (2016) was used. That is, good fit was defined as a non-significant χ^2 value, CFI and TLI values closer to 1.0 and greater than .90, and a RMSEA value closer to .05 and less than .10.

Finally, the fit of the two models was compared by comparing the χ^2 , RMSEA, CFI, and SRMR values of the unmediated model to the χ^2 , RMSEA, CFI, and SRMR values of the partially mediated model. Correspondingly, the Akaike information criterion (AIC) index was used to compare the models. Because the AIC is a measure of relative quality, it provides no information concerning overall model quality (Akaike, 1974). It is, however, useful for model comparison as it distinguishes the amount of variance in a model that is not accounted for by the model paths. As such, lower AIC values signify better fit.

Results

Preliminary Analyses

Descriptive statistics. To acquire a general understanding of the data and the relationships among constructs, preliminary analyses were conducted to determine scale means, standard deviations, and reliability. These results are reported in Table 3. Additionally, intercorrelations among the study variables were calculated and are presented in Table 4. As expected, higher levels of deliberate rumination ($r = .485, p = .000$) and emotional intelligence ($r = .431, p = .000$) were significantly associated with higher levels of PTG as measured by the PTGI. Contrary to expectations, neither management of intrusive rumination ($r = .004, p = .951$) nor goal disengagement ($r = -.013, p = .854$) were significantly associated with PTG. Also in contrast to expectations, management of intrusive rumination was significantly negatively

correlated with deliberate rumination ($r = -.149, p = .031$), suggesting that the lower participants' levels of management of intrusive rumination, the higher their levels of deliberate rumination. Likewise, contrary to predictions, the associations between emotional intelligence and deliberate rumination ($r = .112, p = .122$) and between goal disengagement and deliberate rumination ($r = -.067, p = .328$) were not significant.

Path analysis assumptions. As outlined above, proper application of path analysis rests on four assumptions. Accordingly, data in the current study were checked for satisfaction of these assumptions prior to execution of the path analysis. Visual inspection of the scatterplots depicting the relationships between each of the study variables revealed that these relationships were sufficiently linear. Relatedly, multicollinearity, which occurs when variables fail to differentiate from one another, such that they correlate so highly they appear to measure the same construct, was found to be rightly absent (Kline, 2016). Review of the correlations among the variables included in the present study revealed that all fell well below the $r = .85$ threshold (see Table 4). Further, the skewness and kurtosis values of all endogenous variables were found to fall appropriately between the standard cutoffs of -1 and 1 (see Table 5). Lastly, visual inspection of a residuals plot suggested a lack of correlation among residuals, as did obtainment of a Durbin-Watson value close to 2 (Durbin-Watson = 2.017). Thus, the data in the current study met the assumptions of path analysis.

Model Estimation

Estimating models via path analysis involves identifying model fit, interpreting the parameter estimates, and considering alternative models (Kline, 2016). The value of a model's unknown parameters, as well as the error associated with the estimated values, are derived from model estimation (Weston & Gore, 2006). In the present study, MLE was selected to estimate

both the unmediated and partially mediated models given its status as one of the most impartial, reliable, and well-defined methods of model estimation (Mueller, 1997). The overall fit of both models with the obtained data was evaluated via four fit indices—the χ^2 , CFI, TLI, and RMSEA. As explained by Kline (2016), the χ^2 statistic tests the null hypothesis that the covariance matrix estimated by the model is identical to the population covariance matrix. Accordingly, with this statistic, a value of less than 30 with a non-significant p value is indicative of good fit.

Alternatively, the CFI and TLI are comparative fit indices, meaning that they compare the fit of the proposed model with that of a baseline, or null, model. With these indices, values between .90 and .95 indicate acceptable model fit, whereas values .95 and above indicate good model fit (Bollen & Long, 1993). Finally, the RMSEA is a parsimony-adjusted fit index that operates as a “badness of fit” assessment (Kline, 2016). With this index, values .5 or below suggest good model fit and values .10 or higher suggest poor model fit (Bollen & Long, 1993). Model fit indices for the unmediated and partially mediated models are presented in Table 6.

Correspondingly, unstandardized and standardized parameter estimates for the unmediated model and the partially mediated model are presented in Tables 7 and 8, respectively. Degrees of freedom for both models exceeded zero, indicating that the models were overidentified and, therefore, interpretable (Streiner, 2005).

Unmediated model results. The unmediated model (see Figure 3) resulted in a $\chi^2(6, N = 221) = 14.572, p = .024$, indicating poor model fit. The TLI (TLI = .767) also suggested poor model fit, while the CFI (CFI = .907) indicated acceptable model fit and the RMSEA (RMSEA = .081) indicated fair model fit. Thus, in sum, the observed fit indices showed the model to be poor fitting. Analysis of the individual model paths revealed two significant direct effects (see Table 7). That is, consistent with expectations, both deliberate rumination ($\beta = .482, b = 1.223, SE =$

.141, $p < 0.001$) and emotional intelligence ($\beta = .368$, $b = .679$, $SE = .106$, $p < 0.001$) significantly and positively influenced PTG. However, in contrast to expectations, neither management of intrusive rumination ($\beta = .059$, $b = .273$, $SE = .262$, $p = .297$) nor goal disengagement ($\beta = .033$, $b = .291$, $SE = .487$, $p = .550$) were significantly associated with PTG. Together, the four exogenous variables accounted for 37% of the variance in PTG within the model ($R^2 = 0.370$).

Partially mediated model results. The partially mediated model (see Figure 4) resulted in a $\chi^2(6, N = 221) = .454$, $p = .929$, indicating good model fit. The CFI, TLI, and RMSEA values suggested good model fit also (CFI = 1.000, TLI = 1.138, RMSEA = .000). Analysis of the individual model paths revealed four significant direct effects (see Table 8). Similar to the unmediated model, and consistent with expectations, both deliberate rumination ($\beta = .468$, $b = 1.201$, $SE = .147$, $p < 0.001$) and emotional intelligence ($\beta = .364$, $b = .679$, $SE = .107$, $p < 0.001$) significantly and positively influenced PTG. Further, management of intrusive rumination ($\beta = -.157$, $b = -.287$, $SE = .122$, $p < 0.05$) and goal disengagement ($\beta = -.177$, $b = -.610$, $SE = .277$, $p < 0.01$) significantly and negatively influenced deliberate rumination. This finding was partially congruent with expectations; although it was hypothesized that both management of intrusive rumination and goal disengagement would be significantly associated with PTG, the direction of the associations was expected to be positive.

Contrary to expectations, neither management of intrusive rumination ($\beta = .058$, $b = .273$, $SE = .265$, $p = .303$) nor goal disengagement ($\beta = .035$, $b = .314$, $SE = .495$, $p = .527$) were significantly associated with PTG. Relatedly, the association between emotional intelligence and deliberate rumination ($\beta = .127$, $b = .092$, $SE = .050$, $p = .068$) was not significant. Together, emotional intelligence, management of intrusive rumination, goal disengagement, and deliberate

rumination accounted for 38% of the variance in PTG within this model ($R^2 = 0.370$), whereas emotional intelligence, management of intrusive rumination, and goal disengagement accounted for 7% of the variance in deliberate rumination ($R^2 = 0.07$).

As Kline (2016) explained, “mediation refers to a causal pathway through which effects are conducted from a source through a conduit—the mediator—to the final outcome” (p. 134). To establish mediation, Baron and Kenny (1986) set forth four criteria: 1) The independent variable must be significantly related to the mediating variable. 2) The mediating variable must be significantly related to the dependent variable. 3) The independent variable must be significantly related to the dependent variable. 4) When the mediator is introduced, the significance of the relationship between the independent variable and the dependent variable is either greatly reduced (i.e., partial mediation) or rendered insignificant (i.e., full mediation). The fourth criterion is relevant only in instances in which the first three criteria are met, and all four criteria must be satisfied for mediation to be established.

In the case of the current study, application of these criteria suggests the absence of mediating effects. Regarding deliberate rumination as a mediator of the relationship between emotional intelligence and PTG, the first criterion was not satisfied (i.e., the relationship between emotional intelligence and deliberate rumination was not significant, $\beta = .127$, $b = .092$, $SE = .050$, $p = .068$). Similarly, regarding deliberate rumination as a mediator of the relationship between management of intrusive rumination and PTG, as well as deliberate rumination as a mediator of the relationship between goal disengagement and PTG, the third criterion was not satisfied (i.e., neither the relationship between management of intrusive rumination and PTG, $\beta = .058$, $b = .273$, $SE = .265$, $p = .303$, nor the relationship between goal disengagement and PTG, $\beta = .035$, $b = .314$, $SE = .495$, $p = .527$, were significant). Therefore, in contrast to expectations,

deliberate rumination did not partially mediate the associations between emotional intelligence and PTG, management of intrusive rumination and PTG, and goal disengagement and PTG.

Indirect effects, which involve the effect of the independent variable on the dependent variable through the mediating variable, serve as additional evidence of mediation in instances in which Baron and Kenny's (1986) first three criteria are satisfied (Kline, 2016). Accordingly, given that Baron and Kenny's criteria were not met for any of the potential mediating relationships in the current study, they are of little utility here. Nevertheless, for purposes of reference, the indirect effects of the partially mediated model are summarized in Table 9.

Model Comparison

The final step in the data analysis process involved directly comparing the fit of the unmediated model against the fit of the partially mediated model. As noted previously, this was accomplished through comparison of the fit indices associated with each model, as well as assessment of the models' AIC values. In regard to fit indices (see Table 6)—namely, the χ^2 , CFI, TLI, and RMSEA—the values associated with the partially mediated model were superior in every instance. Likewise, the partially mediated model's AIC value was considerably lower (AIC = 34.454) than was the AIC value achieved by the unmediated model (AIC = 41.572), implying that the partially mediated model is the better fitting of the two models. As such, it appears that the partially mediated model showed better model fit as compared to the unmediated model.

Table 1: *Demographics*

Characteristics	<i>n</i>	(%)
Gender		
Female	165	(74.7)
Male	55	(24.9)
Race Ethnicity		
Caucasian	203	(91.9)
Hispanic/Latino/Latina	5	(2.3)
Other	5	(2.3)
American Indian	3	(1.4)
Asian	2	(0.9)
Black/African American	2	(0.9)
Education Level		
Bachelor's Degree	44	(19.9)
High School Graduate	38	(17.2)
Master's Degree	35	(15.8)
Associate's Degree	26	(11.8)
Trade/Technical School	15	(6.8)
Professional Degree	8	(3.6)
Doctorate Degree	7	(3.2)
Some High School	6	(2.7)
Marital Status		
Married/Partnered	158	(71.5)
Divorced``	26	(11.8)
Widowed	19	(8.6)
Never Married	16	(7.2)
Employment Status		
Employed for Wages	96	(43.4)
Retired	64	(29.0)
Unable to Work	27	(12.2)
Homemaker	16	(7.2)
Out of Work, Not Looking	8	(3.6)
Out of Work, Looking	5	(2.3)
Student	1	(0.5)

Table 2: *Cancer Demographics*

Characteristics	<i>n</i>	(%)
Cancer Type		
Breast	48	(21.7)
Thyroid	31	(14.0)
Colon/Rectum	21	(9.5)
Ovarian	21	(9.5)
Prostate	17	(7.7)
Other	15	(6.8)
Oral Cavity	13	(5.9)
Kidney	12	(5.4)
Bladder	11	(5.0)
Skin	6	(2.7)
Lymphoma	5	(3.6)
Endometrial	5	(2.3)
Leukemia	5	(2.3)
Lung	5	(2.3)
Retinoblastoma	5	(2.3)
Cervical	3	(1.4)
Laryngeal	3	(1.4)
Non-Hodgkin Lymphoma	3	(1.4)
Salivary Gland	3	(1.4)
Small Intestine	3	(1.4)
Brain	2	(0.9)
Hodgkin Disease	2	(0.9)
Uterine Sarcoma	2	(0.9)
Adrenal	1	(0.5)
Anal	1	(0.5)
Bile Duct	1	(0.5)
Bone	1	(0.5)
Liver	1	(0.5)
Malignant Mesothelioma	1	(0.5)
Pancreatic	1	(0.5)
Sarcoma	1	(0.5)
Testicular	1	(0.5)
Vaginal	1	(0.5)
Stage at Diagnosis		
Stage I	64	(29.0)
Stage III	50	(22.6)
Stage II	42	(19.0)
Stage IV	26	(11.8)
Unknown	24	(10.9)

Don't Remember	13	(5.9)
Stage V	2	(0.9)
Treatment Type		
Surgery	182	(82.4)
Chemotherapy	118	(53.4)
Radiation	109	(49.3)
Hormone Therapy	43	(19.5)
Other	29	(13.1)
None	2	(0.9)
Current Cancer Status		
Cancer-free	163	(73.8)
In Remission	30	(13.6)
Don't Know	12	(5.4)
Recurrence	11	(5.0)
Metastatic Disease	5	(2.3)
Time Since Treatment Completion		
2 Months – 1 Year	51	(23.1)
1 Year	49	(22.2)
2 Years	39	(17.6)
3 Years	38	(17.2)
5 Years	26	(11.8)
4 Years	18	(8.1)

Table 3: Scale Means, Standard Deviations, Ranges, and Cronbach's Reliability Coefficients

	Mean	Standard Deviation	Scale Score Range	Reliability Coefficient	% Cases (N=221)
PTGI	71.90	24.41	7-126	.946	100% (N=221)
DR	26.47	9.59	0-40	.948	100% (N=221)
IR1	27.52	9.84	0-40	.972	100% (N=221)
IR2	22.42	9.24	0-36	.970	100% (N=221)
IRM	5.06	5.25	-6-23	-	100% (N=221)
EIS	120.85	12.51	76- 159	.887	100% (N=221)
GD	11.35	2.79	5-20	.724	100% (N=221)

Note. PTGI=Posttraumatic Growth Inventory; DR=deliberate rumination subscale of the Event Related Rumination Inventory; IR1=intrusive rumination subscale of the Event Related Rumination Inventory time frame 1; IR2=intrusive rumination subscale of the Event Related Rumination Inventory time frame 2; IRM=intrusive rumination difference score (i.e., management of intrusive rumination); EIS=Emotional Intelligence Scale; GD=goal disengagement subscale of the Goal Adjustment Scale.

Table 4: *Intercorrelations Among Study Variables*

Variable	1	2	3	4	5
1. PTGI	1				
2. DR	.485**	1			
3. IRM	.004	-.149*	1		
4. EIS	.431**	.112	.020	1	
5. GD	-.013	-.067	.020	-.127	1

Note. PTGI=Posttraumatic Growth Inventory; DR=deliberate rumination subscale of the Event Related Rumination Inventory; IRM=intrusive rumination difference score (i.e., management of intrusive rumination); EIS=Emotional Intelligence Scale; GD=goal disengagement subscale of the Goal Adjustment Scale.

* $p < .05$ ** $p < .01$

Table 5: *Skewness & Kurtosis of Endogenous Variables*

Endogenous Variable	Skewness	Kurtosis
PTGI	-.059	.329
DR	-.794	.329

Note. PTGI=Posttraumatic Growth Inventory; DR=deliberate rumination subscale of the Event Related Rumination Inventory.

Table 6: *Model Fit Index Summary*

Model	χ^2	DF	CFI	TLI	RMSEA	90% CI for RMSEA
Unmediated	14.572	6	.907	.767	.081	.027-.135
Partially Mediated	.454	3	1.000	1.138	.000	.000-.034

Note. χ^2 = Chi-Square Test; DF = Degrees of Freedom; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; RMSEA = Root Mean Square Error of Approximation; CI for RMSEA = Confidence Interval for Root Mean Square Error of Approximation.

Table 7: *Unmediated Model Maximum Likelihood Estimates: Unstandardized and Standardized Parameter Estimates or Regression Weights, Standard Error, Critical Ratio, Significance Level*

Variables (Regression Weights)	Unstandardized Estimate	S.E.	C.R.	Standardized Estimate
PTGI $\leftarrow$ DR	1.223	.141	8.658	.482***
PTGI $\leftarrow$ EIS	.679	.106	6.419	.368***
PTGI $\leftarrow$ IRM	.273	.262	1.043	.059
PTGI $\leftarrow$ GD	.291	.487	.598	.033

Note. S.E. = Approximate Standard Error; C.R. = Critical Ratio; PTGI=Posttraumatic Growth Inventory; DR=deliberate rumination subscale of the Event Related Rumination Inventory; EIS=Emotional Intelligence Scale; IRM=intrusive rumination difference score (i.e., management of intrusive rumination); GD=goal disengagement subscale of the Goal Adjustment Scale.

*** $p < .001$

Table 8: *Partially Mediated Model Maximum Likelihood Estimates: Unstandardized and Standardized Parameter Estimates or Regression Weights, Standard Error, Critical Ratio, Significance Level*

Variables (Regression Weights)	Unstandardized Estimate	S.E.	C.R.	Standardized Estimate
DR $\leftarrow$ EIS	.092	.050	1.827	.127
DR $\leftarrow$ IRM	-.287	.122	-2.359	-.157*
DR $\leftarrow$ GD	-.610	.227	-2.685	-.177**
PTGI $\leftarrow$ EIS	.679	.107	6.363	.364***
PTGI $\leftarrow$ IRM	.273	.265	1.030	.058
PTGI $\leftarrow$ GD	.314	.495	.633	.035
PTGI $\leftarrow$ DR	1.201	.147	8.170	.468***

Note S.E. = Approximate Standard Error; C.R. = Critical Ratio; PTGI=Posttraumatic Growth Inventory; DR=deliberate rumination subscale of the Event Related Rumination Inventory; EIS=Emotional Intelligence Scale; IRM=intrusive rumination difference score (i.e., management of intrusive rumination); GD=goal disengagement subscale of the Goal Adjustment Scale.

* $p < .05$ ** $p < .01$ *** $p < .001$

Table 9: *Partially Mediated Model Maximum Likelihood Estimates of Indirect Effects: Standardized Parameter Estimates or Regression Weights, Standard Error, Bootstrapped 95% Confidence Intervals*

Standardized Indirect Effects DV $\leftarrow$ M $\leftarrow$ IV	Estimate	S.E.	LLCI	ULCI
PTGI $\leftarrow$ DR $\leftarrow$ EIS	.102	.062	-.015	.233
PTGI $\leftarrow$ DR $\leftarrow$ IRM	-.279	.178	-.649	.061
PTGI $\leftarrow$ DR $\leftarrow$ GD	.834*	.328	-1.537	-.233

Note. S.E. = Approximate Standard Error; LLCI = bootstrapped lower level confidence interval; ULCI = bootstrapped upper level confidence interval; PTGI=Posttraumatic Growth Inventory; DR=deliberate rumination subscale of the Event Related Rumination Inventory; EIS=Emotional Intelligence Scale; IRM=intrusive rumination difference score (i.e., management of intrusive rumination); GD=goal disengagement subscale of the Goal Adjustment Scale.

* $p < .05$

Figure 3. Statistical diagram of the unmediated path model for the proposed influence of emotional intelligence, management of intrusive rumination, and goal disengagement on PTG. Path values represent standardized regression coefficients.

*** $p < .001$

Figure 4. Statistical diagram of the partially mediated path model for the proposed influence of deliberate rumination on the relationships between emotional intelligence and PTG, management of intrusive rumination and PTG, and goal disengagement and PTG. Path values represent standardized regression coefficients.

* $p < .05$ ** $p < .01$ *** $p < .001$

Discussion

Review of Study Purpose

The primary aim of the present study was to acquire a more nuanced understanding of the PTG process as it transpires among cancer survivors via exploration of three potential factors that facilitate the deliberate rumination upon which PTG depends. The hope was that delineation of these factors would prove instructive for the development of interventions designed to promote cancer survivors' realization of PTG through means of engagement in deliberate rumination. Guided by the functional-descriptive model of PTG, three specific facilitating factors were explored—emotional intelligence, management of intrusive rumination, and goal disengagement (Tedeschi & Calhoun, 2004). This exploration was accomplished by testing two models, an unmediated model and a partially mediated model, in a normative sample of cancer survivors recruited through the mail and online. Specifically, the models examined deliberate rumination as a partial mediator of the relationships between emotional intelligence and PTG, management of intrusive rumination and PTG, and goal disengagement and PTG. Following from the theoretical framework afforded by the functional-descriptive model and the existing literature base, it was hypothesized that deliberate rumination would partially mediate the associations between the three exogenous variables (i.e., emotional intelligence, management of intrusive rumination, and goal disengagement) and PTG. Further, it was hypothesized that higher levels of the exogenous variables would be associated with higher levels of both deliberate rumination and PTG, as well as that higher levels of deliberate rumination would be associated with higher levels of PTG.

Major Findings

Hypothesis #1. The first hypothesis, which stated that deliberate rumination, emotional intelligence, management of intrusive rumination, and goal disengagement would be associated with higher levels of PTG was partially supported by the data. As expected, higher levels of deliberate rumination were significantly associated with higher levels of PTG among the cancer survivor sample. This finding supports the results of numerous previous studies, all of which have distinguished deliberate rumination as the foremost precursor to PTG (Bosson et al., 2012; Cann et al., 2011; Hallam & Morris, 2014; Morris et al., 2014; Morris & Shakespeare-Finch, 2011; Stockton et al., 2011; Taku et al., 2008; Taku et al., 2015; Taku & Oshio, 2015; Triplett et al., 2012; Zhang et al., 2013). Accordingly, the results of the current study lend additional weight to Taku et al.'s (2008) bold proclamation that deliberate rumination plays an indispensable role in “laying the foundation for PTG” (p. 442), and further highlight the importance of centering PTG interventions for cancer survivors around the facilitation of deliberate rumination.

Also in accord with expectations, higher levels of emotional intelligence were significantly associated with higher levels of PTG. This finding is particularly consequential, as it serves to clarify the role that emotional intelligence plays in the PTG process. As noted previously, research findings pertaining to the association between emotional intelligence and PTG have been mixed, with some researchers reporting a curvilinear relationship and others identifying emotional intelligence as a moderator of the relationship between emotional expression and PTG (Li et al., 2015; Linley et al., 2011). The present study, however, suggests that—at least among the cancer survivor population—emotional intelligence exerts a direct positive influence on PTG, which implies that incorporation of emotional intelligence training into PTG interventions for cancer survivors warrants further study. Likewise, discovery of a significant direct effect of emotional intelligence on PTG not only provides support for use of the

construct to capture the reduction of emotional distress facet of the functional-descriptive model, but also indicates that formal integration of the construct into the model would likely prove constructive.

In contrast to expectations, theory, and previous research, neither management of intrusive rumination nor goal disengagement were found to be significantly associated with PTG. Regarding the association between intrusive rumination and PTG, the present study was the first to directly explore *management* of intrusive rumination in the context of PTG, as opposed to its mere presence or absence. That is, previous research has found that high levels of intrusive rumination, when present in the immediate aftermath of a traumatic event, are predictive of later PTG (Cann et al., 2010; Hallam & Morris, 2014; Taku et al., 2009; Taku et al., 2015), whereas high levels of intrusive rumination, when present some time after a trauma has occurred, are predictive of low levels of PTG and high levels of distress (Cann et al., 2010; Cann et al., 2011; Kolokotroni et al., 2014; Stockton et al., 2011; Taku et al., 2008; Triplett et al., 2012; Zhang et al., 2013). Together, these findings imply that if PTG is to be realized, there is a management process that must transpire, during which survivors internally grapple with, and ultimately moderate, the intrusive rumination that inevitably arises in the immediate aftermath of a trauma. Nevertheless, as the current study was the first to directly investigate, rather than infer, this management process, this study's findings regarding management of intrusive rumination do not so much contradict previous research as they suggest that the process may be more complex than anticipated or may not proceed as theorized.

Relatedly, there is a need for advancement concerning the measurement of management of intrusive rumination. The difference score approach developed and used for the current study, although an improvement over previous research, was by no means ideal as it required

participants to report on their intrusive rumination retrospectively. Unfortunately, due to the limitations of human memory, retrospective reporting has been shown to be fraught with error (Ayjan & Isiksal, 2003). Indeed, as early as 1964, Neter and Waksburg demonstrated that participants were unable to accurately recall past expenditures. More recently, Miller, Newcorn, and Halperin (2010) found that the ability of adolescents ages 16 to 22 to recall their childhood (i.e., ages 7 to 11) attention-deficit/hyperactivity disorder symptoms was “limited” (p. 7). As such, it seems probable that the limitations inherent to the measurement approach used at least partially account for the unexpected insignificant finding.

Regarding the association between goal disengagement and PTG, the present study was the first to explore this association in the context of cancer. Accordingly, the failure to uncover a significant finding implies that while goal disengagement may be a critical facet of the PTG process for those who experience other forms of trauma, it is perhaps less relevant in the case of cancer. In light of the advances in cancer detection and treatment, this is not entirely surprising. As science progresses, cancer is being detected earlier in the disease process and treatment is proving less impairing, permitting greater numbers of cancer survivors to remain active throughout the treatment process and diminishing the long-term consequences of the disease (Burney & Al-Moundhri, 2008; U.S. Department of Health and Human Services, 2017b). Such advances likely translate into less interference with goal pursuit and, therefore, less need for goal disengagement.

Alternatively, it is equally possible that the lack of association between goal disengagement and PTG is reflective of the current sample, in which case breast cancer—one of the more treatable forms of cancer (U.S. Department of Health and Human Services, 2017a; Siegel et al., 2012)—was the most common cancer type, stage I was the most common stage at

time of diagnosis, and nearly 74% of the sample reported a favorable treatment outcome (i.e., cancer-free). Thus, it is possible that goal disengagement simply proved less pertinent for this group of cancer survivors, who reported relatively mild, non-interfering cancer experiences, than it would have if the sample had been composed, for example, of survivors who had faced stage IV pancreatic cancer with recurrence. Additional research using larger, more diverse samples of cancer survivors is needed to ascertain whether the role of goal disengagement in PTG among cancer survivors varies in accord with disease severity.

On the other hand, although less probable, the insignificant association between goal disengagement and PTG may be an artifact of the measurement approach that was employed to assess goal disengagement. The GAS is not time specific, meaning that the instructions do not specify the time frame in which the goal disengagement assessed was to have occurred (Wrosch et al., 2003). As described above, over half of the participants in the present study completed their cancer treatment between two and five years prior to study participation. Subsequently, it is conceivable that the need for cancer-related goal disengagement had abated by the time participants engaged in the study. Moreover, the GAS approaches the measurement of goal disengagement from a trait-like or dispositional perspective. That is, the instructions direct respondents to consider how they “usually react” when forced to cease pursuit of a goal. Presumably, then, the instrument captured participants’ general approach to goal disengagement, as opposed to their approach to disengaging from goals in the context of cancer. Had a more situation-specific measure been used, it is possible results consistent with expectations and theory would have emerged. Finally, given that the existing research in support of a positive association between goal disengagement and PTG is sparse and characterized by its own set of distinctive limitations, the present study’s insignificant finding may indicate that goal

disengagement is not as central to PTG as Tedeschi and Calhoun (2004) presumed and, in turn, that inclusion of the construct in the functional-descriptive model of PTG is unfounded.

Hypothesis #2. In contrast to the first hypothesis, the second hypothesis, which stated that higher levels of emotional intelligence, management of intrusive rumination, and goal disengagement would be associated with higher levels of deliberate rumination, was not supported by the data. More specifically, results revealed that emotional intelligence was not significantly associated with deliberate rumination. This finding, although in opposition to expectations, is informative nonetheless, as the current study was the first to directly examine the role of emotional intelligence in the PTG process in the context of deliberate rumination. Accordingly, when coupled with the significant positive association that was uncovered between emotional intelligence and PTG, obtainment of an insignificant association between emotional intelligence and deliberate rumination implies that emotional intelligence is implicated in the PTG process among cancer survivors, but not in the manner delineated by the functional-descriptive model. That is, rather than emotional intelligence exerting its effect on PTG through means of deliberate rumination, as the functional-descriptive model purports, it appears that emotional intelligence exerts its effect on PTG directly (Tedeschi & Calhoun, 2004). Thus, the results of this study suggest that efforts to enhance emotional intelligence should be incorporated into PTG interventions not for purposes of facilitating deliberate rumination, but for purposes of facilitating PTG itself.

Also in contrast to expectations, lower levels of management of intrusive rumination and goal disengagement were found to be significantly associated with higher levels of deliberate rumination. Identification of a significant negative association between management of intrusive rumination and deliberate rumination implies that intrusive and deliberate rumination may not be

as mutually exclusive as the functional-descriptive model depicts them to be. As outlined previously, per the functional-descriptive model of PTG intrusive rumination must be mitigated, or managed, for deliberate rumination to ensue (Tedeschi & Calhoun, 2004). Results of the present study, however, suggest that this is not the case, for among the cancer survivors surveyed, the lower their levels of management of intrusive rumination, the higher their levels of deliberate rumination. Assuming that—as logic would suggest—low levels of *management* of intrusive rumination are reflective of the continued experience of intrusive rumination, this finding seems to imply that intrusive and deliberate rumination can occur simultaneously.

One particularly compelling explanation for this seemingly puzzling finding regards the process of deliberate rumination. Perhaps the discomfort wrought by intrusive rumination serves as motivation for engaging in deliberate rumination, and that it is in the process of deliberately ruminating on a trauma and extracting meaning from it that intrusive rumination is managed. That is, rather than management of intrusive rumination constituting a separate process that must transpire in advance of deliberate rumination, it is possible that it is in the course of deliberately ruminating upon and making sense of a trauma that intrusive rumination is mitigated. In this case, then, high levels of management of intrusive rumination would constitute premature termination of the rumination process in an aim to achieve quick relief from emotional discomfort, thereby eliminating the need for deliberate rumination. Recent research provides some support for this explanation. Indeed, Andrades, Garcia, Calonge, and Martinez-Arias (2017) investigated the relationships among rumination styles, PTSD, and PTG in a sample of child and adolescent earthquake survivors and found a significant direct effect of intrusive rumination on deliberate rumination.

Conversely, a less likely explanation for the unexpected negative association uncovered between management of intrusive rumination and goal disengagement concerns the limitations of the method used to measure management of intrusive rumination. For one, as detailed above, the method involved reliance on retrospective recall, which research has shown is oftentimes rife with error (Ayjan & Isiksal, 2003). Further, use of a difference score to capture management of intrusive rumination introduced the potential for a “basement effect” of sorts. For purposes of the current study, a low difference score was presumed to reflect the failure to successfully manage intrusive rumination (i.e., a high intrusive rumination score at time one minus a high intrusive rumination score at time two produces a low difference score and suggests continued intrusive rumination, or a lack of *management*). Nevertheless, it must be acknowledged that this is not the only avenue through which a low difference score could be achieved. A low, roughly equivalent score on the intrusive rumination scale at times one and two would also produce a low difference score. In this instance, however, a low score would be indicative not of poor management of intrusive rumination, but of a lack of intrusive rumination altogether. Thus, while both the functional-descriptive model and previous research suggest that intrusive rumination precedes deliberate rumination in the PTG process, the present study suggests this is not necessarily the case (Tedeschi & Calhoun, 2004; Zhou, Wu, Fu, & An, 2015). Rather, results indicate that, perhaps for those who are emotionally stable and possess a strong repertoire of adaptive coping skills, the discomfort and chaos of intrusive rumination can be bypassed, such that individuals progress directly from experience of the trauma itself to making sense of and extracting meaning from the trauma via intrusive rumination.

Regarding the significant negative association uncovered between goal disengagement and deliberate rumination, while this finding does not directly contradict previous research—as

the present study was the first to explicitly explore goal disengagement in the context of deliberate rumination—it does directly contradict theory. From the perspective of the functional-descriptive model, goal disengagement must precede deliberate rumination so that in the course of deliberately ruminating upon a trauma new goals compatible with one's post-trauma reality can be developed to replace those goals the trauma has rendered irrelevant and/or unattainable (Tedeschi & Calhoun, 2004). Nevertheless, the negative association uncovered in this study suggests otherwise, for the lower participants' goal disengagement, the greater their deliberate rumination. This finding indicates that among the current sample of cancer survivors, remaining connected with their goals stimulated their engagement in deliberate rumination, whereas disengaging from goals precluded their participation in the deliberate rumination process. In contemplating an explanation for this unanticipated finding, it is probable that in the cancer context a tendency to remain committed to one's goals reflects maintenance of hope despite the disease and, in turn, maintenance of the motivation necessary to pursue growth through means of deliberate rumination. On the other hand, goal disengagement may reflect a loss of hope and resignation of spirit and, in turn, a loss of the will needed to transform the trauma of cancer into growth via deliberate rumination. This explanation seems especially likely considering the advances in cancer detection and treatment which, as discussed previously, have transformed cancer into a less goal-prohibitive experience than it was in the past (U.S. Department of Health and Human Services, 2017a, 2017b). Nonetheless, additional research on this topic is required before firm conclusions are drawn.

Conversely, it is conceivable that the instrument used to measure goal disengagement is partially responsible for the unexpected negative association between goal disengagement and deliberate rumination. As detailed above, the GAS measures goal disengagement from a trait-like

perspective, meaning that it does not capture cancer-specific goal disengagement (Wrosch et al., 2003). Accordingly, emergence of a significant negative association between goal disengagement and deliberate rumination may not so much contradict the functional-descriptive model's supposition that disengaging from the goals one's cancer has rendered untenable promotes engagement in deliberate rumination, as it indicates that a general proclivity toward goal disengagement impedes engagement in deliberate rumination (Tedeschi & Calhoun, 2004). This explanation makes sense intuitively, for it is not unreasonable to presume that an individual prone to give up on goals in the face of challenge might be less motivated to participate in the work of extracting meaning from a traumatic experience through means of deliberate rumination.

Hypothesis #3. The third hypothesis, which stated that deliberate rumination would partially mediate the associations between emotional intelligence and PTG, management of intrusive rumination and PTG, and goal disengagement and PTG, was not supported by the data. Once again, this finding proved unexpected not because it directly contradicted previous research—the current study was the first to examine deliberate rumination as a mediator between these variables—but because it stands in contrast to theory. According to the functional-descriptive model of PTG, emotional intelligence, management of intrusive rumination, and goal disengagement each exert their influence on PTG through means of deliberate rumination (Tedeschi & Calhoun, 2004). Results of the current study, however, suggest that this is not the case for cancer survivors. Specifically, regarding emotional intelligence, the variable was not significantly related to deliberate rumination, thereby rendering mediation unsupportable, although it was significantly related to PTG itself. Conversely, regarding management of intrusive rumination and goal disengagement, neither variable was significantly related to the

outcome variable—PTG—although both were significantly and unexpectedly negatively related to deliberate rumination. Therefore, in all three instances, evidence for mediation was lacking.

The absence of mediation in the current study suggests that the three variables identified by the functional-descriptive model as facilitators of the deliberate rumination upon which PTG depends may not hold true for cancer survivors and, subsequently, that this portion of the model is in need for modification if it is to accurately represent cancer survivors' PTG process.

Correspondingly, this finding indicates that efforts to enhance PTG among cancer survivors via facilitation of deliberate rumination would be unlikely to prove effective if focused on fostering emotional intelligence, management of intrusive rumination, and goal disengagement. In the case of emotional intelligence, some benefit might be obtained inadvertently through a focus on enhancing emotional intelligence, given the significant positive association that was found between emotional intelligence and PTG. This benefit would not be wrought, however, through means of deliberate rumination, as the functional-descriptive model purports. Alternatively, the negative association found between management of intrusive rumination and deliberate rumination and between goal disengagement and deliberate rumination suggests that fostering management of intrusive rumination and goal disengagement among cancer survivors would prove counterproductive, in that it would serve to impede, rather than promote, deliberate rumination. Thus, while furthering PTG among cancer survivors through facilitation of deliberate rumination remains a worthy and defensible goal, as evidenced by the strong positive association uncovered between deliberate rumination and PTG, additional research is needed to distinguish the factors responsible for promoting engagement in deliberate rumination in the cancer context.

An alternative, albeit less preferred, explanation for the lack of mediation involves the measurement approaches employed to measure the three exogenous variables. Regarding emotional intelligence, it may be that the construct is not, in fact, a good proxy for the reduction of distress facet of the functional-descriptive model. That is, it is possible that reduction of emotional distress and emotional intelligence constitute two separate processes and play distinctive roles in the PTG process. If this is the case, then the failure of deliberate rumination to mediate the relationship between emotional intelligence and PTG may not actually contradict the functional-descriptive model of PTG (Tedeschi & Calhoun, 2004). Rather, the finding may imply that emotional intelligence is not synonymous with reduction of emotional distress and, in contrast to reduction of emotional distress, does not require deliberate rumination to exert its influence on PTG. Relatedly, as outlined in detail above, the methods used to measure management of intrusive rumination and goal disengagement were each associated with their own set of distinctive limitations. Had different measurement strategies been available and utilized, mediation may have been supported.

Model comparison. Results of the current study revealed that the partially mediated model was superior to the unmediated model on all measures of model fit. Despite the above-outlined lack of mediation, this is not surprising because the partially mediated model contained seven paths compared to the unmediated model's four paths. Generally, model fit improves as paths are added regardless of the significance of the individual paths themselves, because additional paths allow for more of the variance in the outcome variable to be accounted for (Kline, 2016). Accordingly, in the case of the current study, the superiority of the partially mediated model proves more statistically meaningful than it does interpretatively meaningful.

Nevertheless, a broader look at model fit does offer some instructive information. For one, in both the unmediated and mediated models, deliberate rumination accounted for a significant portion of the variance in PTG—48% and 47%, respectively. These findings are congruent with the ample research that has highlighted deliberate rumination as the foremost precursor to PTG and further cement the value of centering PTG interventions around facilitation of deliberate rumination (Bosson et al., 2012; Cann et al., 2011; Hallam & Morris, 2014; Morris et al., 2014; Morris & Shakespeare-Finch, 2011; Stockton et al., 2011; Taku et al., 2008; Taku et al., 2015; Taku & Oshio, 2015; Triplett et al., 2012; Zhang et al., 2013). Relatedly, concerning the partially mediated model, together emotional intelligence, management of intrusive rumination, and goal disengagement, accounted for less than 10% of the variance in deliberate rumination. This implies, as detailed above, that the portion of the functional-descriptive model preceding deliberate rumination is not an accurate depiction of the PTG process as it transpires among cancer survivors, as well as that further research aimed at delineating the precursors to deliberate rumination is warranted.

Limitations

Several limitations of the current study are worthy of note. Perhaps most notably, the cross-sectional design of the study precludes derivation of causal conclusions concerning the relationships among the primary study variables. Although this approach is consistent with the majority of the research that has been executed in the PTG domain, and served to facilitate timely study completion, longitudinal research is needed for purposes of ascertaining the causal relationships among the study variables across time. Relatedly, due to the study's cross-sectional nature, several of the key study constructs (e.g., immediate intrusive rumination) were measured retrospectively, which introduced the potential for recall bias. Also, as referenced previously, the

difference score approach used to capture management of deliberate rumination was novel.

While this approach presumably allowed for *management* of intrusive rumination to be measured, as opposed to the construct's mere presence or absence, additional research on the approach is called for to ensure its validity. Likewise, the instrument selected to measure goal disengagement was more trait-like than would have been preferable and may have failed to capture the goal disengagement that results specifically from the experience of cancer (Wrosch et al., 2003).

An additional limitation of the present study involves reliance on self-report measures to assess the constructs of interest. Consequently, it is possible results may reflect, at least in part, participants' perceptions of the PTG process, as opposed to an objective account of the manner in which PTG develops. However, it could be argued that individuals' perceptions of the PTG process are equally as compelling and informative as are objective measurements—particularly given the distinctly positive and personal nature of PTG (Calhoun & Tedeschi, 2006; Tedeschi & Calhoun, 2004). Further, research has demonstrated that responses to the PTGI are not significantly correlated with responses to measures of social desirability (Polatinsky & Esprey, 2000), which diminishes concern that results involving PTG—the foremost endogenous variable—were skewed by participants' efforts to present themselves in a favorable light.

In addition, the sampling procedures employed were not without flaw. Because random sampling proved unattainable, the sample was majority female, Caucasian, college-educated, and married. This demographic composition is likely at least partially attributable to the fact that most participant recruitment occurred at a single cancer treatment center located in a Midwestern university town. The absence of a sufficient number of male participants, in particular, was regrettable in that it prevented inclusion of gender as a covariate, which would have been

informative given the previous research that has demonstrated that females report higher levels of both emotional intelligence and PTG than do males (Cabello, Sorrel, Fernandez-Pinto, Extremera, & Fernandez-Berrocal, 2016; Zwahlen, Hagenbuch, Carley, Jenewein, & Buchi, 2010). Likewise, five varieties of cancer (i.e., breast, thyroid, colon/rectum, ovarian, and prostate) comprised nearly 60% of the cancer diagnoses reported, over half of the participants reported one of two disease stages (i.e., Stage I and Stage III) at time of diagnosis, and the overwhelming majority reported being cancer-free at time of study participation. Thus, the results of the present study may not be reflective of the PTG process as it transpires across the full-range of cancer diagnoses, stages, and treatment outcomes. As such, generalization of the study findings to individuals and populations other than those roughly commensurate with the present sample should be made with caution.

Finally, due to the restraints imposed by time and available resources, it was not possible to include all facets of the functional-descriptive model of PTG in the two models that were tested. Had this been feasible, it is conceivable that some of the seemingly confusing findings uncovered in the present study (e.g., the significant negative association between management of intrusive rumination and deliberate rumination) would have been more easily interpretable. Considering that less than 40% of the variance in PTG was accounted for in both models, there are clearly other variables at play in the PTG process as it unfolds among cancer survivors that were not captured by the models tested herein. Accordingly, as time and resources allow, future research on this topic would benefit from testing of more comprehensive, nuanced models. Correspondingly, use of statistical techniques that allow for investigation of bidirectional causality among variables might also prove illuminative.

Implications

Theoretical implications. Despite the limitations, the present study has several telling implications. Theoretically speaking, results of the present study both support and call into question certain facets of the functional-descriptive model of PTG as it is applied to cancer survivors. In support of the model, the current study demonstrated that deliberate rumination is a foremost precursor to PTG, such that it accounted for a significant portion of the variance in participants' reported PTG levels. This finding is consistent with the overall emphasis of the functional-descriptive model on cognitive processing and supports the model's portrayal of PTG as a fundamentally cognitive process (Tedeschi & Calhoun, 2004). Additionally, results support the functional-descriptive model's contention that managing the difficult emotions incited by experience of a trauma is central to realization of PTG. More specifically, discovery of a significant positive association between emotional intelligence and PTG suggests that using emotional intelligence to capture the *reduction of emotional distress facet* of the functional-descriptive model is defensible and that formal integration of the construct into the model may be warranted. In contrast to reduction of emotional distress, emotional intelligence is clearly defined and easily measured (Schutte et al., 1998). Further, there is research to suggest that the construct is modifiable, meaning that it can be increased through appropriate training (Schutte et al., 2013). Thus, it seems that officially replacing reduction of emotional distress with emotional intelligence in the functional-descriptive model is worthy of strong consideration, as doing so has potential to enhance the model's specificity, measurability, and application.

On the other hand, results of the present study also indicate that there are certain elements of the functional-descriptive model in need of amendment if the model is to accurately capture the PTG process of cancer survivors. For instance, as discussed previously, emotional intelligence did not exert its influence on PTG through means of deliberate rumination, as the

functional-descriptive model purports (Tedeschi & Calhoun, 2004). Correspondingly, the other two factors highlighted by the functional-descriptive model as facilitators of deliberate rumination—namely, management of intrusive rumination and goal disengagement—proved to be inhibitors of deliberate rumination. While this may be unique to the cancer survivor population, it suggests nonetheless that for those who survive cancer, neither managing the intrusive rumination wrought by their cancer experience nor disengaging from goals is necessary for them to progress to the deliberate rumination from which PTG ensues. Rather, the results of this study indicate that engaging in either of these processes is likely to impede cancer survivors' engagement in deliberate rumination and, presumably, their eventual obtainment of PTG.

In general, then, the current study implies that the portion of the functional-descriptive model immediately preceding deliberate rumination requires considerable modification. Not only were the relationships between each of the proposed facilitators (i.e., emotional intelligence, management of intrusive rumination, and goal disengagement) and deliberate rumination not in accord with the functional-descriptive model, but also they were found to account for a meager 7% of the variance in deliberate rumination. As such, it appears that these facilitators are either inappropriately placed in the model as it currently stands (this seems most likely in the case of emotional intelligence), or simply are not as central to the PTG process as the developers of the functional-descriptive model supposed. Accordingly, as research on the functional-descriptive model proceeds, particularly among the cancer survivor population, delineation of those factors responsible for facilitating deliberate rumination should become a major focus. Although the research in this area is young, emerging evidence suggests that constructs such as intrinsic religiosity (Park & Yoo, 2016), personal growth initiative (Shigemoto, Ashton, & Robitschek, 2016), core belief challenge (Triplett et al., 2012; Zhou et al., 2015), pre-trauma rumination (Su

& Chen, 2015), and problem-focused coping (Garcia, Cova, Rincon, Vazquez, & Paez, 2016) are worthy of examination.

Research implications. The current study also has a variety of compelling research implications. Following from the theoretical implications, the failure of the three proposed facilitators of deliberate rumination (i.e., emotional intelligence, management of intrusive rumination, and goal disengagement) to capture a significant amount of variance in the construct suggests that research focused on better delineating this portion of the functional-descriptive model is sorely needed. In other words, if emotional intelligence, management of intrusive rumination, and goal disengagement do not facilitate deliberate rumination, then what does? Identification of these factors is of paramount import given their significant clinical implications, as outlined below. Relatedly, the surprising negative associations uncovered between management of intrusive rumination and deliberate rumination, as well as between goal disengagement and intrusive rumination, indicate that the role of these constructs in the PTG process is more complex than previously assumed. Therefore, additional research is needed to clarify exactly how management of intrusive rumination and goal disengagement interact with deliberate rumination and PTG, along with their proper placement in the functional-descriptive model.

Conceptually, there is much of the PTG process among cancer survivors that remains unspecified. While the present study again confirmed deliberate rumination as a primary facilitator of PTG, deliberate rumination accounted for slightly less than 50% of the variance in PTG, meaning that more than half of the variance in the construct remains unaccounted for. Accordingly, research focused on distinguishing key predictors, mediators, and moderators of PTG should continue in earnest. The better we understand how PTG comes about among cancer

survivors, the better equipped we will be to facilitate its development among those who endure the cancer experience. It would be most advantageous for this research to focus on modifiable facilitators rather than fixed demographic variables, for although the latter are of theoretical interest, they carry no potential to promote PTG through clinical means.

From a measurement perspective, there is need for advancement in the measurement of both management of deliberate rumination and goal disengagement. In regard to management of deliberate rumination, development of a psychometrically sound scale created expressly for purposes of measuring the construct would be ideal. At the least, future studies should aim to validate the difference score approach adopted in this study to ensure that the approach captures management of intrusive rumination accurately. Correspondingly, to ensure measurement of the goal disengagement specific to the experience of cancer, a state-based scale should be developed, or efforts should be made to adapt and validate the GAS so that it can be employed in a state-like—as opposed to trait-like—fashion (Wrosch et al., 2003).

Finally, the present study introduces certain methodological considerations for future research. As noted previously, longitudinal methodology should be employed whenever possible, as should statistical procedures that allow for the potential of bidirectional causality among variables. Use of these methods would permit determination of causality, as well as delineation of more complex relationships among variables not captured by the unidirectional path methodology utilized herein. Further, obtainment of gender balanced samples would be valuable not only to ensure that results are representative of the PTG experience of both genders, but also so gender could be examined as a covariate, consistent with the research that suggests women may be more inclined to realize PTG than men. Lastly, to enhance generalizability, the current study should be replicated using larger, more ethnically-diverse samples of cancer survivors who

represent the full range of cancer diagnoses, disease stages, and treatment outcomes. Given the significant variability that exists among cancer experiences, there is reason to suspect that the PTG process varies in accord with these differences at least somewhat. A larger, more varied sample would allow for investigation of these potential differences, in turn, yielding information that could be used to tailor PTG interventions based on survivors' disease characteristics.

Clinical implications. Lastly, the current study has clinical implications for those mental health providers who serve the cancer survivor population. Most obviously, findings suggest that clinical efforts to promote PTG among cancer survivors should focus on facilitation of survivors' deliberate rumination about their cancer experience. Unfortunately, exactly how clinicians should go about doing this remains somewhat unclear given that the factors responsible for promoting deliberate rumination have yet to be identified. Nevertheless, considering that deliberate rumination is indeed a cognitive process, it seems reasonable to presume that cognitively oriented therapies (e.g., CBT) would likely prove helpful (Cann et al., 2011). Moreover, in employing such therapeutic approaches, clinicians could be confident that even if PTG is not successfully facilitated, the therapy would likely be of benefit. Both cognitive and cognitive-behavioral therapy have been identified as empirically-supported interventions for the cancer population, effective for mitigating distress, anxiety, and depression (Guan et al., 2016; Pitceathly et al., 2009; Tatrow & Montgomery, 2006). In aiming to foster deliberate rumination, clinicians might also consider drawing on existential theory and techniques. As discussed previously, at its core, deliberate rumination involves cognitively contemplating a traumatic experience in an effort to extract meaning and value from it (Cann et al., 2011). In this regard, existential therapy has much to offer with its emphasis on meaning, significance, and purpose, as well as its basic presupposition that humans possess the capacity to transform suffering and

tragedy into achievement through direct confrontation of anxiety, pain, and despair (Frankl, 1978), and has been found beneficial for cancer patients (Breitbart et al., 2010; Breitbart et al., 2012).

Results of the current study also indicate that clinicians aiming to promote PTG among patients who are cancer survivors would be wise to incorporate therapeutic strategies that serve to enhance patients' emotional intelligence. Fortunately, in contrast to deliberate rumination, specific programs for enhancing emotional intelligence have been developed and shown to be effective (Schutte et al., 2013). For example, Ruiz-Aranda et al. (2012) created and implemented a 24-session program referred to as the Emotional Intelligence Training Program (INTEMO). Grounded on Mayer and Salovey's (1997) ability model of emotional intelligence, INTEMO consists of a blend of group-work, role-play, and reflective activities designed to strengthen socioemotional skills, including the perception and expression of emotion, use of emotion to facilitate thinking, understanding and analyzing emotions, and emotion regulation. Following careful evaluation, the authors reported that the program was successful, such that levels of the above-outlined skills increased and participants' overall psychological wellbeing was improved at the program's conclusion.

Alternatively, Slaski and Cartwright (2003) created and implemented a brief emotional intelligence training program designed for use in the management context. Their program, which is four sessions long, is focused on the development of self-awareness and prudent emotional detachment and incorporates a range of techniques, including role-play, lectures, discussion, paired exercises, and maintenance of an emotions diary. Despite the brevity of the program, Slaski and Cartwright reported positive outcomes, such that those individuals who took part in the training reported significant increases in emotional intelligence. Thus, although application

of training programs of the type devised by Ruiz-Aranda et al. (2012) and Slaski and Cartwright to the cancer survivor population would likely require minor modification, there are several empirically sound programs from which clinicians can choose as they strive to promote emotional intelligence, and ultimately PTG, among their cancer survivor patients. Further, clinicians who work with cancer patients might also consider engaging their patients in emotional intelligence training. The earlier such individuals are equipped with the skills afforded by emotional intelligence, the better able they will be to manage the intense emotions wrought by diagnosis and treatment, in turn, heightening their chances of later extracting growth from their cancer experience.

Finally, the present study suggests that clinicians should avoid foreclosing on cancer survivors' intrusive rumination prematurely, despite the emotional discomfort associated with this variety of rumination, and should be mindful of encouraging survivors to remain engaged with their goals. Because intrusive rumination is a generally uncomfortable process and closely resembles the re-experiencing symptoms associated with PTSD, clinicians might be inclined to move patients through this process quickly in the hopes of lessening patient distress (Cann et al., 2011). The present study, however, suggests that doing so could prove prohibitive to patients' realization of PTG by diminishing engagement in the deliberate rumination upon which PTG depends. Therefore, it is important for clinicians who work with this population to become comfortable with the discomfort of intrusive rumination so that they can faithfully companion patients through the intrusive rumination process with an eye toward the deliberate rumination that will presumably follow. Relatedly, considering the current study's finding of a negative association between goal disengagement and deliberate rumination, clinicians should seek to keep their cancer survivor patients engaged in goal pursuit and should remain watchful of signs

of goal disengagement, as this may be indicative of patient resignation. To ensure continued goal pursuit, it may be necessary for clinicians to assume more of a consultant role, collaborating with patients to modify goals and goal pursuit strategies so that they prove congruent with patients' post-cancer realities.

Conclusion

In closing, the present study represents the first attempt to delineate the factors that drive the deliberate rumination upon which PTG depends in a cancer survivor sample. The study is grounded upon a strong theoretical and empirical foundation and uncovered valuable information concerning how PTG develops among cancer survivors. In particular, results suggest that both emotional intelligence and deliberate rumination serve as foremost precursors to PTG among cancer survivors, whereas management of intrusive rumination and goal disengagement do not. Further, results of this study imply that emotional intelligence, management of intrusive rumination, and goal disengagement do not exert their influence on PTG through means of deliberate rumination, as the functional-descriptive model purports. Accordingly, it appears that if the functional-descriptive model is to accurately capture the PTG process as it transpires among cancer survivors, modification of the portion of the model immediately preceding deliberate rumination is required. Future research should focus on elucidation of those factors that are responsible for the facilitation of deliberate rumination among cancer survivors. Such research would engender appropriate amendment of the functional-descriptive model, as well as development of interventions effective for promoting the deliberate rumination from which PTG ensues. In the meantime, mental health clinicians who serve cancer survivors should consider incorporating an emphasis on deliberate rumination and emotional intelligence into their clinical

endeavors, as the present study suggests that doing so has the potential to assist survivors in extracting growth from the decidedly unsettling and life-upending ordeal that is cancer.

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Appendix A – Literature Review

Growth as a consequence of adversity is by no means a new sentiment. Indeed, since ancient times it has been recognized that hardship and trial often facilitate personal growth, serving to deepen relationships, clarify priorities, and strengthen resolve, to name a few of the potential benefits of adversity (Calhoun & Tedeschi, 2006). It is only in recent years, however, that this notion has been investigated empirically and, more specifically, investigated in relation to the adversity of a cancer diagnosis. As reported by the U.S. Department of Health and Human Services (2015), an estimated 1,658,370 new cases of cancer will be diagnosed in the United States in the year 2015 alone. Further, nearly 40% of the United States population will receive a cancer diagnosis at some point during their lifetime (U.S. Department of Health and Human Services, 2015).

Accordingly, interest in how individuals might procure benefit from the cancer experience has proliferated in recent years. In the field of psychology, this research has focused primarily on a specific form of adversity induced growth referred to as posttraumatic growth (PTG). Originally coined in the mid 1980s, PTG refers to “positive psychological change experienced as the result of the struggle with highly challenging life circumstances” (Tedeschi & Calhoun, 2004, p. 1) and involves changes in three distinct domains. First, PTG is associated with a changed perception of self. As Calhoun and Tedeschi (2006) noted, this domain of PTG is perhaps best summed up by the phrase “vulnerable yet stronger” (p. 5). In other words, individuals come to realize that although they are more vulnerable than they ever recognized, they are also stronger than they ever imagined. Second, the relating to others domain pertains to the “greater sense of intimacy, closeness, and freedom to be oneself” (Calhoun & Tedeschi, 2006, p. 5) that results from weathering a significant trial. Finally, PTG is associated with a

changed philosophy of life. This domain encapsulates the shift in priorities, enhanced appreciation of life, and deepened spirituality that adversity frequently engenders.

Cancer and PTG

Research suggests that PTG is in fact a distinct possibility for those forced to endure the harrowing—and unquestionably traumatic—ordeals that is cancer. For instance, Jansen, Hoffmeister, Change-Claude, Brenner, and Arndt (2011) explored the prevalence of PTG among a 483-person sample of long-term colorectal cancer survivors and found that 46% of the sample reported experiencing PTG five years subsequent to their original diagnosis. Relatedly, Sim, Lee, Kim, and Kim (2014) determined that 53% of 122 stomach cancer survivors reported moderate to high levels of PTG. Likewise, in a cross-cultural investigation, Schroevers and Teo (2008) examined prevalence of PTG in a sample composed of Malaysian cancer patients with varying diagnoses. Analyses revealed that the majority of patients reported PTG in a moderate to great degree, leading the authors to conclude that PTG is not a purely Western phenomenon.

Cancer, PTG, and Deliberate Rumination

Further, researchers have determined that deliberate rumination serves as the foremost precursor to PTG among cancer survivors (Hallam & Morris, 2014). In contrast to intrusive rumination—a maladaptive form of rumination characterized by automatic, unwanted thoughts that is generally discussed in relation to posttraumatic stress disorder (PTSD) symptomology—deliberate rumination is an adaptive cognitive activity involving purposeful reflection on and re-examination of a trauma (Morris & Shakespeare-Finch, 2011). Unlike intrusive rumination, deliberate rumination is active rather than passive and is undertaken intentionally for purposes of resolving the confusion incited by a trauma and deriving meaning from the trauma experience (Su & Chen 2015).

Statement of the Problem

Despite the prominent role of deliberate rumination in the PTG process following cancer, research investigating the factors that facilitate cancer survivors' engagement in deliberate rumination has not yet been undertaken. That is, knowledge of the factors responsible for inciting the deliberate rumination upon which PTG depends is lacking. The implications of this gap in the literature are substantial. Deliberate rumination is the foremost precursor to PTG among cancer survivors. As such, interventions designed to enhance survivors' chances of realizing PTG could be targeted at promoting deliberate rumination (Hallam & Morris, 2014). Such interventions cannot be developed, however—at least not successfully—until more is known about the factors responsible for inciting deliberate rumination. The proposed study will attempt to fill this gap in the literature and, in turn, to procure information with potential for informing the development of potent PTG interventions for cancer survivors by exploring three factors theoretically proposed to promote deliberate rumination in the PTG process—reduction of emotional distress, management of intrusive rumination, and goal disengagement (Calhoun & Tedeschi, 2006; Tedeschi & Calhoun, 2004). In an aim to provide a rationale for why these three factors, in particular, have been selected as the most likely principal facilitators of deliberate rumination, the next section will focus on elucidation of the theory undergirding the proposed study.

Theoretical Framework: The Functional Descriptive Model

Perhaps the most well-known and comprehensive model of PTG, and the one that has been applied most frequently to the study of PTG among cancer survivors is Tedeschi and Calhoun's (2004) functional descriptive model. Based on the work of Janoff-Bulman (1992), who argued that meaning making following a traumatic experience depends largely on appraisal processes, the functional descriptive model is a fundamentally cognitive model that regards PTG

as the result of individuals' internal struggle with their new post-trauma reality (Tedeschi & Calhoun, 2004). In other words, from the perspective of the functional descriptive model, PTG is not a certainty following the experience of a traumatic event such as cancer. Rather, PTG develops only when individuals are willing to wrestle significantly with the trauma on an internal level in its aftermath. More specifically, the model contends that PTG begins with the experience of a traumatic event so seismic that one's pre-trauma schema is shattered. That is, as a consequence of the trauma experience, individuals' prior goals and beliefs become extinct and their standard distress management strategies impotent. Accordingly, cognitive processes become overwhelmed by ruminative activity as individuals strive to make sense of the trauma and manage their intense emotional reactions (Calhoun & Tedeschi, 2006). At this point, the ruminative activity individuals experience is of the intrusive variety, meaning that it is automatic and disruptive and resembles the re-experiencing symptoms associated with PTSD.

Per the functional descriptive model, some individuals stagnate at the stage of intrusive rumination, failing to procure any benefit from the trauma and, in certain cases, developing lasting PTSD symptomology (Tedeschi & Calhoun, 2004). Fortunately, others slowly transition from intrusive to deliberate rumination, such that their cognitive processing becomes more purposeful and less disruptive. It is then from this deliberate rumination, the model purports, that adaptive schema change and narrative development ensues, ultimately fomenting the emergence of PTG. Also incorporated into the model is social support, which Tedeschi and Calhoun (2004) postulated contributes to PTG by facilitating self-disclosure that aids in the crafting of narratives about the changes that have occurred. Further, the model recognizes that social support is useful in the PTG process in that other people offer fresh perspectives that can be integrated into schema change.

An additional facet of the functional-descriptive model concerns the intervening step between intrusive rumination and deliberate rumination (Calhoun & Tedeschi, 2006). In particular, the model recognizes three factors that drive the essential intrusive rumination to deliberate rumination shift—reduction of emotional distress, management of intrusive rumination, and disengagement from goals. As these factors are the focus of the proposed study, each one will now be discussed in some detail.

Reduction of Emotional Distress

The first factor highlighted by the functional-descriptive model as a primary instigator of deliberate rumination is management of emotional distress. Tedeschi and Calhoun (2004) explained, “The person facing a major life crisis must find ways of managing initial distress, which can often be debilitating. This is necessary to allow some degree of constructive cognitive processing to occur, producing schema changes that will contribute to the experience of posttraumatic growth” (p. 8). That is, per the model, before individuals can engage in the deliberate rumination upon which PTG depends, they must first succeed in reducing the emotional distress wrought by their trauma exposure. Otherwise, the emotional distress will almost inevitably impede the reflective, purposeful cognitive processing of which deliberate rumination is made (Morris & Shakespeare-Finch, 2011). Exactly how individuals go about reducing this distress depends on the person, the situation, and the available social and emotional resources (Tedeschi & Calhoun, 2004).

Management of Intrusive Rumination

Management of intrusive rumination, on the other hand, involves management of the automatic, disruptive cognitive processes that typically arise in the immediate aftermath of the experience of a traumatic event (Calhoun & Tedeschi, 2006). As noted previously, this form of

rumination closely resembles the re-experiencing symptoms associated with PTSD (Su & Chen, 2015). Accordingly, intrusive rumination and deliberate rumination are best regarded as opposites, which implies they cannot occur simultaneously. Therefore, it follows that intrusive rumination must be largely resolved before deliberate rumination can proceed. Much like reduction of emotional distress, the functional-descriptive model allows for variability in how individuals go about managing their intrusive rumination (Tedeschi & Calhoun, 2004). Generally speaking, however, this management entails application of adaptive cognitive coping strategies.

Disengagement from Goals

The third and final factor recognized by the functional-descriptive model as a facilitator of deliberate rumination in the process of PTG is disengagement from goals. This factor refers to relinquishment of any pre-trauma goals the trauma has made untenable (Tedeschi & Calhoun, 2004). As Tedeschi and Calhoun (2004) reasoned, this disengagement occurs as “it becomes clear [one’s] old way of living is no longer appropriate” (p. 8) in the radically changed circumstances beget by the trauma and proves profitable in that it enables individuals to make space for the new, more situationally compatible, goals the deliberate rumination process will inevitably engender. Grief work is often a component of this disengagement as individuals grapple with and gradually accept the loss of their now defunct goals.

Functional-Descriptive Model: Summary

To summarize, the functional-descriptive model purports that PTG begins with the experience of a traumatic event sufficiently seismic enough that it operates to challenge one’s long-held assumptive world (Tedeschi & Calhoun, 2004). This, in turn, induces intrusive rumination as individuals contend cognitively with the confusion incited by the challenge to their assumptive world. For those who succeed in realizing PTG, intrusive rumination eventually

gives way to deliberate rumination through means of reduction of emotional distress, management of intrusive rumination, and goal disengagement. Subsequently, as a consequence of the schema change and narrative development that deliberate rumination instigates, PTG materializes.

The functional-descriptive model has been the subject of extensive empirical investigation, such that many of the model elements now have research support, including the seismicity of the traumatic event (Su & Chen, 2015), intrusive rumination (Stockton, Hunt, & Joseph, 2011), deliberate rumination (Morris & Shakespeare-Finch, 2011), and social support (McDonough, Sabiston, & Wrosch, 2014). Moreover, research has demonstrated that, when compared to alternative PTG models (e.g., Schaefer and Moos's [1998] life crises model) in medical samples, the functional-descriptive model accounts for significantly more variance in PTG than do alternative models (Hallam & Morris, 2014). Consequently, confidence in the model as an explanatory framework for the PTG process as it unfolds among cancer survivors seems warranted. Accordingly, the functional-descriptive model will serve as the foundation of the proposed study. That is, the factors that will be examined as potential precursors to the deliberate rumination upon which PTG depends are those highlighted by the model—namely, reduction of emotional distress, management of intrusive rumination, and goal disengagement (Tedeschi & Calhoun, 2004). To further set the stage for this examination, the extant literature concerning the relationships among the primary study variables will now be reviewed. First, however, in an effort to ensure clarity of constructs, brief comments will be offered as to the distinction between PTG and several closely related terms.

Construct Clarification: PTG Versus Closely Related Terms

A somewhat unfortunate side effect of the increased theoretical and empirical interest in PTG involves the introduction of a confusing array of closely related terms (Joseph, Linley, & Harris, 2005). To add to the confusion, two of these terms—namely, stress related growth and benefit finding—have been used interchangeably in the literature at times. Thus, to prevent construct confusion in the context of the present proposal, a brief overview of these two terms and the manner in which they are best distinguished from PTG will be provided. It is important to note at the outset that the majority of this discussion will be conceptual in nature, as minimal research has been completed on the topic.

Stress Related Growth

Stress related growth is the term that has been used interchangeably with PTG most commonly. Developed by Park, Cohen and Murch (1996), the concept refers to growth experienced as a consequence of coping with a stressful life event. Similar to Tedeschi and Calhoun (2004), Park et al. (1996) identified three features of stress related growth. The labels assigned to the features, however, differ somewhat from those used by Tedeschi and Calhoun and include improved personal resources, improved social resources, and enhanced coping skills.

Park et al. (1996) grounded stress related growth on Schaefer and Moos' (1998) conceptual model of positive adaptation to life crises or transitions, which emphasizes the interplay between personal and environmental systems and coping and appraisal processes. That is, according to Schaefer and Moos' model, how individuals adapt to life crises and transitions depends on four categories of interrelated variables. The first category is referred to as the personal system category and includes demographic variables, as well as personal characteristics like resilience, self-efficacy, and motivation. Alternatively, the environmental systems category

consists of an individual's social landscape, including social support and relevant features of one's financial, community, and home living situation. The third category of variables captures the features of the event itself, most prominently the severity, intensity, duration, and timing of the life crisis or transition. Finally, there is the coping strategies categories. Indeed, according to Schaefer and Moos', individuals generally respond to crisis and transition through reliance on one of two types of coping strategies. The first is known as approach coping and involves using logic to make sense of the situation, reappraising the situation in a positive light, and seeking social support. Avoidance coping, on the other hand, involves efforts to minimize the impact of the situation, seeking alternative rewards, and emotional venting. Per Schaefer and Moos' model, reliance on approach coping promotes positive adaptation to life crises and transitions, while reliance on avoidance coping impedes it.

Using this model as a guide, Park et al. (1996) postulated that stress related growth depends on the interplay between one's personal and environmental systems and the features of the stressful event. That is, when personal and environmental systems and the features of the event engender approach coping, stress related growth is likely. Conversely, when an individual's personal characteristics and environmental setting, along with the features of the stressful event itself, engender avoidance coping, then stress related growth is typically precluded.

The relationship between PTG and stress related growth has been contested, with some arguing that the concepts are interchangeable and others arguing that they are distinct (Joseph et al., 2005). Generally speaking, however, current consensus is that the concepts are in fact distinct and that the distinction between them is a matter of underlying theory and, in turn, of emphasis. In the case of PTG, that theory is the functional descriptive model, a thoroughly cognitive model

according to which PTG results from the deliberate rumination in which individuals engage following experience of a trauma for purposes of devising new schemas and constructing fresh narratives (Tedeschi & Calhoun, 2004). Stress related growth, on the other hand, is grounded on Schaefer and Moos' (1998) conceptual model, which emphasizes the manner in which diverse categories of variables interact to either increase or decrease one's chances of realizing stress related growth. Thus, whereas the functional descriptive model emphasizes cognitive processes, Schaefer and Moos' model emphasizes coping processes.

Benefit Finding

A second concept that has been used interchangeably with PTG at times is benefit finding. Although not as widespread as stress related growth, any time spent in the PTG literature will inevitably result in an encounter with this term. As defined by Tennen and Affleck (2002), benefit finding refers to the identification of benefit in adversity. Interestingly, the concept has been studied most frequently in the context of medical related adversity. The three benefits research has shown to be most common among those who have experienced serious illness include strengthened relationships with others, enhanced appreciation of life, and a positive shift in life priorities (Collins, Taylor, & Skokan, 1990).

In contrast to PTG and stress related growth, no systematic efforts have been undertaken to develop a comprehensive theory of benefit finding. Nevertheless, as Tennen and Affleck (2002) noted, most conceptualizations of benefit finding hinge on three primary assumptions. First, benefit finding is regarded as requiring selective attention. That is, to identify benefit in adversity, one must choose to focus on certain aspects of the adversity while avoiding other aspects (Taylor, Wood, & Lichtman, 1983). Relatedly, benefit finding is generally perceived as a coping strategy that engenders positive adaptation to adversity. Per Tennen and Affleck,

however, simplistic identification of benefit is not sufficient for benefit finding to assume coping strategy status. Rather, it is when individuals identify benefits and utilize them for purposes of self-soothing and encouragement that benefit finding operates as a coping strategy. Lastly, as the concept is typically understood, benefit finding is viewed as occurring later in the adaptation process after individuals have had time to “work through” the adversity and restore some sense of meaning and order to their lives (Horowitz, 1986).

The distinction between PTG and benefit finding is less contested than is the distinction between PTG and stress related growth. Typically, PTG is regarded as the broader term while benefit finding is regarded as the narrower one. That is, while PTG almost certainly requires the identification of benefit in adversity, benefit finding does not always result in the realization of PTG. Sears, Stanton, and Danoff-Burg (2003) captured this distinction nicely when they explained that benefit finding refers to a single instance of identifying benefit in adversity, while PTG involves the repeated utilization of benefit-related information as a coping strategy, resulting in a wholesale change in outlook and worldview.

Construct Selection

Unfortunately, research regarding the distinction between PTG and stress related growth and the distinction between PTG and benefit finding is sorely lacking (Joseph et al., 2005). Therefore, at present, construct selection depends largely on theoretical perspective and conceptual scope—and to some extent researcher preference. In the context of the current proposal, then, the choice to utilize the term PTG, as opposed to the terms stress related growth or benefit finding, was a natural one. For one, the study proposed herein is grounded entirely on the functional descriptive model, a theory designed specifically to explain the construct of PTG (Tedeschi & Calhoun, 2004). Moreover, a broad view of the trauma-induced growth process is

being taken. That is, the topic of interest is the overall shift in outlook and worldview that cancer survivors realize as a result of grappling internally with their cancer experience, not their ability to simplistically identify beneficial features or outcomes of the experience (Sears et al., 2003). Accordingly, the literature reviewed in the following section is that with specific relevance to PTG. On the other hand, in an effort to promote construct clarity and avert construct confusion, literature with relevance to the related—but seemingly distinct—constructs of stress related growth and benefit finding has been excluded.

Literature Review

Method of the Review

Literature was gathered using the Academic Search Premier, Medline, PsycINFO, and PsycARTICLES databases. Search terms used to identify relevant studies were: *cancer*, *posttraumatic growth*, *rumination*, *automatic rumination*, *intrusive rumination*, *deliberate rumination*, *emotional intelligence*, *goal disengagement*. Additionally, all studies selected included at least one of the identified constructs of interest (i.e., cancer, PTG, deliberate rumination, emotional intelligence, intrusive rumination, goal disengagement) and were empirical in nature.

Deliberate Rumination and PTG

As outlined above, researchers have uncovered a significant link between deliberate rumination and PTG, such that it is now widely understood that deliberate rumination is the primary forerunner to PTG. In one of the earliest studies on the topic, Calhoun, Cann, Tedeschi, and McMillan (2000) employed a correlational analysis and found a positive relationship between deliberate rumination and PTG, such that the higher participants' levels of deliberate rumination following their exposure to a traumatic event, the greater their PTG. Of course, the

correlational nature of their analysis precluded formation of causal conclusions regarding the relationship between deliberate rumination and PTG. Moreover, due to the use of a convenience sample, the generalizability of the study's findings to cancer survivors is questionable.

Relatedly, Stockton et al. (2011) directly compared the association between intrusive rumination and PTG with the association between deliberate rumination and PTG. Congruent with the functional-descriptive model, results indicated that intrusive rumination was negatively associated with PTG, whereas deliberate rumination was positively associated with PTG, but only in the absence of intrusive rumination. Subsequently, the authors concluded that, in contrast to intrusive rumination, deliberate rumination "represents a more productive form of cognitive processing that is associated with growth following trauma" (Stockton et al., 2011, p. 90). Similar to Calhoun et al.'s (2000) study, however, Stockton et al.'s reliance on correlational methodology did not allow for detection of a potential causal relationship between deliberate rumination and PTG. Additionally, over 40% of the sample experienced the traumatic event from which they reported extracting PTG in childhood. As such, it is possible that Calhoun et al.'s results were influenced by recall bias.

Lindstrom, Cann, Calhoun, and Tedeschi (2013) improved somewhat upon the correlational approach adopted by Calhoun et al. (2000) and Stockton et al. (2011) by employing hierarchical regression analysis to examine the deliberate rumination-PTG association. Consistent with the aforementioned studies, they found that deliberate rumination significantly predicted PTG, accounting for 6% of the total variance. Nevertheless, once again, their use of an undergraduate convenience sample significantly limited the generalizability of their findings. Further, although regression is generally regarded as more rigorous than basic correlational methodology, formulation of causal conclusions is still precluded.

Another study involving the relationship between deliberate rumination and PTG with relevance to the current study was performed by Hallam and Morris (2014). Specifically, Hallam and Morris compared the predictive power of two models of PTG—Tedeschi and Calhoun's (2004) functional-descriptive model and Schaefer and Moos's (1998) life crises model—using regression analyses among a 71-person sample of stroke caregivers. Results revealed that Tedeschi and Calhoun's model accounted for significantly more of the variance in PTG, a full 49%, than did Schaefer and Moos model, which accounted for only 21% of the variance (Hallam & Morris, 2014). Furthermore, Hallam and Morris ascertained that of all of the variables studied (i.e., intrusive rumination, deliberate rumination, social support, acceptance coping, survivor functioning), deliberate rumination explained the most variance in PTG. Accordingly, these results suggest that deliberate rumination is of particular import in the PTG process. Nonetheless, as the authors themselves noted, due to the regression methodology, while it can be inferred from Hallam and Morris's findings that deliberate rumination is associated with PTG, inferences regarding exactly how the effects of deliberate rumination occur cannot be drawn.

A final study concerning the relationship between deliberate rumination and PTG with relevance to the current study was executed by Morris and Shakespeare-Finch (2011) who set out to “develop a statistical model identifying factors that are associated with PTG” (p. 1176) through means of structural equation modeling (SEM). Using the functional-descriptive model as a guide, they opted to include the following variables in their SEM: trauma severity, intrusive rumination, deliberate rumination, social support, distress, and PTG. In contrast to the related studies outlined above, Morris and Shakespeare-Finch executed their study using a sample composed entirely of cancer survivors.

Two important findings emerged from Morris and Shakespeare-Finch's (2011) study. First, in support of the functional-descriptive model, the authors found that the model fit the data well, such that 30% of the variance in PTG was accounted for by the included variables. Correspondingly, results indicated that deliberate rumination was directly related to PTG, while intrusive rumination was unrelated to PTG and directly related to distress. Subsequently, Morris and Shakespeare-Finch concluded that clinicians aiming to facilitate PTG in cancer survivors should make a special effort to guide survivors' rumination such that it resembles the constructive cognitive processing exemplified by deliberate rumination as opposed to the maladaptive processing exemplified by intrusive rumination. However, Morris and Shakespeare-Finch failed to include the three factors theoretically proposed to facilitate deliberate rumination in the process of PTG (i.e., reduction of emotional distress, management of intrusive rumination, and goal disengagement) in their SEM. As such, it is unclear how clinicians might go about guiding cancer survivors' rumination.

As one can see, the link between deliberate rumination and PTG is well-established (Calhoun et al. 2000; Stockton et al., 2011). Research suggests not only that deliberate rumination is a significant predictor of PTG (Lindstrom et al., 2013; Hallam and Morris, 2014), but also that deliberate rumination accounts for more of the variance in PTG among cancer survivors than do the other primary elements of the functional-descriptive model (Morris & Shakespeare-Finch, 2011). Curiously, however, researchers have yet to address the question of how the deliberate rumination upon which PTG ostensibly depends is generated, leaving clinicians who desire to enhance cancer survivors' chances of realizing PTG by promoting engagement in deliberate rumination with little to guide their efforts. As such, the next section will focus on examination of the three factors the functional-descriptive model identifies as

instigators of deliberate rumination (i.e., reduction of emotional distress, management of intrusive rumination, and goal disengagement) and the scant existing literature pertaining to the role these factors play in the process of PTG development.

Precursors to Deliberate Rumination

Reduction of emotional distress. Research with relevance to the first factor identified by the functional-descriptive model as a precursor to deliberate rumination—management of emotional distress—almost wholly surrounds a psychological construct referred to as emotional intelligence. Relatively new to the psychology scene, emotional intelligence is most commonly defined as the ability to “perceive emotion, integrate emotion to facilitate thought, understand emotions, and regulate emotions to promote personal growth” (Salovey, Mayer, Caruso, & Lopes, 2003, p. 251). Thus, the construct’s title is somewhat misleading, for emotional intelligence is less an ingrained personality trait and more a learned ability (Mayer, Caruso, & Salovey, 1999). Indeed, several studies have demonstrated that emotional intelligence is amenable to enhancement via emotional intelligence training.

Reliance on emotional intelligence as a means of capturing the reduction of emotional distress facet of the functional-descriptive model is defensible on several counts. Perhaps most obviously, reduction of emotional distress constitutes one form of emotion regulation, which is a key element of the emotional intelligence construct (Salovey et al., 2003). Furthermore, as Salovey et al.’s (2003) definition indicates, emotional intelligence involves the integration of emotion to facilitate thought and per the functional-descriptive model the chief function of reduction of emotional distress is as a facilitator of deliberate rumination—a form of thought (Tedeschi & Calhoun, 2004). Accordingly, for purposes of the proposed study, emotional intelligence will be regarded as a fundamental component of reduction of emotional distress.

Therefore, it can be assumed that whenever the term emotional intelligence is used in the absence of mention of reduction of emotional distress throughout the remainder of this review, the first concept is meant to encapsulate the latter concept.

In one of the few available studies focused on the reduction of emotional distress element of the functional-descriptive model, Linley, Felus, Gillett, and Joseph (2011) examined emotional intelligence as a moderator of the association between emotional expression and PTG among a sample of 148 English college students. They hypothesized that because individuals “higher in emotional intelligence are able to appraise their emotional state more accurately and are more able to assess appropriate emotional expression” (Linley et al., 2011, p. 393), emotional expression would be associated with greater PTG among those participants high in emotional intelligence but not among those participants low in emotional intelligence. Results revealed partial support for this hypothesis, such that emotional intelligence acted as a moderator of emotional expression for male participants but not for female participants. That is, for the male participants, emotional expression proved growth facilitative only in the presence of high emotional intelligence. The authors made sense of this finding by postulating that because women generally report higher levels of emotional intelligence than men, it is possible the majority of the women in their study evidenced relatively high levels of emotional intelligence—hence the absence of a discernible moderation effect of emotional intelligence among the female participants. Nonetheless, Linley et al. cautioned that replication with a larger, more diverse sample is needed before definitive conclusions are drawn based on their study’s findings.

A second study aimed at distinguishing the role of emotional intelligence in the development of PTG was completed by Li, Cao, Cao, and Liu (2015) who explored the association between emotional intelligence and PTG using correlational analyses. Their sample

was composed of Chinese nursing students who reported childhood adversity, which the authors defined as maltreatment and exposure to traumatic stressors experienced during childhood. Data analyses revealed a curvilinear relationship between emotional intelligence and PTG.

Specifically, students with moderate levels of emotional intelligence demonstrated the greatest PTG, as compared to students with low or high levels of emotional intelligence. Li et al.

explained this somewhat curious finding by postulating that low levels of emotional intelligence impede PTG by way of inadequate emotion regulation skills, whereas high levels of emotional intelligence impede PTG by diminishing the extent to which traumatic events are experienced as distressing. In other words, highly emotionally intelligent individuals may be so emotionally adept that they suffer less from confronting traumas, which would imply they are less likely to experience PTG following trauma exposure. For as Li et al. explained, research has established that PTG “occurs only if the trauma has been sufficiently upsetting to drive the survivor to (positive) meaning-making of the negative event” (p. 330).

Taken together, these two studies suggest emotional intelligence is involved in the PTG process (Li et al., 2015; Linley et al., 2011). Nevertheless, not only do they provide a less than comprehensive picture of the nature of this involvement, but also they are characterized by a number of concerning limitations—most notably small convenience samples and cross-sectional research designs. Further, neither of these studies were executed using samples composed of cancer survivors. So the degree to which the findings can be extrapolated to that population is unclear.

Management of intrusive rumination. Research with relevance to management of intrusive rumination—the second factor demarcated by the functional-descriptive model as a precursor to deliberate rumination—although by no means plentiful, is more widely available

than that associated with the first factor. Generally speaking, this research falls into two categories, that which has uncovered a positive association between intrusive rumination that occurs immediately after experience of a traumatic event and PTG, and that which has uncovered a negative association between intrusive rumination that persists beyond the immediate aftermath of a traumatic event and PTG. That is, it appears the nature of the association between intrusive rumination and PTG depends on the timing of the rumination (Cann, Calhoun, Tedeschi, & Solomon, 2010).

Immediate intrusive rumination. In regards to the first body of findings, several studies have determined that intrusive rumination, when measured in the immediate aftermath of a traumatic event, is positively predictive of later PTG (Cann et al., 2010; Hallam & Morris, 2014; Taku, Cann, Tedeschi, & Calhoun, 2009; Taku, Cann, Tedeschi & Calhoun, 2015). For instance, Cann et al. (2010) explored the relationships between PTG and intrusive rumination among a sample of 118 college students, all of whom reported having experienced a “series of traumatic or highly stressful events” (p. 154) within the last three years. Per Cann et al., immediate intrusive rumination was defined as that which participants experienced within three weeks of their trauma exposure. Data was analyzed through means of regression analyses. Results revealed that the intrusive rumination participants experienced in the three weeks following their trauma exposure served as a significant, positive predictor of current PTG levels.

Taku et al. (2009) undertook a similar study. Specifically, they examined the role of intrusive rumination in the PTG process across both US and Japanese samples. In contrast to Cann et al. (2010), however, they defined immediate intrusive rumination more broadly, describing it as the brand of intrusive rumination that occurs “soon after” (p. 132) one’s trauma experience. For the majority of Taku et al.’s participants—both American and Japanese—the

time elapsed since the traumatic event was between one and five years. Again, regression was the primary method of data analysis. Like Cann et al., Taku et al. determined that intrusive rumination soon after the event significantly predicted PTG, meaning that the greater participants' intrusive rumination immediately following their trauma exposure, the greater their PTG at the time of study completion. Interestingly, this finding held regardless of participants' country of origin.

Lastly, Taku et al. (2015) investigated the role of core beliefs, intrusive rumination, and deliberate rumination in the PTG process using a sample of 314 Japanese undergraduate students who survived the Great East Japan Earthquake of 2011. For their purposes, immediate intrusive rumination was characterized as that which occurred “during the weeks immediately after” (p. 565) the earthquake. Consistent with Cann et al.'s (2010) and Taku et al.'s (2009) findings, regression analyses showed that immediate intrusive rumination operated as a significant positive predictor of participants' current PTG levels.

Per Taku et al. (2009), such findings are consistent with the functional-descriptive model (Tedeschi & Calhoun, 2004). As they explained, “intrusive rumination in the aftermath of a traumatic event can be regarded as an indication that the event had a significant impact” (Taku et al., 2009, p. 130), which is a prerequisite for PTG according to the functional-descriptive model. The absence of intrusive rumination directly following a traumatic event, on the other hand, likely indicates that the event did not prove sufficiently disruptive to one's pre-trauma schema to incite the need to engage in the meaning-making and schema reshaping that constitute the core of the PTG process (Cann et al., 2010; Cann et al., 2011).

Recent intrusive rumination. Conversely, researchers also have demonstrated that intrusive rumination that occurs some time (i.e., two months or longer) after experience of a

traumatic event, as opposed to in the event's immediate aftermath, is negatively associated with PTG (Stockton et al., 2011; Zhang, Yan, Du, & Liu, 2013), as well as positively associated with distress (Cann et al., 2011; Kolokotroni, Anagnostopoulos, & Tsikkinis, 2014; Taku, Calhoun, Cann, & Tedeschi, 2008; Triplett, Tedeschi, Cann, Calhoun, & Reeve, 2012; Zhang et al., 2013). One such study, which was detailed previously, was completed by Stockton et al. (2011) and centered on comparison of the association between recent intrusive rumination (i.e., within the last seven days) and PTG with the association between recent deliberate rumination (i.e., within the last seven days) and PTG among a sample of 212 participants recruited from online trauma support groups. The types of trauma experiences reported by participants were varied and included bereavement, cancer, rape, and sexual abuse. Average length of time since the trauma was 4.5 years. Through means of correlational analyses, Stockton et al. (2011) determined that the association between recent intrusive rumination and PTG was negative. That is, the greater the recent intrusive rumination participants reported experiencing, the lower their level of PTG—a finding which suggests that failure to adequately manage intrusive rumination in the aftermath of a traumatic event may impede derivation of PTG from that event. This is further supported by Stockton et al.'s finding that the positive association between recent deliberate rumination and PTG held only in the absence of recent intrusive rumination.

Similarly, Taku et al. (2008) explored the impact of rumination—both intrusive and deliberate—on PTG using a sample of bereaved Japanese university students. Their sample was sizable, consisting of 445 Japanese undergraduate students, all of whom selected a bereavement as their most traumatic/stressful life experience. Length of time since the loss ranged from two months to more than five years, with nearly half of the participants reporting that their loss occurred within the last one to four years. In contrast to the majority of the studies outlined

above, Taku et al. employed structural equation modeling to analyze their data, comparing three hypothesized models, each of which was derived from relevant theory and related research. According to the model that demonstrated the best fit, the greater the intrusive rumination participants reported engaging in “soon after” (p. 435) their loss, the greater deliberate rumination they reported engaging in at time of study completion. Alternatively, the greater the intrusive rumination the bereaved reported engaging in “recently” (p. 435), the higher their current distress levels. Subsequently, the authors concluded that in instances in which intrusive rumination persists long after experience of a traumatic event, distress—as opposed to PTG—is the expectable outcome.

In other words, it appears that when intrusive rumination is still detectable long after the traumatic event has passed, lower levels of PTG and higher levels of distress can be expected. Again, this is congruent with the functional-descriptive model, which purports that the intrusive rumination that inevitably arises immediately following experience of a traumatic event must ultimately be managed so that the deliberate rumination from which PTG ensues can commence (Tedeschi & Calhoun, 2004). As such, it is now widely understood that enduring intrusive rumination is best regarded as evidence of a failure to “deal constructively with the challenges brought on by the traumatic experience” (Cann et al. 2010, p. 163) via deliberate rumination.

Intrusive rumination summary. When considered together, these two bodies of literature indicate that management of intrusive rumination is an essential element in the PTG process. After all, if intrusive rumination immediately following experience of a traumatic event is positively associated with later PTG, while intrusive rumination that persists beyond the immediate aftermath of a traumatic event is negatively associated with PTG, this would imply that the largely unavoidable intrusive rumination that occurs immediately after a traumatic event

must be managed if PTG is to be realized. This concept has not been directly examined, however, nor has it been explored in the context of deliberate rumination, which, per the functional-descriptive model, is the mechanism that management of intrusive rumination immediately facilitates.

Furthermore, the literature pertaining to the management of intrusive rumination-PTG association is not without limitation. For instance, the vast majority of the studies have been cross-sectional in nature, thereby precluding detection of potential causal relationships. Additionally, retrospective measurement of the intrusive rumination that occurs in the immediate aftermath of the traumatic event has been the norm, as has been reliance on convenience, rather than cancer survivor, samples. Lastly, the time frames used to delineate immediate and enduring intrusive rumination vary widely across studies, calling into question exactly how these two variations of intrusive rumination are best defined. As such, adjuvant research on the subject is warranted.

Goal disengagement. Similar to emotional intelligence, research on goal disengagement—the third and final factor recognized by the functional-descriptive model as a precursor to deliberate rumination—is largely nonexistent (Tedeschi & Calhoun, 2004). In fact, my review of the relevant literature failed to uncover a single empirical study that directly investigated goal disengagement in the context of PTG. Rather, it appears the preponderance of the work that has been completed in the area has been theoretical in nature (Calhoun & Tedeschi, 2006; Joseph & Linley, 2005; Tedeschi, 1999). Nevertheless, three studies were uncovered concerning the general shift in goals that oftentimes transpires in the process of PTG development. Seeing as valuable extrapolations regarding the association between goal disengagement and PTG can be drawn from these studies, all three will now be discussed in turn.

In an effort to distinguish the extent to which goal change contributes to the onset of PTG Ransom, Sheldon, and Jacobsen (2008) explored goal change among a sample of 83 individuals with Stages 0-III breast or prostate cancer. They had participants complete a measure of personal life goals both before and after receiving radiotherapy. At time two—that is, after receiving radiotherapy—participants completed a measure of PTG as well. Data analyses revealed two interesting findings. First, between time one and time two participants “showed an actual shift toward a more intrinsic goal orientation” (Ransom et al., 2008, p. 815), meaning that their reported life goals became less extrinsic and more intrinsic in nature. Second, change in goal orientation significantly predicted PTG. Specifically, the more prominent the shift in participants’ goal orientation from extrinsic to intrinsic across their course of radiotherapy, the greater their PTG. Subsequently, the authors concluded their results suggest that clinicians aiming to facilitate PTG in patients should incorporate a focus on goal change into their therapeutic endeavors.

The second and third studies that were uncovered with relevance to goal disengagement involve factor analysis of the Post Traumatic Growth Inventory (PTGI; Tedeschi and Calhoun, 1996), a theoretically grounded self-report measure used to assess positive change following a trauma or major life crisis. Of all of the PTG inventories in existence, the PTGI is the most widely used and is generally regarded as the gold standard of PTG assessment (Purc-Stephenson, 2014). In the process of developing the scale, Tedeschi and Calhoun (1996) administered the PTGI to 604 undergraduate students—199 men and 405 women—and then used principal components analysis to factor analyze the test items. Five factors emerged, one of which they titled New Possibilities. Review of the items that load on this factor reveal that the factor primarily taps the goal changes presumed to accompany PTG. Indeed, examples of New

Possibilities items include “I developed new interests” and “I established a new path for my life.” Tedeschi and Calhoun determined that, of the five factors they uncovered, the New Possibilities factor accounted for 16% of the variance in PTGI scores, making it the second most powerful of the five factors.

Purc-Stephenson (2014) set out to replicate the five-factor structure of the PTGI among a sample of persons diagnosed with chronic diseases. Eight-hundred and forty-five participants were included in total, 301 of whom had received an arthritis diagnosis and 544 of whom had received a diagnosis of irritable bowel syndrome (IBS). A series of confirmatory factor analyses were employed to test Tedeschi and Calhoun’s (1996) five-factor PTGI model. Consistent with Tedeschi and Calhoun’s previous findings, results revealed that the five-factor model proved the best-fitting when compared to four alternative models, as well as that New Possibilities was the second most powerful of the five factors (Purc-Stephenson, 2014). Consequently, Purc-Stephenson contended his results provide strong evidence to suggest that PTG is composed of five related dimensions—one of which is New Possibilities—and that researchers should rely on these five dimensions when describing the construct “in relation to other psychological outcomes” (p. 16).

When regarded in tandem, Tedeschi and Calhoun’s (1996) and Purc-Stephenson’s (2014) studies suggest that goal change—as captured by the factor titled New Possibilities—is an element of PTG. Such an assertion is further supported by Ransom et al.’s (2008) demarcation of goal shift as a significant predictor of PTG. Accordingly, given that goal disengagement is integral to goal change (Wrosch, Scheier, Miller, Schulz, & Carver, 2003), it seems reasonable to conclude that goal disengagement is likely involved in the PTG process as well. Nonetheless, like all of the studies outlined above, these three studies are not without flaw, particularly in

regards to the samples that were used. For example, Ransom et al.'s sample size was relatively modest and non-diverse, such that the generalizability of their findings—especially across cultures—is questionable. Further, the study would have been strengthened had Ransom et al. included a non-cancer control group as part of their research design. Correspondingly, both Tedeschi and Calhoun and Purc-Stephenson relied on convenience samples and had considerably more female than male participants. Therefore, similar to the research on emotional intelligence and management of intrusive rumination, additional research on goal disengagement is required before any firm conclusions regarding the role of goal disengagement in the PTG process can be offered.

Summary of precursors to deliberate rumination. In sum, limited research is available on the association between emotional intelligence, management of intrusive rumination, goal disengagement, and PTG and, generally speaking, this research indicates that all three variables are involved in the process of PTG (Li et al., 2015; Linley et al., 2011; Purc-Stephenson, 2014; Ransom et al., 2008; Stockton et al., 2011; Tedeschi & Calhoun, 1996). Nevertheless, far more research is needed. For not only is the minimal research that is available characterized by a range of limitations, as detailed previously, but also—perhaps even more importantly—none of the proposed precursors have been studied in the context of deliberate rumination. In other words, although the functional-descriptive model presumes that emotional intelligence, management of intrusive rumination, and goal disengagement exert their influence on PTG through means of deliberate rumination (Tedeschi & Calhoun, 2004), this connection has been entirely overlooked thus far in the research arena. It is this oversight the proposed study intends to rectify.

Conclusion and Potential Implications

In closing, the preceding review makes a case for a new line of research focused on the process of PTG development among cancer survivors, in general, and the three factors theoretically proposed to instigate the deliberate rumination responsible for engendering PTG among cancer survivors, in particular. These factors include emotional intelligence, management of intrusive rumination, and goal disengagement (Tedeschi & Calhoun, 2004). The potential implications of this line of research are many. For instance, the component of the functional-descriptive model involving the factors immediately preceding deliberate rumination in the PTG process has not yet been examined empirically. Thus, the proposed study has the potential to strengthen the scientific rigor of the model, thereby increasing confidence in the functional-descriptive model and the picture of PTG that it provides.

Additionally, given the evidence that suggests emotional intelligence (Schutte, Malouff, & Thorsteinsson, 2013), management of intrusive rumination (Campbell, Labelle, Bacon, Faris, & Carlson, 2012), and goal disengagement (Vohs, Park, & Schmeichel, 2013) are each one malleable, execution of the proposed study would serve to satisfy Connerty and Knott's (2013) call to redirect PTG research away from non-modifiable facilitators of PTG, such as socio-demographic and medical variables, to modifiable facilitators—the only facilitators worth targeting in PTG interventions. Finally, and of greatest import, understanding of the factors responsible for inciting the deliberate rumination from which PTG ensues would enable clinicians to develop more potent PTG interventions. Interventions that, if judiciously implemented, would permit greater numbers of those who survive cancer to extract growth from the cancer experience.

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Appendix B – Informed Consent for Participants (Offline Version)

Study Title: Personal Growth Following Cancer

Study Purpose and Rationale

The purpose of this research project is to examine how people grow personally as a result of surviving cancer.

Inclusion/Exclusion Criteria

To be eligible to participate in this study, you must 1) have received treatment for cancer of any type, 2) have completed all cancer treatment (except hormone treatments like tamoxifen or femera) a minimum of two months and a maximum of five years prior to study participation, and 3) be 18 years of age or older

Participation Procedures and Duration

For this project, you will be asked to complete a series of questionnaires assessing demographic information, cancer-related information (e.g., cancer type, cancer stage, type of cancer treatment received), personal growth, thinking styles, emotion management, and goal setting. The questionnaires should take approximately 30 minutes to complete.

Data Confidentiality or Anonymity

Data collected during this study will remain confidential and no identifying information such as names will appear in any publication or presentation of the data.

Storage of Data

Informed consent documents and survey responses will be stored in a locked cabinet at the IUH Ball Memorial Cancer Center. No participant names or addresses will be taken off Cancer Center premises. All information collected via computer will be entered into a software program and stored on the researcher's password-protected computer. None of this will have any information that identifies any participant. Collected data will be kept for an indefinite amount of time for the purpose of future research analyses. Only members of the research team will have access to the data.

Risks or Discomforts

It is possible participation in this study will create minor emotional discomfort, as you will be asked to answer questions about a difficult experience in your life (i.e., cancer). Further, loss of confidentiality is also possible. However, numerous precautions are being taken to protect confidentiality (see above under "Storage of Data"). The potential risks associated with participation in this study are not expected to exceed the threshold of minimal risk.

Who to Contact Should You Experience Any Negative Effects from Participating in this Study

Should you experience any feelings of distress, please contact Dr. Donald Nicholas at 765-285-8040 to be connected to counseling services. Such services will be provided by the IUH Ball Memorial Cancer Center counseling staff at the Cancer Center at no cost to participants.

Benefits

There are no perceived benefits for participating in this study.

Voluntary Participation

Your participation in this study is completely voluntary and you are free to withdraw your permission at anytime for any reason without penalty or prejudice from the investigator.

IRB Contact Information

For questions regarding your rights as a research subject, please contact the Director, Office of Research Integrity, Ball State University, Muncie, IN 47306, (765) 285-5070 or at irb@bsu.edu.

Study Title: Personal Growth Following Cancer

Consent

I, _____, agree to participate in this research project entitled, “Posttraumatic Growth Following Cancer: The Influence of Emotional Intelligence, Management of Intrusive Rumination, and Goal Disengagement as Mediated by Deliberate Rumination.” I have had the study explained to me and my questions have been answered to my satisfaction. I have read the description of this project and give my consent to participate. I understand that I will receive a copy of this informed consent form to keep for future reference.

To the best of my knowledge, I meet the inclusion/exclusion criteria for participation (described on the previous page) in this study.

Participant’s Signature

Date

Researcher Contact Information

Principal Investigator:

Katie Rider, M.A.
Counseling Psychology
Ball State University
Muncie, IN 47306
Telephone: (765)285-8040
Email: karider@bsu.edu

Faculty Supervisor:

Dr. Donald Nicholas
Counseling Psychology

Ball State University
Muncie, IN 47306
Telephone: (765)285-8040
Email: dnichola@bsu.edu

Appendix C – Informed Consent for Participants (Online Version)

Study Title: Personal Growth Following Cancer

Study Purpose and Rationale

The purpose of this research project is to examine how people grow personally as a result of surviving cancer.

Inclusion/Exclusion Criteria

To be eligible to participate in this study, you must 1) have received treatment for cancer of any type, 2) have completed all cancer treatment (except hormone treatments like tamoxifen or femera) a minimum of two months and a maximum of five years prior to study participation, and 3) be 18 years of age or older

Participation Procedures and Duration

For this project, you will be asked to complete a series of questionnaires assessing demographic information, cancer-related information (e.g., cancer type, cancer stage, type of cancer treatment received), personal growth, thinking styles, emotion management, and goal setting. The questionnaires should take approximately 30 minutes to complete.

Data Confidentiality or Anonymity

Data collected during this study will remain confidential and no identifying information such as names will appear in any publication or presentation of the data.

Storage of Data

Informed consent documents and survey responses will be stored in a locked cabinet at the IUH Ball Memorial Cancer Center. No participant names or addresses will be taken off Cancer Center premises. All information collected via computer will be entered into a software program and stored on the researcher's password-protected computer. None of this will have any information that identifies any participant. Collected data will be kept for an indefinite amount of time for the purpose of future research analyses. Only members of the research team will have access to the data.

Risks or Discomforts

It is possible participation in this study will create minor emotional discomfort, as you will be asked to answer questions about a difficult experience in your life (i.e., cancer). Further, loss of confidentiality is also possible. However, numerous precautions are being taken to protect confidentiality (see above under "Storage of Data"). The potential risks associated with participation in this study are not expected to exceed the threshold of minimal risk.

Who to Contact Should You Experience Any Negative Effects from Participating in this Study

Should you experience any feelings of distress, please contact Dr. Donald Nicholas at 765-285-8040 to be connected to counseling services. Such services will be provided by the IUH Ball Memorial Cancer Center counseling staff at the Cancer Center at no cost to participants.

Benefits

There are no perceived benefits for participating in this study.

Voluntary Participation

Your participation in this study is completely voluntary and you are free to withdraw your permission at anytime for any reason without penalty or prejudice from the investigator.

IRB Contact Information

For questions regarding your rights as a research subject, please contact the Director, Office of Research Integrity, Ball State University, Muncie, IN 47306, (765) 285-5070 or at irb@bsu.edu.

Study Title: Personal Growth Following Cancer

Consent

By clicking the “I consent” button below, I agree to participate in this research project entitled, “Posttraumatic Growth Following Cancer: The Influence of Emotional Intelligence, Management of Intrusive Rumination, and Goal Disengagement as Mediated by Deliberate Rumination.” I have had the study explained to me and my questions have been answered to my satisfaction. I have read the description of this project and give my consent to participate. To the best of my knowledge, I meet the inclusion/exclusion criteria for participation in this study.

Researcher Contact Information

Principal Investigator:

Katie Rider, M.A.
Counseling Psychology
Ball State University
Muncie, IN 47306
Telephone: (765)285-8040
Email: karider@bsu.edu

Faculty Supervisor:

Dr. Donald Nicholas
Counseling Psychology
Ball State University
Muncie, IN 47306
Telephone: (765)285-8040
Email: dnichola@bsu.edu

Appendix D – Recruitment Letter

Hello,

We are writing to ask you to participate in an important study of how people cope with cancer. Everyone who completes the study will be entered into a drawing to receive one of ten \$25 Visa gift cards. This drawing will occur once the study is finished (probably about August 1, 2017) and winners will be informed via mail or email

This study is being done by the cancer counseling staff from Ball State University. We have worked at the IU Health Ball Memorial Cancer Center providing services to patients and families for many years and serve as a valuable part of the Cancer Center team.

The purpose of this study is to learn more about how people react to their experiences with cancer.

If you decide to participate, you will be asked to fill out 5 questionnaires that ask you about

- yourself (your age, gender, education, cancer type, cancer stage, cancer treatments, etc.)
- how cancer has affected you or how you have responded to having cancer (both the good and bad!)
- your thinking styles
- how you manage your emotions, and
- how you set goals.

The questionnaires should take about 30 minutes to complete.

You can participate in the study in one of two ways:

- **On the internet via computer** -- simply visit the following website to complete the questionnaires online: *link here*.
- **By completing the questionnaires by hand** -- please contact the primary researcher, Katie Rider, at *phone number here* to request that a packet of the questionnaires be mailed to you.

Thank you in advance for your willingness to participate in this important study. Should you have any questions about this study, please contact the primary researcher, Katie Rider, by phone (*phone number here*) or email (karider@bsu.edu).

Best wishes and good health to you in the coming year!

Sincerely,

Katie Rider Signature

Dr. Nicholas Signature

Contact Information

Appendix E – Recruitment Email

Email Subject Line: Participants Needed for Cancer Survivor Study

Hello,

I am seeking participants for a study on personal growth following the experience of cancer. You can participate in this study by clicking on the following link: *link here*.

In this study, you will complete a series of questionnaires assessing demographic information, cancer-related information (e.g., cancer type, cancer stage, type of cancer treatment received), personal growth, thinking styles, emotion management, and goal setting. The questionnaires should take approximately 30 minutes to complete.

Qualifications for participation: In order to participate in this study, you must 1) be at least 18 years of age at the time of the study, 2) have received treatment for cancer of any type, and 3) have completed all cancer treatment (except hormone treatments like tamoxifen or femera) a minimum of two months and a maximum of five years prior to study participation.

All individuals who complete the study and provide their email address will be entered into **a drawing to receive one of 10 \$25 Visa gift cards**. This random drawing will occur once data collection is complete (anticipated completion date August 1, 2017) and winners will be informed via email.

Should you have any questions about this study, please email Katie at karider@bsu.edu.

Thanks so much!

Katie Rider, MA
Doctoral Student
Donald Nicholas, PhD
Faculty Advisor
Counseling Psychology and Guidance Services
Ball State University
Muncie, IN 47306

Appendix F – Thank-You Reminder Letter

Dear Cancer Survivor,

Last week, we mailed you a letter asking for your help with a study about personal growth following the experience of cancer.

If you have already completed the questionnaires, please accept our sincere thanks. If not and you would be willing to participate, please consider completing the questionnaires as soon as possible by visiting the following link: *link here*. We are especially grateful for your help with this important study.

If you if you have any questions, or would prefer to receive a paper copy of the questionnaires, please contact Katie Rider by phone (*phone number here*) or email at karider@bsu.edu

Also, don't forget that your completion of this study will qualify you for a **drawing to receive one of 10 \$25 Visa gift cards**! This random drawing will occur once data collection is complete (anticipated completion date August 1, 2017) and winners will be informed via mail or email.

Many Thanks,

Katie Rider, MA
Doctoral Student
Donald Nicholas, PhD
Faculty Advisor
Counseling Psychology and Guidance Services
Ball State University
Muncie, IN 47306

Appendix G – Follow-Up Reminder

Dear Cancer Survivor,

About three weeks ago, we sent you a survey request asking for your response to a series of questionnaires about personal growth following cancer. As you know firsthand, cancer is an extremely difficult experience. Our hope is that this study will shed light on how healthcare providers can better go about assisting cancer patients not only in surviving cancer, but also in benefiting from it.

We are writing again because of the importance of your participation. It is only by hearing from a large number of cancer survivors that we can be sure the results of the study prove accurate and useful. Thus, if you have not done so already, we hope that you will fill out the questionnaires very soon.

Simply complete the questionnaires online here: *link here*. Your responses are voluntary and will be kept confidential. Your names are not on our mailing list, and your answers will never be associated with your address in any way. If you have questions about this study, or would prefer to receive a paper copy of the questionnaires, please contact Katie Rider by phone (*phone number here*) or email at karider@bsu.edu.

As a token of our appreciation, individuals who complete this study will be entered into a **drawing to receive one of 10 \$25 Visa gift cards**. This random drawing will occur once data collection is complete (anticipated completion date August 1, 2017) and winners will be informed via mail or email.

Many Thanks,

Katie Rider, MA
Doctoral Student
Donald Nicholas, PhD
Faculty Advisor
Counseling Psychology and Guidance Services
Ball State University
Muncie, IN 47306

Appendix H – Final Reminder Letter

Dear Cancer Survivor,

In recent weeks, our research team has asked you to let us know about your experience of personal growth following cancer. We plan to start summarizing results later this month, so we hope that all questionnaires will be completed by then.

You can help us by completing the questionnaires online here: *link here*.

More and more people are surviving the terrible experience of cancer. As such, it is becoming increasingly important to understand how cancer survivors can be helped not only to survive cancer, but also to benefit personally from it. We hope that this study will provide insights on this topic and lead to healthcare system changes designed to facilitate the personal growth of cancer patients.

This is the last contact we will be sending you about this study, as we are bringing this phase of the project to a close. A summary of preliminary results from this study will be available on our website [*insert link here*] by August. If you have any questions about this study, please contact Katie Rider by phone (*phone number here*) or email at karider@bsu.edu.

Also, don't forget that to demonstrate our gratitude to those who choose to take part, individuals who complete this study will be entered into a **drawing to receive one of 10 \$25 Visa gift cards**. This random drawing will occur once data collection is complete (anticipated completion date August 1, 2017) and winners will be informed via mail or email.

Many thanks for considering our request.

Respectfully and with appreciation,

Katie Rider, MA
Doctoral Student
Donald Nicholas, PhD
Faculty Advisor
Counseling Psychology and Guidance Services
Ball State University
Muncie, IN 47306

Appendix I – Debriefing for Participants (Offline Version)

Thank you for your participation in this study. The purpose of this study is to look at how different emotion management strategies, thinking styles, and goal setting approaches influence whether or not cancer survivors achieve personal growth as a result of their experience with cancer. Now that we have your responses recorded, we are going to look at the relationships among your preferred emotion management strategy, thinking style, and goal setting approach and your level of cancer-induced personal growth.

It is our hope to be able to use this information to better understand how healthcare providers can go about assisting cancer patients not only in surviving the cancer experience, but also in benefiting from it.

If you completed and returned all of the enclosed questionnaires, you will be entered into a random drawing to win one of 10 \$25 Visa gift cards. This random drawing will occur once data collection is complete (anticipated completion date August 1, 2017) and winners will be informed via mail or email.

If you wish to learn about the results of this study, a summary of the preliminary results will be available on our website [*insert link here*] by August.

Thank you for your time and for your participation in this study. It is very much appreciated!

Researcher Contact Information

Principal Investigator:

Katie Rider, MA
Doctoral Student
Counseling Psychology and Guidance Services
Ball State University
Muncie, IN 47306
Telephone: (614)-203-9535
Email: karider@bsu.edu

Faculty Advisor:

Donald Nicholas, PhD
Professor & Director of Doctoral Training
Counseling Psychology and Guidance Services
Ball State University
Muncie, IN 47306
Telephone: (765)285-8040
Email: dnichola@bsu.edu

Appendix J – Debriefing for Participants (Online Version)

Thank you for your participation in this study. The purpose of this study is to look at how different emotion management strategies, thinking styles, and goal setting approaches influence whether or not cancer survivors achieve personal growth as a result of their experience with cancer. Now that we have your responses recorded, we are going to look at the relationships among your preferred emotion management strategy, thinking style, and goal setting approach and your level of cancer-induced personal growth.

It is our hope to be able to use this information to better understand how healthcare providers can go about assisting cancer patients not only in surviving the cancer experience, but also in benefiting from it.

Your completion of this study makes you eligible to be entered into a random drawing to win one of 10 \$25 Visa gift cards. To enter yourself into this drawing, please type your email address into the box below. This will allow a researcher to contact you should you win.

If you wish to learn about the results of this study, a summary of the preliminary results will be available on our website [*insert link here*] by August.

Thank you for your time and for your participation in this study. It is very much appreciated!

Researcher Contact Information**Principal Investigator:**

Katie Rider, MA
Doctoral Student
Counseling Psychology and Guidance Services
Ball State University
Muncie, IN 47306
Telephone: (614)-203-9535
Email: karider@bsu.edu

Faculty Advisor:

Donald Nicholas, PhD
Professor & Director of Doctoral Training
Counseling Psychology and Guidance Services
Ball State University
Muncie, IN 47306
Telephone: (765)285-8040
Email: dnichola@bsu.edu

Appendix K – Demographics and Health Questionnaire

Demographics and Health Questionnaire

Please answer the following questions as honestly as possible.

1. What is your age? _____
2. What is your sex?
 - a. Male
 - b. Female
 - c. Other
3. What is your ethnicity?
 - a. American Indian or Alaska Native
 - b. Asian
 - c. Black or African American
 - d. Native Hawaiian or Other Pacific Islander
 - e. White
 - f. Hispanic/Latino/Latina
 - g. Other
4. What is the highest degree or level of school you have completed?
 - a. No schooling completed
 - b. Nursery school to 8th grade
 - c. Some high school, no diploma
 - d. High school graduate, diploma or the equivalent (for example: GED)
 - e. Some college credit, no degree
 - f. Trade/technical/vocational training
 - g. Associate degree
 - h. Bachelor's degree
 - i. Master's degree
 - j. Professional degree
 - k. Doctorate degree
5. What is your marital status?
 - a. Single, never married
 - b. Married or domestic partnership
 - c. Widowed
 - d. Divorced
 - e. Separated
6. Employment Status: Are you currently...?
 - a. Employed for wages
 - b. Out of work and looking for work

- c. Out of work but not currently looking for work
- d. A homemaker
- e. A student
- f. Retired
- g. Unable to work

7. What type(s) of cancer were you diagnosed with? (check all that apply)

- Adrenal cancer
- Anal cancer
- Bile duct cancer
- Bladder cancer
- Bone cancer
- Brain cancer
- Breast cancer
- Cervical cancer
- Colon/rectum cancer
- Endometrial cancer
- Esophagus cancer
- Eye cancer
- Gallbladder cancer
- Gastrointestinal cancer
- Gestational trophoblastic disease
- Hodgkin disease
- Kaposi sarcoma
- Kidney cancer
- Laryngeal and hypopharyngeal cancer
- Leukemia
- Liver cancer
- Lung cancer
- Lymphoma
- Malignant mesothelioma
- Multiple myeloma
- Myelodysplastic syndromes
- Nasal cavity and paranasal sinus cancer
- Nasopharyngeal cancer
- Neuroblastoma
- Non-Hodgkin lymphoma
- Oral cavity and oropharyngeal cancer
- Osteosarcoma
- Ovarian cancer
- Pancreatic cancer
- Penile cancer
- Pituitary cancer
- Prostate cancer
- Retinoblastoma
- Rhabdomyosarcoma

- Salivary gland cancer
- Sarcoma (adult soft tissue cancer)
- Skin cancer
- Small intestine cancer
- Stomach cancer
- Testicular cancer
- Thymus cancer
- Thyroid cancer
- Uterine sarcoma
- Vaginal cancer
- Vulvar cancer
- Other (please list_____)
- Unknown

8. At the time of diagnosis, what was the stage of your cancer?

- a. Stage I
- b. Stage II
- c. Stage III
- d. Stage IV
- e. Stage V
- f. Unknown
- g. Don't remember

9. What type(s) of cancer treatment(s) did you receive? (check all that apply)

- a. Surgery
- b. Radiation
- c. Chemotherapy
- d. Hormone therapy (including shots and pills)
- e. None
- f. Other (please list_____)

10. How long has it been since you completed cancer treatment (NOT including hormonal therapy, such as Falsodex, Nolvadex, Arimidex, Femera, etc.)?

Years _____ Months _____

11. Based on what your doctors have told you, what is the current status of your cancer?

- a. In remission
- b. Cancer-free (currently there is no evidence of disease)
- c. Recurrence (cancer has come back)
- d. Metastatic Disease (cancer has spread to other parts of my body)
- e. I don't know

Appendix L – The Posttraumatic Growth Inventory

The Posttraumatic Growth Inventory (PTGI)

Instructions: Indicate for each of the statements below the degree to which this change occurred in your life as a result of your cancer, using the following scale.

0 = I did not experience this change as a result of my cancer.

1 = I experienced this change to a very small degree as a result of my cancer.

2 = I experienced this change to a small degree as a result of my cancer.

3 = I experienced this change to a moderate degree as a result of my cancer.

4 = I experienced this change to a great degree as a result of my cancer.

5 = I experienced this change to a very great degree as a result of my cancer.

Possible Areas of Growth and Change	0	1	2	3	4	5
1. I changed my priorities about what is important in life.						
2. I have a greater appreciation for the value of my own life.						
3. I developed new interests.						
4. I have a greater feeling of self-reliance.						
5. I have a better understanding of spiritual matters.						
6. I more clearly see that I can count on people in times of trouble.						
7. I established a new path for my life.						
8. I have a greater sense of closeness with others.						
9. I am more willing to express my emotions.						
10. I know better that I can handle difficulties.						
11. I am able to do better things with my life.						
12. I am better able to accept the way things work out.						
13. I can better appreciate each day.						
14. New opportunities are available which wouldn't have been otherwise.						
15. I have more compassion for others.						
16. I put more effort into my relationships.						
17. I am more likely to try to change things which need changing.						
18. I have a stronger religious faith.						
19. I discovered that I'm stronger than I thought I was.						
20. I learned a great deal about how wonderful people are.						
21. I better accept needing others.						

Appendix M – The Event Related Rumination Inventory

The Event Related Rumination Inventory (ERRI)

INTRUSIVE RUMINATION ITEMS TIME FRAME #1

Instructions: After an experience like cancer, people sometimes, but not always, find themselves having thoughts about their experience even though they don't try to think about it. Using the scale below, indicate for the following items how often, if at all, you had the experiences described *during the weeks immediately after receiving your cancer diagnosis*.

Not at all	Rarely	Sometimes	Often
0	1	2	3

1. I thought about the cancer when I did not mean to.	0	1	2	3
2. Thoughts about the cancer came to mind and I could not stop thinking about them.	0	1	2	3
3. Thoughts about the cancer distracted me or kept me from being able to concentrate	0	1	2	3
4. I could not keep images or thoughts about the cancer from entering my mind.	0	1	2	3
5. Thoughts, memories, or images of the cancer came to mind even when I did not want them.	0	1	2	3
6. Thoughts about the cancer caused me to relive my experience.	0	1	2	3
7. Reminders of the cancer brought back thoughts about my experience.	0	1	2	3
8. I found myself automatically thinking about what had happened.	0	1	2	3
9. Other things kept leading me to think about my cancer experience.	0	1	2	3
10. I tried not to think about the cancer but could not keep the thoughts from entering my mind.				

INTRUSIVE RUMINATION ITEMS TIME FRAME #2

Instructions: After an experience like cancer, people sometimes, but not always, find themselves having thoughts about their experience even though they don't try to think about it. Using the scale below, indicate for the following items how often, if at all, you had the experiences described *in the last few weeks*.

Not at all	Rarely	Sometimes	Often
0	1	2	3

1. I thought about the cancer when I did not mean to.	0	1	2	3
2. Thoughts about the cancer came to mind and I could not stop thinking about them.	0	1	2	3
3. Thoughts about the cancer distracted me or kept me from being able to concentrate	0	1	2	3
4. I could not keep images or thoughts about the cancer from entering my mind.	0	1	2	3
5. Thoughts, memories, or images of the cancer came to mind even when I did not want them.	0	1	2	3
6. Thoughts about the cancer caused me to relive my experience.	0	1	2	3
7. Reminders of the cancer brought back thoughts about my experience.	0	1	2	3
8. I found myself automatically thinking about what had happened.	0	1	2	3
9. Other things kept leading me to think about my cancer experience.	0	1	2	3
10. I tried not to think about the cancer but could not keep the thoughts from entering my mind.				

 DELIBERATE RUMINATION ITEMS

Instructions: After an experience like cancer, people sometimes, but not always, deliberately and intentionally spend time thinking about their experience. Using the scale below, indicate for the following items how often, if at all, you deliberately spent time thinking about the issues indicated *in the last few weeks*.

Not at all	Rarely	Sometimes	Often
0	1	2	3

1. I thought about whether I could find meaning from my cancer experience.	0	1	2	3
2. I thought about whether changes in my life have come from dealing with my cancer.	0	1	2	3
3. I forced myself to think about my feelings about my cancer experience.	0	1	2	3
4. I thought about whether I have learned anything as a result of my cancer experience.	0	1	2	3
5. I thought about whether the cancer has changed my beliefs about the world.	0	1	2	3
6. I thought about what the cancer might mean for my future.	0	1	2	3
7. I thought about whether my relationships with others have changed following my cancer experience.	0	1	2	3
8. I forced myself to deal with my feelings about the cancer.				
9. I deliberately thought about how the cancer had affected me.	0	1	2	3
10. I thought about the cancer and tried to understand what happened.	0	1	2	3

Appendix N – The Emotional Intelligence Scale

The Emotional Intelligence Scale (EIS)

Instructions: Indicate the extent to which each item applies to you using the following scale:

1 = *strongly disagree*

2 = *disagree*

3 = *neither disagree nor agree*

4 = *agree*

5 = *strongly agree*

	1	2	3	4	5
1. I know when to speak about my personal problems to others.					
2. When I am faced with obstacles, I remember times I faced similar obstacles and overcame them.					
3. I expect I will do well on most things I try.					
4. Other people find it easy to confide in me.					
5. I find it hard to understand the nonverbal messages of other people.*					
6. Some of the major events of my life have led me to re-evaluate what is important to me and what is not.					
7. When my mood changes, I see new possibilities.					
8. Emotions are one of the things that make my life worth living.					
9. I am aware of my emotions as I experience them.					
10. I expect good things to happen.					
11. I like to share my emotions with others.					
12. When I experience a positive emotion, I know how to make it last.					
13. I arrange events others enjoy.					
14. I seek out activities that make me happy.					
15. I am aware of the nonverbal messages I send to others.					
16. I present myself in a way that makes a good impression on others.					
17. When I am in a positive mood, solving problems is easy for me.					
18. By looking at their facial expression, I recognize the emotions people are experiencing.					
19. I know why my emotions change.					
20. When I am in a positive mood, I am able to come up with new ideas.					

	1	2	3	4	5
21. I have control over my emotions.					
22. I easily recognize my emotions as I experience them.					
23. I motivate myself by imagining a good outcome to tasks I take on.					
24. I compliment others when they have done something well.					
25. I am aware of the nonverbal messages others people send.					
26. When another person tells me about an important event in his or her life, I almost feel as though I have experienced this event.					
27. When I feel a change in emotions, I tend to come up with new ideas.					
28. When I am faced with a challenge, I give up because I believe I will fail.*					
29. I know what other people are feeling just by looking at them.					
30. I help other people feel better when they are down.					
31. I use good moods to help myself keep trying in the face of obstacles.					
32. I can tell how people are feeling by listening to the tone of their voice.					
33. It is difficult for me to understand why people feel the way they do. *					

*These items are reverse scored.

Appendix O - The Goal Adjustment Scale

The Goal Adjustment Scale (GAS)

Instructions: During their lives people cannot always attain what they want and are sometimes forced to stop pursuing the goals they have set. We are interested in understanding how you usually react when this happens to you. Using the scale below, please indicate the extent to which you agree or disagree with each of the following statements, as it usually applies to you.

1 = *strongly disagree*

2 = *disagree*

3 = *neutral*

4 = *agree*

5 = *strongly agree*

If I have to stop pursuing an important goal in my life . . .	1	2	3	4	5
1. It's easy for me to reduce my effort towards the goal.*					
2. I convince myself that I have other meaningful goals to pursue.					
3. I stay committed to the goal for a long time; I can't let it go.* (-)					
4. I start working on other new goals.					
5. I think about other new goals to pursue.					
6. I find it difficult to stop trying to achieve the goal.* (-)					
7. I seek other meaningful goals.					
8. It's easy for me to stop thinking about the goal and let it go.*					
9. I tell myself that I have a number of other new goals to draw upon.					
10. I put effort toward other meaningful goals.					

* Goal Disengagement subscale items

(-) = items reversed prior to computation