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ABSTRACT OF DISSERTATION

John M. Salsman

The Graduate School
University of Kentucky

2006

POSTTRAUMATIC GROWTH AND PTSD SYMPTOMATOLOGY
AMONG COLORECTAL CANCER SURVIVORS:
THE IMPACT OF EMOTIONAL EXPRESSION AND COGNITIVE PROCESSING

ABSTRACT OF DISSERTATION

A dissertation submitted in partial fulfillment of the
requirements for the degree of Doctor of Philosophy in the
College of Arts and Sciences
at the University of Kentucky

By
John M. Salsman

Lexington, Kentucky

Co-Directors: Dr. Michael A. Andrykowski, Professor of Behavioral Science,
and Dr. Charles R. Carlson, Professor of Psychology

Lexington, Kentucky

2006

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POSTTRAUMATIC GROWTH AND PTSD SYMPTOMATOLOGY AMONG COLORECTAL CANCER SURVIVORS: THE IMPACT OF EMOTIONAL EXPRESSION AND COGNITIVE PROCESSING

The experience of cancer can be understood as a psychosocial transition, producing both positive and negative outcomes. Psychological adjustment to cancer is often impacted by a number of dispositional, coping process, and social-environmental factors. Social-cognitive processing theory provides a framework for understanding the interaction of these factors and examining the differential paths predicting positive and negative psychosocial outcomes. Fifty-five post-treatment, colorectal cancer survivors (M=65.9 years old; SD=12.7), an average of thirteen months post-diagnosis, were recruited from a state cancer registry and completed baseline and three-month questionnaires assessing dispositional (openness to experience, emotional intelligence, social desirability), social-environmental (social support, social constraints), coping process (cognitive intrusions, cognitive rehearsal, emotional approach coping), and psychological adjustment variables (posttraumatic growth (PTG), posttraumatic stress disorder (PTSD) symptomatology, global mental health). Nine participants (16.4%) positively endorsed DSM-IV stressor criterion, and fifteen participants (27.3%) reported both high levels of PTG and PTSD symptomatology. Multiple regression analyses indicated cognitive processing (intrusions, rehearsal) was differentially predictive of psychological adjustment. That is, high cognitive intrusions predicted high PTSD symptomatology and high cognitive rehearsal predicted high PTG. Consistent with social-cognitive processing theory, high social constraints and high cognitive intrusions were associated with poorer mental health at the three month follow-up. Additional research is needed to further delineate the nature of cognitive processing, to understand the trajectory of PTG over time, and to identify additional dispositional and social-environmental variables conducive to better psychological adjustment for patients who are diagnosed with colorectal cancer.

KEYWORDS: Posttraumatic Growth, PTSD, Cognitive Processing, Emotional Processing, Cancer

John M. Salsman

October 9, 2006

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DISSERTATION

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This project would not have been possible without the guidance, help, and support of many individuals. First, I thank my dissertation co-chairs, Michael A. Andrykowski, Ph.D., and Charles R. Carlson, Ph.D. Their support, mentorship, and guidance throughout the various stages of this project were invaluable. I appreciate Michael's admonishments to "keep it simple" and his knowledge of the psychosocial oncology research literature. This allowed me to develop a research project of personal interest, to maintain my focus when feeling overwhelmed, and to complete a dissertation that should be of interest to other investigators of psychological adjustment among cancer patients. His influence on me has left an indelible mark as a researcher, and his work ethic is admirable. I also appreciate Charley's routine "check-ins," frequently asking about more than just the dissertation. This interest in my and my family's well-being has provided much-needed encouragement throughout my graduate career. He has provided quite the model for me as I learn how to balance professional and family obligations with integrity. It goes without saying, but Michael and Charley's impact extends far beyond my dissertation. I have been quite fortunate and really blessed to have them as mentors.

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Of course, this project could not have been completed without the participation of my research subjects. I appreciated their willingness to participate in this project and thoughtfully reflect upon their colorectal cancer experience. As I indicated in my conversations and correspondences with them, I hope this research will, ultimately, contribute to our understanding of how people cope with cancer so that we can facilitate better psychological adaptation and improve the quality of life among cancer survivors.

The past year has been quite challenging as I juggled internship, dissertation, and fatherhood, all while routinely commuting around 1000 miles on the weekend. I cannot begin to say enough about how meaningful the support of family and friends has been to Steph and me during this final stage of my doctoral training. There are so many individuals that really "stepped up" for us during this past year. We have been truly blessed and are so grateful. My deepest gratitude, of course, goes to my wife. She accepted the temporary role of single parent while remaining the primary bread winner at some personal cost for the past year. Her love, patience, and resilience have been admirable and inspiring. I used to joke that if she knew when we were married I would remain in graduate school for as long as I have, she would have renegotiated the prenup! Thankfully, we weathered the most demanding phase of this journey and are delighted to be a family again and excited about the next chapter of our lives.

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Chapter One

Introduction

Background

The experience of being diagnosed with, treated for, and surviving cancer can be stressful. Individuals are initially confronted with concerns regarding diagnosis and survival, then coping with the side effects of surgery and adjuvant treatment, and finally fears of a possible recurrence once treatments are complete. These negative sequelae can be particularly burdensome as patients and survivors experience increased levels of psychological distress (Bloom, 2002; Montgomery, Pocock, Titley, & Lloyd, 2003; Zabora, Brintzenhofesoc, Curbow, Hooker, & Piantadosi, 2001), symptoms of depression and anxiety (Deimling, Kahana, Bowman, & Schaefer, 2002; Gotay & Muraoka, 1998; McDaniel, Musselman, Porter, Reed, & Nemeroff, 1995; Spiegel, 1996), as well as pain, interpersonal challenges, feelings of loneliness (Halstead & Fernsler, 1994) and cancer-related health concerns such as worries about a recurrence or a second primary cancer (Deimling, Bowman, Sterns, Wagner, & Kahana, 2006). Prevalence rates of psychological distress range from 29.6% for gynecologic cancers to 43.4% for lung cancer (Zabora et al., 2001). Studies of women with early stage breast cancer reveal clinically significant levels of depression (7% to 46%) and anxiety (32% to 45%) (Gallagher, Parle, & Cairns, 2002; Omne-Ponten, Holmberg, Burns, Adami, & Bergstrom, 1992). These levels of distress underscore the negative effects of the cancer experience for many individuals.

Occasionally, the cancer experience has a traumatic quality that produces intrusive thoughts, avoidance behavior, and heightened arousability (Alter et al., 1996; Andrykowski, Cordova, Studts, & Miller, 1998; Epping-Jordan et al., 1999; Green et al., 1998; Manne, 1999; Koopman et al., 2002; Widows, Jacobsen, & Fields, 2000), a triad of symptom clusters that comprise posttraumatic stress disorder (PTSD; American Psychiatric Association, 2000). While the presence of PTSD symptoms is common among cancer patients and survivors (Greenberg, et al., 1994; Jacobsen et al., 1998; Kornblith, Herr, Ofman, Scher, & Holland, 1994; Levine, Eckhardt, & Targ, 2005; Mundy et al., 2000; Naidich & Motta, 2000; Smith et al., 1999), estimates vary from 0% to 32% regarding the incidence of a PTSD diagnosis following cancer (see Kangas,

Henry, & Bryant, 2002 for a review). Moreover, a diagnosis of PTSD is no more common among cancer survivors than among individuals without cancer (Palmer, Kagee, Coyne, & DeMichele, 2004). Overall disruptions in mood and psychological functioning, however, are common for those with cancer and are indicative of the stress associated with adjusting to the threat of cancer and the resulting negative sequelae.

In spite of the fact many cancer survivors report increased stress and poor adjustment, many survivors also report positive outcomes and periods of psychosocial growth after their diagnosis. Generally speaking, positive changes in response to stressful events have been identified in three broad domains (Taylor, 1983): 1) self-concept, 2) relationships with social networks, and 3) personal growth and life priorities. The term posttraumatic growth (PTG) was coined by Tedeschi and Calhoun (1995) to describe positive life changes following a stressful experience. These changes are often manifested through new possibilities, relating to others, personal strength, spiritual change, and appreciation of life (Tedeschi & Calhoun, 1996). PTG or stress-related growth has been observed in cases of bereaved parents (Polatinsky & Esprey, 2000), sexual assault (Burt & Katz, 1987; Frazier, Conlon, & Glaser, 2001), HIV infection (Schwartzberg, 1993), bereavement (Bower, Kemeny, Taylor, & Fahey, 1998; Calhoun & Tedeschi, 1989-90), natural disasters (Thompson, 1985), myocardial infarction (Affleck, Tennen, Croog, & Levine, 1987; Laerum, Johnsen, Smith, & Arnesen, 1991), violent crime victims (Peltzer, 2000), and cancer (Bellizzi & Blank, 2006; Collins, Taylor, & Skokan, 1990; Cordova, Cunningham, Carlson, & Andrykowski, 2001b; Fromm, Andrykowski, & Hunt, 1996; Manne et al., 2004; Petrie, Buick, Weinman, & Booth, 1999; Sears, Stanton, & Danoff-Burg, 2003; Taylor, 1983; Thornton & Perez, 2006; Widows, Jacobsen, Booth-Jones, & Fields, 2005). In cancer survivors specifically, indices of distress such as perceived stress (Sears et al., 2003), intrusive cognitions (Manne et al., 2004), and perceived life threat (Cordova et al., 2001b), have been predictive of higher levels of PTG. Similar to other traumatic events, the cancer experience can provide a catalyst for deriving meaning and growth from an otherwise stressful experience.

Although reports of benefits or psychological growth from the cancer experience have been documented, the veracity of these claims is occasionally questioned as researchers speculate about the potential for inflated claims of growth due to socially

desirable responding (Cohen, Cimboric, Armeli, & Hettler, 1998). For example, some cancer patients or survivors believe they *should* experience psychological growth from their experience and subsequently report such growth regardless of a personal experience of positive change or psychosocial benefits. Similarly, some cancer patients know thinking and talking positively about their cancer experience will elicit positive attention from others (Wilkinson & Kitzinger, 2000). Research addressing this question is relatively scarce. In a recent study of cancer survivors, there was no relationship between social desirability and reports of positive physical or psychosocial behavior change (Harper et al, in press). Thus, reports of positive psychosocial changes in response to the cancer experience are thought to be valid occurrences for cancer patients and survivors.

In sum, the experience of cancer is not a source of uniformly negative outcomes, rather it has the potential for both positive and negative sequelae. In fact, the experience of cancer can be understood as a psychosocial transition (Andrykowski, et al., 1996; Andrykowski, Brady, & Hunt, 1993; Parkes, 1971). This perspective emphasizes a broad conceptualization of adjustment, accounting for both positive and negative outcomes. Likewise, Tedeschi and Calhoun (2004) note that distress and growth may coexist, and in fact, elevated levels of initial distress are sometimes thought to be an essential factor in promoting subsequent growth. With the exception of a few studies (Antoni et al., 2001; Cordova, Cunningham, Carlson, & Andrykowski, 2001a; Sears et al., 2003), much of the research literature has failed to examine simultaneously both positive and negative outcomes in cancer patients and survivors. Similarly, only one study (Widows et al., 2005) has included an index of PTSD symptoms as well as a measure of PTG in describing how individuals adjust to their cancer diagnosis and treatment.

Interestingly, both PTSD and PTG have similar initial pathways. In fact, Calhoun and Tedeschi (1998) suggest that PTG often coexists with many of the symptoms of PTSD. Both PTG and PTSD occur in response to an initial, traumatic event or stressor that elicits heightened levels of psychological distress. Typically, this distress is characterized by unwanted, intrusive thoughts about the experience. According to the clinical and theoretical literature, some degree of distress is essential in providing a catalyst for growth (Edmonds & Hooker, 1992; Yalom & Lieberman, 1991), and rumination, specifically, may be a central cognitive process in facilitating PTG given its

associations with changes in beliefs, goals, behaviors, and identity (Epstein, 1990; Martin, Tesser, & McIntosh, 1993). Once individuals begin to process their trauma experience in a more deliberate, effortful manner, they are more likely to experience decreases in their distress levels and subsequent increases in their potential for PTG (Calhoun & Tedeschi, 1998). Finkel (1975) described “cognitive restructuring” of traumatic events occurring, in some cases, within 2 weeks to 4 months after the event, although the specific chronology of rumination with respect to the development of PTG has not been well-documented in the research literature.

Cognitive Processing

This process of rumination, while often considered a maladaptive response, is frequently characterized in more neutral terms as “cognitive processing.” Since traumatic events have the inherent ability to cause people to question beliefs and assumptions about themselves and the world (Janoff-Bulman, 1992), repeated confrontation with memories of the trauma may be useful in promoting healthy adaptation (Greenberg, 1995). Alternating cycles of intrusions (i.e., unwanted thoughts about and images of the traumatic event emerging into consciousness) and avoidance (i.e., efforts to avoid thinking about the traumatic event) are often considered essential elements of cognitive processing, and intrusions are indicative of incomplete cognitive processing (Horowitz, 1986). Creamer, Burgess, and Pattison (1992) provide support for cognitive processing theories in a study of office workers exposed to a multiple shooting. They note intrusion and avoidance mediate the link between exposure to trauma and development of psychological distress. Moreover, they suggest avoidance may impair processing during earlier stages of adjustment to a trauma but the relationships between avoidance and intrusions and between avoidance and distress weakens over time. Consistent with Horowitz’ (1986) theory, intrusions and avoidance are key elements in the cognitive processing of traumatic events.

Other researchers have also contributed to the development of cognitive processing theory. For example, Lepore (2001) has extended this theory by emphasizing the importance of the social environment in general and social constraints, more specifically. The social environment provides a context that can be either helpful or harmful to the cognitive processing of traumatic events. On one hand, social support may

provide greater opportunity to process and discuss stressor-related thoughts and feelings (Lepore & Helgeson, 1998). On the other hand, an unsupportive or constraining social environment (i.e., social constraints) may impede cognitive processing by discouraging processing of stressor-related thoughts and feelings and thus increasing psychological distress (Lepore & Helgeson, 1998). In addition to Lepore and Helgeson's (1998) work with prostate cancer survivors, support for the social cognitive processing model of adjustment to cancer has been found in research with breast cancer patients (Cordova et al., 2001a; Schmidt & Andrykowski, 2004), and in research with metastatic renal cell carcinoma and metastatic melanoma patients (Devine, Parker, Fouladi, & Cohen, 2003).

No gold standard exists for measuring cognitive processing, but the self-report scale frequently used is the Impact of Events Scale (IES; Horowitz, Wilner, & Alvarez, 1979). This 15-item measure consists of two subscales assessing the frequency of intrusive and avoidant cognitions during the past week associated with a specific stressor. Interestingly, the IES has been described as an index of cancer-related distress (Salsman, Pavlik, Boerner, & Andrykowski, 2004; Schwartz et al., 1998; Zakowski et al., 1997) as well as an index of cognitive processing (Cordova et al., 2001a; Cordova et al., 2001b; Devine et al., 2003; Manne et al., 2004; Manne, Glassman, & Hamel, 2000; Sears et al., 2003). Segerstrom, Stanton, Alden, and Shortridge (2003) have noted cognitive processing is one of many forms of repetitive thought and has been associated with positive outcomes such as increased growth and meaning, as well as negative outcomes such as prolonged distress. They suggest a clearer understanding of repetitive thought and its association with relevant outcomes can occur by assessing valence and purpose. As already noted, respondents rate items of the IES based upon frequency of intrusive and avoidant cognitions rather than valence of intrusive and avoidant cognitions (e.g., degree of distress elicited by a particular cognition). In order to enhance understanding of cognitive processing, an index assessing valence as well as frequency of cognitions might prove informative.

Emotional Processing

Related to both the healthy adjustment to the cancer experience in general and cognitive processing in particular is the role of emotional processing. Emotional processing occurs through active attempts to acknowledge and understand emotions

(Stanton, Kirk, Cameron, & Danoff-Burg, 2000). Also described as emotional approach coping (EAC), it consists of emotional identification through increased self-awareness of one's own emotional states, emotional processing by exploring meanings and attempting to understand one's emotions, and emotional expression through intrapersonal and interpersonal forms (Stanton, Kirk, et al., 2000). In a study of breast cancer patients, Stanton, Danoff-Burg, et al. (2000) found higher levels of EAC were associated with fewer cancer-related medical visits, decreased distress, and enhanced physical health and vigor over a 3 month period. Thus, EAC has proven beneficial in coping with cancer.

The nature of the relationship between EAC and positive psychological adjustment to cancer is not fully understood. Lepore and Helgeson (1998) have emphasized the role that emotional processing has in cognitive processing of traumas. Actively contemplating the meaning of traumatic events and confronting emotions associated with these events are thought to be critical components of healthy adaptation. Synchronizing these two coping processes, the cognitive and emotional, may be an effective way to manage elevated levels of stress. Among a group of women with a family history of breast cancer, Zakowski, Valdimarsdottir, and Bovbjerg (2001) noted emotional expressivity moderated the relations between intrusive cognitions and distress. Women who were less emotionally expressive were more distressed by their intrusive cognitions about breast cancer than the other groups. Zakowski and colleagues (2003) also found a trend toward greater emotional expressivity in women compared to men among a sample of cancer survivors that included prostate and gynecological cancers. Importantly, although theory links the emotional expression and cognitive processing constructs, with the exception of these two studies (Zakowski et al., 2003; Zakowski et al., 2001), rarely have both constructs been included within a single research design examining psychological adjustment to cancer.

Other constructs that have been identified as relevant predictors of adjustment and coping are dispositional factors. For example, Mayer and Salovey (1993) suggest emotional intelligence may be relevant for adaptation to trauma given its relationship to emotional disclosure tendencies. Emotional intelligence is defined as “the ability to perceive accurately, appraise, and express emotion; the ability to access and/or generate feelings when they facilitate thought; the ability to understand emotion and emotional

knowledge; and the ability to regulate emotions to promote emotional and intellectual growth” (Mayer & Salovey, 1997). Moreover, people with high emotional intelligence tend to regulate affect better within themselves and within others, which likely enhances their overall quality of life (Mayer & Salovey, 1993). Further, in a study by Mayer & Geher (1996), individuals with more emotional intelligence characteristics scored higher on a scale of empathy, and in a study of women with breast cancer (Schmidt & Andrykowski, 2004), higher emotional intelligence was associated with less distress and buffered against the negative impact of a toxic social environment. Given the potential importance of recognizing and managing one’s emotions to enhanced cognitive and emotional processing, individuals high in emotional intelligence should report better psychological health.

Similarly, openness to experience may be relevant to cognitive and emotional processing. Openness to experience is a personality domain characterized by intellectual curiosity, a rich and complex emotional life, and behavioral flexibility (Costa & McCrae, 1992). In addition, Calhoun & Tedeschi (1998) suggest people who are willing to try new things, open to new perspectives, and tolerant of feelings are more likely to derive meaning from traumatic events. While research studies of psychological adjustment to cancer have examined dispositional factors such as neuroticism (Jamison, Wellisch, & Pasnau, 1978; Jenkins, May, & Hughes, 1991; Morris, Greer, & White, 1977; Ranchor et al., 2002) and optimism (Bjorck, Hopp, & Jones, 1999; Carver et al., 1993; Epping-Jordan et al., 1999; Helgeson, Snyder, & Seltman, 2004; Schnoll, Knowles, & Harlow, 2002; Stanton & Snider, 1993), only one study (Schmidt & Andrykowski, 2004) included the construct of emotional intelligence and no studies exist that included openness to experience. Given their potential relevance to cognitive and emotional processing, an examination of these dispositional factors could prove useful to further understanding the impact of cognitive and emotional processing on psychological adjustment in cancer survivors.

Research Model

Dispositional, social-environmental, and coping process variables have all been identified as predictors of psychological adjustment to cancer. Figure 1.1 presents a graphic representation of potential pathways among these variables as suggested by the

research literature and relevant theories reviewed. As noted at the bottom of the figure, various clinical and demographic factors will serve as potential covariates for subsequent analyses.

Study Aims and Hypotheses

Few studies have examined a broad range of psychosocial sequelae among cancer survivors in a longitudinal fashion. Research including positive and negative outcomes of stressful events, cognitive and emotional processing variables, and relevant factors such as dispositional and social-environment variables would represent an advance in the literature.

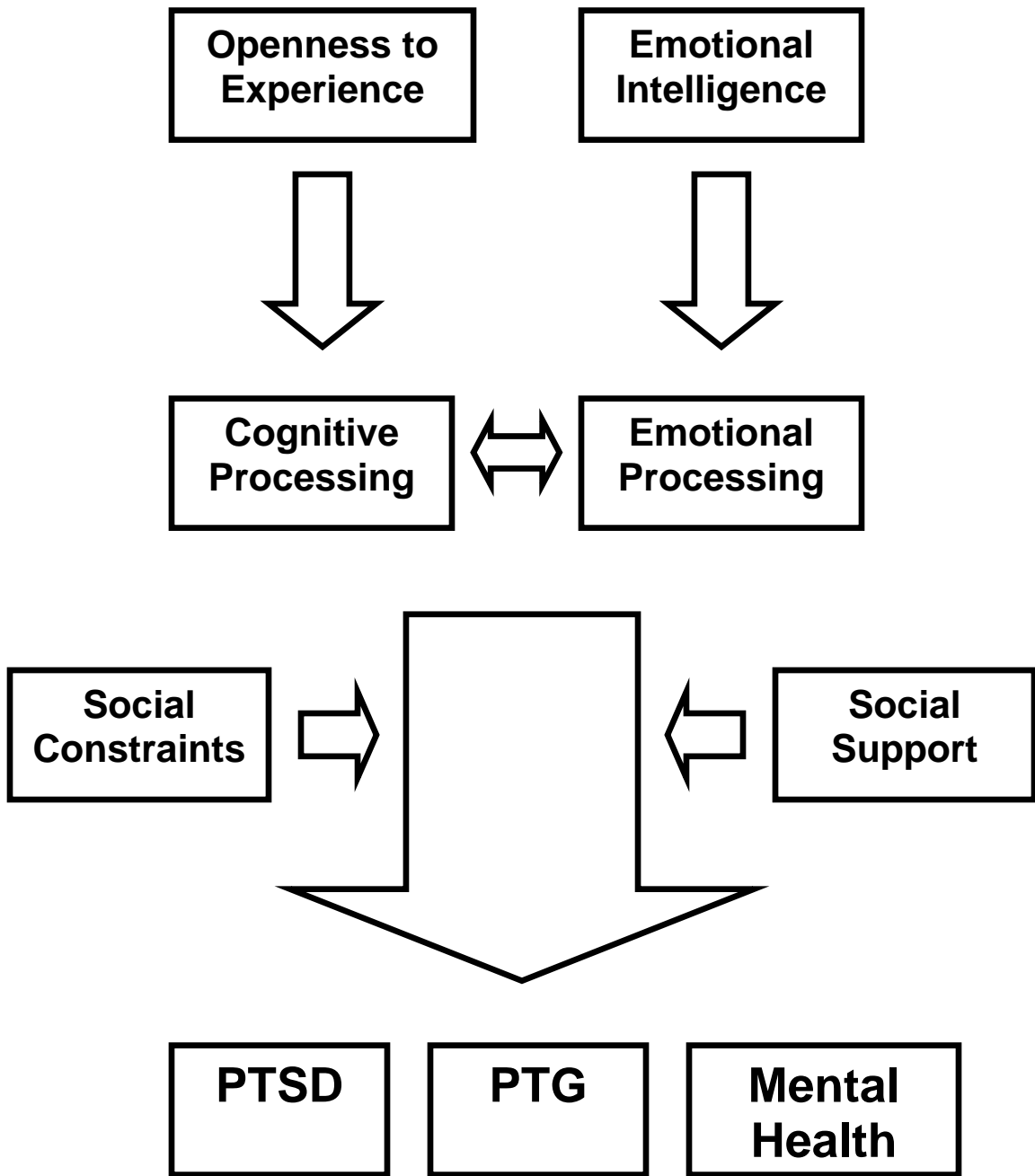
The aim of this study is to clarify the impact of cognitive processing and emotional expression on psychological adjustment among colorectal cancer survivors. Furthermore, the proposed study will contribute to the research literature by clarifying the cognitive processing construct and the role of intrusions. By adding relevant dispositional variables, social-environment variables, and a broader range of outcomes, the nature of adaptation to trauma might be further elucidated. Finally, colorectal cancer patients remain a relatively understudied population, and consequently, little is known about the psychological adjustment among this sample. With these general aims in mind, a few hypotheses can be advanced:

- 1) Cognitive processing will be predictive of both positive and negative psychosocial outcomes of colorectal cancer.
 - a. Higher frequency of intrusive thoughts will be associated with higher levels of PTG and PTSD symptoms.
 - b. Higher distress related to intrusive thoughts will be associated with lower levels of PTG but higher levels of PTSD symptoms.
 - c. Higher frequency of intentional, effortful processing will be associated with higher levels of PTG and lower PTSD symptoms.
- 2) EAC will moderate the relationship between cognitive processing and global mental health. More specifically, higher levels of EAC and cognitive processing will predict better mental health.

- 3) Dispositional factors and social-environment variables will mediate and/or moderate the relationship between coping process variables and psychosocial outcomes:
 - a. Cognitive processing and EAC will mediate the relationship between openness to experience and PTG and between emotional intelligence and global mental health.
 - b. Social constraints and social support will moderate the relationships between cognitive processing and global mental health and between EAC and global mental health.

Figure Captions

Figure 1.1. Proposed research model depicting the pathways through which dispositional and social-environmental variables influence the links among coping process variables and psychological adjustment to cancer.



Note: Stage at diagnosis, time since diagnosis, age, gender, education, and social desirability are all potential covariates.

Chapter Two

Methods

Sample

Participants were identified and recruited through the Kentucky Cancer Registry (KCR). The KCR is part of the National Cancer Institute's Surveillance Epidemiology and End Results (SEER) program. Cancer registries belonging in the SEER program are considered the most accurate and complete population-based cancer registries. Criteria for inclusion in the present study consisted of being a colorectal cancer survivor, stage 0-III at diagnosis, currently post-treatment (i.e., surgery, radiation, and chemotherapy) and within six to eighteen months post-diagnosis. Exclusion criteria include: 1) having a prior history of cancer in addition to colorectal cancer, 2) experiencing a recurrence since initial diagnosis, 3) being cognitively impaired so as not to be able to complete the assessments, 4) being under the age of 18, and 5) not being able to understand or read English. Using these criteria, the KCR identified 286 individuals who were study eligible. Of these, 114 (40%) provided active consent to the KCR to be contacted by study researchers, and 76 (27% of all study eligible) provided informed consent to participate in the study. Of these 76 individuals, 3 had experienced a recurrence, 6 had a prior history of cancer, and 3 were currently receiving treatment, making them ineligible for study consideration. An additional 8 participants dropped out of the study prior to completing any assessments, and 1 participant completed a baseline assessment but was too ill to complete a follow-up assessment. Thus, the final study sample consisted of 55 participants who completed baseline and three-month follow-up assessments.

Procedure

The study protocol was approved by the Institutional Review Board of the University of Kentucky College of Medicine. After IRB approval was obtained, the KCR initially contacted physicians of eligible participants to obtain passive consent for participation in this research study. The KCR then contacted eligible participants via mail (Appendix A) and telephone to obtain active consent to release their contact information to study researchers. After receiving contact information from the KCR, potential participants were mailed a letter describing the study in more detail (Appendix B) and provided with an informed consent form to complete and return by mail. Once informed

consents were received, participants were sent a baseline and, three-months later, a follow-up questionnaire packet (Appendix C). Answers to completed questionnaires were obtained during a scheduled phone interview. Participants were compensated \$20 for completing each assessment for a total of \$40. During the three-month follow-up, participants completed the same questionnaire as the baseline packet with the exception of demographic, clinical, and dispositional questions.

Study Measures

Participants completed a variety of self-report questionnaires assessing: (a) demographic and clinical information; (b) dispositional variables; (c) coping process variables; (d) social-environment variables; and (e) psychological adjustment variables.

Demographic and Clinical Information. Demographic information obtained included age, race, marital status, education, and annual household income. Clinical information obtained through the KCR included stage of cancer at diagnosis, adjuvant treatments received, age at diagnosis, time since diagnosis, and family history (i.e., parent, grandparent, child, sibling, aunt or uncle) of colorectal cancer. Participant responses were coded “yes” for a positive family history of colorectal cancer, or “no” for a negative/unknown family history of colorectal cancer.

Dispositional Variables. Openness to Experience, Emotional Intelligence, and Social Desirability were assessed at baseline. Openness to Experience was assessed using the 12-item Openness to Experience subscale of the Five-Factor Inventory (NEO-FFI; Costa & McCrae, 1989). These items measure a personality domain characterized by a willingness to try new things. This study yielded a coefficient alpha of .65. Emotional Intelligence was assessed using the Trait Meta-Mood Scale (TMMS). The TMMS (Salovey, Mayer, Goldman, Turvey, & Palfai, 1995) is a self-report questionnaire yielding a total emotional intelligence score. For this study, the 30-item version of the TMMS was used and yielded a coefficient alpha of .83. Social desirability was assessed with the Marlowe-Crowne Form C (MC-C; Reynolds 1982). The MC-C consists of 13 items that assess participants’ tendency to engage in impression management. Sample items include “I sometimes feel resentful when I don’t get my way,” and “No matter who I’m talking to, I’m always a good listener.” Response options are “true” or “false.”

Higher scores are indicative of greater impression management. Coefficient alpha for this study was .74.

Coping Process Variables. Cognitive processing was assessed with the Impact of Events Scale (IES; Horowitz et al., 1979) and a rumination measure. As already mentioned, the IES is a fifteen-item self-report measure of intrusive and avoidant cognition, and is frequently used in evaluating stress reactions after traumatic experiences. Subjects respond on a 4-point scale regarding how often they experienced specific symptoms during the past week. The scale ranges from “not at all” to “often.” The IES was keyed to the experience of having colorectal cancer. In addition to the items that assess frequency, a parallel set of items was constructed assessing the valence of the intrusive and avoidant cognitions. In other words, how distressed individuals were by a particular cognition. For example, participants were asked to indicate how frequently the statement “I thought about it when I didn’t mean to” was true for them and then asked “How much did this distress or bother you?” A four-point scale was again used with response options ranging from “not at all” to “often.” For the purposes of this study, the intrusions subscale was of particular interest. Coefficient alphas at baseline and three-month follow-up for the intrusions – frequency and distress scales ranged from .82 to .94. Frequency and distress scores were correlated .89 and .87 for the baseline and three-month assessments, respectively.

The Rumination Scale (Martin et al., 1993) is a 10-item measure of conscious, repetitive, and persistent thoughts. Factor analyses have yielded two subscales, a six-item subscale measuring lack of control and distractibility (e.g., “Sometimes I feel I have no control over my thoughts”) and a four-item subscale measuring cognitive rehearsal and processing (e.g., “When I have a problem, I tend to think of it a lot of the time”). Items were keyed to participants’ experience of cancer. In this sample, coefficient alpha was .47 and .36 for the cognitive distractibility subscale and .69 and .75 for the cognitive rehearsal subscale, at baseline and three-month assessments, respectively. Given the poor reliability for the cognitive distractibility subscale, only the cognitive rehearsal subscale was used in subsequent analyses.

Emotional approach coping (EAC: Stanton, Kirk, Cameron, Danoff-Burg, 2000) is an 8-item scale yielding two subscales: emotional expression (e.g., “I took time to

express my emotions”) and emotional processing (e.g., “I tried to figure out what my feelings meant”). The EAC was keyed to the experience of having colorectal cancer. These subscales were significantly correlated ($p < .0001$) at both the baseline ($r = .53$) and three-month ($r = .68$) assessments, so a total score was used instead of subscale scores. Coefficient alpha for the EAC total score was .89 for both baseline and three-month assessments.

Social-Environment Variables. The Interpersonal Support Evaluation List (ISEL; Cohen & Hoberman, 1983; Cohen, Mermelstein, Kamarck & Hoberman, 1985) was used to assess social support. This study used the short form, ISEL-12, to assess the perceived availability of potential social resources. It yields a total index of social support. Coefficient alphas were .83 and .90 for the baseline and three-month assessments, respectively. Social Constraints was assessed using the Social Constraints Scale (SCS; Lepore, 1997; Lepore & Ituarte, 1999). The SCS is a 15-item self-report measure of the extent to which the respondent’s social environment inhibits expression of trauma-related thoughts and feelings. This study used the “friends/family” version of the SCS. Subjects respond on a 4-point scale regarding how often they had a number of social experiences in the past month. The SCS was keyed to colorectal cancer as the stressor of reference. Coefficient alphas were .92 for baseline and .93 for three-month assessments.

Psychological Adjustment Variables. PTG, mental health, and PTSD symptomatology were assessed as indices of psychological adjustment. PTG was assessed using the Posttraumatic Growth Inventory (PTGI). This 21-item measure was developed by Tedeschi and Calhoun (1995, 1996) to assess positive changes experienced after trauma and yields a total PTG score. For study participants, the response options were modified to refer to cancer. Participants were asked to rate the extent to which they had experienced various changes since their cancer diagnosis. Coefficient alphas were .97 and .98 at baseline and three-month assessments, respectively.

Mental health was assessed using the 18-item short form of the Mental Health Inventory (MHI; Veit & Ware, 1983). This scale yields a global mental health score. Higher scores are indicative of better mental health and more positive psychological adjustment. Coefficient alpha was .93 for the baseline and .92 for the three-month assessments.

The 17-item PTSD Checklist, Civilian Version (PCL-C: Blanchard, Jones-Alexander, Buckley, & Forneris, 1996; Weathers, Huska, & Keane, 1991) was used to assess PTSD symptoms. Respondents answered the questions with reference to their cancer diagnosis. The PCL can be scored by totaling the individual items or by counting the number of symptoms that received an endorsement of at least "moderately" and assessing whether each participant had endorsed symptoms consistent with a diagnosis of PTSD—for example, reexperiencing, arousal, and avoidance symptoms. Coefficient alpha was .93 for baseline and three-month assessments.

Two questions assessed whether the colorectal cancer experience constituted a traumatic stressor. According to the Diagnostic and Statistical Manual of Mental Disorders—IV-Text Revision (DSM—IV-TR; American Psychiatric Association, 2000) criteria for PTSD, an event qualifies as a traumatic stressor if (a) it “involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others,” and (b) “the person's response involved intense fear, helplessness, or horror” (APA, 2000, pp. 467). Participants responded yes or no to two proxy questions: “In response to your cancer experience have you felt that the event was a potential threat to your life and safety or the lives and safety of others?” and “In response to your cancer experience have you reacted with feelings of intense fear, helplessness, or horror?”

Planned Analyses

Differences between participants and non-participants were examined using chi-square, t-test, and ANOVAs/ANCOVAs as indicated. Primary hypotheses were examined with multiple regression techniques, applying Baron and Kenny’s (1986) guidelines for testing mediation and Aiken and West’s (1991) guidelines for testing moderation/interaction effects. Given the sample size of research participants (N=55), power was sufficient (i.e., .80) to detect a moderate effect size of $d = .5$ when comparing participants and nonparticipants (N=218), a moderate effect size of $r = .33$, and a moderate to large effect size of $F^2 = .26$ in a regression model with 5 predictors.

Chapter Three

Results

Descriptive Characteristics of Sample

Study participants (N=55) had a mean age of 65.9 years (SD=12.7), were primarily female (58.9%), Caucasian (98.2%), currently married/partnered (62.5%), had some college education (52.7%), and were retired (50.9%). An equal number of participants reported an annual income of less than \$20,000 (25.5%) and \$41,000 to \$60,000 (25.5%). No significant differences were found between study participants and non-participants (N=218) on key demographic variables, including age, gender, and race.

Regarding important clinical characteristics, at the time of the baseline assessment, study participants were primarily 12 to 18 months post-diagnosis (62.5%), had been diagnosed with Stage 2 disease (37.5%), received only surgical treatment (66.1%), and had no family history of colorectal cancer (57.1%). Non-Participants were not significantly different from participants in any of the clinical characteristics with one exception. Study non-participants had more advanced colorectal cancer than study participants ($X^2(3) = 8.280; p = .041$).

Participant responses to the two proxy trauma questions were varied. Thirty-one participants (56.4%) endorsed neither item. Twenty-three participants (41.8%) endorsed the first item, indicating their cancer experience was a potential threat to their lives and safety, and ten participants (18.2%) endorsed the second item, indicating they responded to their cancer experience with intense fear, helplessness, or horror. Nine participants (16.4%) endorsed both items, indicating they viewed their cancer experience as a traumatic stressor.

Means, standard deviations, and possible ranges for all study measures are shown in Table 3.1. Intercorrelations for these measures are shown in Table 3.2. Correlations among the indices of psychological adjustment varied. Notably, PTGI scores were not significantly associated with MHI or PCL-C scores (all $ps > .05$). In contrast, PCL-C scores were significantly associated with MHI scores with correlations ranging from (-.52 to -.75, all $ps < .001$).

To further examine the associations between PTG and PTSD, participants' scores on the PTGI and the PCL-C at baseline were examined using a median split to create four

separate groups. The low PTGI/low PCL-C group consisted of 15 participants. The low PTGI/high PCL-C group had 12 participants. An additional 13 participants were in the high PTGI/low PCL-C group, and 15 participants comprised the last group, high PTGI/high PCL-C.

Prior to evaluating study hypotheses, bivariate relationships were further examined between the clinical/demographic variables and the study measures in order to identify potential covariates. Given the number of comparisons employed, a more conservative alpha level of $p < .01$ was used to reduce the risk of a Type I error. Gender, race, education, social desirability, age at diagnosis, time since diagnosis, stage of disease, adjuvant treatment (yes vs. no), and family history of colorectal cancer (yes vs. no) were all examined as potential covariates. Age at diagnosis was significantly associated with three-month EAC scores ($r = -.390$, $p < .01$), and baseline social desirability scores were significantly associated with TMMS scores ($r = .373$, $p < .01$). All other comparisons failed to reveal any significant relationships. Age at diagnosis and social desirability were used as covariates in subsequent analyses, when appropriate.

Multiple Regression Analyses

To test the hypotheses regarding the relationship between frequency of intrusive thoughts and PTSD symptoms and between frequency of intrusive thoughts and PTG, a series of regression analyses were performed. First, frequency of intrusive thoughts at baseline was examined as a predictor of baseline PCL-C scores. Second, frequency of intrusive thoughts at baseline was examined as a predictor of three-month PCL-C scores, while controlling for baseline PCL-C scores. Third, frequency of intrusive thoughts at three-month follow-up was examined as a predictor of three-month PCL-C scores, while controlling for baseline PCL-C scores. These three regression models were then repeated with respective baseline and three-month PTGI scores as the dependent variables. Results of these six regressions are shown in Table 3.3. Baseline intrusions significantly predicted baseline PCL-C scores ($\beta = .372$, $p = .005$) and three-month PCL-C scores ($\beta = .301$, $p = .012$) even after controlling for baseline PCL-C scores. This model accounted for the most variance ($R^2 = 39.9$) in outcomes compared to the other regression models. Neither baseline nor three-month frequency of intrusions were significantly associated with baseline or three-month PTGI scores.

To test the hypotheses regarding the relationship between distressing intrusive thoughts and PTSD symptoms and between distressing intrusive thoughts and PTG, a parallel series of regression analyses to those described above were performed substituting frequency of intrusions with distressing intrusions. Six regression analyses were again performed and the results are shown in Table 3.4. Baseline distressing intrusions significantly predicted baseline PCL-C scores ($\beta = .441, p = .001$) and three-month PCL-C scores ($\beta = .361, p = .003$). Three-month distressing intrusions also predicted three-month PCL-C scores ($\beta = .355, p = .001$). This model accounted for the most variance ($R^2=44.4$) in outcomes compared to the other regression models. Neither baseline nor three-month distressing intrusions significantly predicted baseline or three-month PTGI scores (all $ps > .05$). So, while both intrusive frequency and distressing intrusions significantly predicted baseline and three-month PCL-C scores, neither type of intrusions significantly predicted baseline or three-month PTGI scores.

To test the hypotheses regarding the relationship between intentional, effortful processing and PTSD symptoms and between intentional, effortful processing and PTG, a parallel series of regression analyses were performed substituting cognitive rehearsal scores for intrusions. Six regression analyses were performed and the results are shown in Table 3.5. Baseline cognitive rehearsal significantly predicted baseline PCL-C scores ($\beta = .405, p = .002$) and three-month PTGI scores ($\beta = .245, p = .033$). Three-month cognitive rehearsal also predicted three-month PTGI scores ($\beta = .308, p = .007$). This model accounted for the most variance ($R^2=44.4$) in outcomes relative to the other regression models. The association between three-month cognitive rehearsal and three-month PCL-C scores also suggested a trend ($\beta = .222, p = .051$). Interestingly, baseline cognitive rehearsal was significantly associated with baseline PCL-C scores but not with baseline PTGI scores. In contrast, baseline and three-month cognitive rehearsal was significantly associated with three-month PTGI scores but not with three-month PCL-C scores.

Interaction Regression Analyses

To test the hypothesis that emotional expression will moderate the link between cognitive processing and mental health, a hierarchical regression procedure set forth by Aiken and West (1991) was utilized. Prior to conducting the regression analyses,

predictor variables were converted into standardized scores in order to minimize multicollinearity and interaction terms were created using these standardized scores. If necessary, and based upon statistically significant associations described above, covariates were entered in the first step of each regression model. The next step of each regression included the simultaneous entry of cognitive processing (intrusions or cognitive rehearsal) and EAC variables. The third step involved entry of the appropriate interaction term. When an interaction term was significant, it was interpreted by plotting the moderation effect. The slopes of the simple regression lines were then tested to determine whether the slopes were significantly different from zero.

The role of emotional expression as a moderator of the link between cognitive processing (intrusions or cognitive rehearsal) and mental health was examined first. Six regression models were conducted and the results are shown in Table 3.6. The interaction between baseline intrusions and baseline EAC and between baseline cognitive rehearsal and baseline EAC did not account for significant variance in predicting baseline or three-month MHI scores ($p > .05$). In addition, the interaction between three-month intrusions and three-month EAC and between three-month cognitive rehearsal and three-month EAC was also not significant in predicting three-month MHI scores ($p > .05$). However, significant main effects were present. In the regression models examining intrusions, baseline intrusions ($\beta = -.357, p = .008$) were significant predictors of baseline MHI-Scores. Three-month intrusions ($\beta = -.179, p = .038$) and three-month EAC scores ($\beta = .296, p = .002$) accounted for significant variance in three-month MHI scores. Similarly, in the regression models examining cognitive rehearsal, baseline cognitive rehearsal ($\beta = -.422, p = .003$) and baseline EAC scores ($\beta = .304, p = .031$) were significant predictors of baseline MHI scores. Three-month cognitive rehearsal ($\beta = -.166, p = .043$) and three-month EAC scores ($\beta = .242, p = .008$) again accounted for significant variance in three-month MHI scores. Again, no significant interactions emerged between EAC and intrusions or between EAC and cognitive rehearsal in predicting MHI scores, either at baseline or three-month assessments.

Mediation Regression Analyses

To test the hypotheses that cognitive processing (intrusions or cognitive rehearsal) will mediate the link between openness to experience and PTG, and emotional processing

(EAC) will mediate the link between emotional intelligence and mental health, Baron and Kenny's (1986) analytic approach for testing mediation was used. According to this approach, four conditions must be met to test for mediation. First, a significant relationship must exist between the independent variable (dispositional variables) and the dependent variable (PTG or mental health). Second, there must be a significant relationship between the independent variable and the mediating variable (coping process variables). Third, the mediator must be significantly associated with the dependent variable. Fourth, when the mediator is controlled, the previously significant relationship between the independent and dependent variables decreases significantly.

Openness to experience was not significantly associated with cognitive rehearsal, intrusions, or PTG and therefore, was not included in further analyses. Emotional intelligence (TMMS) was significantly associated with baseline ($r=.31$, $p=.023$) and three-month ($r=.38$, $p=.005$) EAC and with baseline ($r=.33$, $p=.014$) and three-month ($r=.38$, $p=.005$) MHI scores at the zero-order level. However, after controlling for the influence of social desirability, semi-partial correlations between TMMS and baseline MHI scores were no longer significant ($p>.05$). After controlling for social desirability and baseline MHI scores, semi-partial correlations between TMMS and three-month MHI scores were also not significant ($p>.05$). Thus, neither of the mediation models met criteria for subsequent analyses. Consequently, there is insufficient evidence to suggest the impact of openness to experience on PTG or of emotional intelligence on mental health occurs through the influence of cognitive or emotional processing, respectively.

Interaction Regression Analyses

To test the hypotheses that social resource variables (constraints and support) will moderate the links between cognitive processing (intrusions and cognitive rehearsal) and mental health (MHI scores) and between emotional processing (EAC) and mental health, Aiken and West's (1991) guidelines for testing moderation were again used. The first set of regression models examined the role of intrusions as a moderator of the relationship between social resource variables (constraints and support) and MHI scores. These six regression models are presented in Table 3.7. There is a significant three-month constraints X intrusions interaction when predicting three-month MHI-scores ($\beta = -.218$, $p=.016$). Figure 3.1 depicts this interaction. Probing simple slopes revealed that under

conditions of low intrusions, the impact of social constraints has no effect on MHI scores ($\beta = -.013$, $p = .931$). High social constraints are associated with lower MHI scores (i.e., poorer mental health) under conditions of high intrusions ($\beta = -.454$, $p = .0001$). Low social constraints are associated with higher MHI scores under conditions of high intrusions than under conditions of low intrusions ($\beta = .322$, $p = .035$). None of the other interactions were statistically significant, though baseline constraints X baseline intrusions approached significance in predicting baseline MHI scores ($\beta = .250$, $p = .071$), as did the three-month support X three-month intrusions ($\beta = .157$, $p = .074$) in predicting three-month MHI scores.

The next set of regression models examined the role of cognitive rehearsal as a moderator of the relationship between social resource variables (constraints and support) and MHI scores. These six regression models are presented in Table 3.8. No significant interactions emerged for any of these models. However, there were significant main effects for baseline social constraints in predicting baseline ($\beta = -.556$, $p = .00007$) and three month MHI scores ($\beta = -.224$, $p = .042$). Three-month social constraints also predicted three-month MHI scores ($\beta = -.262$, $p = .007$). In addition, there was a main effect for three-month social support scores in predicting three-month MHI scores ($\beta = .206$, $p = .024$). Cognitive rehearsal failed to demonstrate a main effect on MHI scores with one exception. In a regression model including baseline social support, there was a main effect for baseline cognitive rehearsal in predicting baseline MHI scores ($\beta = -.276$, $p = .032$).

The final set of regression models examined the role of EAC as a moderator of the relationship between social resource variables (constraints and support) and MHI scores. These six regression models are presented in Table 3.9. Once again, no significant interactions emerged for any of these models. Replicating the above analyses, there were significant main effects for baseline and three-month social constraints in predicting baseline ($\beta = -.511$, $p = .0002$) and three month MHI scores ($\beta = -.283$, $p = .007$). Three-month social constraints also predicted three-month MHI scores ($\beta = -.317$, $p = .0004$). In addition, there was a main effect for baseline social support scores in predicting baseline MHI scores ($\beta = .327$, $p = .016$), and for three-month social support scores in predicting three-month MHI scores ($\beta = .197$, $p = .025$). EAC failed to demonstrate a significant main

effect on MHI scores with one exception. In a regression model including three-month social support scores, there was a main effect for three-month EAC in predicting three-month MHI scores ($\beta = .190$, $p = .035$). In general, social constraints were associated with poorer mental health, and social support was associated with better mental health. Surprisingly, coping process variables (i.e., intrusions, cognitive rehearsal, EAC) were, generally speaking, not significantly associated with MHI scores after accounting for the social environment. Lastly, only one significant interaction emerged from the regression models examined. As noted, the association between three-month constraints and three-month MHI scores varied as a function of three-month intrusions. Under conditions of low intrusions, social constraints experienced are irrelevant in predicting mental health. However, under conditions of high intrusions, higher social constraints predict poorer mental health relative to lower social constraints.

Table 3.1

Descriptive Statistics for Study Measures

Measures	Expected Range	Obtained Range	M	SD
Dispositional Measures				
Social Desirability (MC-C)	0-13	1-12	8.9	2.9
Emotional Intelligence (TMMS)	30-150	80-141	110.9	13.2
Openness to Experience (FFI)	0-48	13-45	25.4	5.5
Social-Environment Measures				
Social Constraints (SCS) – T1	0-45	0-40	8.4	7.7
Social Constraints (SCS) – T2	0-45	0-33	8.8	8.1
Social Support (ISEL-12) – T1	12-48	19-48	42.2	5.7
Social Support (ISEL-12) – T2	12-48	24-48	41.1	6.4
Coping Process Measures				
Intrusions – Frequency (IES) – T1	0-35	0-23	7.0	6.1
Intrusions – Frequency (IES) – T2	0-35	0-31	5.9	6.4
Intrusions – Distress (IES) – T1	0-35	0-27	5.9	6.9
Intrusions – Distress (IES) – T2	0-35	0-31	4.8	6.9
Cognitive Rehearsal – T1	0-12	0-11	4.8	3.0
Cognitive Rehearsal – T2	0-12	0-12	4.7	3.0
Emotional Approach Coping – T1	0-24	0-24	12.6	6.0
Emotional Approach Coping – T2	0-24	0-24	14.4	5.2
Psychological Adjustment Measures				
PTSD Symptomatology (PCL-C) – T1	17-85	17-49	23.2	8.0
PTSD Symptomatology (PCL-C) – T2	17-85	17-46	21.4	6.9
Posttraumatic Growth (PTGI) – T1	0-105	1-98	43.8	29.6
Posttraumatic Growth (PTGI) – T2	0-105	0-102	51.5	30.1
Mental Health (MHI) – T1	0-100	44-98	80.8	13.5
Mental Health (MHI) – T2	0-100	49-99	81.9	12.4

Note. N = 55. T1 = baseline assessment. T2 = three-month assessment. MC-C = Marlowe-Crowne Form C. TMMS = Trait Meta-Mood Scale. FFI = Five Factor Inventory. SCS = Social Constraint Scale. ISEL-12 = Interpersonal Support Evaluation List – 12 item short form. IES = Impact of Events Scale. PCL-C = PTSD Checklist – Civilian Version. PTGI = Posttraumatic Growth Inventory. MHI = Mental Health Inventory.

Table 3.2

Intercorrelations among Study Variables

Measure	1	2	3	4	5	6	7	8	9	10	11	12
1. FFI: OE												
2. TMMS	.36**											
3. ISEL-12 – T1	-.07	.20										
4. ISEL-12 – T2	-.01	.33*	.80***									
5. SCS – T1	.17	-.13	-.58***	-.50***								
6. SCS – T2	.13	-.26	-.43**	-.54***	.69***							
7. IES: Intrusions – T1	-.05	.03	-.25	-.11	.42**	.37**						
8. IES: Intrusions – T2	.05	.14	-.01	.01	.32*	.41**	.59***					
9. Cog. Rehears. – T1	.18	.02	-.13	-.07	.28*	.23	.56***	.35**				
10. Cog. Rehears. – T2	.10	.07	-.03	-.01	.21	.29*	.36**	.44***	.67***			
11. EAC – T1	.29*	.31*	.08	.12	-.09	-.11	.11	.18	.36**	.40**		
12. EAC – T2	.21	.37**	.13	.16	-.12	-.12	-.09	.21	.06	.16	.60***	
13. MHI – T1	.03	.33*	.37**	.42**	-.55***	-.48***	-.34*	-.27*	-.32*	-.09	.15	.15
14. MHI – T2	.00	.38***	.38**	.50***	-.61***	-.61***	-.28*	-.28*	-.30*	-.18	.18	.36**
15. PCL-C – T1	-.03	-.13	-.25	-.11	.38	.22	.37**	.27*	.40**	.13	-.10	-.19
16. PCL-C – T2	.02	-.19	-.46***	-.44***	.59***	.62***	.47***	.33*	.37**	.29*	-.05	-.27*
17. PTGI – T1	.15	-.05	-.12	-.02	.20	.15	.23	.29*	.22	.23	.22	.20
18. PTGI – T2	.18	.19	-.08	.00	.16	.07	.07	.32*	.36**	.42**	.44***	.45***

Note. N = 55. Table shows Pearson Correlations. * $p < .05$, ** $p < .01$, *** $p < .001$.

T1 = baseline assessment. T2 = three-month assessment. FFI:OE = Five Factor Inventory: Openness to Experience. TMMS = Trait Meta-Mood Scale. ISEL-12 = Interpersonal Support Evaluation List – 12 item short form. SCS = Social Constraint Scale. IES = Impact of Events Scale. Cog. Rehears. = Cognitive Rehearsal. EAC = Emotional Approach Coping. MHI = Mental Health Inventory. PCL-C = PTSD Checklist – Civilian Version. PTGI = Posttraumatic Growth Inventory.

Table 3.2 - Continued

Intercorrelations among Study Variables

Measure	13	14	15	16	17
14. MHI – T2	.79***				
15. PCL-C – T1	-.75***	-.52***			
16. PCL-C – T2	-.55***	-.67***	.57***		
17. PTGI – T1	-.06	-.05	.11	.04	
18. PTGI – T2	-.06	.00	.13	.03	.57***

Note. N = 55. Table shows Pearson Correlations. * p<.05, ** p<.01, ***p<.001.
MHI = Mental Health Inventory. PCL-C = PTSD Checklist – Civilian Version.
PTGI = Posttraumatic Growth Inventory.

Table 3.3

Frequency of Intrusions Predicting PTSD Symptomatology and PTG

Step and measure	R ²	ΔR ²	F for Δ in R ²	df	Final Beta
Dependent variable: Baseline PCL-C Scores					
Step 1: Baseline Intrusions	.138	.138**	8.497	1, 53	.372**
Dependent variable: 3-month PCL-C Scores					
Step 1: Baseline PCL-C Scores	.321	.321***	25.088	1, 53	.455***
Step 2: Baseline Intrusions	.399	.078*	6.738	1, 52	.301*
Dependent variable: 3-month PCL-C Scores					
Step 1: Baseline PCL-C Scores	.321	.321***	25.088	1, 53	.515***
Step 2: 3-month Intrusions	.356	.035	2.787	1, 52	.193
Dependent variable: Baseline PTGI Scores					
Step 1: Baseline Intrusions	.054	.054	3.020	1, 53	.232†
Dependent variable: 3-month PTGI Scores					
Step 1: Baseline PTGI Scores	.325	.325***	25.522	1, 53	.586***
Step 2: Baseline Intrusions	.329	.004	0.331	1, 52	-.067
Dependent variable: 3-month PTGI Scores					
Step 1: Baseline PTGI Scores	.325	.325***	25.522	1, 53	.522***
Step 2: 3-month Intrusions	.350	.025	1.985	1, 52	.165

Note. N=55. † p<.10, *p<.05 **p<.01 ***p<.001. PTSD = Posttraumatic Stress Disorder. PTG = Posttraumatic Growth. PCL-C = PTSD Checklist – Civilian Version. PTGI = Posttraumatic Growth Inventory.

Table 3.4

Distressing Intrusions Predicting PTSD Symptomatology and PTG

Step and measure	R ²	ΔR ²	F for Δ in R ²	df	Final Beta
Dependent variable: Baseline PCL-C Scores					
Step 1: Baseline Intrusions	.194	.194***	12.789	1, 53	.441***
Dependent variable: 3-month PCL-C Scores					
Step 1: Baseline PCL-C Scores	.321	.321***	25.088	1, 53	.407**
Step 2: Baseline Intrusions	.427	.105**	9.542	1, 52	.361**
Dependent variable: 3-month PCL-C Scores					
Step 1: Baseline PCL-C Scores	.321	.321***	25.088	1, 53	.511***
Step 2: 3-month Intrusions	.444	.123**	11.500	1, 52	.355**
Dependent variable: Baseline PTGI Scores					
Step 1: Baseline Intrusions	.043	.043	2.404	1, 53	.208
Dependent variable: 3-month PTGI Scores					
Step 1: Baseline PTGI Scores	.325	.325***	25.522	1, 53	.566***
Step 2: Baseline Intrusions	.325	.000	0.023	1, 52	.018
Dependent variable: 3-month PTGI Scores					
Step 1: Baseline PTGI Scores	.325	.325***	25.522	1, 53	.529***
Step 2: 3-month Intrusions	.353	.028	2.241	1, 52	.172

Note. N=55. *p<.05 **p<.01 ***p<.001. PTSD = Posttraumatic Stress Disorder. PTG = Posttraumatic Growth. PCL-C = PTSD Checklist – Civilian Version. PTGI = Posttraumatic Growth Inventory.

Table 3.5

Cognitive Rehearsal Predicting PTSD Symptomatology and PTG

Step and measure	R ²	ΔR ²	F for Δ in R ²	df	Final Beta
Dependent variable: Baseline PCL-C Scores					
Step 1: Baseline Cognitive Rehearsal	.164	.164**	10.374	1, 53	.405**
Dependent variable: 3-month PCL-C Scores					
Step 1: Baseline PCL-C Scores	.321	.321***	25.088	1, 53	.499***
Step 2: Baseline Cognitive Rehearsal	.345	.024	1.891	1, 52	.169
Dependent variable: 3-month PCL-C Scores					
Step 1: Baseline PCL-C Scores	.321	.321***	25.088	1, 53	.515***
Step 2: 3-month Cognitive Rehearsal	.370	.049†	4.004	1, 52	.222†
Dependent variable: Baseline PTGI Scores					
Step 1: Baseline Cognitive Rehearsal	.048	.048	2.659	1, 53	.219
Dependent variable: 3-month PTGI Scores					
Step 1: Baseline PTGI Scores	.325	.325***	25.522	1, 53	.517***
Step 2: Baseline Cognitive Rehearsal	.382	.057*	4.819	1, 52	.245*
Dependent variable: 3-month PTGI Scores					
Step 1: Baseline PTGI Scores	.325	.325***	25.522	1, 53	.500***
Step 2: 3-month Cognitive Rehearsal	.415	.090**	7.991	1, 52	.308**

Note. N=55. † p<.10, *p<.05 **p<.01 ***p<.001. PTSD = Posttraumatic Stress Disorder. PTG = Posttraumatic Growth. PCL-C = PTSD Checklist – Civilian Version. PTGI = Posttraumatic Growth Inventory.

Table 3.6

Cognitive Processing X Emotional Approach Coping Predicting Mental Health

Step and measure	R ²	ΔR ²	F for Δ in R ²	df	Final Beta
Dependent variable: Baseline MHI Scores					
Step 1: Baseline Intrusions	.149	.149*	4.568	2, 52	-.357**
Baseline EAC					.196
Step 2: Baseline Intrusions X EAC	.151	.002	0.101	1,51	.043
Dependent variable: 3-month MHI Scores					
Step 1: Baseline MHI Scores	.629	.629***	89.928	1, 53	.774***
Step 2: Baseline Intrusions	.634	.005	0.323	2, 51	-.025
Baseline EAC					.070
Step 3: Baseline Intrusions X EAC	.634	.000	0.004	1, 50	.006
Dependent variable: 3-month MHI Scores					
Step 1: Age at Diagnosis	.642	.642***	46.593	2, 52	-.043
Baseline MHI Scores					.710***
Step 2: 3-month Intrusions	.711	.069**	5.963	2, 50	-.179*
3-month EAC					.296**
Step 3: 3-month Intrusions X EAC	.719	.008	1.404	1, 49	.095
Dependent variable: Baseline MHI Scores					
Step 1: Baseline Cognitive	.178	.178**	5.614	2, 52	-.422**
Baseline EAC					.304*
Step 2: Cognitive Rehearsal X EAC	.178	.001	0.056	1,51	.030
Dependent variable: 3-month MHI Scores					
Step 1: Baseline MHI Scores	.629	.629***	89.928	1, 53	.743***
Step 2: Baseline Cognitive	.641	.012	0.821	2, 51	-.099
Baseline EAC					.116
Step 3: Cognitive Rehearsal X EAC	.645	.004	0.541	1, 50	.063
Dependent variable: 3-month MHI Scores					
Step 1: Age at Diagnosis	.642	.642***	46.593	2, 52	-.054
Baseline MHI Scores					.748***
Step 2: 3-month Cognitive	.715	.073**	6.434	2, 50	-.166*
3-month EAC					.242**
Step 3: Cognitive Rehearsal X EAC	.716	.001	0.212	1, 49	-.037

Note. N=55. *p<.05 **p<.01 ***p<.001. EAC = Emotional Approach Coping. MHI = Mental Health Inventory.

Table 3.7

Social Resource Variables X Intrusions Predicting Mental Health

Step and measure	R ²	ΔR ²	F for Δ in R ²	df	Final Beta
Dependent variable: Baseline MHI Scores					
Step 1: Baseline Social Constraints	.320	.320***	12.218	2, 52	-.627***
Baseline Intrusions					-.155
Step 2: Constraints X Intrusions	.362	.042†	3.395	1,51	.250†
Dependent variable: 3-month MHI Scores					
Step 1: Baseline MHI Scores	.629	.629***	89.928	1, 53	.684***
Step 2: Baseline Social Constraints	.675	.046*	3.587	2, 51	-.219†
Baseline Intrusions					.070
Step 3: Constraints X Intrusions	.679	.004	0.618	1, 50	-.079
Dependent variable: 3-month MHI Scores					
Step 1: Baseline MHI Scores	.629	.629***	89.928	1, 53	.710***
Step 2: 3-month Social Constraints	.698	.068**	5.759	2, 51	-.233*
3-month Intrusions					.101
Step 3: Constraints X Intrusions	.731	.033*	6.168	1, 50	-.218*
Dependent variable: Baseline MHI Scores					
Step 1: Baseline Social Support	.204	.204**	6.653	2, 52	.348*
Baseline Intrusions					-.291*
Step 2: Support X Intrusions	.213	.009	0.608	1,51	-.112
Dependent variable: 3-month MHI Scores					
Step 1: Baseline MHI Scores	.629	.629***	89.928	1, 53	.776***
Step 2: Baseline Social Support	.637	.008	0.531	2, 51	.030
Baseline Intrusions					.048
Step 3: Support X Intrusions	.656	.020†	2.844	1, 50	.162†
Dependent variable: 3-month MHI Scores					
Step 1: Baseline MHI Scores	.629	.629***	89.928	1, 53	.682***
Step 2: 3-month Social Support	.674	.045*	3.485	2, 51	.177†
3-month Intrusions					-.157†
Step 3: Support X Intrusions	.694	.020†	3.325	1, 50	.157†

Note. N=55. † p<.10, *p<.05 **p<.01 ***p<.001. MHI = Mental Health Inventory.

Table 3.8

Social Resource Variables X Cognitive Rehearsal Predicting Mental Health

Step and measure	R ²	ΔR ²	F for Δ in R ²	df	Final Beta
Dependent variable: Baseline MHI Scores					
Step 1: Baseline Social Constraints	.334	.334***	13.032	2, 52	-.556***
Baseline Cognitive Rehearsal					-.165
Step 2: Constraints X CR	.347	.013	1.010	1,51	.124
Dependent variable: 3-month MHI Scores					
Step 1: Baseline MHI Scores	.629	.629***	89.928	1, 53	.657***
Step 2: Baseline Social Constraints	.673	.043*	3.380	2, 51	-.224*
Baseline Cognitive Rehearsal					-.025
Step 3: Constraints X CR	.674	.001	0.218	1, 50	-.042
Dependent variable: 3-month MHI Scores					
Step 1: Baseline MHI Scores	.629	.629***	89.928	1, 53	.662***
Step 2: 3-month Social Constraints	.699	.070**	5.902	2, 51	-.262**
3-month Cognitive Rehearsal					-.042
Step 3: Constraints X CR	.704	.006	0.947	1, 50	-.077
Dependent variable: Baseline MHI Scores					
Step 1: Baseline Social Support	.212	.212**	6.995	2, 52	.358**
Baseline Cognitive Rehearsal					-.276*
Step 2: Support X CR	.217	.005	0.350	1,51	-.076
Dependent variable: 3-month MHI Scores					
Step 1: Baseline MHI Scores	.629	.629***	89.928	1, 53	.753***
Step 2: Baseline Social Support	.639	.010	0.702	2, 51	.058
Baseline Cognitive Rehearsal					-.040
Step 3: Support X CR	.653	.014	1.962	1, 50	.122
Dependent variable: 3-month MHI Scores					
Step 1: Baseline MHI Scores	.629	.629***	89.928	1, 53	.695***
Step 2: 3-month Social Support	.677	.048*	3.776	2, 51	.206*
3-month Cognitive Rehearsal					-.117
Step 3: Support X CR	.677	.000	0.046	1, 50	.017

Note. N=55. *p<.05 **p<.01 ***p<.001. MHI = Mental Health Inventory. CR = Cognitive Rehearsal.

Table 3.9

Social Resource Variables X Emotional Approach Coping Predicting Mental Health

Step and measure	R ²	ΔR ²	F for Δ in R ²	df	Final Beta
Dependent variable: Baseline MHI Scores					
Step 1: Baseline Social Constraints	.316	.316***	11.999	2, 52	-.511***
Baseline EAC					.127
Step 2: Constraints X EAC	.322	.006	0.434	1,51	.087
Dependent variable: 3-month MHI Scores					
Step 1: Baseline MHI Scores	.629	.629***	89.928	1, 53	.657***
Step 2: Baseline Social Constraints	.676	.047*	3.682	2, 51	-.283**
Baseline EAC					.028
Step 3: Constraints X EAC	.684	.008	1.311	1, 50	-.104
Dependent variable: 3-month MHI Scores					
Step 1: Age at Diagnosis	.642	.642***	46.593	2, 52	-.043
Baseline MHI Scores					.640***
Step 2: 3-month Social Constraints	.751	.109***	10.915	2, 50	-.317***
3-month EAC					.161†
Step 3: Constraints X EAC	.759	.008	1.665	1, 49	-.111
Dependent variable: Baseline MHI Scores					
Step 1: Baseline Social Support	.154	.154*	4.716	2, 52	.327*
Baseline EAC					.103
Step 2: Supports X EAC	.174	.021	1.276	1,51	-.150
Dependent variable: 3-month MHI Scores					
Step 1: Baseline MHI Scores	.629	.629***	89.928	1, 53	.750***
Step 2: Baseline Social Support	.641	.011	0.809	2, 51	.093
Baseline EAC					.063
Step 3: Supports X EAC	.641	.000	0.001	1, 50	.003
Dependent variable: 3-month MHI Scores					
Step 1: Age at Diagnosis	.642	.642***	46.593	2, 52	-.002
Baseline MHI Scores					.722***
Step 2: 3-month Social Support	.713	.071**	6.234	2, 50	.197*
3-month EAC					.190*
Step 3: Supports X EAC	.724	.011	1.933	1, 49	.118

Note. N=55. † p<.10, *p<.05 **p<.01 ***p<.001. EAC = Emotional Approach Coping. MHI = Mental Health Inventory.

Figure Captions

Figure 3.1. Relationship between 3-month social constraints and 3-month MHI scores under conditions of low and high frequency of intrusions measured at 3-months.



Chapter Four

Discussion

General Discussion

The aim of this study was to examine the impact of cognitive processing and emotional expression on psychological adjustment among colorectal cancer survivors. Previous studies with other cancer patients have yielded mixed results regarding the influence of cognitive processing and few studies have simultaneously included positive and negative indices of psychological adjustment. Therefore, this study sought to extend our understanding of the coping process, in general, and social cognitive processing theory, more specifically, by incorporating relevant dispositional and social resource variables. Although colorectal cancer is the third most common cancer in both men and women (ACS, 2006), few studies examine psychosocial outcomes among colorectal cancer patients and survivors. As a result, this study was designed to address these omissions in the existing research literature and provide valuable descriptive and theory-driven data about psychological adjustment among colorectal cancer survivors.

In general, clinical and demographic variables were unrelated to coping process and psychosocial outcome variables. On measures of PTG, average scores were 43.8 and 51.5 for baseline and three-month assessments, respectively. In contrast, prior research with breast cancer patients and survivors reported mean PTGI scores of 64.1 (Cordova et al., 2001b), 60.2 (Weiss, 2002), 49.0 to 55.7 (Manne et al., 2004), and 58.4 (Sears et al., 2003). Patients undergoing bone marrow transplant reported mean PTGI scores of 64.7 (Widows et al., 2005). However, mean PTGI scores of 46.6 were reported among a sample of prostate cancer survivors (Thornton & Perez, 2006), scores similar to those in this current study sample. With respect to intrusive cognitions, this sample of colorectal cancer survivors reported average scores at baseline of 7.0 and at three-month follow-up of 5.9. By comparison, studies of breast cancer patients have yielded higher average intrusion scores of 8.7 to 13.6 (Manne et al., 2004) and 11.9 (Sears et al., 2003). Similarly, breast cancer survivors an average of two years post-treatment reported average scores of 11.1 (Cordova et al., 2001b). Lower mean intrusion scores ($M=7.4$) were obtained in a sample of breast cancer survivors an average of two and a half years post-treatment (Cordova et al., 1995), scores comparable to those of the current sample.

Regarding mean scores on the PCL-C, this sample reported lower average scores (23.2 & 21.4) compared to mean PCL-C scores of 33.5 from breast cancer patients (Levine et al., 2005) and 27.1 from breast cancer survivors (Cordova et al., 1995). Comparable mean PCL-C scores of 22.4 were found in a study of bone marrow transplant survivors (Johnson Vickberg et al., 2001). In addition, responses to the proxy trauma questions were compared to a study of breast cancer patients. Palmer et al. (2004) used the A2 criterion (i.e., responding to cancer with intense fear, helplessness, or horror) from the DSM-IV-TR criteria for PTSD (American Psychiatric Association, 2000) as the critical diagnostic item. In their sample, 41% positively endorsed the A2 criterion. By comparison, this study sample reported a much lower rate of 18.2% who indicated their response to the cancer experience was one of intense fear, helplessness, or horror.

One possible explanation for the lower mean PTGI, PCL-C, and IES-Intrusion scores relative to other studies of cancer patients and survivors emphasizes the impact of gender on psychological distress. Evidenced is mixed on this issue. While some studies of cancer patients report gender differences on indices of psychological adjustment, specifically females reporting higher distress scores than men (Johnson Vickberg et al., 2001; Kaasa et al., 1993), other research suggests that gender has no impact on the trajectory of the stress response after a trauma (Sundin & Horowitz, 2003) or on reports of psychological distress among cancer patients (Zabora et al., 2001). Although the reason for lower scores among this sample is unclear, generally speaking, this sample of colorectal cancer survivors was reporting less distress and fewer problems with psychological adjustment relative to other cancer populations studied.

It was hypothesized that cognitive processing would be predictive of both positive and negative psychosocial outcomes of colorectal cancer. This hypothesis was supported. As already noted, cognitive processing is frequently measured by the intrusions subscale of the IES. In this study, cognitive processing was measured using this subscale as well as a subscale examining more effortful, deliberate processing (cognitive rehearsal). As hypothesized, higher frequency of intrusive thoughts about the cancer experience and higher levels of distress secondary to intrusive cognitions were positively associated with PTSD symptomatology. Specifically, baseline intrusions (both frequency and distress) significantly accounted for unique variance in predicting three-month PTSD symptoms

above and beyond baseline PTSD symptoms. Though this may not seem surprising given the significant overlap in item content for the IES and PCL-C, the association between frequency and distress versions of the intrusions subscale is notable. In fact, frequency and distress measures of cancer-related intrusions were significantly correlated at both baseline ($r=.89$) and three-month ($r=.87$) assessments, suggesting these cognitions were predominantly negatively-valenced and accurately measured cancer-related distress. Segerstrom et al. (2003) have noted, when people can control their thoughts, they typically prefer to think about positive topics. So, the greater frequency of uncontrollable, intrusive, cancer-related cognitions would tend to be experienced more negatively and arouse more distress. In sum, this finding supports research suggesting the IES is a measure of subjective psychological distress related to a specific stressor (Sundin & Horowitz, 2003) and can be properly used as a measure of cancer-related distress (Salsman et al., 2004; Schwartz et al., 1998; Zakowski et al., 1997).

Contrary to my predictions, neither frequency of cancer-related intrusions or distress associated with these intrusions reliably predicted PTG. As Horowitz (1986) has suggested, higher levels of intrusive cognitions are often evidence of incomplete processing. As a result, this incomplete processing would be more predictive of PTSD symptomatology and not PTG which typically arises after more intentional cognitive engagement. Relatedly, the two assessments occurred several months after the initial diagnosis and may have not adequately captured much variability in psychological adjustment. Though PTG has been thought to occur as frequently as 2-weeks to four-months following a traumatic event (Finkel, 1975), it has also been suggested that PTG may occur over the course of several years until a successful resolution of the crises leads to a decline in both negative and positive sequelae (Schaefer & Moos, 1998). At baseline assessment, the average time since diagnosis was thirteen months, and this may not have been an optimal amount of time from which to measure PTG. It is also possible the intensity of the stressful event was too low to disrupt the assumptions individuals hold about their lives, often considered a critical element of PTG (Tedeschi & Calhoun, 1996). In fact, the majority of participants (56.4%) did not endorse either proxy trauma question.

In contrast to the lack of associations between automatic, intrusive cognitions and PTG, more intentional effortful processing was associated with higher levels of PTG as

hypothesized. The strength of this relationship was most evident in predicting three-month PTG. Specifically, both baseline and three-month cognitive rehearsals were positively associated with three-month PTG, after controlling for baseline PTG. So, while deliberate, cognitive engagement with the cancer experience may not translate into immediate growth, results suggest later PTG is a product of this cognitive rehearsal. This is a particularly important finding since no studies have examined the impact of a deliberate, effortful component of cognitive processing on PTG.

Interestingly, cognitive rehearsal did not reliably predict PTSD symptomatology. Though baseline cognitive rehearsal was significantly associated with baseline PTSD symptoms, neither baseline nor three-month cognitive rehearsal significantly predicted three-month PTSD symptoms. Taken together with the above data, it is possible individuals who were experiencing higher levels of PTSD symptoms at baseline were experiencing higher levels of intrusions and engaging in more deliberate reflection as a means to begin processing their cancer experience. Three months later, those who had engaged in higher levels of cognitive rehearsal were more likely to report higher levels of PTG as a result. As hypothesized, cognitive processing (intrusions, cognitive rehearsal) was differentially predictive of PTG and PTSD symptoms.

In spite of the contrasting associations between cognitive processing and psychological adjustment variables, the relationship between PTG and PTSD remains unclear. As noted above, Calhoun and Tedeschi (1998) have argued that PTG often coexists with PTSD symptoms and other clinical and research data have emphasized the importance of psychological distress as a catalyst for PTG. Interestingly, the empirical literature reveals mixed results regarding the presence of intrusions and PTG. In related studies, researchers have found no associations (Manne et al., 2004) between PTG and intrusive thoughts and between PTG and negative mood states (Widows et al., 2005). Other studies have found positive associations between intrusive thoughts and PTG (Sears et al., 2003; Thornton & Perez, 2006). In this study, PTGI scores were not significantly associated with PCL-C or MHI scores. However, 15 (27.3%) participants reported baseline scores that placed them in the high PTGI/high PCL-C group. So, it is possible for cancer survivors to be actively experiencing higher levels of PTSD symptoms while simultaneously reporting higher levels of PTG. The exact nature of the

relationship between PTSD and PTG remains an area in need of additional research.

The hypothesis that emotional expression will moderate the link between cognitive processing and mental health was not supported. Though EAC emerged as a reliable predictor of both PTG and mental health, the relationship between cognitive processing (intrusions and cognitive rehearsal) and mental health did not vary as a function of EAC. Participants who were attuned to and expressive of their feelings about their cancer experience were more likely to report higher levels of PTG and better mental health at the three-month assessment. This adaptive benefit of EAC is consistent with previous research that found an association between EAC and less distress over a three-month period in a group of breast cancer patients (Stanton, Danoff-Burg, et al., 2000). The lack of a significant interaction between emotional and cognitive processing was somewhat surprising though the only study providing support for such an interaction was conducted not with cancer survivors, but with women at high risk for breast cancer (Zakowski et al., 2001). As noted above, Zakowski et al. (2001) found women who were less emotionally expressive were more distressed by their intrusive cognitions about breast cancer than those who were more emotionally expressive. In general, this sample of colorectal cancer survivors was not particularly distressed as evidenced by lower IES-Intrusion (Cordova et al., 2001b; Manne et al., 2004; Sears et al., 2003) and PCL-C (Cordova et al., 1995; Johnson Vickberg et al., 2001; Levine et al., 2005) scores relative to other samples. It is possible that under conditions of greater distress and hence greater intrusions, an interaction between EAC and cognitive processing would be more likely to occur. It is also possible given the low sample size, statistical power was inadequate to detect an interaction effect even if one was present. In summary and contrary to the hypothesized relationships, no significant interactions were identified for EAC X intrusions or for EAC X cognitive rehearsal in predicting mental health.

The hypothesis that coping process variables will mediate the link between dispositional factors and mental health (i.e., total MHI scores), also failed to be supported. Specifically, it was hypothesized that cognitive processing would mediate the link between openness to experience and PTG and EAC would mediate the link between emotional intelligence and mental health. It was expected the disposition of openness to experience might yield a mental flexibility conducive to greater reflection and more

cognitive processing which would result in higher levels of PTG. In this sample, openness to experience was not associated with cognitive processing scores and also failed to predict PTG. In contrast, emotional intelligence was predictive of EAC and MHI scores. However, research participants who had higher social desirability scores were also more likely to report greater emotional intelligence. Consequently, the relationship between emotional intelligence and mental-health scores was no longer significant after controlling for the influence of social desirability.

The final hypothesis that social resource variables (social constraints, social support) would moderate the relationship between coping process variables (intrusions, cognitive rehearsal, EAC) and mental health (MHI scores) was partially supported. A significant interaction emerged for three-month intrusions and three-month social constraints in predicting three-month MHI scores. For individuals reporting low intrusions, there was no difference in MHI scores for those reporting high social constraints compared to low social constraints. In other words, the social environment is not as important when very few cancer-related intrusions occur. However, for individuals reporting high intrusions, the social environment is of particular importance. High intrusions are suggestive of incomplete processing and elevated distress levels. Participants who experienced high intrusions in the context of a constraining social environment reported poorer mental health. In contrast, participants who experienced high intrusions in the context of a less constraining social environment reported better mental health, even when compared to participants with low intrusions. That is, the best mental health was reported for those individuals who were cognitively processing their cancer experience in a non-constraining social environment. These findings are consistent with research on the social cognitive processing model among cancer patients and survivors (Cordova et al., 2001a; Devine et al., 2003; Lepore, 2001; Lepore & Helgeson, 1998; Schmidt & Andrykowski, 2004) and further emphasize the importance of the social environment in adaptation to the cancer experience.

Limitations

A few caveats should be considered when interpreting these data. First, our sample size was a small group of colorectal cancer survivors. Even though participants were comparable to nonparticipants on demographic and clinical characteristics,

generalizability to other cancer survivors is likely limited. Furthermore, with a small sample size and the resulting decreased statistical power, the ability to detect interaction effects is compromised. This was particularly problematic given the amount of hypothesized interactions in this current study. Second, only one ethnic minority was represented in this sample. Examining differences among coping processes and psychosocial outcomes among ethnic minorities is essential to advancing research and understanding the role of psychological adaptation to cancer more fully. Third, coefficient alpha for the openness to experience measure was relatively low (.65). Since reliability is a necessary condition for validity, it is possible the validity of this construct was compromised due to the relatively low reliability and thus contributed to the lack of hypothesized relations with other key study variables. Fourth, the average baseline assessment occurred over one year after the initial cancer diagnosis. To understand the trajectory of PTG more completely and its relationship to coping processes and to PTSD symptoms, an extended time range of assessments accurately capturing more variability in distress levels is needed.

Summary and Future Directions

In spite of these limitations, this study provided substantial data regarding the impact of emotional and cognitive processing on psychological adjustment among colorectal cancer survivors. First, few participants (16.4%) perceived their cancer experience as a traumatic stressor, but 27.3% of the total sample reported high levels of PTSD and PTG. Second, cognitive processing differentially predicted psychosocial outcomes. More specifically, cancer-related intrusions were associated with PTSD symptomatology whereas cognitive rehearsal was associated with PTG. Third, social constraints moderated the link between intrusions and mental health. That is, lower levels of constraints (i.e., a more supportive, social environment) were conducive to better mental health when cancer survivors were experiencing greater intrusions. Much work remains to further delineate the nature of cognitive processing, understand the developmental trajectory of PTG, and identify additional social-environmental and dispositional variables promoting better psychological adjustment among colorectal cancer survivors.

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Appendix A

Initial Contact Letter from the KCR

««Date»»

««AddressBlock»»

««GreetingLine»»

The Kentucky Cancer Registry (KCR) is the official population-based cancer registry for the Commonwealth of Kentucky. State law requires that information about all cases of cancer occurring in residents of Kentucky be reported to KCR. The information from these reports helps planners identify areas of the state where cancer control programs are most needed to reduce the burden of this disease. The identity of individuals with cancer who have been reported to KCR is held confidential. There are, however, situations where information about an individual's experience with cancer can help researchers better understand how to prevent or treat the disease. I am writing to inform you about one of these opportunities.

A research study is being conducted by the University of Kentucky to better understand *coping processes associated with adjustment to colorectal cancer*. This *noninvasive* study is designed only to collect information *via questionnaires* and does not involve any particular treatment. *All information will be obtained over the telephone or through the mail and participants will be compensated for their time*. The KCR would like your permission to release your name, address, and telephone number to the researchers conducting this study. If you are interested in finding out more about this study, you do not need to do anything. Your name will be released to the researchers. You will be contacted in approximately four weeks and given more detailed information about the study. At that time, you will have the opportunity to choose for yourself whether or not you are interested in participating in the study. Your participation in this study is completely voluntary and your decision will have no impact on your care. However, **if you are not interested in being contacted by a member of the research team, please complete and sign the enclosed form and return it in the pre-addressed, postage-paid envelope by July 22, 2004.**

KCR takes very seriously its responsibility to keep confidential the identity of all individuals with cancer who are reported to the registry. If you choose not to be contacted, your name will not be released. If you are willing to be contacted and choose to participate, your identity will continue to be held confidential. The information released by KCR will only be used to contact you. Once the valuable information about you and your experience with cancer has been gathered, all information that would personally identify you with any aspect of the research study will be destroyed.

We believe this is a valuable opportunity for researchers to learn from your experience with cancer, and we would be grateful if you would be willing to participate. If you have any questions, please feel free to contact Emily Reed, Coordinator of Research Studies for KCR, at (859) 219-0773 ext. 229. Thank you for your thoughtful consideration of this opportunity.

Sincerely,

Thomas C. Tucker, PhD, MPH
Director, Kentucky Cancer Registry

Appendix B

Follow-Up Letter and Information Sheet from Primary Investigator

««Date»»

««AddressBlock»»

««GreetingLine»»

The Department of Behavioral Science at the University of Kentucky is conducting a research study of colorectal cancer survivors. This study is partially funded by the National Institute of Mental Health. Approximately 200 men and women who participate in this research study will be interviewed, and all information is kept confidential.

The purpose of this study is to learn about different strategies of coping with colorectal cancer and their impact on psychological adjustment. Your participation in this research study would involve completion of two telephone interviews over a period of 3 months. That's all. During the interviews, we will ask questions about how you are feeling both physically and emotionally. We will also ask questions regarding the impact of your cancer experience on your life. The telephone interviews will be scheduled at your convenience and will not cost you anything. In appreciation of the time you devote to completion of the telephone interviews we will pay you \$20 for each interview you participate in. Thus, completion of both interviews would earn you a total of \$40.

Of course, you are under no obligation to participate in this research study. **However, if you are interested in participating in this research study, simply fill out the attached information sheet and a copy of the informed consent and mail these sheets back to us in the enclosed, stamped envelope.** The second copy of the informed consent is for your own personal records. Once we receive your information sheet and informed consent in the mail, I will telephone you to tell you more about the study and answer any questions you might have. It's that simple. If you are not interested in participating in this research, simply complete the information sheet and return it to us in the stamped envelope.

If you have any questions regarding this letter, please telephone me, the principal investigator of the research study, at (859) 257-4547 and I will be happy to answer your questions.

Sincerely,

John M. Salsman, M.S., M.A.
Principal Investigator
Doctoral Candidate
NIMH Predoctoral Trainee

INFORMATION SHEET

Please complete the information below and mail back to our project office using the enclosed stamped and addressed envelope.

Please check one:

____ **NO**, I am not interested in participating in this research project

If NO, please check the appropriate box below.

____ Too busy

____ Too stressed

____ Not interested

____ Other reason: _____

____ **YES**, I am interested in learning more about how I might earn up to \$40 by participating in this research study of how men and women cope with colorectal cancer. Please telephone me to provide more information.

If YES, please complete the following information below. Please print.

NAME _____

CURRENT ADDRESS _____

MY CURRENT TELEPHONE NUMBER (_____) _____ (home)

(_____) _____ (work)

MY E-MAIL ADDRESS _____

BEST DAYS AND TIMES TO TELEPHONE ME:

For your convenience the research staff is available Mon. – Sat. 8:00 am – 8:00 pm.

Thanks for providing this information. Now simply **place this Information Sheet in the attached stamped and addressed envelope and mail back to our project office.** If you answered YES above, a member of our research staff will contact you to furnish you with more details about the study. Thanks and best wishes.

Appendix C

Measures

Demographic Questionnaire

1. What is your gender?

Male Female

2. What is your date of birth?

____ / ____ / ____ (Month / Day / Year)

3. What group do you belong to?

- White (non-Hispanic)
- Black/ (non-Hispanic)
- Asian/Pacific Islander
- American Indian/Alaskan Native
- Hispanic
- Other: _____

4. What is your current employment status?

- Employed Full-time
- Employed Part-time
- Part- or Full-time Student
- Retired
- Never worked
- Unemployed/looking for work
- Disabled

5. What is your marital/partner status?

- Married
- Single
- Cohabiting
- Separated or Divorced
- Widowed

Demographic Questionnaire - Continued

6. How far did you go in school?

- 0 – 8 years
- Some high school but didn't finish
- High school diploma or GED
- Business or trade School
- Some college
- 2-year college degree
- 4- year college degree
- Graduate or professional degree (i.e., M.S., Ph.D.)

7. What is your household income per year? (Combined income of everyone living in your house)

\$ _____

8. How many dependents currently live with you? (Select one)

- One
- Two
- Three
- Four
- Five
- Six
- More than Six

9. With regard to your cancer diagnosis, what treatment(s) have you received? (Check all that apply)

- Surgery
- Chemotherapy
- Radiation
- Other _____

NEO-FFI: Openness to Experience

For each statement, check the box that best represents your opinion:

		<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>
1.	I don't like to waste my time daydreaming.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	Once I find the right way to do something, I stick to it.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	I am intrigued by the patterns I find in art and nature.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	I believe letting students hear controversial speakers can only confuse and mislead them.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	Poetry has little or no effect on me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	I often try new and foreign foods.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	I seldom notice the moods and feelings that different environments produce.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.	I believe we should look to our religious authorities for decisions on moral issues.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.	Sometimes when I am reading poetry or looking at a work of art, I feel a chill or wave of excitement.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.	I have little interest in speculating on the nature of the universe or the human condition.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.	I have a lot of intellectual curiosity.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.	I often enjoy playing with theories or abstract ideas.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

TMMS

Please read each statement and decide whether or not you agree with it. Please indicate how much you *agree* or *disagree* with each of the following statements. To do so, simply check a box using the scale shown below.

	<i>Strongly Disagree</i>	<i>Some- what Disagree</i>	<i>Neither Agree or Disagree</i>	<i>Some- what Agree</i>	<i>Strongly Agree</i>
1. I try to think good thoughts no matter how badly I feel.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. People would be better off if they felt less and thought more.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. I don't think it's worth paying attention to your emotions or moods.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. I don't usually care much about what I'm feeling.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Sometimes I can't tell what my feelings are.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. I am rarely confused about how I feel.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Feelings give direction to life.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Although I am sometimes sad, I have a mostly optimistic outlook.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. When I am upset I realize that the "good things in life" are illusions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. I believe in acting from the heart.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. I can never tell how I feel.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. The best way for me to handle my feelings is to experience them to the fullest.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. When I become upset I remind myself of all the pleasures in life.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. My belief and opinions always seem to change depending on how I feel.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. I am often aware of my feelings on a matter.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

TMMS – Continued

	<i>Strongly Disagree</i>	<i>Some- what Disagree</i>	<i>Neither Agree or Disagree</i>	<i>Some- what Agree</i>	<i>Strongly Agree</i>
16. I am usually confused about how I feel.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. One should never be guided by emotions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. I never give into my emotions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Although I am sometimes happy, I have a mostly pessimistic outlook.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. I feel at ease about my emotions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. I pay a lot of attention to how I feel.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. I can't make sense out of my feelings.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. I don't pay much attention to my feelings.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. I often think about my feelings.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. I am usually very clear about my feelings.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. No matter how badly I feel, I try to think about pleasant things.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27. Feelings are a weakness humans have.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. I usually know my feelings about a matter.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. It is usually a waste of time to think about your emotions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. I almost always know exactly how I am feeling.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

MC-C

Listed below are a number of statements concerning personal attitudes and traits. Read each item and decide whether the statement is *true* or *false* as it pertains to you personally.

	<i>True</i>	<i>False</i>
1. It is sometimes hard for me to go on with my work if I am not encouraged.	<input type="checkbox"/>	<input type="checkbox"/>
2. I sometimes feel resentful when I don't get my way.	<input type="checkbox"/>	<input type="checkbox"/>
3. On a few occasions, I have given up doing something because I thought too little of my ability.	<input type="checkbox"/>	<input type="checkbox"/>
4. There have been times when I felt like rebelling against people in authority even though I knew they were right.	<input type="checkbox"/>	<input type="checkbox"/>
5. No matter who I'm talking to, I'm always a good listener.	<input type="checkbox"/>	<input type="checkbox"/>
6. There have been occasions when I took advantage of someone.	<input type="checkbox"/>	<input type="checkbox"/>
7. I'm always willing to admit it when I make a mistake.	<input type="checkbox"/>	<input type="checkbox"/>
8. I sometimes try to get even rather than forgive and forget.	<input type="checkbox"/>	<input type="checkbox"/>
9. I am always courteous, even to people who are disagreeable.	<input type="checkbox"/>	<input type="checkbox"/>
10. I have never been irked when people expressed ideas very different from my own.	<input type="checkbox"/>	<input type="checkbox"/>
11. There have been times when I was quite jealous of the good fortune of others.	<input type="checkbox"/>	<input type="checkbox"/>
12. I am sometimes irritated by people who ask favors of me.	<input type="checkbox"/>	<input type="checkbox"/>
13. I have never deliberately said something that hurt someone's feelings.	<input type="checkbox"/>	<input type="checkbox"/>

IES

Below is a list of comments made by people after stressful life events. Please read each item, and then indicate how frequently these comments were true for you during the past 7 days with respect to your experience with cancer and how much this distressed or bothered you.

	<i>Not at All</i>	<i>Rarely</i>	<i>Sometimes</i>	<i>Often</i>
1. I thought about it when I didn't mean to.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much did this distress or bother you?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. I avoided letting myself get upset when I thought about it or was reminded of it.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much did this distress or bother you?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. I tried to remove it from memory.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much did this distress or bother you?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. I had trouble falling asleep or staying asleep because of pictures or thoughts about it that came into my mind.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much did this distress or bother you?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. I had waves of strong feelings about it.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much did this distress or bother you?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. I had dreams about it.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much did this distress or bother you?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. I stayed away from reminders of it.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much did this distress or bother you?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. I felt as if it hadn't happened or wasn't real.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much did this distress or bother you?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. I tried not to talk about it.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much did this distress or bother you?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Pictures about it popped into my mind.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much did this distress or bother you?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Other things kept making me think about it.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much did this distress or bother you?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

IES – Continued

	<i>Not at All</i>	<i>Rarely</i>	<i>Sometimes</i>	<i>Often</i>
12. I was aware I still had a lot of feelings about it, but didn't deal with them.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much did this distress or bother you?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. I tried not to think about it.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much did this distress or bother you?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Any reminder brought back feelings about it.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much did this distress or bother you?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. My feelings about it were kind of numb.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How much did this distress or bother you?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Rumination Scale

Below is a list of comments made by people after stressful life events. Read each item and indicate how frequently these comments were true for you during the past 7 days with respect to your experience with cancer. Respond to the items by checking your response on the four point scale below each item.

	<i>Not at All</i>	<i>Rarely</i>	<i>Some- times</i>	<i>Often</i>
1. I seldom thought about it.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. I often got distracted from what I was doing by thoughts about it.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. If I don't want to think about it, I am able to just stop thinking about it.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. I often think about what my life as a cancer survivor will be like in the future.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. When I have a problem related to my cancer experience, I tend to think of it a lot of the time.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. I rarely become lost in thought about it.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. When I know that I am going to have an important talk about it with someone in the near future, I rehearse in my mind what I will say and what he or she will probably say in response.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Sometimes I feel like I have no control over my thoughts about it.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. I have no trouble focusing all of my attention on one thing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. When I do not understand something about it, I tend to run it over in my mind until I can make sense of it.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

EAC

We are interested in how people respond when they confront their cancer experience. There are many ways to deal with cancer. This questionnaire asks you to indicate what *you* generally do, feel, and think when *you* reflect on your cancer experience. Obviously, different experiences may bring out different responses, but think about what you usually do when you are thinking about your cancer experience.

1 = I usually don't do this at all

2 = I have done this a few times before

3 = I sometimes do this

4 = I usually do this a lot

	1	2	3	4
1. I take time to figure out what I'm really feeling.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. I delve into my feelings to get a thorough understanding of them.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. I realize that my feelings are valid and important.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. I acknowledge my emotions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. I let my feelings come out freely.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. I take time to express my emotions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. I allow myself to express my emotions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. I feel free to express my emotions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

ISEL-12

This scale is made up of a list of statements each of which may or may not be true about you. For each statement check "definitely true" if you are sure it is true about you and "probably true" if you think it is true but are not absolutely certain. You should check "definitely false" if you are sure the statement is false and "probably false" if you think it is false but are not absolutely certain.

	<i>Definitely False</i>	<i>Probably False</i>	<i>Probably True</i>	<i>Definitely True</i>
1. If I wanted to go on a trip for a day (for example, to the country or mountains), I would have a hard time finding someone to go with me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. I feel that there is no one I can share my most private worries and fears with.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. If I were sick, I could easily find someone to help me with my daily chores.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. There is someone I can turn to for advice about handling problems with my family.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. If I decide one afternoon that I would like to go to a movie that evening, I could easily find someone to go with me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. When I need suggestions on how to deal with a personal problem, I know someone I can turn to.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. I don't often get invited to do things with others.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. If I had to go out of town for a few weeks, it would be difficult to find someone who would look after my house or apartment (the plants, pets, garden, etc.).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

ISEL-12 - Continued

		<i>Definitely False</i>	<i>Probably False</i>	<i>Probably True</i>	<i>Definitely True</i>
9.	If I wanted to have lunch with someone, I could easily find someone to join me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.	If I was stranded 10 miles from home, there is someone I could call who could come and get me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.	If a family crisis arose, it would be difficult to find someone who could give me good advice about how to handle it.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.	If I needed some help in moving to a new house or apartment, I would have a hard time finding someone to help me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SCS

Below is a list of social experiences. For each question, please indicate how often you have had that experience in the past month.

How often in the past month did your friends or family...	<i>Never</i>	<i>Rarely</i>	<i>Sometimes</i>	<i>Often</i>
1. change the subject when you tried to discuss your stressful experience?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. not seem to understand your situation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. avoid you?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. minimize your problems?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. seem to be hiding their feelings?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. act uncomfortable when you talked about your stressful experience?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. trivialize your problems?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. complain about their own problems when you wanted to share yours?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. act cheerful around you to hide their true feelings or concerns?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. tell you not to worry so much about your health?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. tell you to try not to think about your stressful experience?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. give you the idea that they didn't want to hear about your stressful experience?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. make you feel as though you had to keep your feelings about your stressful experience to yourself, because they made them feel uncomfortable?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. make you feel as though you had to keep your feelings about your stressful experience to yourself, because they made them feel upset?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. let you down by not showing you as much love and concern as you would have liked?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

MHI

The next set of questions are about how you feel, and how things have been for you during the past 4 weeks. Please check the appropriate response and answer every question. If you are not sure which answer to select, please choose the one answer that comes closest to describing you.

<u>During the past 4 weeks, how much of the time...</u>	<i>All of the time</i>	<i>Most of the time</i>	<i>A good bit of the time</i>	<i>Some of the time</i>	<i>A little bit of the time</i>	<i>None of the time</i>
1. has your daily life been full of things that were interesting to you?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. did you feel depressed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. have you felt loved and wanted?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. have you been a very nervous person?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. have you been in firm control of your behavior, thoughts, emotions, feelings?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. have you felt tense or high-strung?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. have you felt calm and peaceful?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. have you felt emotionally stable?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. have you felt downhearted and blue?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. were you able to relax without difficulty?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. have you felt restless, fidgety, or impatient?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. have you been moody, or brooded about things?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. have you felt cheerful, light-hearted?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. have you been in low or very low spirits?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. were you a happy person?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. did you feel you had nothing to look forward to?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. have you felt so down in the dumps that nothing could cheer you up?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. have you been anxious or worried?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Proxy Trauma Questions

In response to your cancer experience have you...

1. Reacted with feelings of intense fear, helplessness, or horror?
 Yes
 No

2. Felt that the event was a potential threat to your life and safety or the lives and safety of others?
 Yes
 No

PCL-C

Below is a list of problems and complaints that people sometimes have in response to stressful experiences. Please read each one carefully. Then check one of the boxes to the right to indicate how much you have been bothered by that problem *in the past month*. Remember to complete the following questions with reference to your cancer experience.

	<i>Not at all</i>	<i>A little bit</i>	<i>Moderately</i>	<i>Quite a bit</i>	<i>Extremely</i>
1. Repeated, disturbing memories, thoughts or images of a stressful experience?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Repeated, disturbing dreams of a stressful experience?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Suddenly acting or feeling as if a stressful experience were happening again (as if you were reliving it)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Feeling very upset when something reminded you of a stressful experience?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Having physical reactions (e.g., heart pounding, trouble breathing, sweating) when something reminded you of a stressful experience?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Avoiding thinking about or talking about of a stressful experience or avoiding having feelings related to it?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Avoiding activities or situations because they reminded you of a stressful experience?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Trouble remembering important parts of a stressful experience?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Loss of interest in activities you used to enjoy?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Feeling distant or cut off from other people?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PCL-C - Continued

	<i>Not at all</i>	<i>A little bit</i>	<i>Moderately</i>	<i>Quite a bit</i>	<i>Extremely</i>
11. Feeling emotionally numb or being unable to have loving feelings for those close to you?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Feeling as if your future somehow will be cut short?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Trouble falling or staying asleep?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Feeling irritable or having angry outbursts?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Having difficulty concentrating?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Being “superalert” or watchful or on guard?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Feeling jumpy or easily startled?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PTGI

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

- 1) ***I did not experience this change as a result of having cancer.***
- 2) ***I experienced this change to a very small degree as a result of having cancer.***
- 3) ***I experienced this change to a small degree as a result of having cancer.***
- 4) ***I experienced this change to a moderate degree as a result of having cancer.***
- 5) ***I experienced this change to a great degree as a result of having cancer.***
- 6) ***I experienced this change to a very great degree as a result of having cancer.***

		<i>No Change</i>	<i>Very Small Degree</i>	<i>Small Degree</i>	<i>Moderate Degree</i>	<i>Great Degree</i>	<i>Very Great Degree</i>
1.	My priorities about what is important in life.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	I'm more likely to try to change things which need changing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	An appreciation for the value of my own life.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	A feeling of self-reliance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	A better understanding of spiritual matters.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	Knowing that I can count on people in times of trouble.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	A sense of closeness with others.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.	Knowing I can handle difficulties.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.	A willingness to express my emotions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.	Being able to accept the way things work out.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.	Appreciating each day.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.	Having compassion for others.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.	I'm able to do better things with my life.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PTGI - Continued

	<i>No Change</i>	<i>Very Small Degree</i>	<i>Small Degree</i>	<i>Moderate Degree</i>	<i>Great Degree</i>	<i>Very Great Degree</i>
14. New opportunities are available which wouldn't have been otherwise.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Putting effort into my relationships.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. I have a stronger religious faith.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. I discovered that I'm stronger than I thought I was.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. I learned a great deal about how wonderful people are.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. I developed new interests.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. I accept needing others.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. I established a new path for my life.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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VITA
JOHN M. SALSMAN, M.S., M.A.

A. Biographical Information

Date of Birth: October 9, 1972

Place of Birth: Elizabethtown, Kentucky

B. Educational History

Pre-Doctoral Internship, Memphis VA Medical Center, Memphis, TN, September 2006.

M.S. Clinical Psychology, University of Kentucky, Lexington, KY, December 2002.

M.A. Theological Studies, Asbury Theological Seminary, Wilmore, KY, May 2000.

B.A. Psychology, Asbury College, Wilmore, KY, May 1995.

C. Honors And Awards

NIMH Predoctoral Traineeship, Department of Behavioral Science, University of Kentucky, Lexington, KY, 2003-2005.

DOD Predoctoral Traineeship in Psychosocial Breast Cancer Research, Department of Behavioral Science, University of Kentucky, Lexington, KY, 2002-2003.

Meritorious Student Poster Presentation, Annual meeting of the Society of Behavioral Medicine, Washington, DC, 2002.

Target of Opportunity for Research Award, University of Kentucky, Lexington, KY, 2000-2001, and 2001-2002.

Student Development Award, University of Kentucky, Lexington, KY, 2000-2001.

Psi Chi Honor Society, Asbury College, Wilmore, KY, 1994-present.

McPheeters Academic Scholarship, Asbury Theological Seminary, Wilmore, KY, 1998-2000.

Highest Academic Achievement in Psychology, Asbury College, Wilmore, KY, 1995.

Dean's List, Asbury College, Wilmore, KY, 1992-1995

Morrison Academic Scholarship, Asbury College, Wilmore, KY, 1991-1995.

D. Peer-Reviewed Publications

Gaugler, J.E., Pavlik, E., **Salsman, J.M.**, & Andrykowski, M.A. (in press). Longitudinal modeling of the psychological and behavioral impact of participation in routine screening for ovarian cancer. *Preventive Medicine*.

Harper, F., Schmidt, J.E., Beacham, A.O., **Salsman, J.M.**, Averill, A.J., Graves, K.D., & Andrykowski, M.A. (in press). The role of Social Cognitive Processing theory and optimism in positive psychosocial and physical behavior change after cancer diagnosis and treatment. *Psycho-Oncology*.

Salsman, J.M., Brown, T.L., Brechting, E.H., & Carlson, C.R. (2005). The link between religion and spirituality and psychological adjustment: The mediating role of optimism and social support. *Personality and Social Psychology Bulletin*, *31*, 522-535.

Andrykowski, M.A., Schmidt, J.E., **Salsman, J.M.**, Beacham, A.O., & Jacobson, P.B. (2005). Use of a case definition approach to identify the prevalence of cancer-related fatigue in women undergoing adjuvant therapy for breast cancer. *Journal of Clinical Oncology*, *23*, 6613-6622.

Salsman, J.M., & Carlson, C.R. (2005). Religious orientation, mature faith, and psychological distress: Elements of positive and negative associations. *Journal for the Scientific Study of Religion*, *44*, 201-209.

Salsman, J.M., Pavlik, E., Boerner, L.M., & Andrykowski, M.A. (2004). Clinical, demographic, and psychological characteristics of new, asymptomatic participants in a transvaginal ultrasound screening program for ovarian cancer. *Preventive Medicine*, *39*, 315-322.

Andrykowski, M.A., Boerner, L.M., **Salsman, J.M.**, & Pavlik, E. (2004). Psychological response to abnormal test results in an ovarian cancer screening program: A prospective, longitudinal study. *Health Psychology*, *23*, 622-629.

H. Oral Presentations

Brechting, E.H., Brown, T.L., **Salsman, J.M.**, & Carlson, C.R. (2005, March). *Religiousness, coping, and alcohol use in college students*. Paper presented at the conference on Addiction and Spirituality: Scientific, Theological, and Clinical Perspectives, Terre Haute, Indiana.

Salsman, J., Boerner, L., Pavlik, E., & Andrykowski, M. (2004, March). *Temporal course of response to normal test results in an ovarian cancer screening program*. Paper presented at the annual meeting of the Society of Behavioral Medicine, Baltimore, MD.

Andrykowski, M.A., **Salsman, J.**, Boerner, L., & Pavlik, E. (2004, March). *Adherence with screening recommendations in an ovarian cancer screening program*. Paper presented at the annual meeting of the Society of Behavioral Medicine, Baltimore, MD.

Andrykowski, M.A., Schmidt, J.E., Beacham, A., **Salsman, J.**, Averill, A., Graves, K.D., & Harper, F.W.K. (2004, January). *Psychosocial and physical health behavior change after cancer diagnosis and treatment*. Paper presented at the 1st Annual Conference of the American Psychosocial Oncology Society, Orlando, FL.

Andrykowski, M.A., Boerner, L.M., **Salsman, J.**, & Pavlik, E. (2003, April). *Response to abnormal test results in an ovarian cancer screening program: A prospective, longitudinal study*. Paper presented at the 6th World Congress in Psycho-Oncology, Banff, Alberta, Canada.

Salsman, J. M., Brown, T.L., Brechting, E.H., & Carlson, C.R. (2003, March). *Beyond positive psychology: Linking spirituality, religiosity, mental health, and alcohol*. Paper presented at the annual meeting of the Southeastern Psychological Association, New Orleans, LA

I. Poster Presentations

Salsman, J., Brechting, E., Brown, T., Phillips, C., Collier, B., & Carlson, C. (2006, March). *Identifying religious and spiritual associations with health among college students: Does one size fit all?* Poster session to be presented at the annual meeting of the Society of Behavioral Medicine, San Francisco, CA.

Brechting, E.H., Brown, T.L., **Salsman, J.M.**, & Carlson, C.R. (2005, June). *Religiousness and alcohol use: The impact of coping style*. Poster session presented at the annual meeting of the Research Society on Alcoholism, Santa Barbara, CA.

Salsman, J., Schmidt, J., & Andrykowski, M. (2005, April). *Religious and spiritual behavior change among cancer survivors*. Poster session presented at the annual meeting of the Society of Behavioral Medicine, Boston, MA.

Brechting, E.H., Brown, T.L., **Salsman, J.M.**, & Carlson, C.R. (2004, June). *Failing to walk the talk: The role of spiritual beliefs and behaviors in predicting alcohol problems*. Poster session presented at the annual meeting of the Research Society on Alcoholism, Vancouver, Canada.

Schmidt, J.E., Graves, K.D., Beacham, A., **Salsman, J.**, Averill, A., Boerner, L., & Andrykowski, M.A. (2004, March). *Linguistic analysis and cancer-related distress: Characteristic differences in written disclosure*. Poster session presented at the annual meeting of the Society of Behavioral Medicine, Baltimore, MD.

Graves, K.D., Harper, F.W.K., Schmidt, J.E., Beacham, A., **Salsman, J.**, Averill, A., Boerner, L., & Andrykowski, M.A. (2004, January). *Linguistic analysis of cancer patients' expressive writing: Association with psychosocial variables and differences among disease stages*. Poster session presented at the 1st Annual Conference of the American Psychosocial Oncology Society, Orlando, FL.

Harper, F.W.K., Graves, K.D., Schmidt, J.E., Beacham, A., **Salsman, J.**, Averill, A., Boerner, L., & Andrykowski, M.A. (2004, January). *The role of social support and positive mood in cancer-related distress in breast and lung cancer patients*. Poster session presented at the 1st Annual Conference of the American Psychosocial Oncology Society, Orlando, FL.

Salsman, J.M., Boerner, L.M., Pavlik, E., & Andrykowski, M.A. (2003, March). *Psychosocial factors in an ovarian cancer screening program: A controlled comparison study*. Poster session presented at the annual meeting of the Society of Behavioral Medicine, Salt Lake City, Utah.

Brechting, E.H., Brown, T.L., **Salsman, J.**, & Carlson, C.R. (2003, March). *Religiosity and alcohol use: Is the glass half full?* Poster session presented at the annual meeting of the Southeastern Psychological Association, New Orleans, LA.

Salsman, J., Boerner, L., Pavlik, E., & Andrykowski, M. (2002, March). *Characteristics of participants in an ovarian cancer screening program: A controlled comparison*. Poster session presented at the annual meeting of the Society of Behavioral Medicine, Washington, D.C.

M. Research Positions

NIMH Research Trainee, Department of Behavioral Science, University of Kentucky, Lexington, KY.

Supervisor: Michael Andrykowski, Ph.D., Department of Behavioral Science.
Fellowship, July 2003-June 2005.

DOD Research Trainee, Department of Behavioral Science, University of Kentucky, Lexington, KY.

Supervisor: Michael Andrykowski, Ph.D., Department of Behavioral Science.
Fellowship, 2002-2003.

Research Assistant, Department of Behavioral Science, University of Kentucky, Lexington, KY.

Supervisor: Michael Andrykowski, Ph.D., Department of Behavioral Science.
Full-time research assistantship, 2001-2002.

Student Research Assistant, University of Kentucky, Lexington, KY.

Supervisor: Tom Widiger, Ph.D.
Volunteer position, 1999-2000.

N. Teaching

Adjunct Faculty, Department of Psychology, Asbury College, Wilmore, KY.
Spring Semester 2004.

Teaching Assistant, University of Kentucky, Lexington, KY.
Supervisor: Jonathon Golding, Ph.D., Experimental Psychology.
Full-time teaching assistantship, 2000-2001.

O. Clinical Experiences

Clinical Psychology Intern, Memphis VA Medical Center (APA-Approved Internship),
Memphis, TN.

Major Rotations: Geriatrics/Rehabilitative Medicine, Spinal Cord Injury/Acute Rehab.

Supervisors: Karen Clark, Ph.D., Bethany Spiller, Ph.D.

Minor Rotations: Hematology/Oncology, Psychological Assessment, Pain Management,
Psychiatry C&L.

Supervisors: Jon DeVore, Ph.D., Jennifer Jacobson, Psy.D., Jeff West, Ph.D., Robert
Korres, Ph.D.

Additional Clinical Experiences: Outpatient individual and group psychotherapy.

Supervisor: Anne Ayres, Ph.D.

Internship year, September 2005-September 2006.

Behavioral Medicine Trainee, Symptom Management and Palliative Care Clinic,

Markey Cancer Center, University of Kentucky, Lexington, KY.

Supervisor: Steven Passik, Ph.D., Department of Internal Medicine

Clinical placement, July 2004-March 2005.

Behavioral Medicine Trainee, Orofacial Pain Clinic, University of Kentucky,
Lexington, KY.

Supervisor: Charles R. Carlson, Ph.D., Department of Psychology

Clinical placement, July 2003-June 2004.

Clinical Trainee, Harris Psychological Services Center, University of Kentucky,
Lexington, KY.

Supervisors: Mary Beth Diener, Ph.D., David T. Susman, Ph.D., & Ruth Baer, Ph.D.

Part-time, 2001-2005.

Practicum Counselor, Asbury College Center for Counseling, Asbury College,
Wilmore, KY.

Supervisor: Steve Stratton, Ph.D., Clinic Director.

Half-time volunteer placement, 2002-2003.

Co-Therapist, Social Skills Group, Jessie Clark Middle School, Lexington, KY.

Supervisor: Rich Milich, Ph.D. & Wendy Mager, M.S.

Volunteer position, 2002.

Co-Leader, UK101: Freshmen Orientation, University of Kentucky, Lexington, KY.

Volunteer position, 2001-2002.