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Coping, psychological well-being, and posttraumatic growth in adolescent cancer survivors and their families.

Andrea M. Turner-Sack
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COPING, PSYCHOLOGICAL WELL-BEING, AND POSTTRAUMATIC GROWTH
IN ADOLESCENT CANCER SURVIVORS AND THEIR FAMILIES

by

Andrea M. Turner-Sack

A Dissertation
Submitted to the Faculty of Graduate Studies and Research
through the Department of Psychology
in Partial Fulfillment of the Requirements for
the Degree of Doctor of Philosophy at the
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Abstract

Researchers have focused on adolescent cancer survivors' negative psychological functioning and paid less attention to indicators of positive psychological functioning, such as posttraumatic growth. The purpose of this study was to examine psychological well-being, posttraumatic growth, and coping strategies in adolescent cancer survivors, their parents, and their siblings. It also investigated various demographic (e.g., age) and disease-related variables (e.g., time since diagnosis, treatment length). Thirty-one adolescents (M age = 15.74) who finished cancer treatment 2 to 10 years prior, 18 siblings (M age = 15.67), and 30 parents (M age = 45.07) completed a background questionnaire, the Brief Symptom Inventory (Derogatis & Melisaratos, 1983), a modified version of the Posttraumatic Growth Inventory (Tedeschi & Calhoun, 1996), and the COPE (Carver, Scheier, & Weintraub, 1989). Survivors and siblings also completed a modified version of the Life Events Checklist (Johnson & McCutcheon, 1980) and the Students' Life Satisfaction Scale (Huebner, 1991). Parents also completed a modified version of the Social Readjustment Rating Scale (Holmes & Rahe, 1967) and the Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985). The findings revealed that parents had higher levels of posttraumatic growth than siblings. A younger age at diagnosis and the use of less avoidant coping strategies predicted higher levels of psychological well-being in adolescent cancer survivors. Beliefs that they were more likely to relapse and the use of more acceptance coping strategies predicted higher levels of posttraumatic growth in adolescent cancer survivors. A younger age and a higher level of life satisfaction predicted higher levels of psychological well-being in parents. None of the variables predicted parents' posttraumatic growth. Information about demographic

variables, coping strategies, and remission predictions will help in the better understanding of positive psychological functioning in adolescent cancer survivors and their families.

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CHAPTER I

Introduction

Over the past few decades, childhood cancer incidence rates have increased and mortality rates have decreased in Canada (National Cancer Institute, n.d.; National Cancer Institute of Canada, 2006). As a result, Canada has a growing population of adolescent cancer survivors with a unique set of psychological issues. Researchers have explored some of these issues, including survivors' moods, anxieties, and methods of coping. However, they have focused on negative aspects of childhood cancer such as low mood, without exploring positive aspects such as gaining a better appreciation of life.

Psychology has recently shifted its focus from illness to health and resilience. This shift has helped highlight the idea that a traumatic experience such as cancer can lead to dramatic positive transformations in an individual's perspectives, priorities, and personal relationships. These transformations have been referred to as posttraumatic growth. Researchers tend to study positive psychological outcomes such as posttraumatic growth in adult cancer populations; they have only recently begun to empirically examine positive outcomes in adolescent cancer populations (e.g., Yaskowich, 2003). This is unfortunate because information about such positive outcomes can help facilitate positive transformations in adolescents.

An adolescent's cancer experience affects the entire family (Tarnow, 1983). Consequently, it is important to examine the family of adolescent cancer survivors. However, few studies have thoroughly examined the experiences of young cancer survivors' families. Information about the family will help researchers and clinicians understand the dynamic interaction between young cancer survivors' experiences and the

experiences of their families. The present study examines psychological functioning (psychological well-being and posttraumatic growth) and coping in adolescent cancer survivors, their siblings, and their parents.

Specific coping strategies have been linked to psychological well-being in adolescents, and to posttraumatic growth in adults. The present study examines the coping strategies associated with adolescent cancer survivors, siblings, and parents' psychological functioning. Moreover, it examines the associations between adolescent survivors and their parents with respect to psychological functioning and coping.

The present study provides important conceptual and clinical information about childhood cancer. By examining both positive and negative aspects of psychological functioning, researchers and clinicians can develop a more balanced conceptualization of the psychological effects of childhood cancer and survivorship on young cancer survivors and their families.

Childhood Cancer in Canada

The incidence of cancer in Canadian children and adolescents has steadily increased over the past thirty years (National Cancer Institute, n.d.; National Cancer Institute of Canada, 2002). In 2002, approximately 1300 children and adolescents were diagnosed with cancer in Canada (National Cancer Institute of Canada, 2002). As the incidence has been rising, improvements in diagnostic technology and treatment protocols have led to declines in mortality. As a result, child and adolescent cancer survival rates have increased by more than 50% over the past fifty years (National Cancer Institute of Canada, 2006) and five-year survival rates are now close to 80% (National Cancer Institute, n.d.). Given the growing population of young cancer survivors,

researchers must seek to thoroughly examine and understand the psychological issues that these survivors face.

From Illness to Health and Beyond—A Paradigm Shift

Over the past few decades, the field of health psychology experienced a notable paradigm shift. Seligman (as cited in Ickovics & Park, 1998) noted this shift at the 1998 U.S. Congressional Briefing on Prevention. The first part of this shift was from a focus on fighting illness to a focus on enhancing health. Others (e.g., Holahan & Moos, 1990) described this as a shift from stress-induced pathology to resilience in the face of stress. In support of this shift, the Committee on Future Directions for Behavioral Health Social Sciences at the National Institutes of Health in the United States advocated for the study of positive health variables, such as adaptive coping strategies, meaning-making, and resilience (Singer & Ryff, 2001). The second part of the shift was a movement beyond illness, health, and resilience to thriving. Ickovics and Park wrote of efforts to move past illness, vulnerability, and deficit to an examination of the ability to thrive. Thriving has been defined as “the effective mobilization of individual and social resources in response to risk or threat... something more than a return to equilibrium” (O’Leary & Ickovics, 1995, p. 122).

A similar two-step paradigm shift occurred in the child and adolescent cancer literature, and coincided with increases in survival rates. As more children and adolescents began to survive cancer, researchers shifted their focus from dying to coping and adaptation (Spinetta, 1977), reflecting the first step of the shift. Soon after, Koocher and O’Malley (1981) conducted their landmark study of young cancer survivors, and described the psychological consequences of surviving cancer as the Damocles

Syndrome. They suggested that survivors were no longer frozen in their struggle to deal with an imminent death, but focused on coping with an uncertain survival, as if living with swords dangling over their heads.

Other researchers have begun to question whether the Damocles Syndrome is an appropriate portrayal of the young cancer survivor. For example, Zebrack and Zeltzer (n.d.) noted that “survivors and their families do not wait passively for an ominous sword to come crashing down and shatter their lives...we can learn from those survivors who have come to wield the Sword of Damocles for their own personal growth” (Zebrack & Zeltzer, para. 8). Their assertions reflect the second step in the paradigm shift—from simply regaining one’s health to attaining an improved psychological state, beyond premorbid levels of functioning. Child and adolescent cancer research has just begun to follow this shift from adjustment to growth and thriving in response to cancer. Personal accounts of such growth in young cancer survivors are found in the literature. For instance, one young survivor stated the following:

Bad things like cancer aren’t a punishment; they’re a way of learning. It’s a hard way of learning because of all the suffering, but it’s probably the only way. If it wasn’t for the bad things that have happened to me, I wouldn’t know so much about hope. (Barnes et al., 1988, p. 22)

Another young survivor stated, “I wouldn’t trade my past for any other life. I am glad to be who I am. I think I am a stronger person because of it” (Barnes et al., p. 81). These comments illustrate the positive transformations that some young cancer survivors experience. They respect the difficult journey they have been on, and recognize the benefits that it has brought them. While researchers have reported a number of such stories, they have not fully explored these positive transformations in young cancer

survivors. An empirical study of adolescent cancer survivors and their experiences of psychological growth is a unique contribution to the literature.

Psychological Consequences of Cancer in Childhood and Adolescence

Adolescent cancer patients and survivors have been the focus of research for several decades. However, the literature does not present a clear and consistent picture of the psychological consequences of cancer in childhood and adolescence. A number of studies found that child and adolescent cancer survivors had similar levels of psychological well-being to their healthy peers. For example, Kazak, Christakis, Alderfer, and Coiro (1994) studied 74 children and adolescents who were in remission from cancer for at least five years. They found that the cancer survivors' anxiety and hopelessness were at or below normal levels. Fritz, Williams, and Amylon (1988) studied 52 children and adolescents who had completed cancer treatment at least two years earlier. They found that 80% of participants had no signs of depression and 87% had an excellent, good, or average level of global adjustment based on researchers' ratings of participants. Kazak et al. (1997) examined symptoms of posttraumatic stress disorder in 130 children and adolescents who had completed treatment for cancer at least one year earlier and 155 children and adolescents with no history of chronic medical conditions. The Diagnostic and Statistical Manual of Mental Disorders (fourth edition [DSM-IV]; American Psychiatric Association, 1994) criteria for posttraumatic stress disorder includes repeatedly reliving aspects of a trauma (e.g., cancer), avoiding stimuli related to the trauma or having a numbed responsiveness, and experiencing hyperarousal. Kazak et al. found no differences between the groups in terms of posttraumatic stress disorder symptoms. Greenberg, Kazak, and Meadows (1989) compared 138 children and

adolescents who had been diagnosed with cancer at least five years earlier and completed treatment at least two years earlier to 92 children and adolescents with no history of chronic medical or psychological conditions. They found that the groups had similar levels of depression. While the cancer survivors had poorer self-concept than the healthy controls, their self-concept level was within normal limits. These findings suggest that many young cancer patients are functioning as well as their healthy peers.

However, the results of several studies suggest that a portion of child and adolescent cancer survivors have significant psychopathology. For example, Sanger, Copeland, and Davidson (1991) studied 48 children and adolescents who had been diagnosed with cancer 3 to 57 months earlier. They found that while many of the participants were functioning within normal limits, 52% were experiencing clinically significant difficulties in at least two areas of concern, such as emotional lability, somatic complaints, or cognitive difficulties. This group of survivors differs from those in the previously mentioned studies in that many of these survivors were very young (as young as 4 years of age), diagnosed more recently, and experiencing a relapse. In addition, these difficulties are reported by parents, whereas the majority of the previously mentioned studies relied on self-report measures. These differences may contribute to the high levels of psychological difficulties that Sanger et al. reported in some young cancer survivors. However, Koocher and O'Malley (1981) also suggested that some young cancer survivors experience psychological difficulties. They studied 117 children, adolescents, and adults (5-37 years of age) who had been diagnosed with cancer 5 to 32 years earlier (before age 18) and whose treatment had ended at least one year earlier. They found that almost half of the participants had some psychiatric symptoms and 21% had moderate to

severe symptoms. Erickson and Steiner (2001) studied 40 adolescent and adult (12-35 years of age) pediatric cancer survivors who had been in remission for at least 5 years. They found that 10% met the criteria for posttraumatic stress disorder, and an additional 78% who did not meet criteria had at least one symptom of posttraumatic stress disorder. These results suggest that many young cancer patients and survivors may be experiencing mild psychological distress and a small portion may be experiencing significant distress.

In contrast, a number of studies demonstrated that adolescent cancer survivors had higher levels of psychological well-being than reported norms. For example, Fritz and Williams (1988) studied 41 adolescents who had completed cancer treatment two to eight years earlier. They found that the survivors' had higher self-concepts than the reported norms. Furthermore, Elkin, Phipps, Mulhern, and Fairclough (1997) studied 161 adolescents and adults (14-30 years of age) who had been diagnosed with cancer at least five years earlier and completed treatment at least two years earlier. They found that survivors' levels of anxiety, psychoticism, and overall symptoms were significantly below the reported norms.

A number of other researchers found that adolescent cancer survivors were functioning better than their peers with no history of cancer. For example, Arnholt, Fritz, and Keener (1993) studied 62 children and adolescents, half of whom had completed cancer treatment within the six months prior to the study, and half who had completed treatment at least two years prior to the study. They compared the cancer survivors to 120 children and adolescents with no history of chronic medical conditions and found that the cancer survivors had more positive feelings about their intellect, behaviour, and overall happiness and satisfaction than the healthy controls. Phipps and Srivastava (1997) studied

107 children and adolescents who had been diagnosed with cancer at least one month earlier and ended treatment less than one year earlier. The group, which included some people who were receiving treatment and some who were in remission, was compared to 442 children and adolescents with no history of medical illness. Phipps and Srivastava found that cancer patients and survivors' levels of depression and anxiety were significantly lower than both the healthy controls and reported norms. These findings suggest that young cancer survivors and patients are experiencing less psychological distress than their healthy peers.

Based on the findings from these sets of studies, one might suggest that some young cancer survivors have psychological difficulties, some have no difficulties, and some have better psychological functioning than their healthy peers. The next generation of studies must focus on the predictors of psychological difficulties in young survivors. Armstrong (1995) stated that “[t]he issue that most limits [childhood cancer] research is the assumption that children (and their families) with cancer have a common experience” (p. 418). Young survivors have varied experiences before and during their cancer treatment, and these differences likely contribute to different psychological outcomes. The present study investigates these psychological outcomes in adolescent cancer survivors, as well as personal and interpersonal variables that may be associated with differences in outcome.

Some researchers question whether adolescent cancer survivors who report levels of psychological well-being similar to their healthy peers are truly functioning as well as they claim to be. Several (e.g., Greenberg et al, 1989) suggest that the adolescents may deny their experience of psychological difficulties, such as depression. For example,

Koocher and O'Malley (1981) found that almost all of the adolescent and young adult cancer survivors in their study used denial to cope with their difficulties, and that the survivors who experienced more adjustment difficulties were those who used denial less effectively. A number of studies (e.g., Canning, Canning, & Boyce, 1992; Grootenhuis & Last, 2001; Phipps & Srivastava, 1997) found that child and adolescent cancer patients and survivors who were more defensive or repressive tended to report less anxiety and depression. However, Chesler, Weigers, and Lawther (1992) found that adolescent and young adult cancer survivors who reported feeling different from their healthy peers in positive ways also spoke about their struggles in the past and concerns for the future, suggesting that they had realistic self-appraisals. Overall, it appears likely that some survivors experience psychological difficulties and use denial in an effort to cope with them, while others do not experience psychological difficulties.

Psychological Growth

Resilience. Resilience research pre-dated posttraumatic growth research. In order to best understand posttraumatic growth, it is important to begin with a review of resilience. Resilience has been defined as a process that protects the individual by encouraging successful adaptation to a stressor or traumatic event (Rutter, 1987). Factors that protect children and adolescents from developing psychopathology have been identified. These protective factors include personal attributes (e.g., self-esteem, effective coping strategies, and positive personality characteristics), supportive family environments, and non-familial sources of support (Garmezy, 1983). Several studies of healthy adolescents highlight such protective factors. For example, Dumont and Provost (1999) studied 141 grade 8 students and 156 grade 11 students, most of who were from

middle-class families. They found that those who were resilient (defined as having many daily stressors and low levels of depression) tended to have higher self-esteem and use more problem-focused coping than those who were well-adjusted (defined as having few daily stressors and low levels of depression) or vulnerable (defined as having many daily stressors and high levels of depression). Markstrom, Marshall, and Tryon (2000) studied 113 adolescents from rural, low-income Appalachian communities. They found that resilience (defined as having high ego strength) was positively associated with familial social support and problem-focused coping, and negatively associated with avoidance and wishful-thinking coping. In addition, Rodgers and Rose (2002) studied 2011 early adolescents and adolescents and found that peer support was associated with resiliency (defined as low parental support and low internalizing symptoms) in divorced single-parent families.

Posttraumatic growth. It is important to differentiate between resiliency and growth. Resilient individuals are able to maintain or resume their premorbid levels of psychological functioning, whereas those who achieve growth move beyond their premorbid levels of functioning (O'Leary & Ickovics, 1995). Individuals who are resilient or experience no symptoms of distress will not necessarily experience psychological growth. Therefore, the factors associated with resilience are likely to predict general psychological well-being, but may not sufficiently or appropriately predict psychological growth.

While researchers have examined adolescent resilience, they have paid little attention to adolescent growth. In contrast, the adult literature has addressed both resilience and growth. Thus the discussion of posttraumatic growth begins with a

definition based primarily on adult literature. Growth in the face of adversity has been defined as the ability to “go beyond the original level of psychosocial functioning, to grow vigorously, to flourish” (O’Leary & Ickovics, 1995, p. 128). Facing and coping with a traumatic experience such as cancer provides individuals with opportunities to revise and enhance their sense of self, relationships to others, and philosophies of life—to achieve posttraumatic growth. Those who achieve posttraumatic growth have mastered their trauma, perceived benefits from it, and developed beyond their original level of psychological functioning (Tedeschi, Park, & Calhoun, 1998). Posttraumatic growth can result in enhanced self-knowledge, increased personal strength, improved relationships with others, modified priorities, a greater sense of purpose in life, and spiritual changes (Tedeschi & Calhoun, 1995). To highlight the changes associated with growth, O’Leary and Ickovics describe it as transformative.

The concept of posttraumatic growth is consistent with a variety of theories. For instance, Social-Cognitive Theory suggests that traumas such as cancer represent a threat to an individual’s self-image and self worth, as well as to assumptions of immortality and of a meaningful and benevolent world (Janoff-Bulman, 1992; Moorey & Greer, 1989). These threats lead individuals to integrate new information into their schemata and generate new beliefs. Constructivist Self-Development Theory suggests that traumatic events tend to influence five areas of the self: frame of reference, self-capacity, ego resources, central psychological needs, and perceptual and memory systems (Saakvitne, Tennen, & Affleck, 1998). According to these theories, a threat or traumatic event may result in positive or negative psychological states. Moreover, an individual may

experience both types of change—psychological distress and growth—concurrently (Saakvitne et al.; Weiss, 2002).

Existential Theory proposes that people can find meaning through suffering (Frankl, 1961). Dialectical Theory suggests that life crises are “constructive confrontations” that fuel development (Riegel, 1976). Crisis Theory states that a crisis causes a personal disruption; resolution of the crisis demands reorganization that often leads to personal growth. Schaefer and Moos (1992) explained that “[l]ife crises are an inherent part of the human condition and...are instrumental in stimulating psychological change and maturity” (p. 170). These theories suggest that people have a tendency to change after life crises, and that such change can be beneficial.

Several theorists not only hypothesize about how individuals react to trauma, but also propose specific variables that mediate reactions to trauma. Brennan (2001) developed the Social-Cognitive Transition model of adjustment, an extension of Social-Cognitive Theory. He suggested that the way individuals respond to life-threatening events depends upon their social environment, assumptions about themselves, the world, and others, and their methods of responding to information that is incompatible with their assumptions. These factors determine whether a cancer survivor experiences a negative or a positive personal transition—psychological distress or growth. Similarly, Carver (1998) suggested that an individual’s personality, coping strategies, and contextual variables such as social support determine whether he or she is impaired, remains unchanged, or thrives in response to a traumatic event.

These models and theories highlight slightly different aspects of the human capacity for growth and the growth process. However, they all propose that traumatic

events prompt personal changes in perspective about the self and the world that can result in psychological growth beyond premorbid levels of functioning.

Posttraumatic growth in adults. Most of the posttraumatic growth research has been conducted with adults. In a review of 39 studies, Linley and Joseph (2004) found that perceived benefits and posttraumatic growth were reported in a variety of adult populations, including those who experienced natural disasters, abuse, bereavement, and illness. Some of the research has documented posttraumatic growth in adult cancer survivors. Austin (2001) used grounded theory to analyze the journals of 20 women diagnosed with cancer several months to 12 years earlier. The analysis yielded two themes, one of which was the search for positive aspects of cancer. Sears, Stanton, and Danoff-Burg (2003) studied 92 women who had been diagnosed with breast cancer one year earlier. They found that 83% of the women identified at least one benefit of their cancer experience and that, on average, women identified 2.62 benefits. On a standardized measure of posttraumatic growth (the Posttraumatic Growth Inventory [PTGI]; Tedeschi & Calhoun, 1996), they tended to report a small amount of posttraumatic growth. Similarly, Heiland (2003) found that 92 adults who had been diagnosed with cancer an average of 50 days earlier tended to report a small amount of posttraumatic growth on the PTGI. However, Heiland's results may not be generalizable to the cancer survivor population because the participants were adults who had been diagnosed with cancer recently and who had low socioeconomic statuses. Moreover, the PTGI, which was developed as a self-report questionnaire, was administered in an interview format.

Several studies of adult cancer survivors utilized the PTGI in its original self-report format. Cordova, Cunningham, Carlson, and Andrykowski (2001) used the PTGI to compare 70 women who had been diagnosed with breast cancer less than five years earlier and completed treatment at least two months earlier to 70 age-matched women with no history of cancer. They found that while the two groups did not differ with respect to psychological well-being or depression, the cancer survivors had more posttraumatic growth than the healthy controls. Weiss (2002) also used the PTGI in her study of 41 women who had been diagnosed with cancer one to five and a half years earlier and who had completed treatment 9 to 63 months earlier. The survivors reported moderate levels of posttraumatic growth, similar to those reported by Cordova et al. and higher than those reported by Heiland (2003) and Sears et al. (2003). Thus, adult cancer survivors appear to have higher levels of posttraumatic growth than adult cancer patients and healthy adult controls.

A number of studies have investigated not only the extent of posttraumatic growth, but also the positive health outcomes associated with posttraumatic growth in ill adults. For example, posttraumatic growth has been associated with lower levels of AIDS-related mortality and second heart attacks (Affleck, Tennen, Croog, & Levine, 1987; Bower, Kemeny, Taylor, & Fahey, 1998). These results suggest that posttraumatic growth may be not only a psychological outcome variable, but also a significant factor in health outcomes.

Posttraumatic growth in adolescents. In Linley and Joseph's (2004) review of adult posttraumatic growth research, they recommended that researchers investigate posttraumatic growth in children and adolescents. In fact, researchers have begun to

document posttraumatic growth in a number of child and adolescent populations. Horowitz, Loos, and Putnam (1997) found that 136 early adolescents, adolescents, and adults (11-24 years of age) who had experienced a variety of abuse tended to report experiencing posttraumatic growth. Salter and Stallard (2004) interviewed 158 children and adolescents who survived road traffic accidents and found that more than 40% reported experiencing aspects of posttraumatic growth. Laufer and Solomon (2006) studied 2999 adolescents. Seventy percent of the participants had experienced at least one terror incident and all of them had been exposed to media coverage of terror incidents. Laufer and Solomon found that 74% reported at least a small amount of posttraumatic growth. Milam, Ritt-Olson, and Unger (2004) studied 435 adolescents who had experienced a major life event (e.g., being the victim of a major crime, experiencing illness in self, family, or close friend, experiencing death in family or close friend,) within the previous three years. They found that, on average, the adolescents experienced mild levels of posttraumatic growth, and almost 30% experienced moderate levels of posttraumatic growth. The latter two studies used modified versions of the PTGI; however, the modifications were significant (e.g., adding new factors to better suit the culture). As such, the results should not be compared to the results of studies that used the PTGI or the PTGI with minor modifications.

Studies of adolescent cancer survivors tend to pay little attention to posttraumatic growth. Instead, most researchers (e.g., Elkin et al., 1997; Frank, Blount, & Brown, 1997; Hobbie et al., 2000) focus on psychological distress, with some recent attention to psychological well-being (e.g., Arnholt et al., 1993; Fritz & Williams, 1988). However, Parry (2003) used grounded theory to analyze in-depth interviews with 23 adolescents

and young adults who had been diagnosed with cancer 6 to 21 years earlier. She found a number of themes in the interviews, including faith, hope, and an existential perspective, a changed life outlook, a deeper appreciation of life, and strength and resilience.

Several other studies have made reference to psychological growth among adolescent cancer survivors. For example, Fritz et al. (1988) found that many child and adolescent survivors reported feeling more confident, empathic, and mature since the end of their cancer treatment. Chesler et al. (1992) found that many adolescent and young adult cancer survivors reported feeling stronger, feeling more mature, having a different set of personal priorities, and having a greater sense of purpose in life than their healthy peers. Barakat, Alderfer, and Kazak (2006) found that the adolescent cancer survivors reported an average of close to three positive consequences of having had cancer. However, these studies did not use standardized measures of positive change and addressed one or few aspects of positive change, without examining overall growth. Thus, it is not possible to draw strong conclusions from them.

One study empirically evaluated overall growth in young cancer survivors. Yaskowich (2003) studied 35 children, adolescents, and young adults (8-25 years of age) who had completed cancer treatment at least two years earlier. She found that 59% of survivors reported at least a small degree, 37% reported at least a moderate degree, and 6% reported at least a great degree of posttraumatic growth on each item of their posttraumatic growth questionnaire (a modified version of the PTGI; Tedeschi & Calhoun, 1996). Only 17% reported no change or a very small degree of posttraumatic growth on each item of the PTGI. Yaskowich compared her results to the PTGI norms and reported that 48% of the young cancer survivors experienced at least as much

posttraumatic growth as adult trauma survivors. Moreover, parents corroborated the survivors' levels of posttraumatic growth, in that parents' reports of their survivor child's posttraumatic growth were not significantly different from the survivors' own reports of posttraumatic growth. Thus, research using a modified standardized measure suggests that posttraumatic growth is prevalent in young cancer survivors. Yaskowich's research was the only study found in the literature review to use a standardized measure of posttraumatic growth in an adolescent cancer survivor population.

Despite the fact that theories of development, crisis, and meaning highlight the human capacity to experience positive change and growth as a result of traumas such as cancer, most of the child and adolescent cancer literature has focused on psychological distress, depression, and anxiety. The limited attention that has been given to posttraumatic growth in adolescent cancer survivors has led to an inappropriate emphasis on negative psychological consequences of childhood cancer. This has, in turn, resulted in incomplete and misleading conceptualizations of cancer in childhood and adolescence, and of adolescent cancer survivorship. By examining both psychological well-being and posttraumatic growth in adolescent cancer survivors, the present study contributes to the development of a more comprehensive conceptualization of adolescent cancer survivorship.

The few studies that have addressed adolescent cancer survivors' positive psychological functioning were limited in their research design. Most used non-standardized measures of growth and many examined a limited number of current symptoms. Thus, the results are limited and their reliability is questionable. To address

these limitations, the present study uses a standardized measure of posttraumatic growth that asks about change over time and provides a measure of overall growth.

The present study addresses the question of whether psychological well-being and posttraumatic growth are associated. There is little research that has explored a possible link between psychological well-being and posttraumatic growth in adults, and the few studies that have done so (e.g., Heiland, 2003; Cordova et al., 2001; Widows, Jacobsen, Booth-Jones, & Fields, 2005) have yielded mixed results. Similarly, research pertaining to a link between adolescents' psychological well-being and their posttraumatic growth (e.g., Milam et al., 2004) has been scarce and inconclusive. The present study investigates the association between psychological well-being and posttraumatic growth in adolescent cancer survivors.

The present study also addresses the uncertainty regarding a possible link between life stress and posttraumatic growth. According to one theory of family stress, the extent to which an individual and a family experience a "pile up" of stressors affects the way in which they perceive, cope with, and adapt to stress (McCubbin & Patterson, 1983). Within this theory, the "pile up" of stressors affects negative and positive adaptations to stress, such as posttraumatic growth, and personal resources, such as psychological well-being. The majority of research with cancer survivors does not examine the potential effects of life stress. The few studies that have done so suggest that life stress is not correlated with posttraumatic growth. Heiland (2003) found that trauma history was not associated with posttraumatic growth in adult cancer patients. Similarly, Yaskowich (2003) found that previous life stressors were not associated with posttraumatic growth in adolescent cancer survivors. With respect to parents' psychological well-being, Sloper

(2000) found that in fathers, but not mothers, of child cancer patients, the level of stress they attributed to their life events within the previous year was correlated with their current level of distress. Van Dongen-Melman, Pruyn, et al. (1995) found that experiencing illness in another family member was associated with both negative feelings and perceived loss of control in parents of childhood cancer survivors. Posttraumatic growth was not assessed in either of the two studies of parents. These results suggest that life stress may be associated with psychological well-being in parents of cancer survivors and may not be associated with posttraumatic growth in survivors. However, there are a limited number of studies in this area, and many of them focus on specific types of life stress (e.g., trauma history) or particular aspects of psychological well-being (e.g., negative feelings). The present study examines the relations between life stress since treatment completion and both psychological well-being and posttraumatic growth in adolescent cancer survivors and their parents.

Cancer and the Family

A child or adolescent's illness affects the entire family (Eiser, 1998). Family systems theory suggests that each member of the family system is interdependent. Thus, a change in one member leads to changes in the other members (Nichols & Schwartz, 2001). In the case of child or adolescent cancer, not only does a child's cancer affect his or her parents, but their reactions also affect the child. The present study's examination of adolescents', siblings', and parents' psychological functioning is consistent with the conceptualization of cancer as an illness that affects the entire family.

The present study fits within the Double ABCX Model, a widely cited model of family stress adapted by McCubbin and Patterson (1983) from Hill's (1949) ABCX

Model. Hill proposed that the extent to which a family is susceptible to experiencing a crisis depends upon the interaction between three factors: the stressor (factor a), the existing family resources (factor b), and the family's perception of the stressor (factor c). The Double ABCX Model extended the ABCX Model to include a second set of factors and three time periods. The first is the pre-crisis period, consisting of the three factors outlined by Hill. Within this framework, the diagnosis of cancer would represent the stressor. The second time period is the crisis period. The extent to which the family experiences the stressor as a crisis (factor x) depends upon the interaction of the three factors in the pre-crisis period. Thus, the diagnosis of cancer is not necessarily a crisis. However, the interaction of the diagnosis with the family's perception of the diagnosis and their personal and interpersonal resources can result in a crisis. The third time period is the post-crisis period. Within this period, the way in which the family copes with the crisis is affected by the extent to which the family experiences a "pile up" of stressors (including the original stressor and any other family stressors; factor aA), the family's existing and new resources (factor bB), and the family's perception of the crisis, the pile up of stressors, and their resources (factor cC). The interaction between factors aA, bB, and cC affect the way in which the individuals and the family cope with and adapt to the crisis. Adaptation (factor xX) is considered within a spectrum of maladaptation to bonadaptation.

The present study does not address the pre-crisis period (the first ABCX component) of the Double ABCX Model. Within the post-crisis period (the second ABCX component), the present study addresses the interaction between the pile-up of stressors (life stress; factor aA), the family's resources (psychological well-being and

coping strategies; factor bB), and the effect of these factors on adaptation to cancer (posttraumatic growth; factor xX).

Psychological Well-Being in Parents of Young Cancer Survivors

Little research has been conducted on the long-term effects of parenting a child with cancer (Eiser, 1998). The few studies that have been conducted have yielded mixed results. Some parents of children and adolescents with cancer experience psychological difficulties. Kazak et al. (2004) studied 150 families of early adolescent and adolescent cancer survivors. They reported that almost 20% of families had at least one parent who met criteria for a posttraumatic stress disorder. Brown, Madan-Swain, and Lambert (2003) studied 52 mothers of adolescent and young adult (12-23 years of age) cancer survivors. They found that a quarter of the mothers met criteria for a posttraumatic stress disorder. Barakat et al. (1997) compared 309 parents of child and adolescent cancer survivors to 309 parents of healthy child and adolescent controls. Similarly, Kazak et al. (1997) compared 226 parents of child and adolescent cancer survivors to 228 parents of children and adolescents with no history of chronic health problems. Both studies found that parents of survivors had more posttraumatic stress disorder symptoms than parents of healthy controls. Sloper (2000) studied more than just posttraumatic stress disorder symptoms. She studied 126 parents of infant, child, and adolescent (9 months-18 years of age) cancer patients and survivors, and found that 40% of fathers and 51% of mothers experienced high levels of overall psychological distress.

While some parents of survivors experience psychological difficulties, others function just as well as parents of healthy controls or in accordance with standardized norms. For example, Dahlquist, Czyzewski, and Jones (1996) studied 84 parents of

infant, child, and adolescent (22 months-18 years of age) cancer patients and survivors. They found that parents' levels of anxiety were similar to the reported norms. Radcliffe, Bennett, Kazak, Foley, and Phillips (1996) studied 38 mothers of child and adolescent cancer survivors. They found that while mothers experienced high levels of parenting stress, their anxiety and depression levels were within normal limits. Speechley and Noh (1992) compared 112 parents of child and adolescent cancer survivors to 126 parents of children and adolescents with no history of severe medical conditions. They found that the groups reported similar levels of anxiety and depression. However, they noted that among parents who reported low levels of social support, parents of survivors were more anxious and depressed than parents of healthy controls. Using a similar research design, Greenberg et al. (1989) compared 138 mothers of child and adolescent cancer survivors to 92 mothers of children and adolescents with no history of chronic medical conditions. They found that the two groups of mothers reported similar levels of psychological distress.

These studies suggest that while some parents of cancer survivors may experience some psychological difficulties, particularly posttraumatic stress disorder symptoms, many seem to be functioning as well as parents of healthy children. However, much of this literature is limited in its research design or focus. For example, several studies assessed only mothers and many investigated only a few aspects of psychological functioning, such as posttraumatic stress disorder or anxiety. Thus, additional research on parents of young cancer survivors is required to gain a better understanding of their psychological well-being. The present study examines parents' overall level of psychological well-being.

Similar to the literature concerning child and adolescent cancer survivors, psychological growth in parents of young survivors has received little attention. Some reports suggest that parents of young survivors may experience psychological growth. One parent of an adolescent who had been diagnosed with cancer at age four stated, “our experience with childhood cancer has made all of us SURVIVORS. We lived through it, and learned from it. It has strengthened each of us in who we are together and as individuals” (Barnes et al., 1998, p. 39). This statement highlights the positive transformations that some parents experience as a result of having a child who survived cancer. One empirical study (Best, Streisand, Catania, & Kazak, 2001) referred to posttraumatic growth in parents of young cancer patients. However, their results concerned posttraumatic growth as a predictor of psychological well-being in parents, and they did not include details about the extent of posttraumatic growth experienced by the parents. Notably, they found that posttraumatic growth predicted parental anxiety and avoidance. In contrast, Yaskowich (2003) studied the extent of posttraumatic growth in parents of young cancer survivors. She found that these parents tended to experience high levels of posttraumatic growth.

Posttraumatic growth has also been examined in other family members of cancer patients. Weiss (2002) found that 41 husbands of women who survived breast cancer (having completed treatment 9 to 63 months earlier) reported experiencing posttraumatic growth, though to a lesser degree than their wives. These results suggest that psychological growth is not limited to the family member who was ill. The experience of having an ill family member is stressful, if not traumatic. As a result, healthy individuals whose family members had cancer may question and alter their personal perspectives and

priorities. In accordance with a familial model of illness-related stress and growth, the present study examines the psychological well-being and growth among parents and siblings of adolescent cancer survivors.

The Relation between Survivor and Parental Psychological Well-Being and Posttraumatic Growth

According to a family systems perspective, one individual's well-being is related to other family members' well-being (Nichols & Schwartz, 2001). Several studies found that more psychological distress in child and adolescent cancer patients and survivors was associated with more distress in parents. Frank et al. (1997) studied 86 child and adolescent cancer patients and survivors and their parents. They found that greater child depression and behavioural problems were associated with more parental anxiety. Mulhern, Fairclough, Smith, and Douglas (1992) studied 99 child and adolescent cancer patients and their mothers. They found that greater child depression was associated with greater maternal depression. Barakat et al. (1997) and Phipps, Long, Hudson, and Rai (2005) found that more posttraumatic stress in their samples of child, adolescent, and young adult cancer survivors ($N = 309$; $N = 162$) was associated with more posttraumatic stress in their parents. Kupst et al. (1995) found that perceived adjustment in 28 adolescents and adults (14-30 years of age) who completed cancer treatment ten years earlier was related to their mothers' perceived adjustment. Grootenhuis and Last (1997) studied 84 child and adolescent cancer patients and survivors and their parents. In contrast with Kupst et al., they found no association between child or adolescents' emotional adjustment and mothers' emotional adjustment. However, half of the participants in the study were experiencing a relapse of their cancer. It is possible that this

difficult experience disturbed the connection between child or adolescent adjustment and maternal adjustment in many of the participants in the study. Overall, most young cancer survivors' psychological well-being appears to be related to their parents' well-being.

Given the limited research concerning psychological growth in parents of child and adolescent cancer survivors, it is not surprising that there is little research investigating the association between parent's psychological growth and their children's psychological growth. Just as psychological well-being in adolescents and parents are often related, psychological growth in adolescents and parents may also be related. Weiss (2004) studied 72 breast cancer survivors and their husbands. She found that husbands' posttraumatic growth was predicted by their wives' posttraumatic growth. The only known study to examine the association between young cancer survivors' posttraumatic growth and their parents' posttraumatic growth yielded intriguing results. Yaskowich (2003) found that parents' posttraumatic growth was not correlated with survivors' overall posttraumatic growth. However, parents' posttraumatic growth accounted for up to 10% of the variance in two aspects of survivors' posttraumatic growth: improved relationships and appreciation for life. The results suggest that the association between survivor posttraumatic growth and parental posttraumatic growth warrants further investigation.

Research concerning adolescent cancer survivors' psychological well-being and their parents' well-being is in its infancy and must be extended. The present study adds to the existing literature because it examines the link between adolescent cancer survivors and parents with respect to their psychological well-being and growth.

Psychological Functioning in Young Siblings of Cancer Survivors

Although siblings of cancer patients and survivors are neither diagnosed with, nor treated for, cancer, their lives are affected by it. In a review of qualitative literature pertaining to young siblings of cancer patients, Wilkins and Woodgate (2005) found three themes in siblings' reports: experiencing changes in their lives, experiencing intense negative feelings, and having unmet needs. Other studies (e.g., Sargent et al., 1995) highlight siblings' tendencies to experience distress as a result of having family disruptions, having negative feelings, fearing death, and lacking of attention. Nevertheless, there is significantly less literature examining the psychological functioning of young siblings of cancer patients than there is of young cancer patients, themselves. There is even less literature examining the psychological functioning of young siblings of cancer survivors.

With respect to siblings of cancer patients, Houtzager, Grootenhuis, and Last (1999) conducted a literature review of studies concerning young siblings of cancer patients. They stated that the findings were mixed, with some studies suggesting that siblings had more internalizing or externalizing problems than norms, and others suggesting that siblings were similar to norms. Some subsequent studies (e.g., Dolgin et al., 1997; Labay & Walco, 2004; Martin, 2001) found that child and adolescent siblings of cancer patients had levels of psychological adjustment and behavioural problems that were similar to norms. One study (Houtzager, Grootenhuis, Caron, & Last, 2004) examined 103 adolescent siblings of cancer patients two years after diagnosis, when some were still receiving treatment and all were classified as patients. Most siblings were

functioning well, but a greater proportion than in the normative sample reported significant internalizing problems.

With respect to adolescent siblings of cancer survivors, some research (e.g., Alderfer, Labay, & Kazak, 2003) suggests that they have more posttraumatic stress symptoms and similar levels of general anxiety compared to controls. Others (e.g., Van Dongen-Melman, De Groot, Hahlen, & Verhulst, 1995) suggest that child and adolescent siblings of young cancer survivors are similar to controls with respect to psychological difficulties.

Houtzager et al.'s (1999) literature review suggested that some young siblings of cancer patients report positive effects of having had a brother or sister with cancer. Although posttraumatic growth has not been empirically investigated in young siblings of cancer patients or survivors, some sibling studies make reference to positive changes that are related to posttraumatic growth. For instance, Chesler, Allswede, and Barbarin (1991) and Barbarin et al. (1995) reported that some child and adolescent siblings of cancer patients are more mature and independent as a result of their brother or sister's cancer. With respect to child and adolescent siblings of cancer survivors, Havermans and Eiser (1994) found that some of the 21 siblings they interviewed reported becoming more empathic and valuing life more as a result of their brother or sister's cancer. There is no known study that has compared adolescent cancer survivors to their siblings with respect to posttraumatic growth.

In keeping with a familial model of illness-related stress and growth, the present study examines adolescent cancer survivors' siblings with respect to their psychological well-being and posttraumatic growth. It also examines the differences and similarities

between the siblings and both the adolescent cancer survivors and the parents of the adolescent cancer survivors.

Coping

Coping is often associated with various aspects of psychological functioning, including psychological well-being and posttraumatic growth. Coping is generally considered an individual's reaction to stress (Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001). It is often defined as "constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (Lazarus & Folkman, 1984, p. 141). Given that adolescence is a time of challenge and change, adolescents strive to find and utilize sufficient resources in order to maintain their stability. As individuals learn and develop the skills of flexibility and adaptation during adolescence, they learn new ways to cope with stress (Compas et al.).

While the definition of coping is clear and intelligible, its conceptualization and operationalization are far more complex. Coping in adulthood has been conceptualized in a variety of ways. Some of the most popular adult coping models focus on coping as either effortful or voluntary (Gottlieb, 2002). Two of the most commonly cited and utilized conceptualizations (Gottlieb) centre on the dimensions of problem-focused vs. emotion-focused coping and approach vs. avoidance coping (Lazarus & Folkman, 1984). While these conceptualizations appear to be useful in gaining a basic understanding of adult coping, they have been criticized as too simplistic (Gottlieb).

Coping in childhood and adolescence has been given far less attention than coping in adulthood (Compas, 1998). Many studies conceptualize coping in childhood or

adolescence using models derived from the adult literature without evaluating their applicability to a younger population (Compas). Ryan-Wenger (1992) stressed that this practice is problematic because children and adults tend to face a different set of stressors, children tend to have less control over their stressors than adults do, and children do not have many of the cognitive abilities associated with adult coping strategies. Compas identified a variety of dimensions upon which childhood and adolescent coping has been conceptualized: the function or focus of the response (problem-focused vs. emotion-focused; Lazarus & Folkman, 1984), the type of response (behavioural vs. cognitive; voluntary vs. involuntary; Compas et al., 2001; Ebata & Moos, 1991), the orientation of the response (engagement vs. disengagement; Tobin, Holroyd, Reynolds, & Wigal, 1989; Compas et al.), and the intention (primary vs. secondary control; Weisz, McCabe, & Dennig, 1994). Researchers and theorists have found fault with each of these conceptualizations of coping. For example, the problem-focused vs. emotion-focused and the engagement vs. disengagement conceptualizations of coping have been criticized for being too broad, and the former reportedly results in the inclusion of dissimilar coping styles within a single category (Compas et al.). The primary vs. secondary control conceptualization of coping has been criticized for not incorporating disengagement coping strategies (Compas et al.). Thus, there is no agreement among coping theorists about the most accurate and useful conceptualization of adolescent coping.

While individually, the problem-focused vs. emotion-focused and the engagement vs. disengagement conceptualizations of coping are likely too broad, the present study incorporates them, which holds several advantages. First, such a combination provides

more specific and precise classifications than a conceptualization based on only one dimension. Second, this specific combination addresses not only the function or focus of the individual's response, but also the manner in which the individual carries out the response. This combined conceptualization of coping based on the problem-focused vs. emotion-focused and the engagement vs. disengagement dimensions fits with Compas et al.'s (2001) perspective. Compas et al. support this combined conceptualization, and suggest that three additional dimensions may be important: active coping (taking action to decrease the effects of the stressor), avoidance or disengagement (behaviourally or mentally avoiding the stressor), and cognitive adaptation to the situation (including acceptance of that which cannot change, distraction through positive thoughts and behaviours, and the reframing of problems). These additions fit with categories of coping strategies Ryan-Wenger derived from her literature review (1992). For instance, active coping fits with the stressor modification category; avoidance coping fits with the behavioural avoidance and cognitive avoidance categories; and cognitive adaptation fits with some of the strategies in the cognitive restructuring category.

This combined conceptualization of coping fits with the current literature concerning coping in adolescent and adult cancer survivors and posttraumatic growth. Within the adolescent cancer survivor literature, active, disengagement, and emotion-focused coping strategies have been highlighted and emphasized (e.g., Frank et al., 1997, Friedman, Baer, Lewy, Lane, & Smith, 1988, Phipps & Srivastava, 1997, Sorgen & Manne, 2002). Within the adult oncology and posttraumatic growth literatures, active, avoidant, social support, and acceptance coping have been identified as relevant and important coping strategies (e.g., Bellizzi & Blank, 2006; Widows et al., 2005).

Similarly, Calhoun and Tedeschi's (1999) overall model of posttraumatic growth suggests that the coping strategies most closely associated with posttraumatic growth are active coping, social support, and acceptance. Thus, the proposed conceptualization of coping is well suited for the study of posttraumatic growth in adolescent cancer survivors and their families.

Coping has been associated with a variety of psychological outcomes in child and adolescent populations. For example, coping strategies predict resiliency in various groups of children and adolescents (Wolin & Wolin, 1993). Dumont and Provost (1999) studied 141 grade 8 students and 156 grade 11 students experiencing depression and daily hassles. They found that the students' resiliency was associated with their increased use of problem-focused coping. Markstrom et al. (2000) examined 113 adolescents from rural, low-income Appalachian communities and found that resiliency was positively associated with problem-focused coping and negatively associated with avoidant and wishful-thinking coping.

With respect to adolescent cancer survivors, a number of researchers have attempted to determine the types of coping strategies commonly used by young cancer survivors. For instance, Phipps and Srivastava (1997) found that 107 child and adolescent cancer survivors used more blunting and defensive coping strategies than 442 child and adolescent healthy controls. Derevensky, Tsanos, and Handman (1998) found that 21 child and adolescent cancer patients used higher levels of adaptive coping than the reported norms. However, their small group of participants had all received extensive support and psychotherapy, which could have contributed to their use of effective coping strategies. In addition, the results are vague as to whether the adaptive coping is as

reported by the children and adolescents or by their mothers. Sorgen and Manne (2002) studied 76 child and adolescent cancer patients and found that they used more emotion-focused coping than problem-focused coping.

A number of researchers have suggested that active coping predicts better psychological well-being in adolescent and adult cancer patients and survivors. For instance, Friedman et al. (1988) studied 67 adult cancer patients and found that an active coping style was associated with better overall psychological adjustment. However, these results were based on an adult cancer patient population and may not generalize to an adolescent cancer survivor population. While Friedman et al. described the positive psychological well-being associated with active coping, others have led to similar conclusions by describing the poor psychological well-being associated with avoidance coping, which is commonly considered to be the opposite of active coping. For example, Frank et al. (1997) found that among 86 child and adolescent cancer patients and survivors, those who used more avoidant coping were more depressed and anxious. In contrast, Kupst and Schulman (1988) found no correlation between level of psychological adjustment and use of effective coping strategies in 43 child and adolescent cancer survivors. However, the researchers used staff ratings of family interviews to generate the coping scores—a method with questionable validity. Moreover, the survivors' levels of adjustment were based on parents' reports.

A number of models of change in the adult psychology literature (e.g., Aldwin, 1994; O'Leary & Ickovics, 1995; Schaefer & Moos, 1992; Tedeschi et al., 1998) suggest that coping is associated with psychological growth and thriving. There are several empirical studies that have examined this association in oncology populations. Among

adult cancer patients and survivors who received bone marrow transplantations an average of two years earlier, avoidant, positive reappraisal, and problem solving coping were positively associated with posttraumatic growth (Widows et al., 2005). Among women who completed treatment for breast cancer between one and four years earlier, active adaptive coping (which consisted of active, positive reframing, planning, acceptance, seeking support, venting, self-distraction, and religious coping) was positively associated with various aspects of posttraumatic growth (Bellizzi & Blank, 2006). There are no known studies that have examined the relations between coping and posttraumatic growth in young cancer survivors. This is unfortunate given that information about such a link would help researchers and clinicians understand which young cancer survivors are likely to develop posttraumatic growth. The present study adds to the literature by providing new information about the links between coping and both psychological well-being and psychological growth in adolescent cancer survivors.

Coping in Parents of Young Cancer Survivors

Research on coping in parents of young cancer survivors is scarce. The literature that is available suggests that many parents of young cancer survivors cope well ten years after the completion of their child's cancer treatment (Kupst et al., 1995). Several types of coping appear related to parents' psychological well-being. Sloper (2000) found that more problem solving and less self-directed coping strategies were associated with poorer psychological well-being in parents of child and adolescent cancer patients and survivors. In contrast, Barrera, D'Agostino, et al. (2004) and Fuemmeler, Mullins and Marx (2001) found that emotion-focused coping was associated with poorer psychological well-being in mothers of child and adolescent cancer patients and survivors. Norberg, Lindblad, and

Boman (2005) studied parents of child and adolescent cancer patients and survivors. They found that parents who used more avoidant or less active coping were more depressed and anxious. Moreover, Koraman (2006) found that more avoidant coping was associated with greater psychological distress in fathers of young cancer patients. Additionally, Blotcky, Raczynski, Gurwitch, and Smith (1985) found that parents of child and adolescent cancer patients and survivors who used less maintaining self-stability coping had poorer psychological well-being.

With respect to coping and posttraumatic growth in parents, some information can be found in the posttraumatic growth literature. Based on their literature review, Linley and Joseph (2004) proposed that problem-focused coping, acceptance, and positive reinterpretation coping were associated with posttraumatic growth in adults who experienced various forms of adversity. However, these suggestions do not lead to clear answers about how parents of cancer survivors cope and how their coping strategies are related to their psychological well-being and posttraumatic growth. There are no known studies that have addressed the association between coping and posttraumatic growth in survivors' parents. Thus, there is little information about the types of coping that may predict posttraumatic growth in parents of young cancer survivors. The present study addresses the associations between coping and both psychological well-being and psychological growth in parents of adolescent cancer survivors.

The Relation between Survivor and Parental Coping

Some theorists suggest that children's coping is related to their parents' coping, and that this is the result of parents coaching or teaching their children how to cope with stressful events. For instance, social learning theorists (e.g., Bandura, 1977, Tarnow,

1983) believe that parents act as models from whom children learn coping behaviours. Kliewer and Lewis (1995) studied adolescents with sickle cell disease and found that parents coached their adolescents to use specific coping strategies, and that adolescents' coping was associated with their parents' coping.

With respect to cancer, Noojin, Causey, Gros, Bertolone, and Carter (1999) and Kupst et al. (1995) suggest that parents may model adaptive coping strategies for their children and adolescents with cancer. In fact, Kupst and Schulman (1988) and Kupst et al. found that the extent to which young cancer survivors used effective coping strategies was related to the extent to which their parents used effective coping strategies at the time of diagnosis, as well as six and ten years after they completed cancer treatment. However, these studies relied on a questionable measure of coping, and as such, it is not possible to draw strong conclusions from them. Previous studies that used standardized and well-recognized measures of coping did not assess the relations between young survivors' coping and their parents' coping. The present study uses standardized measures to assess adolescent cancer survivors' coping, parents' coping, and the relations between the two.

The Relation between Parental Coping and Survivor Psychological Well-Being

Based on the theory that children's psychological well-being is affected by their environments (Nichols & Schwartz, 2001), parental coping may affect survivors' psychological well-being. Parents who cope well are likely to not only model good coping strategies, but also set a stable and positive atmosphere within which an adolescent's psychological well-being can flourish. Researchers have empirically examined whether parental coping strategies are associated with survivors' psychological well being. In fact, Kupst et al. (1995) found that maternal coping was the best predictor

of adolescent and young adult cancer survivors' psychological well-being ten years after ending cancer treatment. Various forms of parental active coping strategies, including efforts to maintain family integration, self-stability, an optimistic view of the illness, and general approach-oriented coping strategies, have been associated with young survivors' psychological well-being (Blotcky et al., 1985; Noojin et al., 1999; Sanger et al., 1991). Researchers have yet to investigate whether parental coping is associated with survivors' psychological growth.

Coping in Siblings of Adolescent Cancer Survivors

As was the case with psychological functioning, more research has been conducted on adolescent cancer survivors' coping than on their siblings' coping. Much of the research that has been conducted on siblings highlights coping strategies that involve social support. One study (Vogel, 1997) used grounded theory to analyze interviews with 19 siblings of adolescent cancer survivors. It revealed that they tended to use three types of coping strategies: seeking spiritual support and comfort, being with the ill sibling in hospital, and identifying sources of support. Some studies examined the relation between siblings' use of specific coping strategies and their psychological functioning. Cohen, Friedrich, Jaworski, Copeland, and Pendergrass (1994) studied 129 child and adolescent siblings of cancer patients and found that social support predicted adjustment. Barrera, Fleming, and Khan (2004) studied 72 siblings of child cancer patients. They concluded that siblings who had high emotional social support tended to be less depressed, less anxious, and have fewer behavioural problems than siblings with low emotional social support. However, siblings whose brother or sister is a cancer survivor may differ from those whose brother or sister is still a cancer patient. Sloper and While (1996) found no

relation between the use of social support coping and psychological adjustment in 99 child and adolescent siblings of young cancer survivors. The relation between coping and both psychological well-being and posttraumatic growth in siblings of adolescent cancer survivors requires further inquiry.

The Role of Development

Adolescence is a time of vast change. It is also a time when appearance is heavily scrutinized, acceptance by peers is important, and separation from parents is sought. Given that cancer often results in changes to physical appearance, absences from social groups, and extended reliance on parents, it can make the developmental tasks of adolescence particularly challenging (Koocher & O'Malley, 1981). Thus, it is important to recognize that adolescent cancer survivors may differ from healthy adolescents and young cancer survivors at different developmental stages.

An adolescent's age, as well as levels of social, emotional, and cognitive development, contributes to his or her psychological functioning and well-being. Cognitive maturation enhances adolescents' abilities to think about the future, life, and death and likely affects their vulnerability and resilience (Aldwin & Sutton, 1998; Noppe & Noppe, 1996). Thus, adolescents' levels of cognitive development may influence their responses to and attempts to cope with life-threatening diseases such as cancer. Age and cognitive development may be particularly relevant to studies of psychological growth, given that growth is thought to require cognitive processing to interpret the trauma or illness, as well as to evaluate and redefine the self, values, and priorities (O'Leary & Ickovics, 1995).

Surprisingly, a number of studies (e.g., Hoekstra-Weebers, Jaspeers, Kamps, & Klip, 1998; Kopel, Eiser, Cool, Grimer, & Carter, 1998; Sloper, 2000; Speechley & Noh, 1992) have not examined the relation between current age and psychological well-being in adolescent cancer survivors. The studies that did examine age yielded mixed results. A number of them (e.g., Blotcky et al., 1985; Canning et al., 1992; Derevensky et al., 1998; Frank et al., 1997; Sanger et al., 1991) found no relation between age and psychological well-being in child and adolescent cancer patients and survivors. In contrast, Kazak et al. (1997) found that younger child and adolescent cancer survivors reported higher anxiety than their healthy peers, while those who were older were similar to healthy peers. Grootenhuis and Last (2001) found that younger child and adolescent patients and survivors were more depressed than those who were older. However, Elkin et al. (1997) found that younger adolescent cancer survivors had less psychological distress than older adolescent survivors. The results of these studies suggest that there may be age differences in young cancer survivors' psychological well-being, though they appear to be inconsistent across studies.

There are two known studies to investigate the relation between age and posttraumatic growth in adolescents. Milam et al. (2004) found that posttraumatic growth was positively correlated with age in their sample of adolescents who experienced various forms of adversity. In contrast, Yaskowich (2003) studied 35 child, adolescent, and young adult cancer survivors and found that posttraumatic growth was unrelated to age. Moreover, Bitsko (2005) studied benefit finding, which is closely related to posttraumatic growth. He found that among 50 adolescent and adult cancer survivors, age was unrelated to benefit finding. Thus, age may be unrelated to posttraumatic growth and

benefit finding in adolescent cancer survivors. However, due to the limited number of studies, it is also possible that the effects of age on posttraumatic growth depend upon the trauma, age group, and conceptualization of posttraumatic growth. The relation between age and posttraumatic growth in adolescent cancer survivors requires further study.

Peterson (1989) stated that the coping strategies an adolescent is likely to use depends on his or her developmental stage. Several studies (e.g., Band, 1990; Compas, Worsham, Ey, & Howell, 1996) found that emotion-focused coping strategies tended to increase with age in healthy children and adolescents. In their coping literature review, Losoya, Eisenberg, and Fabes (1988) determined that the use of cognitive coping strategies, including emotion-focused, intrapsychic, positive self-talk, cognitive reappraisal, and avoidant/distraction coping strategies, tended to increase with age in healthy children. With respect to oncology populations, Worchel, Copeland, and Barker (1987) found that adolescent cancer patients used more cognitive control, including spending time thinking and talking about cancer and their treatment, than did child cancer patients. Kameny and Bearison (2002) studied personal narratives and found that older adolescent cancer survivors made more references to coping than younger survivors. They suggested that this finding could be the result of an increased capacity for self-reflection, including recognition of personal coping strategies. As they get older, adolescents are likely better able to use coping strategies that require more abstract and sophisticated thinking and problem solving. While there are some patterns of coping in healthy adolescents, the research concerning the relation between developmental level and coping in young cancer survivors is limited. The present study examines the relation

between age and psychological well-being, psychological growth, and coping styles in adolescent cancer survivors.

Many studies examined the relation between adolescent cancer survivors' age and their parents' psychosocial functioning. However, most of these studies (e.g., Barakat et al., 2006; Dahlquist et al., 1996; Greenberg et al., 1989; Kupst & Schulman, 1988; Van Dongen-Melman, Pruyn, et al., 1995) did not examine the relation between parents' age and their psychosocial functioning. An exception was Fuemmeler et al.'s (2001) research, which found that age was associated with less severe symptoms of posttraumatic stress in parents of young cancer patients and survivors. In addition, Weiss (2004) found that age was unrelated to posttraumatic growth in husbands of breast cancer survivors.

Many studies have examined the relation between age and psychological functioning in groups of child and adolescent siblings of cancer patients, but have not investigated the relation between age and psychological functioning amongst adolescent siblings, in particular (e.g., Alderfer et al., 2003; Barrera, Fleming, et al., 2004; Houtzager, Grootenhuis, et al., 2004; Houtzager, Oort, et al., 2004; Martin, 2001; Skidmore, 1996). Thus, little is known about the relation between age and psychological well-being, posttraumatic growth, and coping in adolescent siblings of cancer patients or survivors.

Age at the Time of Diagnosis

In addition to considering the young cancer survivor's age, it is also important to consider the survivor's age at the time of diagnosis. Children and adolescents interpret events differently depending upon their age and developmental level (Siegler, 1991). Greenberg et al. (1989) stated that research must examine the positive and negative

aspects of cancer in young survivors who were diagnosed at different developmental stages. The few studies that have done so have yielded mixed results. Elkin et al. (1997), Zebrack and Chesler (2002), and Stam, Grootenhuis, Caron, and Last (2006) found that adolescent and young adult cancer survivors diagnosed at older ages tended to have poorer psychological well-being and quality of life in the social domain. However, Frank et al. (1997) found that child and adolescent cancer patients and survivors diagnosed at older ages tended to be less anxious and depressed than those diagnosed at younger ages. Brown et al. (2003) and Kazak et al. (1997) found that age at the time of diagnosis was not associated with posttraumatic stress symptoms in child and adolescent cancer survivors. Because these studies examined different aspects of psychological well-being, it is difficult to draw strong conclusions.

Bitsko (2005) found that age at diagnosis was not associated with benefit finding in a sample of pre-adolescent, adolescent and young adult cancer survivors. However, Barakat et al. (2006) found that age at diagnosis was positively associated with levels of posttraumatic growth in adolescent cancer survivors. Additional research is required to further examine the relation between age at diagnosis and adolescent cancer survivors' coping, psychological well-being and posttraumatic growth.

The relation between adolescent cancer survivors' age at diagnosis and parents' psychosocial functioning has been explored in only a small number of studies. Brown et al. (2003) and Kazak et al. (1998) found that child and adolescent cancer survivors' age at diagnosis was unrelated to parents' posttraumatic stress symptoms. Barakat et al. (2006) found that adolescent cancer survivors' age at diagnosis was unrelated to mothers' and fathers' levels of posttraumatic growth. As with research on adolescent cancer

survivors, the relation between adolescent cancer survivors' age at diagnosis and parents' coping, psychological well-being, and posttraumatic growth must be further explored.

The research concerning survivors' age at diagnosis and its relation to siblings' psychological functioning provides inconsistent findings. Alderfer et al. (2003) suggested that siblings who were older than six years of age when their brother or sister was diagnosed reported experiencing more posttraumatic stress symptoms than those who were six years of age or younger at diagnosis. In contrast, Van Dongen-Melman, Pruyn, et al. (1995) found that age at diagnosis was unrelated to parents' reports of internalizing and externalizing problems in child and adolescent siblings of young cancer survivors. This discrepancy could be due to differences between self and parent reports, or differences in outcome measures. However, there are too few studies at this point to draw such conclusions, or any conclusions about the relation between survivors' age at diagnosis and siblings' coping, psychological well-being, and posttraumatic growth.

Time since Diagnosis and Treatment Completion

Amongst a group of adolescent cancer survivors, some may have been diagnosed with cancer two years ago, and some, eight years ago. Similarly, some may have completed their cancer treatment a few years ago, and some, many years ago. While few researchers have examined the relation between both time since diagnosis and time since treatment completion and young cancer survivors' psychological functioning, several (e.g., Brennan, 2001; Frank et al., 1997; Kazak et al., 1994) have highlighted the importance of considering the relation between these time variables and either coping or psychological well-being in young cancer survivors. Most of the studies that have considered time since diagnosis found that it was not associated with psychological well-

being of child and adolescent cancer patients and survivors (e.g., Grootenhuis & Last, 2001; Kazak et al., 1997; Phipps & Srivastava, 1997; Sanger et al., 1991; Worchel et al., 1987). However, there was a relatively small range of time since diagnoses for the populations in most of these studies. One study (Phipps et al., 2005) found that among child, adolescent, and young adult cancer patients and survivors, those who were diagnosed between 2 and 30 months prior had more posttraumatic stress symptoms than those diagnosed at least 5 years prior. None of these studies examined time since treatment completion. Two adolescents who were both diagnosed with cancer five years ago but who completed their treatment four years ago and two years ago, respectively, may feel and present as quite different from one another. It is important to investigate whether time since treatment completion is associated with adolescent cancer survivors' psychological well being.

Time since diagnosis and treatment completion may also be associated with posttraumatic growth. Theorists (e.g., Schaefer & Moos, 1992) have suggested that while positive consequences of life crises can happen shortly after the crisis, they are more likely to occur after a long process or crisis resolution and personal recovery. According to these theorists, the adolescent cancer survivors who report more posttraumatic growth are likely to be those who have had more time since they completed cancer treatment because they have had more time to revisit and reconsider their perspectives and priorities. In adult breast cancer patients and survivors, a longer time since diagnosis has been associated with more posttraumatic growth (Cordova et al., 2001; Sears et al., 2003). However, in a sample of pre-adolescent, adolescent, and young adult cancer survivors, time since diagnosis and time since treatment completion were unrelated to

benefit finding (Bitsko, 2005). The relations between both time since diagnosis and treatment completion and posttraumatic growth have not been empirically evaluated in an adolescent cancer survivor population.

The length of time since diagnosis and treatment completion may also have an effect on parents of young cancer survivors. Dahlquist et al. (1996), Hoekstra-Weebers et al. (1998), and Kupst and Schulman (1988) found that psychological distress in parents of child and adolescent cancer patients and survivors decreased from the time of diagnosis to up to six years later. Similarly, Fuemmeler et al. (2001) found that a longer time since diagnosis (ranging from 11 months to 19 years) was associated with less psychological distress in parents of child and adolescent cancer patients and survivors. Kazak et al. (1994) found no change in psychological well being of parents of adolescent cancer survivors over the course of one year. However, it is possible that changes take place over extended periods of time and that one year may be too short a period in which to detect changes. With respect to posttraumatic growth, Barakat et al. (2006) found that a shorter time since the end of treatment was associated with more posttraumatic growth in fathers, but not mothers, of adolescent cancer survivors who completed treatment at least one year earlier.

Only one known research project addressed changes in coping over time among parents of young survivors. Kupst et al. (1995) and Kupst and Schulman (1988) found that the coping adequacy of parents of child and adolescent cancer survivors improved from the time of diagnosis to between six and eight years after diagnosis, and that maternal coping adequacy then decreased over the following four years. However, as previously noted, the authors utilized a questionable method of assessing coping. It

appears that more research is required to explore the relation between both time since diagnosis and treatment completion and coping in young cancer survivors and their parents.

Similarly, there are only a handful of studies that have examined the relation between time since diagnosis or treatment completion and siblings' psychological functioning. Cohen et al. (1994) found that more time since diagnosis was associated with fewer psychological difficulties in child and adolescent siblings of cancer patients. With respect to time since treatment completion, Van Dongen-Melman, De Groot, et al. (1995) found that child and adolescent siblings of cancer survivors who had completed cancer treatment more than five years earlier made more somatic complaints than siblings of survivors who had completed cancer treatment five or fewer years earlier. However, these two groups of siblings did not differ on any other aspect of psychological well-being. There are no known studies that examined the relation between time since diagnosis or treatment completion and siblings' use of coping strategies and posttraumatic growth.

Several researchers (e.g., Canning et al., 1992; Fritz et al., 1988; Greenberg et al., 1989) did not explain why they chose a specific length of time since diagnosis or end of treatment, and some did not examine the relation between these lengths of time and their outcome variables. Most of those who did consider the time since diagnosis did not consider time since treatment completion. It is important to note the difference between time since diagnosis and time since completion of treatment, given that some cancer treatments can last several years, while others last several months. The present study examines the relations between both time since diagnosis and time since treatment

completion and coping, psychological well-being, and psychological growth in adolescent cancer survivors, siblings, and parents. These lengths of time may be particularly relevant to psychological growth, given that growth is thought to require time to deliberate on and redefine one's life events, values, and perspectives.

Research Objectives and Hypotheses

Research Objective 1: Examine Age, Time, and Treatment Variables, and Psychological Functioning in Adolescent Cancer Survivors

The present study's first objective is to examine age variables (current age, age at diagnosis), time variables (time since diagnosis, time since treatment completion), treatment variables (treatment length and treatment difficulty), life stress, psychological intervention, predictions about remission, life satisfaction, coping, psychological well-being, and posttraumatic growth in adolescent cancer survivors.

As presented earlier, the child and adolescent literature presents mixed findings regarding the relation between age and psychological well-being amongst child and adolescent cancer patients and survivors. However, research with adolescent cancer survivors suggests that younger adolescents have higher levels of psychological well-being than older adolescents. Literature concerning children and adolescents who are healthy, as well as those with cancer, has shown that as they get older, they use more cognitive coping styles, such as positive self-talk, discussing experiences with others, reappraisal, and emotion-focused coping. The cognitive development literature and posttraumatic growth theory suggest that level of posttraumatic growth should increase with age. There is some suggestion in the pediatric psycho-oncology literature that time since diagnosis is positively associated with psychological well-being. Due to the relation

between time since diagnosis and time since treatment completion, time since treatment completion is also expected to be positively associated with psychological well-being. The adult psycho-oncology literature and posttraumatic growth theory suggest that time since diagnosis and treatment completion are positively related to posttraumatic growth. To date, there is no literature to suggest whether time from diagnosis or treatment completion will be related to the use of specific coping strategies. Also, there is limited and conflicting research concerning age at the time of diagnosis. Theories of family stress and the cancer survival literature suggest that life stress is negatively related to psychological well-being; however there is no such suggestion about a relation to either coping strategies or posttraumatic growth. There is little research concerning treatment length and difficulty, life satisfaction, remission predictions, and participation in psychological intervention.

Based on the review of the literature, the following hypotheses are suggested for adolescent cancer survivors.

Hypothesis 1a. Age will be negatively associated with psychological well-being.

Hypothesis 1b. Age will be positively associated with the use of emotion-focused, acceptance, restraint, and positive reinterpretation and growth coping, as well as with posttraumatic growth.

Hypothesis 1c. Time since diagnosis and treatment completion will be positively associated with psychological well-being.

Hypothesis 1d. Time since diagnosis and treatment completion will be positively associated with posttraumatic growth.

Hypothesis 1e. Life stress will be negatively associated with psychological well-being.

There is insufficient research to make predictions regarding the following: the relation between the use of specific coping strategies and both time since diagnosis and time since treatment completion; the relation between life stress and both the use of specific coping strategies and posttraumatic growth; the relation between (a) coping, psychological well-being, and posttraumatic growth and (b) age at diagnosis, treatment length and difficulty, life satisfaction, remission predictions, and participation in psychological intervention.

The first study objective also includes the examination of the relations among coping, psychological well-being, and posttraumatic growth in adolescent cancer survivors. As presented earlier, the adult psycho-oncology literature and adolescent psychosocial literature have yielded mixed findings regarding an association between psychological well-being and posttraumatic growth. The adolescent psychosocial literature suggests that more problem-focused coping is associated with resilience. The pediatric and adult psycho-oncology literature suggest that more active coping and less avoidant coping are associated with greater psychological well-being in cancer survivors. The adult psycho-oncology literature and posttraumatic growth theory suggest that more active, planning, problem-solving, acceptance, positive appraisal, and positive reframing coping and are associated with posttraumatic growth in cancer survivors.

The following hypotheses are suggested for adolescent cancer survivors.

Hypothesis 1f. Coping factors involving active, planning, and avoidant coping will predict psychological well-being.

Hypothesis 1g. Coping factors involving active, planning, acceptance, and positive reinterpretation and growth coping will predict posttraumatic growth.

There is insufficient research to make predictions regarding the association between psychological well-being and posttraumatic growth in adolescent cancer survivors.

Research Objective 2: Examine Age, Time, and Treatment Variables, and Psychological Functioning in Parents of Adolescent Cancer Survivors

The second study objective is to examine parents' reports of adolescent cancer survivors' age, time, and treatment variables, as well as parents' life stress, psychological intervention, predictions about their child's remission, life satisfaction, coping, psychological well-being, and posttraumatic growth.

As presented earlier, there is little research concerning the relation between parents' age and their psychosocial functioning. The research that has addressed time since diagnosis and time since treatment completion suggest that they are positively associated with psychological well-being in parents of adolescent cancer survivors. Adult psycho-oncology literature and posttraumatic growth theory both suggest that time since diagnosis and treatment completion are positively related to posttraumatic growth in cancer survivors, though there are mixed findings in studies of parents of cancer survivors. Although theories of family stress suggest that life stress is negatively associated with psychological well-being, they make no suggestions about the relation between life stress and coping strategies or posttraumatic growth. There is little research concerning treatment length and difficulty as reported by parents, life satisfaction, remission predictions, and participation in psychological intervention.

Based on the review of the literature, the following hypotheses are suggested for parents of adolescent cancer survivors.

Hypothesis 2a. Time since diagnosis and treatment completion will be positively associated with psychological well-being and posttraumatic growth.

Hypothesis 2b. Life stress will be negatively associated with psychological-well-being.

There is insufficient research to make predictions regarding the following: the relation between the use of specific coping strategies and both time since diagnosis and time since treatment completion; the relation between life stress and both the use of specific coping strategies and posttraumatic growth; the relation between (a) parents coping, psychological well-being, and posttraumatic growth and (b) adolescent cancer survivors' age at diagnosis, parents' current age, parents' reports of adolescent cancer survivors' treatment length, treatment difficulty, and physical difficulties, parents' remission predictions, parents' life satisfaction, and parents' participation in psychological intervention.

The second objective also includes the examination of the associations among parents' coping, psychological well-being, and posttraumatic growth. As presented earlier, there is a paucity of research examining the association between psychological well-being and posttraumatic growth in parents of adolescent cancer survivors. The literature concerning parents of young cancer patients and survivors suggests that more active, less avoidant, and less emotion-focused coping strategies are associated with greater parental psychological well-being. The adult psychosocial literature suggests that more problem-focused coping, acceptance, and positive reinterpretation coping are

associated with posttraumatic growth. As noted in the fourth research objective, the posttraumatic growth theory suggests that active coping are also associated with posttraumatic growth.

The following hypotheses are suggested for parents of adolescent cancer survivors.

Hypothesis 2c. Coping factors involving active, avoidant, and emotion-focused coping will predict psychological well-being.

Hypothesis 2d. Coping factors involving active, planning, acceptance, and positive reinterpretation and growth coping will predict posttraumatic growth.

There is insufficient research to make predictions regarding the association between psychological well-being and posttraumatic growth in parents of adolescent cancer survivors.

Research Objective 3: Examine Age, Time, and Treatment Variables, and Psychological Functioning in Siblings of Adolescent Cancer Survivors

Although a number of studies have examined siblings of adolescent cancer patients, very few have examined siblings of adolescent cancer survivors. The few studies of siblings of survivors provide little information about the relation between siblings' psychological functioning and age, time, and treatment variables. The studies present mixed findings regarding siblings' levels of psychological-well being, little information about their use of specific coping strategies, and no information about their levels of posttraumatic growth. Although there is some suggestion that social support coping may be related to psychological well-being in siblings of cancer patients, there is limited research pertaining to social support in siblings of cancer survivors. Thus, there is

insufficient research to make predictions regarding age, time, and treatment variables, and psychological functioning in siblings of adolescent cancer survivors. As such, the analyses pertaining to siblings are considered exploratory.

Research Objective 4: Compare Adolescent Cancer Survivors, Siblings, and Parents

The fourth study objective is to compare adolescent cancer survivors, siblings, and parents. Research has suggested that husbands have lower posttraumatic growth scores than their breast cancer survivor wives (e.g., Weiss, 2002). This discrepancy might have been due to differences in proximity to the threat of cancer, which would suggest that parents and siblings are likely to have lower posttraumatic growth than adolescent cancer survivors. However, the discrepancy might also have been due to gender differences. The one study that examined posttraumatic growth in adolescent cancer survivors and parents (Barakat et al., 2006) did not compare their levels of posttraumatic growth, nor did it use a standardized measure of posttraumatic growth. The research concerning siblings of adolescent cancer survivors is scarce. There is insufficient research to make predictions about differences between adolescent cancer survivors, siblings, and parents with respect to levels of psychological well-being, levels of posttraumatic growth, and use of coping strategies.

The fourth objective includes the examination of the associations between adolescent cancer survivors' coping, psychological well-being, and posttraumatic growth and their matched parents' coping, psychological well-being, and posttraumatic growth. The pediatric psychology and pediatric psycho-oncology literature, as well as social learning theory, suggest that adolescent cancer survivors' coping strategies are associated with their parents' coping strategies. Similarly, the pediatric psycho-oncology literature

and family systems theories suggest that adolescent cancer survivors' psychological well-being and posttraumatic growth will be associated with their parents' psychological well-being and posttraumatic growth.

Based on the review of the literature, the following hypotheses are suggested.

Hypothesis 4a. Adolescent cancer survivors' use of specific coping strategies will be positively associated with their parents' use of the same coping strategies.

Hypothesis 4b. Adolescent cancer survivors' psychological well-being will be positively associated with their parents' psychological well-being.

Hypothesis 4c. Adolescent cancer survivors' posttraumatic growth will be positively associated with their parents' posttraumatic growth.

CHAPTER II

Methodology

Participants

English speaking families with an adolescent (13-20 years of age) who completed treatment for a solid tumor, leukemia, or lymphoma at the Children's Hospital of Western Ontario (CHWO) between two and ten years earlier were eligible to participate in the study. Adolescents who completed treatment less than two years earlier were not eligible for long-term follow-up at CHWO, and thus, were not yet considered survivors. Those who completed treatment more than ten years earlier may have forgotten aspects of their pre-cancer functioning, and may no longer consider themselves survivors. Adolescents whose cancer relapsed, who required an organ transplant, or who had a brain tumour that required only surgery were excluded because their cancer treatment and prognosis would have differed greatly from the majority of other participants. In addition, adolescents who had significant cognitive or neurological impairments were excluded because such impairments could affect their ability to complete the measures. Staff from the CHWO oncology team identified those who met the exclusion criteria.

General Demographics

Thirty-one adolescent cancer survivors participated in the study. Table 1 presents a summary of survivors, siblings, and parents' general demographics. Table 2 presents a summary of their ethnic/cultural group and religious identification. Most adolescent cancer survivors identified themselves as North American. With respect to religion, most survivors identified themselves as Christian, Catholic, or Roman Catholic. Table 2 also presents a summary of highest parental levels of education. The majority of survivors

have parents whose highest level of education was college or university. Survivors' mean rating for strength of religious or spiritual beliefs was 2.50 ($SD = 1.14$; range = 0 – 5). Thirty six percent of adolescent cancer survivors reported participating in counselling or psychotherapy.

Table 1

Age and Gender in Adolescent Cancer Survivors, Siblings, and Parents

Group	<i>n</i>	Age (years)			Gender (% female)
		<i>M</i>	<i>SD</i>	Range	
Adolescent cancer survivors	31	15.74	2.25	13 - 20	65
Siblings	18	15.67	2.74	13 - 20	50
Parents	30	45.07	5.64	34 - 55	97

Eighteen siblings participated in the study. Most siblings identified themselves as North American. With respect to religion, one third of siblings identified themselves as Christian. The majority of siblings have mothers whose highest level of education was college or university and fathers whose highest level of education was high school. Siblings' mean rating for strength of religious or spiritual beliefs was 2.33 ($SD = 1.37$; range = 0 – 5). Twenty eight percent of siblings reported participating in counselling or psychotherapy.

Table 2

Group Identification, Religious Identification, and Highest Parental Education Level in Adolescent Cancer Survivors, Siblings, and Parents

Group or Level	Number of Adolescent Cancer Survivors	Number of Siblings	Number of Parents
Ethnic/Cultural Group			
North American	24	14	23
European	3	2	3
'Other': Mennonite	4	2	3
'Other': French Canadian	0	0	1
Religious Group			
Catholic / Roman Catholic	11	2	8
Christian	8	6	4
Protestant	3	2	5
Mennonite	2	1	1
United	1	2	3
Anglican	1	0	4
Presbyterian	0	1	1
None reported	5	4	4
Highest Maternal Education Level			
Professional or graduate school	0	1	0
College or university	18	11	20
High school	10	5	7
Not reported	3	1	0
Highest Paternal Education Level			
Professional or graduate school	1	1	1
College or university	12	7	12
High school	10	8	12
Less than high school	3	2	4
Not reported	5	0	1

Thirty parents participated in the study. Most parents identified themselves as North American. In terms of religion, one third of parents identified themselves as Christian, Catholic, or Roman Catholic. With respect to parental education, the parent who participated reported on their highest level of education and their survivor child's other parents' highest level of education. The majority of parents completed college or university. Parents' mean rating for strength of religious or spiritual beliefs was 3.48 ($SD = 1.15$; range = 1 – 5). Thirty three percent of parents reported participating in counselling or psychotherapy.

Cancer Demographics

The types of cancer that the adolescent cancer survivors experienced are presented in Table 3. Most of the survivors had leukemia, and acute lymphoblastic leukemia, in particular.

The mean age at diagnosis for adolescent cancer survivors was 7.45 years ($SD = 4.75$; range = 2-17). Their cancer treatment lasted an average of 21.31 months ($SD = 12.10$; range = 4-42) and consisted of chemotherapy (100% of adolescents), radiation (13% of adolescents), and surgery (10% of adolescents). The adolescent cancer survivors' mean rating of treatment difficulty was 2.97 ($SD = 1.27$; range = 0-5). Twenty percent of adolescent cancer survivors reported that they had physical difficulties as a result of their cancer treatment (e.g., physical weakness, joint pain). The mean time since diagnosis was 8.28 years ($SD = 3.02$; range = 2.5-12.5) and mean time since cancer treatment ended was 6.47 years ($SD = 2.67$; range = 2.0-10.0). The adolescent cancer survivors' mean estimated chance of staying in remission for the coming ten years was 4.38 ($SD = 1.29$; range = 0-5).

Table 3

Adolescent Cancer Survivors' Type of Cancer

	ALL	AML	ES	HL	NHL	OS	WT
Adolescents' report	18	3	2	4	1	2	1
Siblings' report	13	0	1	2	0	1	1
Parents' report	17	3	1	4	2	2	1

Note. ALL = acute lymphoblastic leukemia; AML = Acute myelogenous leukemia; ES = Ewing's sarcoma; HL = Hodgkin's lymphoma; NHL = non-Hodgkin's lymphoma; OS = Osteosarcoma; WT = Wilms tumor.

When the adolescent cancer survivors were diagnosed with cancer, the siblings who participated in the study had a mean age of 6.83 years ($SD = 3.97$; range = 2-15). They all lived with the survivor while he or she was receiving cancer treatment. Siblings reported that the mean age at diagnosis for their brother or sister was 7.17 years ($SD = 3.99$; range = 2-17). Their cancer treatment lasted an average of 25.33 months ($SD = 12.58$; range = 4-78) and included chemotherapy (100% of adolescent cancer survivors), radiation (11% of adolescent cancer survivors), and surgery (11% of adolescent cancer survivors). The siblings' mean rating of treatment difficulty for the adolescent cancer survivors was 3.35 ($SD = 1.00$; range = 1-5). Eleven percent of siblings reported that the survivor had physical difficulties as a result of the cancer treatment (e.g., limp, limited arm use). The mean time since diagnosis was 8.69 years ($SD = 2.42$; range = 3.0-12.5) and mean time since cancer treatment ended was 6.57 years ($SD = 2.26$; range = 2.0-

10.0). The siblings' mean reported chance that the survivor would remain in remission for the next ten years was 4.67 ($SD = 0.77$; range = 2-5).

Based on parents' reports, the adolescent cancer survivors' mean age at diagnosis was 7.62 years ($SD = 4.51$; range = 2-17). Their cancer treatment lasted an average of 20.52 months ($SD = 11.78$; range = 4-39) and consisted of chemotherapy (100% of adolescent cancer survivors), radiation (10% of adolescent cancer survivors), and surgery (17% of adolescent cancer survivors). The parents' mean rating of treatment difficulty for the adolescent cancer survivors was 3.57 ($SD = 1.03$; range = 1-5). Twenty seven percent of parents reported that the adolescent cancer survivors had physical difficulties as a result of the cancer treatment (e.g., limb and heart problems). The mean time since diagnosis was 8.15 years ($SD = 2.88$; range = 2.5-12.5) and mean time since cancer treatment ended was 6.42 years ($SD = 2.57$; range = 2.0-10.0). The parents' mean reported chance that the adolescent cancer survivors would remain in remission for the next ten years was 4.60 ($SD = 0.62$; range = 3-5).

Measures

Participants completed a background questionnaire, the Brief Symptom Inventory (Derogatis & Melisaratos, 1983), the COPE (Carver, Scheier, & Weintraub, 1989), and a modified version of the Posttraumatic Growth Inventory (Tedeschi & Calhoun, 1996). Adolescent cancer survivors and siblings completed a modified version of the Life Events Checklist (Johnson & McCutcheon, 1980) and the Students' Life Satisfaction Scale (Huebner, 1991). Parents completed the Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985) and the Social Readjustment Rating Scale (Holmes & Rahe, 1967).

Measures Completed by All Participants

Background Information. Participants completed a background questionnaire to obtain their demographic information, including age, gender, ethnicity, religion, receipt of psychotherapy or counselling, and parental education and occupation. In addition to asking participants' to identify their religion, the questionnaire also asked participants to rate the strength of their religious or spiritual beliefs using a scale from 0 (not religious or spiritual at all) to 5 (very religious or spiritual). The questionnaire included questions about the survivor's cancer experience, including age at diagnosis, disease variables (type of cancer and stage of cancer, when applicable), treatment variables (length, type), physical difficulties resulting from treatment, and estimated chance of remission. Participants were also asked to rate the difficulty of the cancer treatment on the adolescent cancer survivors using a scale from 0 (not difficult at all) to 5 (extremely difficult; see Appendix A).

Brief Symptom Inventory (BSI; Derogatis & Melisaratos, 1983). The BSI is a 53-item self-report questionnaire that assesses psychological distress. Participants use a five-point scale to report the extent to which they experience psychological symptoms (0 = not at all; 4 = extremely). The BSI yields scores on nine symptom dimensions: Somatization, Obsessive-Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation, and Psychoticism. It also yields scores on three global indices of distress: General Severity Index (GSI), Positive Symptom Distress Index, and Positive Symptom Total. This study utilized the GSI T-scores. Low GSI T-scores indicate low psychological distress. As such, they were taken to represent high psychological well-being.

Derogatis and Melisaratos (1983) reported internal consistency for the nine scales that ranged from .71 to .85 in a sample of 1002 adult outpatients. In 60 non-patient adults, the test-retest reliability ranged from .68 to .91 for the nine scales and was .90 for the GSI after eight weeks. Derogatis and Melisaratos also report that the BSI can be used with individuals as young as 13.

COPE (Carver et al., 1989). The COPE is a 60-item self-report questionnaire that assesses coping strategies. It is one of a small group of coping questionnaires that can be used with both adolescents and adults. The COPE has the strongest psychometric properties of these measures. Participants use a four-point scale (1 = I usually don't so this at all; 4 = I usually do this a lot) to report the extent to which they respond to stressful events in 60 specific ways (e.g., I discuss my feelings with someone; I accept that this has happened and that it can't be changed). The COPE has two versions: dispositional (how people tend to cope) and time-limited (how people have coped during a specific period of time). This study used the dispositional version of the COPE.

The COPE yields scores on 15 scales: Active Coping, Planning, Suppression of Competing Activities, Restraint, Use of Instrumental Social Support, Use of Emotional Social Support, Positive Reinterpretation and Growth, Acceptance, Religious Coping, Focus on and Venting of Emotions, Denial, Behavioral Disengagement, Mental Disengagement, Substance Use, and Humor. The Humor scale was not recognized in the original COPE; thus, it is not noted in the following factor analysis. Carver et al.'s (1989) factor analyses generated four factors. The first is composed of Active Coping, Planning, and Suppression of Competing Activities. The second is composed of Use of Instrumental Social Support, Use of Emotional Social Support, and Focus on and Venting

of Emotions. The third is composed of Denial, Behavioral Disengagement, and Mental Disengagement. The final factor is composed of Acceptance, Restraint, and Positive Reinterpretation and Growth. Religious Coping failed to load onto any of the factors, and Substance Use was not included in the analyses. In a sample of 978 undergraduate students, the internal consistency ranged from .45 to .92. The test-retest reliability in 89 undergraduate students ranged from .46 to .86 after eight weeks.

Carver (n.d.) suggested that instead of using predetermined dimensions or second-order factors of the COPE generated with a different data set, researchers should generate their own second-order factors that are specific to their data sets. However, due to the small sample size in this study, it was not possible to perform a sound factor analysis to derive second-order factors based on the sample in this study. This study utilized the four second-order factors that Carver et al. (1989) found in their factor analysis: Active Coping, Social Support and Emotion-Focused Coping, Avoidant Coping, and Acceptance Coping.

Phelps and Jarvis (1994) examined the COPE among middle adolescents. In a sample of 484 14- to 18-year-old students, the internal consistency ranged from .51 to .87. Their factor analyses generated a factor structure similar to that suggested by Carver et al. (1989). Their first factor was composed of Active Coping, Planning, Suppression of Competing Activities, and Use of Instrumental Social Support. The second factor consisted of Denial, Behavioral Disengagement, and Substance Use. The third factor consists of Use of Emotional Social Support and Focus on and Venting of Emotion. The final factor consisted of Acceptance, Restraint, Positive Reinterpretation and Growth, and Mental Disengagement. Religious coping failed to load onto any of the factors. While the

youngest participants in Phelps and Jarvis' study were 14, the COPE has been used with participants as young as 12 and 13 (e.g., Greco, Brickman, & Routh, 1996; Laurent, Catanzaro, & Callan, 1997). This study utilized the four second-order factors derived in Phelps and Jarvis' factor analysis: Active Coping, Avoidant Coping, Emotion-Focused Coping, and Acceptance Coping. Similar factor structures have been found in other analyses of the COPE in adolescent populations (e.g., Washburn-Ormachea, Hillman, & Sawilowsky, 2004).

The COPE is grounded in Lazarus and Folkman's (1984) problem-focused vs. emotion-focused model of coping. While it moves beyond the simplicity of a single dimension and provides additional depth, it maintains its allegiance with Lazarus and Folkman's model. The previously discussed proposed conceptualization of coping (incorporating the problem-focused vs. emotion-focused and engagement vs. disengagement coping dimensions) and the COPE have similar theoretical foundations. Furthermore, the COPE factor structures for adult and adolescent populations fit with the proposed conceptualization of coping in that they focus on comparable dimensions or categories of coping.

Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996). The PTGI is a 21-item self-report questionnaire that assesses the positive changes experienced after a traumatic event. Each item represents a positive change (e.g., I discovered that I'm stronger than I thought I was). Participants use a six-point scale to indicate the extent to which they experienced each positive change (0 = I did not experience this change as a result of my crisis true; 5 = I experienced this change to a very great degree as a result of my crisis). The PTGI was modified to ask about changes as a result of having had cancer

or having a family member with cancer. For adolescents, the language of the PTGI was modified to better suit a younger population. These modifications are comparable to those used by Yaskowich (2003) in her study of child and adolescent cancer survivors using her PTGI-Revised for Children and Adolescents. For example, the original PTGI asks participants the degree to which they experienced “a feeling of self-reliance” as a result of their crisis. The comparable item on the PTGI-Revised for Children and Adolescent asks participants the degree to which they believe “I now feel more capable of dealing with my problems myself” as a result of having had cancer.

The PTGI yields a total score and five subscale scores: Relating to Others, New Possibilities, Personal Strength, Spiritual Change, and Appreciation of Life. This study used the Total posttraumatic growth score. Tedeschi and Calhoun (1996) reported internal consistency for the full-scale of .90 in a sample of 604 undergraduate students. The test-retest reliability in 28 undergraduate students was .71 after two months. In two samples of women with breast cancer (Cordova et al., 2001; Weiss, 2002), the internal consistency coefficients were .95 and .91. Yaskowich (2003) reported internal consistency for the full scale of the PTGI-Revised for Children and Adolescents of .94 in her sample of 35 adolescent cancer survivors.

Measures Completed by Adolescent Cancer Survivors and Siblings

Life Events Checklist (LEC; Johnson & McCutcheon, 1980). The LEC is a 43-item self-report questionnaire that assesses major life events. Participants indicate whether an event has occurred to them, and if so, whether the event was “good” or “bad.” Participants then use a four-point scale to report the extent to which the event had an impact on their lives (0 = no effect; 3 = great effect). In addition to the 43 life events,

there is space for participants to add and rate four other life events not included in the list. The events in the LEC fall into 10 categories: family health, family member changes, family moves, money, crises, unexpected news, parent's marital relationship, parent-child relationship, family resources, and general. This study utilized the sum of the effect ratings for negative life events (hereinafter referred to as life stress). As such, participants completed a modified version of the LEC that excluded eight positive life events such as "special recognition for good grades" and "getting your own car." While the LEC typically asks participants to indicate whether they experienced the major life events within the past year, participants in this study were asked to indicate whether they experienced the events since they or their sibling completed cancer treatment.

Brand and Johnson (1982) reported that in 50 non-patient children and adolescents (10-17 years of age), the test-retest reliability for the sum of the effect ratings for negative events was .72 after two eight weeks.

Students' Life Satisfaction Scale (SLSS; Huebner, 1991). The SLSS is a self-report questionnaire that assesses global life satisfaction in children and adolescents. Participants use a six-point scale (from strongly disagree to strongly agree) to respond to seven statements about their life (e.g., "My life is going well"). The scale generates one score that represents overall life satisfaction. In a sample of 330 children from grades four to eight, the internal consistency was .82. In a sample of 202 children in grades four to six, the test-retest reliability was .74 after one to two weeks.

Measures Completed by Parents

Social Readjustment Rating Scale (SRRS; Holmes & Rahe, 1967). The SRRS is a frequently used self-report questionnaire that asks adults about major life events. In the

original SRSS, participants indicate whether they experienced life events and rate the relative degree of readjustment that each event demanded. In an effort to simplify the data from the scale and to generate information that is similar to the information from the life events scale that adolescents completed (the Life Events Checklist), participants did not rate the degree of readjustment required by each event. Instead, they indicated whether the 43 events (e.g., personal injury or illness, change in living conditions) were “good” or “bad.” They then used a four-point scale (from no effect to great effect) to report the extent to which the event impacted on their lives. Similar modifications have been utilized in numerous studies (e.g., Pakenham, Sofronoff, & Samios, 2004). As was the case with the adolescents’ life events scale, parents were asked to report on events they experienced since their child completed cancer treatment. Casey, Masuda, and Holmes (1967) reported that the test-retest reliability in 54 resident physicians ranged from .64 to .74 after nine months.

Satisfaction with Life Scale (SWLS; Diener et al., 1985). The SWLS is a brief self-report questionnaire that assesses adult global life satisfaction. Participants use a seven-point scale (1 = strongly disagree; 7 = strongly agree) to respond to five statements about their life (e.g., “In most ways my life is close to my ideal”). The scale yields one score that represents overall satisfaction with life. The internal consistency in 176 undergraduate students was .87. The test-retest reliability in 76 undergraduate students was .82 after eight weeks.

Procedure

Several pediatric oncology centres in Southwestern Ontario and Michigan were approached regarding data collection. Due to the large number of ongoing studies using

pediatric oncology populations, none of the centres other than the CHWO permitted data collection for the present study. The CHWO is the regional cancer centre for southwestern Ontario. The study received approval from the University of Windsor and the University of Western Ontario (responsible for research at the CHWO) ethics boards. Questionnaire packages were mailed to 89 families that met criteria for the study. Each family received a study cover letter (see Appendix B). The adolescent cancer survivors, sibling, and parent each received an information and consent form (see Appendix B), the study measures, and a list of local resources (see Appendix B for an example) to help them seek mental health services should they experience any distress. Families were informed that participants' names would be entered into one of three draws (one for adolescent cancer survivors, one for siblings, and one for parents) to win a \$50 gift certificate from a store that sells books, music, and movies.

Thirty-one adolescents (35%) returned completed packages. Twenty-one (24%) indicated that they planned to participate when contacted by telephone, but did not return their questionnaires; 18 (20%) indicated that they were not interested in participating when contacted by telephone; 10 (11%) did not return a package and were unreachable by telephone; 5 (6%) returned blank packages, indicating that they were uninterested; and 4 (4%) were unreachable by mail (package was returned by postal service).

Eighteen (20%) of the sibling questionnaire packages were completed and returned (some families did not have a sibling or an eligible sibling). Twenty-one (24%) indicated that they would respond when contacted by telephone, but did not return their questionnaires; 14 (16%) blank questionnaires were returned, indicating that the sibling was uninterested, sibling was ineligible, or there was no sibling; 13 (15%) were

uninterested according to their parents when contacted by telephone; 10 (11%) did not return a package and were unreachable by telephone; 9 (10%) were ineligible according to their parents when contacted by telephone; and 4 (4%) were unreachable by mail.

Thirty parents (34%) returned completed packages. Twenty three (26%) indicated that they planned to participate when contacted by telephone, but did not return their questionnaires; 8 (9%) returned blank questionnaires, indicating that they were uninterested; 14 (16%) stated that they were uninterested in participating when contacted by telephone; 10 (11%) were unreachable by telephone; and 4 (4%) were unreachable by mail.

In total, 35 families (89%) had at least one member participate in the study. Forty percent of participating families had an adolescent, sibling, and parent participate. The remaining 60% had various combinations of family member participation. The rates of various types of family participation are presented in Table 4. Due to the various types of family participation, the adolescent, sibling, and parent groups represent different sets of families. As such, demographic information will be reported for each group.

Table 4

Study Participation by Family Members

Type of Family Participation	Number of Families	(% of participating families)
At least one family member	35	(100)
Adolescent, sibling, and parent	14	(40)
Adolescent and sibling only	1	(3)
Adolescent and parent only	14	(40)
Sibling and parent only	1	(3)
Adolescent only	2	(5)
Sibling only	2	(5)
Parent only	1	(3)

CHAPTER III

Results

Examination of the Data

Prior to analysis, each variable was examined for missing data, outliers, and normality. Missing data on individual items on questionnaires were replaced with the participant's mean for all other items on the questionnaire or scale, as suggested by Tabachnick and Fidell (1996). Univariate outliers were identified as data points with z scores above 2.5. Tabachnick and Fidell suggest that univariate outliers have z scores of 3.29, and possibly lower for smaller samples. Rather than remove univariate outliers, they were winsorized, so as to avoid further reducing the size of the sample. The scores were adjusted such that their adjusted z scores were not above 2.5. Tabachnick and Fidell encourage this practice. The univariate outlier adjustments are presented in Appendix C.

In accordance with Tabachnick and Fidell's (1996) suggestions, multivariate outliers were identified by examining scatterplots and seeking data points with Cook's values greater than 1. Multivariate outliers were removed from correlation and regression analyses that included the specific variables. Details about the removed outliers in the adolescent cancer survivors, siblings, and parents are presented in Appendix C.

All analyses were conducted using SPSS. All tests of significance were two-tailed. To correct for the number of analyses in the study, the criterion for significance was set at an alpha level of .01. Regressions were conducted with small samples, and as such, caution should be taken when interpreting the results. However, it is important to note that variables in each regression were correlated with the outcome and that the conservative alpha level of .01 was used to determine these significant correlations.

Preliminary Analyses

Analyses were completed separately for adolescent cancer survivors, siblings, and parents. The mean scores, standard deviations, and range of scores for study measures for adolescent cancer survivors are presented in Table 5. The Cronbach's alpha coefficients, calculated for the survivors and siblings together, are also presented in Table 5. The adolescent cancer survivors' mean BSI *t*-score was within the average range for adolescents. Although there have been mixed previous findings regarding adolescent cancer survivors' psychological well-being, the results of this study are consistent with previous studies (e.g., Fritz et al., 1988, Greenberg et al., 1989; Kazak et al., 1997, Kazak et al., 1994) that found that adolescent cancer survivors have an average level of psychological well-being compared to others their age.

Table 5

Means, Standard Deviations, Ranges of Scores, and Scale Reliabilities for Adolescent Cancer Survivors

Measure	<i>M</i>	<i>SD</i>	Range	Cronbach's Alpha
BSI	47.31	13.59	25.00-79.00	0.97
PTGI	2.15	1.01	0.00-3.62	0.94
ACT COPE	2.23	0.58	1.38-3.38	0.88
AVD COPE	1.33	0.30	1.00-2.05	0.83
EF COPE	2.08	0.77	1.13-3.63	0.89
ACP COPE	2.58	0.42	1.63-3.53	0.74
REL COPE	2.24	1.00	1.00-4.00	0.94
LEC	0.14	0.14	0.00-0.62	-
SLSS	4.77	0.86	2.30-5.90	0.87

Note. Cronbach's Alpha for survivors and siblings; BSI = GSI T-score; PTGI = average score per PTGI item; ACT COPE = average score per Active Coping factor item; AVT COPE = average score per Avoidant Coping factor item; EF COPE = average score per Emotion-Focused Coping factor item; ACP COPE = average score per Acceptance Coping factor item; REL COPE = average score per Religious Coping subscale item; LEC = average score per LEC item; SLSS = average score per SLSS item.

The mean scores, standard deviations, and range of scores for study measures for the siblings of adolescent cancer survivors are presented in Table 6. The Cronbach's alpha coefficients, calculated for the survivors and siblings together, are also presented in Table 6. The siblings' mean BSI *t*-score indicated that siblings also had an average level of psychological well-being, which is consistent with some of the previous research (e.g., Dolgin et al., 1997, Labay & Walco, 2004) on siblings of adolescent cancer survivors. The mean scores, standard deviations, and range of scores for study measures for parents of adolescent cancer survivors are presented in Table 7. The Cronbach's alpha coefficients for parents are also presented in Table 7. Similar to the survivors and siblings, parents' mean BSI *t*-score indicated that they also had an average level of psychological well-being. These results are consistent with some of the previous research (e.g., Dahlquist et al., 1996, Greenberg et al., 1989, Radcliffe et al., 1996) on parents of adolescent cancer survivors.

Table 6

Means, Standard Deviations, Ranges of Scores, and Scale Reliabilities for Siblings

Measure	<i>M</i>	<i>SD</i>	Range	Cronbach's Alpha
BSI	48.94	10.83	27.00-72.00	0.97
PTGI	1.84	1.14	0.00-3.33	0.94
ACT COPE	2.17	0.49	1.38-3.13	0.88
AVD COPE	1.41	0.30	1.08-2.15	0.83
EF COPE	1.99	0.73	1.00-3.50	0.89
ACP COPE	2.53	0.46	1.81-3.19	0.74
REL COPE	1.88	1.13	1.00-4.00	0.94
STRS	0.21	0.13	0.03-0.46	-
LSAT	4.43	0.79	2.40-5.30	0.87

Note. Cronbach's Alpha for survivors and siblings' responses; BSI = GSI T-score; PTGI = average score per PTGI item; ACT COPE = average score per Active Coping factor item; AVT COPE = average score per Avoidant Coping factor item; EF COPE = average score per Emotion-Focused Coping factor item; ACP COPE = average score per Acceptance Coping factor item; REL COPE = average score per Religious Coping subscale item; LEC = average score per LEC item; SLSS = average score per SLSS item.

Table 7

Means, Standard Deviations, Ranges of Scores, and Scale Reliabilities for Parents

Measure	<i>M</i>	<i>SD</i>	Range	Cronbach's Alpha
BSI	53.72	11.94	33.00-80.00	0.98
PTGI	2.83	1.13	0.05-4.67	0.96
ACT COPE	2.81	0.54	1.58-3.91	0.87
AVD COPE	1.55	0.25	1.17-2.17	0.52
SSEF COPE	2.61	0.52	1.58-3.55	0.82
ACP COPE	3.01	0.42	1.98-3.75	0.89
REL COPE	2.64	1.01	1.00-4.00	0.94
SRRS	0.16	0.14	0.00-0.49	-
SWLS	5.21	1.20	1.80-7.00	0.91

Note. Cronbach's Alpha for parents' responses; BSI = GSI T-score; PTGI = average score per PTGI item; ACT COPE = average score per Active Coping factor item; AVT COPE = average score per Avoidant Coping factor item; SSEF COPE = average score per Social Support and Emotion-Focused Coping factor item; ACP COPE = average score per Acceptance Coping factor item; REL COPE = average score per Religious Coping subscale item; SRRS = average score per SRRS item; SWLS = average score per SWLS item.

The mean posttraumatic growth scores (average score per PTGI item) for adolescent cancer survivors, siblings, and parents were compared to the mean posttraumatic growth score for undergraduate university students who experienced a

major traumatic event (Calhoun, Cann, Tedeschi, & McMillan, 2000). The means, standard deviations, and comparisons to the study groups are presented in Table 8. One-sample *t*-tests revealed that the mean posttraumatic growth scores for adolescent cancer survivors, siblings, and parents were all lower than the mean posttraumatic growth score for undergraduates. With respect to comparisons with oncology samples, the adolescent cancer survivors' mean posttraumatic growth score was similar to that of child and adolescent cancer survivors in other research (Yaskowich, 2003) and lower than that of adult cancer survivors (Cordova et al., 2001; Weiss, 2002). The siblings in the present study also had a mean posttraumatic growth score that was similar to that of the child and adolescent cancer survivors in other research (Yaskowich). The parents in the present study had a mean posttraumatic growth score that was similar to that of adult cancer survivors (Cordova et al.; Weiss, 2002). With respect to comparisons with other family members of cancer survivors, the siblings in the present study had a mean posttraumatic growth score that was similar to that of parents of child and adolescent cancer survivors in other research (Yaskowich) and husbands of adult cancer survivors (Weiss, 2002). The parents in the present study also had a mean posttraumatic growth scores that was similar to that of parents of child and adolescent cancer survivors in other research (Yaskowich). They had a higher mean posttraumatic growth score than that of husbands of breast cancer survivors (Weiss, 2002), though this may be at least partially related to gender differences.

Table 8

PTGI Scores for Study Participants, PTGI Scores for Participants in other Research, and Comparisons

	ACS (present study)	Siblings (Calhoun et al., 2000)	Parents (Calhoun et al., 2000)	Healthy students (Calhoun et al., 2000)	Child and ACS (Yaskowich, 2003)	Adult CS (Cordova et al., 2001)	Adult CS (Weiss, 2002)	Parents of ACS (Yaskowich, 2003)	Husbands of adult CS (Weiss, 2002)
PTGI <i>M</i>	2.15	1.84	2.83	3.64	2.30	3.05	2.87	2.94	2.19
PTGI <i>SD</i>	1.01	1.14	1.13	1.05	1.15	1.18	0.90	0.94	1.09
Comparison with ACS (<i>t</i> -value; <i>df</i> = 29)				-8.06***	-0.83	-4.87***	-3.87***		
Comparison with siblings (<i>t</i> -value; <i>df</i> = 17)				-6.71***	-1.72			-4.10***	-1.30
Comparison with parents (<i>t</i> -value; <i>df</i> = 29)				-3.95***		-1.09	-0.19	-0.56	3.08**

Note. PTGI *M* = average score per Posttraumatic Growth Inventory item; ACS = adolescent cancer survivors; Healthy Students = healthy university students with trauma histories; CS = cancer survivors; SD = standard deviation.

p* < .05, *p* < .01, ****p* < .001.

The means and standard deviations of adolescent cancer survivors', siblings', and parents' scores on the COPE factors and religious subscale are presented in Tables 5, 6, and 7. Phelps and Jarvis (1994) provided separate male and female adolescent norms for the COPE factors because they found gender differences in their standardization group. Carver et al. (1989) presented one set of adult norms for the COPE. The norms and comparisons to norms for adolescent cancer survivors are presented in Table 9. One-sample *t*-tests revealed that the female adolescent cancer survivors in this study reported higher levels of acceptance coping and similar levels of active, avoidant, emotion-focused, and religious coping compared to norms. Male adolescent cancer survivors reported lower levels of avoidant and emotion-focused coping, higher levels of acceptance coping, and similar levels of active and religious coping compared to norms.

The norms and comparisons to norms for siblings of adolescent cancer survivors are presented in Table 10. Although the differences between siblings and norms are significant at only the .05 level, it is important to note them, given the limited amount of literature in this area. Similar to the adolescent cancer survivors, female siblings of adolescent cancer survivors reported higher levels of acceptance coping and similar levels of active, avoidant, emotion-focused, and religious coping compared to norms. Comparable to male adolescent cancer survivors, male siblings of adolescent cancer survivors reported lower levels of emotion-focused coping compared to norms. In contrast with all other study groups, male siblings reported lower levels of religious coping compared to norms. Male siblings reported levels of active, avoidant, and acceptance coping that were similar to norms.

Table 9

COPE Scores for Adolescent Cancer Survivors, COPE Norms, and Comparisons

Type of coping	Study <i>M</i>	Norm	Comparison	
			(<i>df</i>)	<i>t</i> -value
Female adolescents (<i>n</i> = 20)				
ACT	2.23	2.30	(19)	-0.09
AVD	1.35	1.41	(19)	-0.74
EF	2.36	2.68	(19)	-1.81
ACP	2.62	2.20	(19)	4.58***
REL	2.26	2.05	(19)	0.87
Male adolescents (<i>n</i> = 11)				
ACT	2.13	2.20	(10)	-0.40
AVD	1.28	1.54	(10)	-3.23**
EF	1.58	2.13	(10)	-4.45***
ACP	2.51	2.11	(10)	3.03*
REL	2.21	1.87	(10)	1.25

Note. ACT = average score per Active Coping factor item; AVD = average score per Avoidant Coping factor item; EF = average score per Emotion-Focused Coping factor item; ACP = average score per Acceptance Coping factor item; REL = average score per Religious Coping subscale item.

p* < .05, *p* < .01, ****p* < .001.

Table 10

COPE Scores for Siblings, COPE Norms, and Comparisons

Type of coping	Study <i>M</i>	Norm	Comparison	
			(<i>df</i>)	<i>t</i> -value
Female siblings (<i>n</i> = 8)				
ACT	2.15	2.30	(7)	-0.77
AVD	1.40	1.41	(7)	-0.08
EF	2.24	2.68	(7)	-1.30
ACP	2.60	2.20	(7)	2.60*
REL	2.44	2.05	(7)	0.80
Male siblings (<i>n</i> = 9)				
ACT	2.18	2.20	(8)	-0.13
AVD	1.42	1.54	(8)	-1.15
EF	1.78	2.13	(8)	-2.70*
ACP	2.48	2.11	(8)	2.21
REL	1.39	1.87	(8)	-2.36*

Note. ACT = average score per Active Coping factor item; AVD = average score per Avoidant Coping factor item; EF = average score per Emotion-Focused Coping factor item; ACP = average score per Acceptance Coping factor item; REL = average score per Religious Coping subscale item.

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

The norms and comparisons to norms for parents of adolescent cancer survivors are presented in Table 11. Parents reported lower levels of avoidant coping, higher levels of religious coping, and similar levels of active, social support and emotion-focused, and acceptance coping compared to norms.

Table 11

COPE Scores for Parents, COPE Norms, and Comparisons

Type of coping	Study <i>M</i>	Norm	Comparison
			<i>t</i> -value (<i>df</i> = 29)
ACT	2.81	2.87	-0.54
AVD	1.55	1.82	-5.97***
SSEF	2.61	2.72	-1.21
ACP	3.01	2.88	1.74
REL	2.64	2.21	2.36*

Note. ACT = average score per Active Coping factor item; AVD = average score per Avoidant Coping factor item; SSEF = average score per Social Support and Emotion-Focused Coping factor item; ACP = average score per Acceptance Coping factor item; REL = average score per Religious Coping subscale item.

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

Research Objective 1: Examine Age, Time, and Treatment Variables, and Psychological Functioning in Adolescent Cancer Survivors

To examine age, time, and treatment variables, as well as life stress, psychological intervention, remission predictions, and life satisfaction, in the adolescent cancer survivors, Pearson product-moment correlations, independent sample *t*-tests, and ANOVAs were conducted. Correlations are presented in Table 12.

Correlational analyses revealed that hypothesis 1a was supported. Age was negatively associated not only with psychological well-being, but also with life satisfaction. Contrary to hypotheses 1b, age, as well as age at diagnosis, was not significantly correlated with posttraumatic growth. In partial support of hypothesis 1b, survivors' use of acceptance coping was positively associated with both current age and age at diagnosis. In addition, age and age at diagnosis were positively correlated with avoidant coping. This suggests that older adolescent cancer survivors and those diagnosed at an older age tended to report experiencing lower levels of psychological well-being and life satisfaction, and using more acceptance and avoidant coping.

Table 12

Correlations among Psychological Well-Being, Posttraumatic Growth, Coping, Life Stress, Life Satisfaction, and Age, Time, Treatment, and Study Variables in Adolescent Cancer Survivors

Variable	PWB	PTG	ACT	AVD	EF	ACP	RLG	STRS	LSAT	RMS	Age	AgeDx	TMDx	TMTC	TxDF	TxLG	PSY
PWB	-																
PTG	-.33	-															
ACT	-.01	.40*	-														
AVD	-.57***	.40*	.19	-													
EF	-.47*	.26	.49**	.32	-												
ACP	-.49**	.49**	.52**	.46**	.28	-											
RLG	-.19	.51**	.29	.54**	.53**	.41*	-										
STRS	-.44*	.08	.20	.24	.56***	.14	.12	-									
LSAT	.52**	-.05	-.04	-.38*	-.37*	-.20	-.28	-.30	-								
RMS	.32	-.54**	-.01	-.10	-.03	-.08	-.03	-.37	.03	-							
Age	-.55**	.19	.21	.56***	.19	.48**	.06	.14	-.49**	.08	-						
AgeDx	-.63***	.21	.13	.53**	.13	.46**	-.09	.06	-.48**	.01	.86***	-					
TMDx	.56**	-.18	-.05	-.51**	-.07	-.22	-.11	.00	.38*	.04	-.60***	-.93***	-				
TMTC	.54**	-.19	-.07	-.36*	-.10	-.20	-.09	-.13	.41*	.09	-.53**	-.86***	.95***	-			
TxDF	-.17	-.03	.19	.21	.46*	-.24	-.12	.26	-.36	.15	.27	.23	-.16	-.23	-		
TxLG	.09	.01	.02	.26	.03	-.12	-.06	.34	.07	-.15	-.37*	-.45*	.42*	.12	.13	-	
PSY	-.45*	.35	.20	.33	.39*	.11	.04	.31	-.50**	-.20	.23	.35	-.38*	-.44*	.47**	.04	-

Note. PWB = psychological well-being; PTG = posttraumatic growth; ACT = active coping; AVD = avoidant coping; EF = emotion-focused coping; ACP = acceptance coping; RLG = religious coping; STRS = life stress; LSAT = life satisfaction; RMS = remission prediction; AgeDx = age at diagnosis; TMDx = time since diagnosis; TMTC = time since treatment completion; TxDF = treatment difficulty; TxLG = treatment length; PSY = psychological intervention length.

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

Time since diagnosis and time since treatment completion were positively associated with psychological well-being in adolescent cancer survivors, which is consistent with hypothesis 1c. Time since diagnosis was also negatively associated with avoidant coping. Due to the fact that age is also significantly associated with all of these variables, the correlations were re-run after partialling out the effects of age to determine whether the time variables would remain significantly associated with psychological well-being and coping. After partialling out the effects of age, the correlations were no longer significant and no longer supporting hypothesis 1c. Contrary to hypothesis 1d, time since diagnosis and time since treatment completion were not significantly correlated with posttraumatic growth.

Cancer treatment length and reported treatment difficulty were not significantly associated with psychological well-being or posttraumatic growth, nor were they significantly associated with any of the coping strategies.

Contrary to hypothesis 1e, life stress was not significantly correlated with psychological well-being. Life stress was also unrelated to posttraumatic growth, but was positively associated with emotion-focused coping. This suggests that adolescent cancer survivors who experienced more life stress tended to use more emotion-focused coping strategies. Life satisfaction was positively associated with psychological well-being, but not significantly associated with posttraumatic growth or any of the coping strategies.

Survivors' predictions about remaining in remission for the coming ten years were negatively associated with their posttraumatic growth, but not significantly associated with their psychological well-being or use of coping strategies. This suggests

that adolescent cancer survivors who believed they were more likely to relapse tended to experience more posttraumatic growth.

Independent sample *t*-tests were used to compare adolescent cancer survivors who participated in psychological intervention and those who did not participate in psychological intervention. As seen in Table 13, the two groups had similar levels of psychological well-being, posttraumatic growth, and life stress, as well as active, avoidant, acceptance, and religious coping. However, those who participated in psychological intervention used more emotion-focused coping than those who did not participate in psychological intervention. Although the two subgroups had similar mean life satisfaction scores, the length of psychological intervention in adolescent cancer survivors was negatively correlated with life satisfaction, as seen in Table 12. This suggests that adolescent cancer survivors who participated in psychological intervention over longer periods of time tended to report lower life satisfaction.

Independent sample *t*-tests were used to compare the group of adolescent cancer survivors who reported having physical difficulties as a result of their treatment and those who reported no such physical difficulties. The two groups had similar levels of psychological well-being, posttraumatic growth, life satisfaction, life stress, and coping strategies. A summary of the results are presented in Appendix D.

Table 13

Comparisons between Adolescent Cancer Survivors who did and did not Participate in Psychological Intervention

Measure	Psych. intervention (n = 21)		No psych. intervention (n = 10)		Comparison	
	M	SD	M	SD	(df)	t-value
BSI	55.56	10.24	43.60	13.47	(27)	-2.36
PTGI	2.73	0.75	1.91	1.02	(28)	-2.16
ACT COPE	2.36	0.66	2.17	0.55	(29)	-0.87
AVD COPE	1.33	0.33	1.33	0.29	(29)	-0.04
EF COPE	2.61	0.87	1.83	0.59	(29)	2.93**
ACP COPE	2.59	0.41	2.58	0.43	(29)	-0.03
REL COPE	2.33	1.23	2.20	0.90	(29)	-0.32
STRS	0.18	0.15	0.11	0.12	(28)	-1.35
LSAT	4.49	0.88	4.81	0.74	(29)	1.07

Note. BSI = GSI T-score; PTGI = average score per PTGI item; ACT COPE = average score per Active Coping factor item; AVT COPE = average score per Avoidant Coping factor item; EF COPE = average score per Emotion-Focused Coping factor item; ACP COPE = average score per Acceptance Coping factor item; REL COPE = average score per Religious Coping subscale item; STRS = life stress (average score per LEC item); LSAT = life satisfaction (average score per SLSS item).

** $p < .01$.

One-way ANOVAs were conducted to examine the relations between parental education (two levels for maternal education; four levels for paternal education) and adolescent cancer survivors' psychological functioning. The analyses revealed that adolescent cancer survivors' levels of psychological well-being, posttraumatic growth, life satisfaction, life stress, and coping strategies did not differ according to the highest level of education achieved by their mothers or fathers (see Appendix E for a summary of the results).

Pearson product-moment correlations and standard regressions with forward entry were used to examine the relations between coping, psychological well-being, and posttraumatic growth in adolescent cancer survivors. The correlations are displayed in Table 12. In partial support of hypothesis 1f, psychological well-being was negatively correlated with avoidant coping. Psychological well-being was also negatively correlated with acceptance coping. After partialling out the effects of age or age at diagnosis, psychological well-being was correlated with acceptance and avoidant coping at the .05 level of significance. After partialling out the effects of age at diagnosis, psychological well-being was positively correlated with religious coping, $r(24) = .52, p < .01$. These results suggest that adolescent cancer survivors who experienced higher levels of psychological well-being tended to use more religious coping.

A standard regression was performed to predict psychological well-being from the variables significantly correlated with it: avoidant coping, acceptance coping, life satisfaction, and age at diagnosis. While age, age at diagnosis, and time from diagnosis were all correlated with psychological well-being, age at diagnosis was included in the set of predictors because it had the highest correlation with psychological well-being. The

results of the regression are displayed in Table 14. The overall regression model for psychological well-being was significant. Examination of the squared semi-partial correlation coefficients indicated that both age at diagnosis and avoidant coping made significant unique contributions to the prediction of psychological well-being. Age at diagnosis accounted for 14% of the unique variance in psychological well-being and avoidant coping accounted for 10% of the unique variance in psychological well-being. The results suggest that adolescent cancer survivors who were diagnosed at earlier ages and used less avoidant coping were likely to have greater psychological well-being.

Table 14

*Standard Regression to Predict Psychological Well-Being in Adolescent Cancer**Survivors*

Variable	Total R^2	(df)	F	β	t	sr^2
Psychological well-being	.53	(2, 24)	13.76***			
Age at diagnosis				-.45	2.69*	.14
Avoidant coping				-.38	2.23*	.10
Acceptance coping				-.19	1.07	
Life satisfaction				.12	-0.66	

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

Hypothesis 1g pertained to adolescent cancer survivors' posttraumatic growth. Consistent with hypothesis 1g, posttraumatic growth was positively associated with survivors' use of acceptance coping. Posttraumatic growth was also positively associated

with religious coping. However, after partialling out the effects of remission predictions, both correlations were significant at the .05 level. Posttraumatic growth was not significantly correlated with psychological well-being.

A standard regression was performed to predict posttraumatic growth from the variables significantly correlated with it: acceptance coping, religious coping, and remission predictions. The results of the regression analyses are displayed in Table 15. The overall regression model for posttraumatic growth was significant. Examination of the squared semi-partial correlation coefficients indicated that both remission prediction and acceptance coping made significant unique contributions to the prediction of posttraumatic growth. Remission prediction accounted for 23% of the unique variance in posttraumatic growth and acceptance coping accounted for 15% of the unique variance in posttraumatic growth. The results suggest that adolescent cancer survivors who made more pessimistic predictions about their chances of remaining in remission for the coming ten years and used more acceptance coping were likely to have higher posttraumatic growth.

Table 15

Standard Regression to Predict Posttraumatic Growth in Adolescent Cancer Survivors

Variable	Total R^2	(df)	F	β	t	sr^2
Posttraumatic growth	.44	(2, 25)	9.64***			
Remission prediction				-.48	-3.18**	.23
Acceptance coping				.39	2.57*	.15
Religious coping				.22	1.29	

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

Research Objective 2: Examine Age, Time, and Treatment Variables, and Psychological Functioning in Parents of Adolescent Cancer Survivors

To examine parents' reports of age, time, and treatment variables regarding their survivor child, as well as their own life stress, life satisfaction, psychological intervention, and predictions about their child's remission, Pearson product-moment correlations, independent sample t -tests, and ANOVAs were conducted. Correlations are presented in Table 16.

Contrary to study hypothesis 2a, time since diagnosis and time since treatment completion were not correlated with psychological well-being or posttraumatic growth in parents of adolescent cancer survivors. However, time since treatment completion was positively associated with parents' social support and emotion-focused coping. These findings suggest that parents whose adolescent cancer survivors completed treatment longer ago were likely to use more social support and emotion-focused coping.

Table 16

Correlations among Psychological Well-Being, Posttraumatic Growth, Coping, Life Stress, Life Satisfaction, and Age, Time, Treatment, and Study Variables in Parents

Variable	PWB	PTG	ACT	AVD	SSEF	ACP	RLG	STRS	LSAT	RMS	Age	AADx	TMDx	TMTC	TxDF	TxLG	PSY
PWB	-																
PTG	-.01	-															
ACT	.57***	.21	-														
AVD	-.52**	-.04	-.42*	-													
SSEF	-.30	.14	-.05	.29	-												
ACP	.29	.10	.64**	-.18	-.15	-											
RLG	-.09	.10	.12	-.12	.01	.20	-										
STRS	-.17	-.07	.58***	.01	-.24	-.05	-.04	-									
LSAT	.62***	.27	.56***	-.13	-.26	.39*	.27	-.46*	-								
RMS	.25	-.04	.34	-.36	.17	.01	-.29	-.23	.04	-							
Age	-.53**	.06	-.15	.09	.19	-.19	.27	-.17	-.05	.21	-						
AADx	-.04	-.05	.08	-.13	-.20	.15	.19	-.13	.10	-.06	.38*	-					
TMDx	.03	.14	-.07	.17	.21	-.07	-.28	.14	-.11	.13	-.27	-.91***	-				
TMTC	.03	.05	.01	.21	.50**	-.06	-.31	.00	-.12	.25	-.20	-.84***	.95***	-			
TxDF	.10	.33	.05	.15	.22	-.01	-.22	-.30	.14	.18	.28	.08	.03	.09	-		
TxLG	-.03	.29	-.25	.08	-.14	-.07	.01	.37	-.04	-.33	-.26	-.42*	.41*	.09	-.20	-	
PSY	-.26	.17	-.35	.53**	.52**	-.39*	-.20	.10	-.23	-.05	-.01	.02	-.02	.02	-.09	-.06	-

Note. PWB = psychological well-being; PTG = posttraumatic growth; ACT = active coping; AVD = avoidant coping; SSEF = social support and emotion-focused coping; ACP = acceptance coping; RLG = religious coping; STRS = life stress; LSAT = life satisfaction; RMS = parent's remission prediction; AADx = adolescent's age at diagnosis; TMDx = time since diagnosis; TMTC = time since treatment completion; TxDF = parents' report of treatment difficulty; TxLG = treatment length; PSY = psychological intervention length.

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

Contrary to hypothesis 2b, parents' life stress since the end of their child's cancer treatment was not significantly associated with their psychological well-being. Life stress was also unrelated to posttraumatic growth, but was positively associated with active coping. This suggests that parents of adolescent cancer survivors who reported more life stress since their child's cancer treatment were likely to use more active coping.

Parents' reports of their adolescent cancer survivors' age at diagnosis, treatment length, and treatment difficulty were unrelated to parents' psychological well-being, posttraumatic growth, and use of specific coping strategies.

While life satisfaction was positively associated with psychological well-being and active coping, it was not significantly associated with posttraumatic growth or any of the other coping strategies in parents of adolescent cancer survivors. This suggests that parents of adolescent cancer survivors who had more life satisfaction tended to experience more psychological well-being and use more active coping. Predictions about their child remaining in remission for the coming ten years were not correlated with psychological well-being, posttraumatic growth, or any of the coping strategies.

As seen in Table 17, parents of adolescent cancer survivors who participated in psychological intervention and those who did not participate in psychological intervention had similar levels of psychological well-being, posttraumatic growth, life satisfaction, and life stress, as well as active, social support and emotion-focused, acceptance, and religious coping. However, parents who participated in psychological intervention used more avoidant coping than those who did not participate in psychological intervention. As seen in Table 16, the length of psychological intervention was positively associated with avoidant coping, as well as social support and emotion-

focused coping. This suggests that parents who participated in psychological intervention over longer periods of time tended to use more avoidant and social support and emotion-focused coping.

Independent sample *t*-tests revealed that parents of adolescent cancer survivors who reported that their adolescent cancer survivors had physical difficulties as a result of cancer treatment and those who reported that their adolescent cancer survivors had no physical difficulties had similar levels of psychological well-being, posttraumatic growth, life satisfaction, life stress, and coping strategies (see Appendix F for a summary of the results).

One-way ANOVAs were conducted to examine the relations between parental education (three levels for maternal education; four levels for paternal education) and their psychological functioning. The analyses revealed that there were no significant differences in their levels of psychological well-being, posttraumatic growth, life satisfaction, life stress, or coping strategies according to their or their spouse's highest level of education (see Appendix G for a summary of the results).

Finally, parents' age was negatively correlated with their psychological well-being, indicating that older parents tended to report lower levels of psychological well-being.

Table 17

Comparisons between Parents who did and did not Participate in Psychological Intervention

Measure	Psych. intervention (<i>n</i> = 20)		No psych. intervention (<i>n</i> = 10)		Comparison	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	(<i>df</i>)	<i>t</i> -value
BSI	59.78	9.31	51.00	12.19	(27)	-1.92
PTGI	3.20	1.00	2.64	1.17	(28)	-1.28
ACT COPE	2.58	0.57	2.93	0.49	(28)	1.73
AVD COPE	1.71	0.28	1.47	0.20	(28)	-2.77**
SSEF COPE	2.78	0.65	2.52	0.44	(13)	-1.14
ACP COPE	2.87	0.56	3.08	0.32	(28)	1.30
REL COPE	2.48	1.15	2.73	0.96	(28)	0.63
STRS	0.18	0.16	0.15	0.13	(26)	-0.62
LSAT	4.82	1.37	5.44	1.00	(28)	1.42

Note. BSI = GSI T-score; PTGI = average score per PTGI item; ACT COPE = average score per Active Coping factor item; AVT COPE = average score per Avoidant Coping factor item; SSEF COPE = average score per Social Support and Emotion-Focused Coping factor item; ACP COPE = average score per Acceptance Coping factor item; REL COPE = average score per Religious Coping subscale item; STRS = life stress (average score per SRRS item); LSAT = life satisfaction (average score per SWLS item).

***p* < .01.

Pearson product-moment correlations and standard regressions with forward entry were used to examine the relations between coping, psychological well-being, and posttraumatic growth in parents of adolescent cancer survivors. The correlations are presented in Table 16. Consistent with hypothesis 2c, parents' psychological well-being was positively correlated with active coping and negatively correlated with avoidant coping. However, after controlling for the effects of parents' age, only active coping remained significantly correlated, $r(25) = .57, p < .01$, with psychological well-being.

A standard regression was performed to predict psychological well-being in parents of adolescent cancer survivors using parent variables correlated with it: active coping, avoidant coping, life satisfaction, and age. The results of the regression are displayed in Table 18. The overall regression model for psychological well-being was significant. Examination of the squared semi-partial correlation coefficients indicated that avoidant coping, age, and life satisfaction all made significant unique contributions to the prediction of psychological well-being. Avoidant coping accounted for 13% of the unique variance in psychological well-being, age accounted for 11% of the unique variance, and life satisfaction accounted for 10% of the unique variance. The results suggest that parents who used less avoidant coping, were younger, and who had higher life satisfaction were likely to have greater psychological well-being.

Table 18

*Standard Regression to Predict Psychological Well-Being in Parents using Parent**Variables*

Variable	Total R^2	(df)	F	β	t	sr^2
Psychological well-being	.51	(3, 22)	7.69***			
Avoidant coping				-.37	-2.42*	.13
Age				-.35	-2.26*	.11
Life satisfaction				.33	2.14*	.10
Active coping				.15	0.77	

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

A second standard regression was performed in order to assess both parent and survivor child predictors of parents' psychological functioning. For parents whose survivor child also participated in the study, parent data were matched with the data provided by their survivor child. Details about the matched parent-survivor data are discussed in research objective four and the Pearson product-moment correlations are presented in Table 22. Parents' psychological well-being was correlated with their survivor child's active coping. As such, the parents' survivor child's active coping was included in the second regression. However, this inclusion would result in the use of too many predictors, given the small sample size (Tabachnick & Fidell, 1996). As a result, parent's active coping was excluded from the regression. This variable was chosen for exclusion because it was the parent variable with the highest multicollinearity (highly correlated with avoidant coping and life satisfaction). The results of the second regression

are displayed in Table 19. The overall regression model of psychological well-being was significant. Examination of the squared semi-partial correlation coefficients indicated that parents' age, parents' survivor child's active coping, and parents' life satisfaction all made significant unique contributions to the prediction of parents' psychological well-being. Parents' age accounted for 24% of the unique variance in psychological well-being, their adolescent cancer survivors' active coping accounted for 14% of the unique variance, and parents' life satisfaction accounted for 13% of the unique variance. The results suggest that parents who were younger, whose survivor child used more active coping, and who had higher life satisfaction were likely to have greater psychological well-being.

Table 19

Standard Regression to Predict Psychological Well-Being in Parents using Parent and Matched Survivor Child Variables

Variable	Total R^2	(df)	F	β	t	sr^2
Psychological well-being	.61	(3, 19)	9.74***			
Age				-.50	3.43**	.24
ACS' active coping				.38	-2.63*	.14
Life satisfaction				.36	2.49*	.13
Avoidant coping				-.20	1.32	

Note. ACS = adolescent cancer survivors.

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

Overall, the psychological well-being regressions revealed that parents' age and life satisfaction were consistently identified as significant predictors of their psychological well-being. Parents' avoidant coping was also a significant predictor when considering parent variables. When considering both parent and matched survivor child variables, survivor child's active coping significantly predicted their parents' psychological well-being.

Contrary to hypothesis 2d, posttraumatic growth was not significantly associated with active or acceptance coping in parents of adolescent cancer survivors. Posttraumatic growth was also unrelated to psychological well-being. Moreover, none of the other variables were significantly correlated with parents' posttraumatic growth. As such, no regressions were performed.

Research Objective 3: Examine Age, Time, and Treatment Variables, and Psychological Functioning in Siblings of Adolescent Cancer Survivors

To examine siblings' reports of age, time, and treatment variables regarding their survivor brother or sister, as well as their own life stress, life satisfaction, psychological intervention, and predictions about their survivor brother or sister's remission, Pearson product-moment correlations were conducted. Correlations are presented in Table 20.

Table 20

Correlations among Psychological Well-Being, Posttraumatic Growth, Coping, Life Stress, Life Satisfaction, and Age, Time, Treatment, and Study Variables in Siblings

Variable	PWB	PTG	ACT	AVD	EF	ACP	RLG	STRS	LSAT	RMS	Age	ASDx	AADx	TMDx	TMTC	TxDF	TxLG	PSY
PWB	-																	
PTG	-.05	-																
ACT	-.31	.21	-															
AVD	-.55*	-.18	.19	-														
EF	-.35	.13	.30	.36	-													
ACP	-.37	.28	.69**	-.14	.33	-												
RLG	-.55*	.77	.21	.66**	.73***	.28	-											
STRS	-.35	.35	.43	.12	.64**	.44	-.70**	-										
LSAT	.57*	.12	.28	-.71***	-.08	.32	-.50	-.12	-									
RMS	.13	-.21	-.10	-.48	-.51*	.16	-.49*	-.18	.33	-								
Age	-.26	.11	.73***	.05	.32	.30	.25	.62**	.10	.10	-							
ASDx	-.18	.11	.61*	.38	.20	.10	.19	.51*	-.09	-.01	.83***	-						
AADx	.02	.34	-.14	.27	-.16	-.27	-.11	.11	-.35	-.22	.29	.73***	-					
TMDx	.05	-.42	.16	-.67**	-.06	.14	-.14	-.14	.28	.26	-.22	-.72**	-.89***	-				
TMTC	-.04	-.57*	.10	-.58*	-.17	.15	-.18	-.21	.27	.35	-.29	-.72**	-.82***	.91***	-			
TxDF	-.21	.37	.19	-.36	.15	.05	-.13	.39	-.41	.10	.46	.47	.21	-.19	-.30	-		
TxLG	.17	.45	.15	-.25	.27	.05	.16	.19	.05	-.21	.18	-.01	-.18	.23	-.19	.15	-	
PSY	.29	.09	.30	-.10	.15	.19	-.01	-.02	-.06	-.17	.15	-.05	-.21	.20	-.06	.32	.61**	-

Note. PWB = psychological well-being; PTG = posttraumatic growth; ACT = active coping; AVD = avoidant coping; EF = emotion-focused coping; ACP = acceptance coping; RLG = religious coping; STRS = life stress; LSAT = life satisfaction; RMS = sibling's remission prediction; ASDx = age when their survivor sibling was diagnosis; AADx = adolescent's age at diagnosis; TMDx = time since diagnosis; TMTC = time since treatment completion; TxDF = sibling's report of treatment difficulty; TxLG = treatment length; PSY = psychological intervention length.

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

Siblings' age was positively associated with their active coping and life stress. Life stress was also positively associated with emotion-focused coping and negatively associated with religious coping. Time from diagnosis and life satisfaction were both negatively associated with avoidant coping. Thus, older siblings tended to use more active coping. Siblings whose brother or sister was diagnosed longer ago or who were more satisfied with their lives tended to use less avoidant coping. Siblings tended to report greater life stress if they were older, used more emotion-focused coping, or used less religious coping. In addition, survivor's treatment length, as reported by the sibling, was positively associated with the length of siblings' psychological intervention.

To examine the relations between sibling's coping, psychological well-being, and posttraumatic growth, Pearson product-moment correlations were used. Correlations are presented in Table 20. None of the variables were correlated with psychological well-being or posttraumatic growth at the $p < .01$ level.

Research Objective 4: Compare Adolescent Cancer Survivors, Siblings, and Parents

Independent sample *t*-tests and one-way ANOVAs were conducted to compare the adolescent cancer survivors, siblings, and parents. Means, standard deviations, and ANOVA results are presented in Table 21. Adolescent cancer survivors, siblings, and parents had similar levels of psychological well-being. In contrast, adolescent cancer survivors, siblings, and parents had significantly different levels of posttraumatic growth. Specifically, parents' posttraumatic growth was significantly higher than that of siblings, $t(46) = 2.91, p < .01$. Adolescent cancer survivors' posttraumatic growth was similar to that of parents, $t(58) = -2.433, ns$, and siblings, $t(46) = -0.98, ns$.

Table 21

Analyses of Variance Comparing Adolescent Cancer Survivors, Siblings, and Parents on the BSI and PTGI

Measure	ACS		Siblings		Parents		Comparison	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	(<i>df</i>)	<i>F</i> -value
BSI	47.31	13.59	48.94	10.83	53.72	11.94	(2, 71)	2.04
PTGI	2.15	1.01	1.84	1.14	2.83	1.13	(2, 75)	5.32**

Note. ACS = adolescent cancer survivors; BSI = GSI T-score; PTGI = average score per PTGI item.

** $p < .01$.

Comparisons of coping levels were not made between parents and either adolescent cancer survivors or siblings because the parent coping factor structure differs from that of the adolescent coping factor structure. Independent sample *t*-tests revealed no significant differences between adolescent cancer survivors and siblings on their levels of active, $t(46) = 0.39$, *ns*, avoidant, $t(46) = -.93$, *ns*, emotion-focused, $t(46) = 0.39$, *ns*, acceptance, $t(46) = 0.38$, *ns*, or religious, $t(46) = 1.14$, *ns*, coping strategies.

In 28 of the participating families, the adolescent survivor and one of their parents participated. Thus, there were 28 matched survivor-parent dyads. In order to examine the associations between survivors' coping, psychological well-being, and posttraumatic growth and that of their matched parents, Pearson product-moment correlations were used. The correlations are presented in Table 22. Contrary to hypotheses 4a, 4b, and 4c, none of the adolescent cancer survivor variables were significantly correlated with the

same variables in their parents. The one significant association between adolescent and parent variables was between parents' psychological well-being and their survivor child's active coping. The results suggest that parents tended to have higher psychological well-being if their survivor child used more active coping.

Table 22

Correlations between Adolescent Cancer Survivors and Matched Parents' Psychological Well-Being, Posttraumatic Growth, and Coping (n = 28)

Variable	Parents						
	PWB	PTG	ACT	AVD	SSEF	ACP	RLG
<u>Adolescent cancer survivors</u>							
PWB	.11	-.09	-.08	-.06	-.13	-.05	.04
PTG	.45*	.05	.39*	-.04	-.12	.31	.02
ACT	.53**	.04	.14	-.07	-.38*	.18	-.08
AVD	.20	-.05	.23	.02	.02	.10	.01
EF	.19	.14	.08	.04	-.08	-.15	-.43*
ACP	.14	-.24	-.01	.19	-.11	.03	-.13
RLG	.05	.04	.20	.02	.15	-.14	-.15

Note. PWB = psychological well-being; PTG = posttraumatic growth; ACT = active coping; AVD = avoidant coping; EF = emotion-focused coping; SSEF = social support and emotion-focused coping; ACP = acceptance coping; RLG = religious coping.

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

Summary of Hypothesis Testing

A summary of the analyses are presented in Table 23. Although many hypotheses were not fully supported by the study findings, a considerable number were at least partially supported.

Table 23
Results Summary

Research Objective and Hypothesis	Finding
Objective 1: Examine Age, Time, and Treatment Variables, and Psychological Functioning in Adolescent Cancer Survivors	
Hypothesis 1a. Survivors' age will be negatively associated with well-being.	SUPPORTED
Hypothesis 1b. Survivors' age will be positively associated with emotion-focused, acceptance, restraint, and positive reinterpretation and growth coping, as well as posttraumatic growth.	PARTIALLY SUPPORTED Older survivors used more acceptance coping (which consists of acceptance, restraint, and positive reinterpretation and growth coping).
Hypothesis 1c. Time since diagnosis and treatment completion will be positively associated with well-being in survivors.	PARTIALLY SUPPORTED Survivors who were diagnosed longer ago or completed treatment longer ago had higher well-being, but not after partialling out the effects of age.
Hypothesis 1d. Time since diagnosis and treatment completion will be positively associated with posttraumatic growth in survivors.	NOT SUPPORTED
Hypothesis 1e. Life stress will be negatively associated with well-being in survivors.	NOT SUPPORTED
Hypothesis 1f. Coping factors involving active, planning, and avoidant coping will predict well-being in survivors.	PARTIALLY SUPPORTED Avoidant coping predicted well-being in survivors.

Hypothesis 1g. Coping factors involving active, planning, acceptance, and positive reinterpretation and growth coping will predict posttraumatic growth in survivors.

PARTIALLY SUPPORTED
Acceptance coping (which consists of acceptance, restraint positive reinterpretation and growth, and mental disengagement) predicted posttraumatic growth in survivors.

Objective 2: Examine Age, Time, and Treatment Variables, and Psychological Functioning in Parents of Adolescent Cancer Survivors

Hypothesis 2a. Time since diagnosis and treatment completion will be positively associated with well-being and posttraumatic growth in parents.

NOT SUPPORTED

Hypothesis 2b. Life stress will be negatively associated with well-being in parents.

NOT SUPPORTED

Hypothesis 2c. Coping factors involving active, avoidant, and emotion-focused coping will predict well-being in parents.

PARTIALLY SUPPORTED
Avoidant coping predicted well-being in parents.

Hypothesis 2d. Coping factors involving active, planning, acceptance, and positive reinterpretation and growth coping will predict posttraumatic growth in parents.

NOT SUPPORTED

Objective 3: Examine Age, Time, and Treatment Variables, and Psychological Functioning in Siblings of Adolescent Cancer Survivors

No Hypotheses

Objective 4: Compare Adolescent Cancer Survivors, Siblings, and Parents

Hypothesis 4a. Survivors' use of specific coping strategies will be positively associated with their parents' use of the same coping strategies.	NOT SUPPORTED
Hypothesis 4b. Survivors' well-being will be positively associated with their parents' well-being.	NOT SUPPORTED
Hypothesis 4c. Survivors' posttraumatic growth will be positively associated with their parents' posttraumatic growth.	NOT SUPPORTED

Post Hoc Analyses

Gender and adolescent cancer survivors' current age were examined in post hoc analyses. With respect to gender, female adolescent cancer survivors ($n = 20$) used more emotion-focused coping, $t(29) = 3.06, p < .01$, and experienced more life stress since the end of their cancer treatment, $t(28) = 3.04, p < .001$, than male adolescent cancer survivors ($n = 11$). There were no significant gender differences among siblings. Gender differences were not explored in parents because only one father participated in the study.

The relations between adolescent cancer survivors' current age and psychological functioning in both parents and siblings were examined using Pearson product-moment correlations. The current age of adolescent cancer survivors was not significantly associated with their parents' psychological well-being, posttraumatic growth, or coping. Survivors' current age was unrelated to their sibling's psychological well-being, posttraumatic growth, and active, avoidant, and emotion-focused coping. However, survivor's current age was negatively associated with their siblings' use of acceptance, $r(15) = -.71, p < .01$, and religious coping, $r(16) = .65, p < .01$, suggesting that siblings with older survivor brothers or sisters tended to use less acceptance and religious coping.

CHAPTER IV

Discussion

The purpose of the present study was to investigate positive psychological functioning in adolescent cancer survivors and their families. Two aspects of psychological functioning, posttraumatic growth and psychological well-being, appear to exist independently in adolescent cancer survivors and their families, which is consistent with findings in adult cancer survivors (e.g., Cordova et al., 2001). Thus, adolescent cancer survivors, their siblings, and their parents can experience both positive and negative reactions to cancer simultaneously. It was determined that different sets of demographic and coping strategies predict aspects of psychological functioning in adolescent cancer survivors, their parents, and their siblings. By providing a better understanding of psychological well-being and posttraumatic growth, the present study contributes to the development of a more comprehensive conceptualization of adolescent cancer survivors and their families.

Adolescent Cancer Survivors

Adolescent cancer survivors had an average level of psychological well-being. This is consistent with Fritz et al.'s (1988) finding that most child and adolescent cancer survivors have average or above average levels of global adjustment. It is also consistent with reports that child and adolescent cancer survivors and healthy controls have similar levels of depression and PTSD symptoms (Greenberg et al., 1989; Kazak et al., 1997).

Survivors' level of posttraumatic growth was comparable to levels of posttraumatic growth in other child and adolescent cancer survivors (Yaskowich, 2003) and similar to levels of posttraumatic growth among siblings and parents in the present

study. However, their level of posttraumatic growth was lower than that of healthy university students who experienced various traumas (Calhoun et al., 2000), suggesting that the nature of the trauma (e.g., cancer vs. motor vehicle accident, robbery, murder of a loved one) may affect the extent of posttraumatic growth experienced. Adolescent cancer survivors' level of posttraumatic growth was lower than that of adult cancer survivors (Cordova et al., 2001; Weiss, 2002). This discrepancy may be due to differences in cognitive maturation or challenges associated with different developmental tasks in adolescence and adulthood. For instance, adult cancer survivors may feel more frightened and overwhelmed by the threat of death, and feel they have more to lose (e.g., their children) than adolescent cancer survivors.

Female adolescent cancer survivors had a coping strategy profile similar to that of norms, though adolescent cancer survivors reported using more acceptance coping strategies. In contrast, the male adolescent cancer survivors' coping strategy profile differed from that of norms. Male adolescent cancer survivors used less avoidant and emotion-focused coping strategies and more acceptance coping strategies than norms. These profiles are consistent with Derevensky et al.'s (1998) report that young cancer survivors use more adaptive coping than norms. Given that female siblings of adolescent cancer survivors also reported using more acceptance coping strategies than norms, the use of more acceptance coping strategies may be a common adolescent reaction to having had cancer or a sibling with cancer. Given that male adolescent cancer survivors and male siblings of adolescent cancer survivors used less emotion-focused coping strategies than norms, this may be a common male adolescent reaction to having had cancer or a sibling with cancer.

The hypothesis put forth regarding adolescent cancer survivors' age and psychological well-being was supported. Adolescents who were younger or younger at diagnosis were likely to report higher levels of psychological well-being and life satisfaction. This fits with Elkin et al.'s (1997) report that younger adolescent cancer survivors were less psychologically distressed than older survivors, and Stam et al.'s (2006) report that adolescent and young adult cancer survivors diagnosed at younger ages had greater psychological well-being than those diagnosed at older ages. These findings may reflect older adolescents experiencing distress when contemplating their future and the ways in which their survivor experiences negatively impact upon their lives. Younger adolescents may be less future-focused, and research (e.g., Weigers, Chesler, Zebrack, & Goldman, 1998) suggests they may be less worried about their fertility. Moreover, some young adult cancer survivors achieve fewer social and autonomy milestones or achieve them later than healthy peers (Stam, Grootenhuis, & Last, 2005), which could contribute to lower levels of psychological well-being in older adolescents. Adolescent cancer survivors who were diagnosed at younger ages may remember less about their negative cancer experiences or feel that their lives were less disrupted. In contrast, adolescent cancer survivors diagnosed at older ages may have had a greater understanding of the seriousness of the disease. They may also have been more affected by school absences and felt socially isolated during a period of social development in which social interaction and social inclusion are more significant than in earlier stages of development (Feldman & Elliott, 1990).

Psychological well-being in adolescent cancer survivors was predicted by a younger age at diagnosis and the use of less avoidant coping. The negative association

between avoidant coping and psychological well-being is in accordance with study predictions. Moreover, it is consistent with Frank et al.'s (1997) finding that an increased use of avoidant coping was associated with greater depression and anxiety in child and adolescent cancer patients and survivors. Adolescent cancer survivors who use less avoidant coping strategies, such as denial, behavioural disengagement, and substance abuse, are likely better able to face their challenges directly and deal with them. As a result, these survivors may feel less burdened and distressed by challenges, and experience greater psychological well-being. This finding suggests that clinicians can educate adolescent cancer survivors about the disadvantages of using avoidant coping and encourage them to use alternate coping strategies. In their efforts to identify adolescent cancer survivors who may benefit from further psychological assessment and possibly intervention, clinicians should bear in mind that survivors diagnosed at older ages tend to experience lower psychological well-being, and thus, higher psychological distress.

Cancer treatment length and difficulty, subsequent physical difficulties, remission predictions, participation in psychological intervention, and parental education were unrelated to adolescent cancer survivors' psychological well-being. Contrary to hypotheses, life stress since treatment completion and parents' psychological well-being, were also unrelated to survivors' psychological well-being. Additionally, parents' posttraumatic growth and parents' use of specific coping strategies were not significantly related to survivors' psychological well-being. With the exception of remission predictions, all of the variables were also unrelated to survivors' posttraumatic growth. The lack of association between adolescent cancer survivors' psychological functioning

and their parents' psychological functioning is in contrast with social learning and family systems theories suggesting that parents model coping behaviours for their children and that family members' psychological functioning is often interdependent (Bandura, 1977 ; Nichols & Schwartz, 2001). However, the finding fits with Grootenhuis and Last's (1997) study, which found no relation between child and adolescent cancer patient and survivors' emotional adjustment and their mothers' emotional adjustment. Moreover, it fits with Yaskowich's (2003) report that there was no association between young cancer survivors' posttraumatic growth and their parents' posttraumatic growth. The study findings suggest that adolescent cancer survivors and parents experience and react to cancer independently.

Contrary to predictions, adolescent cancer survivors' posttraumatic growth was unrelated to the length of time since their diagnosis and time since their treatment ended. However, the findings are consistent with Bitsko's (2005) research, which found that benefit finding was unrelated to time since diagnosis and treatment completion in young cancer survivors. The findings in these pediatric populations differ from the findings in adult populations. Cordova et al. (2001) and Sears et al. (2003) reported that higher levels of posttraumatic growth were associated with longer times since diagnosis and treatment completion in adult breast cancer survivors. The study results suggest that although adult cancer survivors may need an extended period of reflection and evaluation in order to experience posttraumatic growth, adolescent cancer survivors may not need this period of time. In addition, the hypothesis put forth that age would be related to posttraumatic growth was not supported. Thus, posttraumatic growth appears to exist independent of

age or level of cognitive maturation in adolescents. Even young adolescents are capable of experiencing posttraumatic growth.

Posttraumatic growth in adolescent cancer survivors was predicted by beliefs that they were more likely to relapse in the coming ten years and the use of more acceptance coping strategies. Adolescent cancer survivors who were more pessimistic about their health future were likely to have higher levels of posttraumatic growth. Similarly, Barakat et al. (2006) reported that higher levels of posttraumatic growth were associated with greater perceived life threat in adolescent cancer survivors. Interestingly, Widows et al. (2005) found that adult cancer survivors' posttraumatic growth was associated with a greater degree of perceived life threat, but not objective life threat. Thus, greater perceived life threat is associated with posttraumatic growth in adolescent cancer survivors. Adolescent cancer survivors who have a greater perceived life threat may reflect upon their lives more, have a greater appreciation for life, and adjust their priorities accordingly. It is unclear, at this time, whether objective life threat is associated with posttraumatic growth in adolescent cancer survivors.

In accordance with study hypotheses, posttraumatic growth was positively associated with acceptance coping strategies, which includes acceptance of situations, restraint, positive reinterpretation and growth, and mental disengagement. The findings suggest that adolescent cancer survivors who can learn from and move past their difficult cancer experiences, restrain themselves from reacting too quickly, focus on positive aspects of situations, and stop negative thoughts are likely to have higher posttraumatic growth. Just as clinicians can encourage adolescent cancer survivors to use fewer

avoidant coping strategies, they can also facilitate adolescent cancer survivors' employment of acceptance coping strategies.

Overall, adolescent cancer survivors' psychological well-being is comparable to norms based on their healthy peers. Adolescent cancer survivors who are younger at diagnosis and use less avoidant coping strategies are likely to have higher levels of psychological well-being. Although they have less posttraumatic growth than adult cancer survivors in other studies, even young adolescent cancer survivors have the capacity to experience posttraumatic growth. Adolescent cancer survivors who believe they are more prone to relapse and use more acceptance coping strategies are likely to have higher levels of posttraumatic growth.

Parents of Adolescent Cancer Survivors

Parents of adolescent cancer survivors had an average level of psychological well-being, which is consistent with some of the previous research. For example, Dahlquist et al. (1996) and Radcliffe et al. (1996) reported that parents of young cancer patients and survivors had levels of anxiety and depression that were comparable to reported norms. In addition, Greenberg et al. (1989) found that mothers of child and adolescent cancer survivors and mothers of healthy children and adolescents had similar levels of psychological distress.

Parents of survivors had a level of posttraumatic growth that was lower than that of healthy university students (Calhoun et al., 2000), similar to that of adult cancer survivors (Cordova et al., 2001; Weiss, 2002) and higher than that of husbands of breast cancer survivors (Weiss) and siblings of adolescent cancer survivors in the present study. These findings suggest that parents' reactions to their child having had cancer are similar

to reactions of people who, themselves, had cancer. Due to the close and dependent nature of the child-parent relationship, parents may feel closer to the trauma of cancer and experience a stronger reaction than husbands and siblings of cancer survivors.

Parents of adolescent cancer survivors used less avoidant and more religious coping strategies than norms. This coping profile appears different from that of adolescent cancer survivors and siblings. Parents' roles as guardians and caretakers of an ill child may lead them to face challenges directly and use less avoidant coping than parents of healthy adolescents. They may also feel a stronger need to seek meaning, comfort, and hope through religious coping.

Younger age and higher life satisfaction were strong predictors of higher parental psychological well-being. As parents of adolescent cancer survivors get older, they may have a greater awareness of the difficulties and possible limitations that their adolescent cancer survivors might face. Younger parents may pay less attention to these difficulties or be more naïve about them, and as such, report experiencing higher psychological well-being. Parents who are more satisfied with their lives (i.e., feel their lives are good, have what they want in life, and would change little about their lives) may have fewer things to worry about and feel assured and grounded, which could contribute to higher levels of psychological well-being.

When considering parental variables, less avoidant coping also predicted higher psychological well-being in parents, which supports the study hypothesis concerning parental coping and psychological well-being. The negative association between avoidant coping and psychological well-being applies to both adolescent cancer survivors and their parents. As with adolescent cancer survivors, parents who face their difficulties are less

troubled by ongoing and neglected difficulties, and thus, experience greater psychological well-being. Based on these findings, clinicians may choose to discourage parents of adolescent cancer survivors from engaging in avoidant coping strategies and encourage them to take behavioural, psychological, and spiritual steps towards experiencing greater life satisfaction.

Parents' survivor child's active coping also predicted their psychological well-being. Active coping involves actively planning and dealing with problems, focusing on problems without getting distracted, and seeking helpful social support. Parents whose survivor children actively address and cope with their challenges may experience a sense of relief that the survivors are capable of dealing with life's difficulties. In contrast, parents whose survivor children use little active coping may feel the need to plan for the survivors and actively encourage them to work towards solving problems. These parents may feel burdened by such added responsibilities and more worried about the survivors. As a result, they may experience lower levels of psychological well-being.

The hypotheses that time since survivors' diagnosis, time since survivors' treatment completion, and parents' life stress since survivors' treatment completion would be related to parents' psychological well-being were not supported. Adolescent cancer survivors' age at diagnosis, treatment length, treatment difficulty, and subsequent physical difficulties as reported by parents, parents' predictions about their child's remission, parents' participation in psychological intervention, and parents' education were also unrelated to their psychological well-being. In addition, their survivors children's psychological well-being, posttraumatic growth, and avoidant, emotion-focused, acceptance, and religious coping strategies were unrelated to parents'

psychological well-being. These variables, as well as survivors' active coping strategies, were also unrelated to parents' posttraumatic growth. The lack of relation between most of the survivors' psychological functioning and parents' psychological functioning is in contrast with study hypotheses. Moreover, hypotheses related to predictors of parents' posttraumatic growth were not supported by the results of the study, in that none of the study variables were significant predictors of parents' posttraumatic growth.

Research with adult breast cancer survivors found that a husband's posttraumatic growth was predicted by his survivor wife's posttraumatic growth (Weiss, 2004). Moreover, there was a trend suggesting that husbands who had contact with people experiencing posttraumatic growth as a result of cancer, other than their wives, had higher posttraumatic growth than husbands without such contact. Thus, it is possible that parents of adolescent cancer survivors could benefit from participating in a group intervention that included other parents of adolescent cancer survivors who experienced posttraumatic growth.

Overall, parents of adolescent cancer survivors have levels of psychological well-being that are comparable to norms based on their healthy peers. Parents who are younger and more satisfied with their lives are likely to report higher levels of psychological well-being. There is some evidence to suggest that parents who use less avoidant coping and whose survivor children use more active coping are more likely to experience higher levels of psychological well-being. Parents of survivors have as much posttraumatic growth as adolescent and adult cancer survivors. Although their own lives are not at risk, parents of adolescent cancer survivors may be as affected by, and likely to experience positive reactions to, the trauma of cancer as if their own lives were at risk.

Siblings of Adolescent Cancer Survivors

Siblings of adolescent cancer survivors had an average level of psychological well-being. These findings fit with Van Dongen-Melman, De Groot, et al.'s (1995) research, which suggested that child and adolescent siblings of young cancer survivors and child and adolescent siblings of healthy youngsters have similar levels of psychological difficulties. As was the case with adolescent cancer survivors, siblings' posttraumatic growth was lower than that of healthy university students (Calhoun et al., 2000); it was also lower than that of parents in the present study. Their level of posttraumatic growth was similar to that of adolescent cancer survivors in the present study and husbands of breast cancer survivors in other research (Weiss, 2002). Thus, siblings had similar levels of posttraumatic growth to those who were in a shared environment and of a similar age, which may reflect similar levels of cognitive maturation. However, they also had similar levels of posttraumatic growth to those who were adult family members of a cancer survivor, which suggests that their proximity to the trauma may influence their posttraumatic growth. Female siblings of adolescent cancer survivors had a similar coping profile to female adolescent cancer survivors, in that they both had used more acceptance coping strategies than norms. Male siblings of adolescent cancer survivors were similar to male adolescent cancer survivors, in that they used less emotion-focused coping strategies than norms. In addition, male siblings used less religious coping strategies than norms. Overall, siblings' psychological functioning and reactions to cancer appear to be fairly similar to those of their family members.

Although no specific hypotheses regarding siblings were put forward, the findings suggest that older siblings were likely to use more active coping strategies and to report

greater life stress since their brother or sister completed cancer treatment. When their brother or sister was receiving cancer treatment, their parents were busy with the ill child, such that the siblings likely had to attend to their own needs. During this period of time, siblings may have learned about the utility of self-reliance, active coping, and problem solving. In their older adolescence, they may consolidate life lessons, and choose to use more active coping strategies. In addition, siblings who were forced to be more independent and self-reliant when they were growing up may lack some of the skills necessary to cope with events later in their lives. The high demands of late adolescence may be perceived as particularly stressful for these siblings.

Siblings who used more emotion-focused coping or less religious coping were also likely to report experiencing greater life stress since their brother or sister completed cancer treatment. Adolescent cancer survivors in the present study who used more emotion-focused coping also reported greater life stress. Siblings and survivors with greater life stress may feel overwhelmed by their stressors and resort to using more emotion-focused coping in their attempts to cope. Siblings with high levels of life stress may question their religious beliefs, and be less likely to seek and experience support through religion.

Siblings whose brother or sister was diagnosed longer ago tended to use less avoidant coping strategies. This association was also found among the adolescent cancer survivors in the present study. Siblings and survivors may use more avoidant coping to deal with the stressors they experience soon after the cancer diagnosis. As time passes, they likely experience fewer cancer-related stressors, may better adapt to such stressors, and may find more effective ways of coping with them, and as such, use less avoidant

coping strategies. Siblings who felt more satisfied with their lives also used less avoidant coping strategies. Those who are more satisfied with their lives may feel they have fewer problems or difficult situations to avoid, and thus, use less avoidant coping.

It is interesting to note that the survivors' age was related to their siblings' use of several coping strategies. Specifically, as the age of the survivors increased, their siblings were likely to use more acceptance and religious coping strategies. Given that older adolescent cancer survivors tended to use more acceptance coping strategies, it is possible that they modeled the use of acceptance coping strategies for their siblings. The older survivors' tendencies to accept that which they cannot change and focus on positive aspects of their lives may lead their siblings to use religious coping as a way of trying to be as accepting as the survivors.

It was determined that siblings whose brother or sister had longer cancer treatment participated in psychological interventions for a longer period of time. A longer treatment likely resulted in a longer period of family disruptions and unmet needs. This could have contributed to more distress during and after treatment, and thus, necessitate longer psychological interventions.

No significant relations were found between study variables and siblings' psychological well-being or posttraumatic growth. This may have been due to the small sibling sample size, particularly given that some of the variables were correlated with psychological well-being and posttraumatic growth at the .05 level. Examining the psychological functioning of siblings of cancer survivors is a promising area of research. Future studies should further examine the study variables, particularly those associated with age and time, in a larger sample size.

Overall, adolescent siblings of young cancer survivors have levels of psychological well-being that are comparable to norms based on their healthy peers. Although they are not cancer survivors, they experience similar levels of posttraumatic growth to their survivor brother or sister, as well as to husbands whose wives survived breast cancer. Even siblings in early adolescence appear to have the capacity to experience posttraumatic growth in response to their brother or sister having had cancer. Their use of specific coping strategies depends upon their age, the time since their brother or sister was diagnosed with cancer, their brother or sister's current age, and the life stress they experienced since the cancer treatment ended.

Study Limitations

Overall, the findings contribute to an understudied area and assist in the further understanding of adolescent cancer survivors and their families. There are a number of limitations that must be acknowledged. The main study limitation is sample size. Although the criterion for significance was set low to account for the sample size, this strategy might have masked associations between variables that are actually highly correlated. In addition, the sample size did not permit for a factor analysis of the coping measure. As such, the factors used were based on previous samples and not specific to adolescent cancer survivors and their families.

Due to the retrospective design of the study, growth is as recounted by the participant. However recollections of the past and perceived change may be more important than actual, objective change in understanding current psychological functioning. Posttraumatic growth is a personal experience based on reconstructions of past events and subsequent changes. Adolescent cancer survivors who feel they have

become stronger, have become more spiritual, and developed new priorities in life would likely feel more positive and empowered than adolescent cancer survivors who feel they have not changed, despite objective evidence of change. An additional area of research would involve measuring psychological functioning at the time of cancer diagnosis and treatment, and examining its relation to posttraumatic growth after treatment completion.

The generalizability of the study is limited. All but one of the parents in the present study were mothers. Thus, the results may not be generalizable to fathers. Moreover, the sample consisted primarily of middle-class individuals who identified themselves as Christian North Americans. There is some evidence (e.g., Porter et al., 2006) to suggest that there are different sets of predictors of psychological growth in breast cancer survivors from different ethnic backgrounds. Thus, the results cannot necessarily be generalized to more ethnically diverse populations, such as those in major Canadian cities. As well, the sample consisted of individuals who chose to participate in the study. It is possible that there was a participation bias and that the results may not be generalizable to the adolescent cancer survivors, siblings, and parents who chose not to participate.

In addition, posttraumatic growth, psychological well-being, and coping were assessed using single measures. Replication of the study with a larger, more diverse sample and using multiple measures of each construct could provide more information about the constructs and the relations between them. Caution must be taken when applying these findings to other populations.

Directions for Future Research

The similarities between adolescent cancer survivors and siblings with respect to psychological well-being levels, posttraumatic growth levels, and coping profiles could be considered evidence of a shared reaction to cancer in accordance with theories of family stress (e.g., McCubbin & Patterson, 1983). However, without a control group of adolescents unaffected by cancer, either personally or in their family, it would be imprudent to draw such a conclusion. It is possible that adolescents who survived cancer, who have a sibling cancer survivor, and have no cancer experiences would report similar levels of posttraumatic growth. Future research should compare adolescent cancer survivors and their siblings to healthy adolescents who experienced a trauma and their siblings in order to determine which aspects of their psychological functioning are attributable to the cancer experience, rather than to traumatic events, in general. Future research should also compare adolescent survivors of different cancers to better understand their diverse experiences.

Posttraumatic growth should be investigated in other samples of young cancer survivors, including those who relapsed and those who underwent organ transplants. Child cancer survivors and adolescent cancer survivors who may have cognitive delays should be studied to determine the minimum level of cognitive development necessary to experience posttraumatic growth.

Although the present study indicates that parents and siblings of adolescent cancer survivors experience posttraumatic growth, the predictors of posttraumatic growth are, at this time, still unclear. Referring to the Double ABCX Model of family behaviour (McCubbin, & Patterson, 1983), parents and siblings' family resources (factor bB) and

perceptions of the cancer experience, ongoing stressors, and their resources (factor cC) warrant additional examination. Referring to the Social-Cognitive Transition model of adjustment (Brennan, 2001), parents and siblings' social support and assumptions about themselves, the world, and others warrant examination. Associations between psychological functioning and marital status should also be investigated, given that there is some evidence (e.g., Bellizzi & Blank, 2006) to suggest that marital status is positively associated with several aspects of posttraumatic growth in breast cancer survivors. It is also possible that some of the variables included in the present study are relevant to fathers but not mothers. Thus, it is important to actively recruit both fathers and mothers in subsequent studies of psychological well-being and posttraumatic growth in families of adolescent cancer survivors. In addition, bereaved parents should be recruited in order to better understand their experiences and posttraumatic growth.

In conclusion, despite limitations, the present study examined the psychological functioning of not only adolescent cancer survivors, but also their family members. It investigated whether participants in the same family had similar levels of psychological functioning and addressed various demographic and cancer variables, as well as several aspects of psychological functioning.

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What type of cancer did you have? _____

What stage of cancer did you have? _____

What type of treatment did you receive when you had cancer? (e.g., chemotherapy, radiation, surgery, etc.)

How long did you receive cancer treatment for? _____

How difficult was the treatment for you? (please circle one number)

0 _____ 1 _____ 2 _____ 3 _____ 4 _____ 5
 Not Difficult At All Extremely Difficult

Do you have any physical difficulties as a result of your cancer treatment?

No Yes - please describe: _____

What do you think your chances are of remaining in remission from cancer for the next 10 years?

0 _____ 1 _____ 2 _____ 3 _____ 4 _____ 5
 Very Poor Very Good

Part II: The following questions are for you to answer about your parents

What is your mother's highest level of education (her highest grade level or diploma or degree)?

What is her occupation? _____

What is your father's highest level of education (his highest grade level or diploma or degree)?

What is his occupation? _____

Background Questionnaire for Siblings

Today's Date: _____

Part I: The following questions are for you to answer about yourself

Age: _____

Gender: Male Female

Which ethnic or cultural group do you most identify with?

- Aboriginal
- Afro-Caribbean
- Asian
- Indian
- European
- Hispanic
- North-American
- Other (please specify) _____

What is your religion (if any) ? _____

How religious or spiritual do you feel? (please circle one number)

0	1	2	3	4	5
Not Religious or Spiritual At All					Very Spiritual or Religious

Have you ever received counselling or psychotherapy from a professional?

- No Yes – for how long? _____

How old were you when your sibling was diagnosed with cancer? _____

Were you living in the same home as your brother or sister when he or she was going through cancer treatment? Yes No

If no, please explain: _____

Part II: The following questions are for you to answer about your brother or sister who had cancer.

How old was your sibling when he or she was diagnosed with cancer? _____

How old is he or she now? _____

What type of cancer did he or she have? _____

What stage of cancer did he or she have? _____

What type of treatment did he or she receive? (e.g., chemotherapy, radiation, surgery, etc.) _____

How long did he or she receive cancer treatment for? _____

How difficult was the treatment for him or her? (please circle one number)

0 _____ 1 _____ 2 _____ 3 _____ 4 _____ 5

Not Difficult At All

Extremely Difficult

Does your sibling have any physical difficulties as a result of his or her cancer treatment?

No Yes - please describe: _____

What do you think your sibling's chances are of remaining in remission from cancer for the next 10 years?

0 _____ 1 _____ 2 _____ 3 _____ 4 _____ 5

Very Poor

Very Good

Part III: The following questions are for you to answer about your parents

What is your mother's highest level of education (her highest grade level or diploma or degree)?

What is her occupation? _____

What is your father's highest level of education (his highest grade level or diploma or degree)?

What is his occupation? _____

Background Questionnaire for Parents

Today's Date: _____

Part I: The following questions are for you to answer about yourself

Age: _____

Gender: Male Female

Which ethnic or cultural group do you most identify with?

- Aboriginal
- Afro-Caribbean
- Asian
- Indian
- European
- Hispanic
- North-American
- Other (please specify) _____

Which religion do you most identify with (if any) ? _____

How strong are your religious or spiritual beliefs? (please circle one number)

0 _____ 1 _____ 2 _____ 3 _____ 4 _____ 5

Not Strong At All Very Strong

Have you ever received personal counselling or psychotherapy from a professional for personal problems or distress ? No Yes – for how long? _____

Please fill in the following chart:

	<u>Highest level of education</u> (highest grade or diploma or degree)	<u>Occupation</u>
You -	_____	_____
Your child's other parent -	_____	_____

Part II: The following questions are for you to answer about your child who had cancer

How old was your child when he or she was diagnosed with cancer? _____

How old is he or she now? _____

What type of cancer did he or she have? _____

What stage of cancer did she or he have? _____

What type of treatment did he or she receive? (e.g., chemotherapy, radiation, surgery, etc.) _____

How long did he or she receive cancer treatment for? _____

How difficult was the treatment for him or her? (please circle one number)

0 _____ 1 _____ 2 _____ 3 _____ 4 _____ 5
 Not Difficult At All Extremely Difficult

Does your child have any physical difficulties as a result of his or her cancer treatment?

No Yes - please describe: _____

What do you think your child's chances are of remaining in remission from cancer for the next 10 years?

0 _____ 1 _____ 2 _____ 3 _____ 4 _____ 5
 Very Poor Very Good

Appendix B

Information and Consent Documents

Study Cover Letter for the Family

This cover letter is being sent to your family from the oncology staff at Children's Hospital of Western Ontario. Some of your family members have their own packages included with this cover letter.

Each package includes:

- a letter that explains why we sent you the package and the study we are conducting
- some questionnaires
- a self-addressed, stamped envelope.

We invite you to read the letter in your package and then decide if you would like to participate in the study.

Other members of your family have also been invited to participate in the study. You can participate in the study even if nobody else in your family decides to participate. Some of the questions for different family members are similar; this is done just in case only one person in your family decides to participate.

Please make sure that your family members read this cover letter and get their package.

Thank you very much.

Information and Consent Form

TITLE OF THE STUDY: *Thoughts and Feelings After Cancer*

STUDY INVESTIGATORS:

Danielle Cataudella, Psy.D., C.Psych.

Cathy Maan, Ph.D., C.Psych.

Andrea Turner, M.A.

Psychology Department at the Children's Hospital of Western Ontario
(519) 685 - 8144

A. Elizabeth L. Cairney, MD, FRCP(C)

Lawrence Jardine, MD, FRCP(C)

Shayna Zelcer, MD, FRCP(C)

Pediatrics Department at the University of Western Ontario
(519) 685 - 8494

The results of the study will contribute to Andrea Turner's doctoral dissertation, which is being supervised by Rosanne Menna, Ph.D., C.Psych. from the University of Windsor (519-253-3000). Dr. Cataudella and Dr. Maan are also supervising her research. The research is partially sponsored by the Canadian Institutes of Health Research.

PURPOSE OF THE STUDY

We are inviting you to participate in a study that is looking at the thoughts and feelings of 13 to 20-year-olds who had cancer (solid tumour, leukemia, or lymphoma). We also want to learn about their parents and their 13 to 20-year old siblings. The purpose of this study is to learn about the ways that thoughts and feelings may change because of having cancer or having a child or sibling with cancer. We are inviting 90 families to be part of the study. In order to get a really good idea about thoughts and feelings related to cancer, we need information from about 40 adolescents who had cancer, 40 parents, and 40 siblings. The purpose of this letter is to give you information about the study so that you can choose if you want to participate in it.

PROCEDURE OF THIS STUDY

If you choose to participate in this study, we would ask you to complete the questionnaires that are in your package. It will take between 45 and 90 minutes to complete them. The background questionnaire asks about general information, such as your age and your gender. The other questionnaires ask about how you react to stress, difficulties you are having now or you had in the past, and changes in your thoughts or feelings since you / your brother or sister /

your child had cancer. If you choose to participate, we would ask you to send back the completed questionnaires in the self-addressed, stamped envelope in your package.

We would also get basic identifying information about your family and medical information related to you / your brother or sister's / your child's cancer diagnosis and treatment from your / his or her medical chart at the Children's Hospital of Western Ontario.

Please call the psychology department at the Children's Hospital of Western Ontario (519-685-8144) if you want to get a summary of the findings from this study. The summary will be available once the study has finished.

POTENTIAL RISKS AND DISCOMFORTS

There are no known harms associated with participating in this study. There is a chance that some people might feel a bit upset after answering questions about changes and difficulties they had. Just in case you feel upset, we have included a list of people (or ways to find people) in your area who provide psychological services. If you want further help, you can call the psychology department at the Children's Hospital of Western Ontario (519-685-8144).

POTENTIAL BENEFITS TO YOU AND TO SOCIETY

You will not directly benefit from being in this study. But by answering questions about positive changes you may have had, you may feel good about these changes. The results of this study may help science and society by increasing our understanding of how families react to cancer.

COMPENSATION

There is no financial payment for participating in this study. To thank you for your time, we will enter your name into one of three draws to win a \$50 gift certificate from a store that sells books, music, and movies. One cancer survivor, one sibling, and one parent will win.

CONFIDENTIALITY

Your personal information will be used only for this study. Your questionnaires will be kept in a locked cabinet in a secure office. They will be destroyed in 5 years (or sooner, if you request). Representatives of the University of Western Ontario Health Sciences Research Ethics Board may require access to your study-related records or may follow up with you to monitor the conduct of the study. If the results of the study are published, none of your personal information will be used. If you report things on the questionnaires that suggest that you are having serious difficulties, we will contact you to ensure that you know how to get help, if you need it.

PARTICIPATION AND WITHDRAWAL

Your participation in this study is voluntary. You may refuse to participate, refuse to answer any question, or withdraw from the study at any time with no effect on your or your family member's care at the Children's Hospital of Western Ontario or London Health Sciences Centre. Even if other family members decide to participate in the study, you do not have to do so. If you decide not to answer certain questions or to withdraw from the study, your name will still be entered into a draw to win one of the gift certificates. If you are already participating in another study at this time, please inform one of the investigators right away to determine whether it is appropriate for you to participate in this study also. If, during the course of this study, new information becomes available that may relate to your willingness to continue to participate, this information will be provided to you by the investigator.

YOUR RIGHTS AS A RESEARCH PARTICIPANT

You may withdraw your consent at any time and end your participation.

If you have any questions about your rights as a research participant or the conduct of the study you may contact:

Dr. Joe Gilbert
Chief Administrative Officer, Lawson Health Research Institute
(519) 667-6649

QUESTIONS ABOUT THE STUDY

If you have any questions or concerns about the research, please contact the psychology department at the Children's Hospital of Western Ontario (519-685-8144) and one of the study investigators will answer your questions.

CHOOSING TO PARTICIPATE

You show that you are choosing to participate in this study by completing and returning the questionnaires in your package. If you do not want to participate in the study, please return the blank questionnaires and we will not contact you further.

This letter is yours to keep for future reference.

Thank you for thinking about participating in this study.

Resource Information Sheet (London, Middlesex, and Oxford)

If you want to talk to someone right away:

Kid's Help Phone: 1-800-668-6868 or
<http://www.kidshelpphone.ca/en/home.asp>

-a 24-hour, free, confidential, and anonymous service for kids, teens, and young adults that provides information, counselling, and can refer you to someone else, if needed

Parent Help Line: 1-888-603-9100 or <http://www.parenthelpline.ca/>

-a 24-hour, free, confidential, and anonymous service for parents that provides information, counselling, and can refer you to someone else, if needed

If you want to learn about counsellors and other services in your community:

Health Services in London, Middlesex, and Oxford:
<http://www.info.london.on.ca/>

-lists physical health services, psychological services, and a variety of other services for children, youth, and adults in Southwestern Ontario

College of Psychologists Of Ontario: 1-800-489-8388 or cpo.on.ca

-use the 'Directory of Members' to search for a psychologist in your city
-NOTE: unless covered by insurance, you must pay for psychological services

If you want to talk to a psychologist who is part of this study and works at the Children's Hospital of Western Ontario:

Psychology Department of the Children's Hospital of Western Ontario:

- call the secretary at (519) 685-8144

Appendix C

Outliers

Winsorized Univariate Outliers

Univariate outliers were winsorized as follows: two high avoidant coping scores were lowered in the adolescent cancer survivors group, and one was lowered in the sibling group; two low acceptance coping scores were increased in the parent group; two low life satisfaction scores were increased in the adolescent cancer survivors group, and one was increased in each of the sibling and the parent groups; one high life stress score was lowered in the adolescent cancer survivors group; one low chance of remission entry was raised in each of the adolescent cancer survivors and sibling groups, and two were raised in the parents group; three reports of lengthy psychological intervention were decreased in the adolescent cancer survivors and parent groups, and one was decreased in the sibling group; and one low maternal education entry was raised in the adolescent cancer survivors group.

Removed Multivariate Outliers

In the adolescent cancer survivors group, there were several outliers pertaining to psychological well-being (one with acceptance coping, one with age at diagnosis, one with time since diagnosis, and one with time since treatment completion) and one pertaining to posttraumatic growth with chance of remission. There were also some outliers pertaining to coping (one for avoidant coping with time since diagnosis, one for acceptance coping with age, one for acceptance coping with age at diagnosis, two for emotion-focused coping with religious coping, and two for emotion-focused coping with parents' religious coping).

In the sibling group, there was one outlier pertaining to psychological well-being with length of psychological intervention and several pertaining to posttraumatic growth (one with time since diagnosis, one with since time since treatment completion, and one with treatment difficulty). There were also several outliers pertaining to active coping (one with sibling's age, one with sibling's age when their survivor sibling was diagnosed, and one with avoidant coping), avoidant coping (two with religious coping and one with treatment difficulty), religious coping (one with life stress, one with life satisfaction, and one with their survivor sibling's current age), and two pertaining to acceptance coping with their survivor sibling's current age.

In the parent group, there were several outliers pertaining to psychological well-being (one with avoidant coping, one with age, and two with their adolescent cancer survivors' use of active coping), one pertaining to active coping with life stress, several pertaining to social support and emotion-focused coping (two with length of psychological intervention and two with time from treatment completion), and one pertaining to avoidant coping with length of psychological intervention.

Appendix D

Comparisons between Adolescent Cancer Survivors who did and did not Report Physical Difficulties Following Treatment

Measure	Physical Difficulties			No Physical Difficulties			Comparison	
	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	(<i>df</i>)	<i>t</i> -value
BSI	56.83	15.00	6	44.83	12.36	23	(27)	2.03
PTGI	2.58	1.14	6	2.05	0.98	24	(28)	1.16
ACT COPE	2.21	0.41	6	2.27	0.61	24	(28)	-0.24
AVD COPE	1.54	0.36	6	1.29	0.27	24	(28)	1.90
EF COPE	2.16	0.58	6	2.09	0.82	24	(28)	0.19
ACP COPE	2.77	0.20	6	2.55	0.45	24	(28)	1.15
REL COPE	2.96	0.58	6	2.11	1.01	24	(28)	-1.96
STRS	0.12	0.14	6	0.14	0.13	23	(27)	0.41
LSAT	4.44	1.00	6	4.79	0.74	24	(28)	0.95

Note. BSI = GSI T-score; PTGI = average score per PTGI item; ACT COPE = average score per Active Coping factor item; AVT COPE = average score per Avoidant Coping factor item; EF COPE = average score per Emotion-Focused Coping factor item; ACP COPE = average score per Acceptance Coping factor item; REL COPE = average score per Religious Coping subscale item; STRS = life stress (average score per LEC item); LSAT = life satisfaction (average score per SLSS item).

Appendix E

*Analyses of Variance for Adolescent Cancer Survivors' Psychological Functioning
According to Highest Parental Level of Education*

Measure	Less than HS			HS			College or Univ.			Prof. or Grad.			Comparison	
	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	(<i>df</i>)	<i>F</i> -value
Maternal Highest Level of Education														
BSI				45.30	8.87	10	47.41	16.23	17				(1, 25)	0.14
PTGI				2.11	0.98	10	2.10	1.09	18				(1, 26)	0.00
ACT				2.08	0.55	10	2.39	0.59	18				(1, 26)	1.86
AVD				1.36	0.24	10	1.32	0.34	18				(1, 26)	0.11
EF				1.94	0.55	10	2.12	0.85	18				(1, 26)	0.37
ACP				2.53	0.42	10	2.63	0.45	18				(1, 26)	0.36
REL				2.43	0.98	10	2.07	0.95	18				(1, 26)	0.89
STRS				0.15	0.10	9	0.13	0.14	18				(1, 25)	0.69
LSAT				4.74	0.65	10	4.77	0.77	18				(1, 26)	0.13
Paternal Highest Level of Education														
BSI	35.67	9.71	3	51.00	9.91	9	47.17	17.16	12	39.00	-	1	(3, 21)	0.99
PTGI	2.42	1.18	3	2.23	0.94	10	2.10	1.19	12	1.33	-	1	(3, 22)	0.28
ACT	2.48	0.60	3	2.18	0.51	10	2.47	0.61	12	1.81	-	1	(3, 22)	0.81
AVD	1.25	0.25	3	1.44	0.23	10	1.33	0.38	12	1.25	-	1	(3, 22)	0.40
EF	2.08	0.63	3	2.03	0.57	10	2.28	0.90	12	1.38	-	1	(3, 22)	0.54
ACP	2.22	0.31	3	2.68	0.34	10	2.70	0.46	12	2.75	-	1	(3, 22)	1.26
REL	2.75	1.25	3	2.30	0.75	10	2.13	1.12	12	1.75	-	1	(3, 22)	0.41
STRS	0.10	0.09	3	0.13	0.11	9	0.16	0.15	12	0.00	-	1	(3, 21)	0.59
LSAT	4.98	0.52	3	4.65	0.70	10	4.72	0.85	12	4.57	-	1	(3, 22)	0.16

Note. HS = High School; Univ. = University; Prof. or Grad. = Professional or Graduate School; BSI = GSI T-score; PTGI = average score per PTGI item; ACT = average score per Active Coping factor item; AVT = average score per Avoidant Coping factor item; EF = average score per Emotion-Focused Coping factor item; ACP = average score per Acceptance Coping factor item; REL = average score per Religious Coping subscale item; STRS = life stress (average score per LEC item); LSAT = life satisfaction (average score per SLSS item).

Appendix F

Comparisons between Parents who did and did not Report Physical Difficulties for their Adolescent Cancer Survivors Following Treatment

Measure	Physical Difficulties			No Physical Difficulties			Comparison	
	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	(<i>df</i>)	<i>t</i> -value
BSI	55.86	13.93	7	53.05	11.52	22	(27)	0.54
PTGI	3.14	0.92	8	2.72	1.20	22	(28)	0.90
ACT COPE	2.61	0.40	8	2.88	0.57	22	(28)	-1.23
AVD COPE	1.57	0.28	8	1.54	0.25	22	(28)	0.33
SSEF COPE	2.69	0.55	8	2.58	0.52	22	(28)	0.54
ACP COPE	2.89	0.48	8	3.05	0.40	22	(28)	-0.92
REL COPE	2.62	0.96	8	2.65	1.05	22	(28)	-0.05
STRS	0.19	0.18	7	0.15	0.12	21	(26)	0.71
LSAT	4.95	1.41	8	5.34	1.06	22	(28)	-0.81

Note. BSI = GSI T-score; PTGI = average score per PTGI item; ACT COPE = average score per Active Coping factor item; AVT COPE = average score per Avoidant Coping factor item; SSEF COPE = average score per Social Support and Emotion-Focused Coping factor item; ACP COPE = average score per Acceptance Coping factor item; REL COPE = average score per Religious Coping subscale item; STRS = life stress (average score per SRRS item); LSAT = life satisfaction (average score per SWLS item).

Appendix G

Analyses of Variance for Parents' Psychological Functioning According to their Highest Level of Education

Measure	Less than HS			HS			College or Univ.			Comparison	
	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	(<i>df</i>)	<i>F</i> -value
Highest Level of Education											
BSI	53.67	13.65	3	52.50	13.20	8	54.28	11.84	18	(2, 26)	0.57
PTGI	2.40	1.19	3	2.22	1.36	8	3.15	0.94	19	(2, 27)	2.36
ACT	3.10	0.72	3	2.75	0.45	8	2.79	0.56	19	(2, 27)	0.46
AVD	1.53	0.55	3	1.42	0.14	8	1.61	0.22	19	(2, 27)	0.20
SSEF	2.69	0.76	3	2.29	0.50	8	2.73	0.47	19	(2, 27)	0.13
ACP	3.17	0.17	3	2.97	0.50	8	3.00	0.42	19	(2, 27)	0.79
REL	3.50	0.87	3	2.56	1.06	8	2.54	1.00	19	(2, 27)	0.31
STRS	0.09	0.09	3	0.19	0.14	7	0.16	0.14	18	(2, 25)	0.57
LSAT	5.53	1.30	3	5.15	1.22	8	5.22	1.16	19	(2, 27)	0.89

Note. HS = High School; Univ. = University; BSI = GSI T-score; PTGI = average score per PTGI item; ACT = average score per Active Coping factor item; AVT = average score per Avoidant Coping factor item; SSEF = average score per Social Support and Emotion-Focused Coping factor item; ACP = average score per Acceptance Coping factor item; REL = average score per Religious Coping subscale item; STRS = life stress (average score per SRRS item); LSAT = life satisfaction (average score per SWLS item).

VITA AUCTORIS

Andrea Turner-Sack was born in 1976 in Toronto, Ontario. After graduating from Earl Haig Secondary School in 1995, she began her university education. She earned her Honours Bachelor of Science degree in psychology at the University of Toronto in 1999. She then earned her Master of Arts degree in clinical psychology at the University of Windsor in 2001. She is currently completing her Doctor of Philosophy degree at the same institution, specializing in child and adolescent clinical psychology.