ABSTRACT

Posttraumatic growth, or positive psychological change experienced as a result of struggling with highly challenging life circumstances, has not been thoroughly examined in young adult survivors of serious and/or chronic childhood illnesses. The present study aimed to examine posttraumatic growth in young adult survivors by identifying specific disease factors, distress variables, and family and individual coping factors associated with and predictive of posttraumatic growth. Individuals who identified their current illness status as “recovered” reported greater growth than those who currently experience illness symptoms. Hierarchical regression analyses were used to examine a model of posttraumatic growth, with the order of entry of variables determined by Wallander and Varni’s (1992) disability-stress-coping model. The final model, which included perceived disruptiveness, perceived pain, current illness status, posttraumatic stress symptoms, and healthy family functioning, accounted for 53% of the variance in posttraumatic growth. Research and clinical implications are discussed.
INDEX WORDS: Posttraumatic growth; Posttraumatic stress; Perceived benefits; Chronic Illness; Family functioning; Coping with illness
POSTTRAUMATIC GROWTH IN COLLEGE STUDENTS WHO HAD A SERIOUS
AND/OR CHRONIC CHILDHOOD ILLNESS

by

KATIE ANN DEVINE

B.S., Cornell University, 2003

A Thesis Submitted to the Graduate Faculty of The University of Georgia in Partial Fulfillment
of the Requirements for the Degree

MASTER OF SCIENCE

ATHENS, GEORGIA

2006
POSTTRAUMATIC GROWTH IN COLLEGE STUDENTS WHO HAD A SERIOUS
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May 2006
ACKNOWLEDGEMENTS

I would like to thank Ron Blount for providing me with countless hours of guidance and support, and for sharing his enthusiasm for research with me over the past few years. Ron is an exceptional role model in his passion for meaningful research and his dedication to the field of pediatric psychology. I have learned a tremendous amount from him. I would also like to thank Jon Campbell and Lenny Martin for their time and insightful suggestions as part of my thesis committee. I want to recognize Patrick Gauld, Ashley Beatty, and Megan McCay for their efforts in collecting and entering the data analyzed in this thesis. I am also appreciative of the feedback and encouragement provided by the pediatric psychology laboratory team. Finally, I would like to extend my gratitude to my parents, partner, family, and friends for their incredible caring and support.
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CHAPTER 1
INTRODUCTION

Background and Significance

Due to significant advances in medical technology, the population of children surviving serious medical diseases has greatly increased. Approximately 10-20% of children have a chronic physical condition, with 1-2% of all children suffering from severe conditions (Wallander, Thompson & Alriksson-Schmidt, 2003). That is, 1-2 out of every 100 children have a severe chronic condition, totaling to more than 1 million children in the United States that are affected. As the number of survivors increases, interest in the psychosocial functioning and quality of life of survivors of illnesses and children living with chronic physical conditions has also increased. Despite heightened interest and expansion of research in this area, much remains to be known about the long-term impact of having a serious and/or chronic childhood illness.

A chronic physical condition has been defined as a condition that (1) interferes with daily functioning for more than 3 months a year; or (2) causes hospitalization that lasts more than 1 month a year; or (3) is thought at the time of diagnosis to be likely to do either of the preceding (Pless & Pinkerton, 1975). Chronic physical conditions may exist at birth or may develop at any age. The symptoms of many chronic physical conditions can be managed, but these conditions usually cannot be cured. Examples of chronic physical conditions include sickle cell disease, diabetes, asthma, cerebral palsy, congenital heart disease, cystic fibrosis, hemophilia, leukemia, and spina bifida.
In addition to these diseases, many children suffer from serious conditions that may not meet the criteria for a chronic physical condition, such as certain types of cancer and burns. Objectively, a serious condition can be defined as one that is life-threatening, interferes with daily functioning, or causes hospitalization or neurological impairment. For the purposes of this article, the definitions of serious and chronic conditions will be combined and the terms serious and chronic will be used interchangeably. However, it is important to note that Kazak, Rourke, and Crump (2003) suggested that the subjective experience of severity of an illness (i.e., the ill person’s perception of how severe the disease is) may be more important for adjusting to the illness than the objective severity of an illness.

Although a great number of children are affected by serious illnesses, much remains to be known about the long-term impact of such conditions. A great deal of research has emerged regarding the psychosocial adjustment (i.e., behavioral and emotional functioning) and quality of life (i.e., well-being) of affected children. However, the literature concerning children’s increased risk for adjustment problems (i.e., behavioral and/or emotional problems) is inconclusive. There does not seem to be a direct relationship between serious physical conditions and psychosocial adjustment; instead, there is broad individual variability in response to a serious physical condition (Wallander et al., 2003). Although major psychiatric problems are not common among children with chronic physical conditions, evidence suggests that this population is at an increased risk for behavioral and emotional problems (Wallander et al., 2003). One study that randomly sampled 1,189 families found that children and adolescents with chronic physical conditions were at 2-3 times greater risk for psychiatric disorders than healthy children (Cadman, Boyle, Szatmari, & Oxford, 1987). A meta-analysis showed that children with chronic physical conditions on average had more adjustment problems than comparison groups, and were at
approximately two times greater risk for adjustment problems (Lavigne & Faier-Routman, 1992). Although the prevalence of problems was greater in children with physical conditions, only a minority of those children appeared clinically maladjusted.

The present study aims to add to the current literature by examining the long-term impact of a serious childhood illness in college students. Although many studies have focused on the negative aspects of having a serious illness, this study uniquely aims to assess the perceived benefits of surviving a childhood illness, or posttraumatic growth due to the illness. These data aim to provide information about factors associated with greater perceived benefits.

Theoretical Basis and Empirical Findings

Although the purpose of this study is to examine the long-term impact of illness, it is likely that coping at the time of treatment affects long-term coping with an illness. Therefore, a brief review of factors that influence coping and adaptation at the time of illness is presented.

*Model of psychosocial adjustment to a chronic condition.* Many different variables have been proposed to influence adjustment to a chronic condition. To make sense of the variety of potentially influential factors, some integrative models of psychosocial adjustment have been proposed. One of these models, Wallander and Varni’s disability-stress-coping model (Wallander & Varni, 1992), has been developed from an understanding of general adjustment and disease processes, and organizes the factors into a risk-and-resilience framework. According to the model, adjustment is influenced by disease condition parameters (i.e., diagnosis, visibility of condition, CNS involvement, and severity), functional independence of the child, psychosocial stress (i.e., disability-related problems, major life events, and daily hassles), stress processing (i.e., cognitive appraisal of stress, coping strategies), intrapersonal factors (i.e., temperament, competencies, and problem-solving skills), and social-ecological factors (i.e.,
family environment, social support, parental adjustment, and utilitarian resources). The model also suggests that resilience factors, such as high social support, moderate the impact of risk factors on the development of disability-related problems.

Wallander and Varni’s (1992) model reflects the complexity of factors hypothesized to influence adjustment to chronic physical conditions. Due to this complexity, only portions of the models have been tested at any given time. In a review of this literature, Wallander, Thompson and Alriksson-Schmidt (2003) organized these factors into three broad categories: condition parameters, child parameters, and social-ecological parameters.

**Condition parameters.** Condition parameters include condition (disease) type, severity, functional independence, and duration of condition. In Lavigne and Faier-Routman’s (1992) meta-analysis, a significant relationship was found between condition parameters and adjustment. However, it has been suggested that psychosocial factors, such as intrapersonal, stress-processing, and social-ecological factors, may be stronger predictors of adjustment than condition parameters (Burlew, Telfair, Colangelo, & Wright, 2000; Lavigne & Faier-Routman, 1992). Condition type has not consistently shown differences among groups, with the exception that conditions involving the brain have more behavior problems and poorer social functioning (Wallander et al., 2003). Greater severity of the condition has been associated with poorer outcomes in some studies (e.g., Perrin, MacLean, & Perrin, 1989), but not in others (e.g., Hurtig, Koepke, & Park, 1989). Functional status has been found to be correlated to adjustment (Wallander et al., 2003). Duration has not been well-studied, most likely due to a lack of longitudinal studies to directly address the influence of duration. One study of children with juvenile rheumatoid arthritis found that longer disease duration was related to more adjustment problems (Daniels, Moos, Billings, & Miller, 1987).
Child parameters. Although condition parameters are significantly correlated with adjustment, child parameters seem to be better predictors of adjustment (Burlew et al., 2000; Lavigne & Faier-Routman, 1992). Child parameters include gender, age at the time of the study, age of onset of condition, temperament, coping methods, and cognitive processes. No effects have been found for gender or age at the time of study, and the findings regarding age of onset have been mixed (Wallander et al., 2003). For example, in one study, boys who developed diabetes after age four (late-onset) reported more behavior problems than boys with early-onset and girls with early- and late-onset, but there were no differences in self-esteem among the groups (Rovet, Ehrlick, & Hopped, 1987). In another study, however, girls with early-onset reported poorer self-concept than boys with early-onset (Ryan & Morrow, 1986).

Few studies have examined the relationship between temperament and adjustment, but a consistent link between difficult temperament and poorer adjustment has been found (e.g., Gartstein, Noll, & Vannatta, 2000). The relation between adjustment and child coping methods has also been examined. Avoidance coping has been found to be associated with psychosocial problems (Frank, Blount, & Brown, 1997), while active and support coping have been found to moderate the negative relationship between hope and anxiety in children with sickle cell disease (Lewis & Kliewer, 1996). Significant relationships between several cognitive processes and adjustment have been found. Several studies have found perceived stress to be associated with adjustment problems (Wallander et al., 2003). Cognitive processes seem to be important, as the child’s perception of physical appearance and stigma has been associated with self-esteem, self-worth, depressive symptoms, and anxiety (Wallander et al., 2003).

Social-ecological parameters. In addition to child parameters, social-ecological parameters, including family functioning, parental stress and adjustment, and peer relationships,
are an important influence on child psychosocial adjustment. There has been strong and consistent support for the importance of family functioning to adjustment. Family functioning encompasses a range of variables, including family cohesion, expressiveness, organization, independence, conflict, and control. Wallander, Varni, Babani, Banis, and Wilcox (1988) used a multidimensional measure of family psychological resources and found that psychological resources were more strongly associated with behavioral and social adjustment than utilitarian family resources. Other researchers have studied particular dimensions of family functioning. For example, family cohesion was positively correlated with adjustment (Lavigne, Nolan, & McLone, 1988). Family conflict has consistently been shown to be associated with adjustment problems (Manne & Miller, 1998; Thompson et al., 1999).

In addition to the impact of family, the impact of peers on child adjustment has also been considered. Peers have been recognized as important sources of emotional support for children (La Greca & Thompson, 1998), but reports on the quality of peer relationships of children with chronic conditions have varied results. The association between peer social support and adjustment has not been well-studied, but one investigation found that children with high levels of social support from both family and peers showed significantly better adjustment than children with social support from either family or peers (Wallander & Varni, 1989). These results suggest that social support is important when measuring psychological outcomes for individuals with illness.

Overall, the use of Wallander and Varni’s disability-distress-coping model has led to great advances in research concerning correlates of adjustment in children with chronic illness. However, the long-term impact of chronic conditions needs to be more thoroughly examined.
What happens after treatment? Late Effects of Illness

The types of late effects can be characterized as physical, cognitive and neuropsychological, and psychological (including individual and family functioning). The most developed area of survivorship of childhood illness is the body of literature focusing on survivors of pediatric cancer. Therefore, this review will concentrate on studies conducted with pediatric cancer survivors and their families.

**Physical late effects.** The physical late effects of cancer have been well-documented, but continue to change as treatment continues to advance. There is a risk of relapse or recurrence of the primary cancer. Additionally, survivors appear to be at an increased risk for second cancers, with that risk being documented at up to six times the risk of the general population (Hawkins, Draper, & Kingston, 1987). Other late effects include abnormal growth and endocrine function, physical disfigurement, functional limitations, fertility problems or infertility, cardiac dysfunction, hearing loss, vision problems, and dental problems (Eiser, 1998; National Cancer Policy Board, 2003). Physical limitations are likely to impact psychological functioning. Indeed, Greenberg, Kazak, and Meadows (1989) found that more severe late effects were associated with psychological problems. Further, late effects that interfere with daily activities have been negatively related to self-image and life outlook (Zebrack & Chesler, 2001).

**Cognitive and neuropsychological late effects.** Cognitive late effects, such as learning disabilities, reduced IQ, and memory deficits, may be directly or indirectly related to the specific type of treatment received (Eiser, 1998). That is, cognitive difficulties may be due to effects of medication or radiation, or to increased absence from school due to treatment, or to lower expectations for academic performance due to significance of disease (Eiser, 1998; National Cancer Policy Board, 2003). Children who are treated for cancers of the central nervous system,
such as leukemia or brain tumors, are at risk for neurocognitive damage and cognitive impairment (National Cancer Policy Board, 2003). It has been noted that younger children are more vulnerable to such risks, especially those who receive intense or prolonged treatment (Meadows, Gallagher, & Bunin, 1992; National Cancer Policy Board, 2003). Attentional deficits have also been documented (Peckham, Meadows, Bartel, & Marrero, 1988).

**Psychological late effects.** Review of the literature indicates that overall, survivors of pediatric cancer do not experience significant difficulties with adjustment relative to their healthy peers or general population norms (Eiser, 1998; Kazak, 1994; Kupst et al., 1995; Patenaude & Kupst, 2005). A review by Eiser, Hill, and Vance (2000) found that survivors do not show deficits on standardized measures of depression, anxiety, or self-esteem. It has consistently been demonstrated that survivors do not experience impaired quality of life, well-being, or behavioral maladjustment compared to norms (Barakat et al., 1997; Eiser et al., 2000; Kazak & Meadows, 1989; Noll et al., 1997). A recent commentary on the literature by Phipps (2005) called for researchers to start examining the mechanisms that lead to positive outcomes since the positive outcomes appear to be the rule rather than the exception.

Although most studies find that survivors do not differ in terms of overall adjustment, several studies indicate that survivors do show some adjustment problems and cancer-related concerns (e.g., Eiser et al., 1997; Fritz & Williams, 1988; O’Malley, Koocher, Foster, & Slavin, 1980). Some of the concerns expressed by survivors include fear of recurrence, worries about health, problems with late effects, restriction of work opportunities, and difficulties establishing social and emotional relationships (Eiser et al., 1997; Fritz & Williams, 1988; Gray et al., 1992; Greenberg & Meadows, 1991; Zebrack & Chesler, 2001). There is some evidence that survivors have more difficulty relating to their peers. Pendley, Dahlquist, and Dreyer (1997) found that
survivors reported engaging in half as many social activities as healthy controls, and reported
more feelings of social anxiety and isolation. Further, it has been noted that survivors often
worry about their cancer status and other cancer-specific thoughts that their healthy peers are less
likely to consider (Zebrack & Chesler, 2001). This may make forming and sustaining peer
relationships more challenging.

Family functioning. Family functioning appears to change over the course of the illness
and treatment, and the influence of family functioning on individual members’ adjustment seems
to depend on the demands of the stage of illness/treatment (Barakat & Kazak, 1999). For
example, a stronger association was found between family cohesion, adaptability, and adjustment
in survivors who recently went off treatment and those who were long-term survivors (greater
than 5 years) relative to survivors in-between those times (Rait et al., 1992). The authors
suggested that families in the middle time period may disengage in attempt to regain “normalcy”
(Rait et al., 1992). Individual family members’ coping are likely to be influenced by each other.
For example, a study of long-term leukemia survivors and their mothers indicated that families
perceived themselves to be coping well ten years after treatment ended (Kupst et al., 1995).
Further, the coping and adjustment of the mother was the strongest predictor of the adolescent
survivor’s coping and adjustment, suggesting the transactional nature of family coping.
Uncertainty and loneliness, as well as posttraumatic stress symptoms, have also been reported in
parents of childhood cancer survivors, demonstrating family-wide effects of the illness (Barakat
et al., 1997; Kazak et al., 1997; Kazak et al., 2004; Van Dongen-Melman et al., 1995).

Posttraumatic stress. Several researchers have conceptualized the long-term
psychological effects of surviving childhood cancer using a posttraumatic stress model (e.g.,
Stuber, Kazak, Meeske, & Barakat, 1998). Being diagnosed with a life-threatening illness is
viewed as a traumatic event (and is cited as one in the Diagnostic and Statistical Manual of Mental Disorders – Fourth Edition Text Revised, American Psychiatric Association, 2000). Posttraumatic stress symptoms include re-experiencing of the traumatic event, persistent avoidance of stimuli associated with the trauma, numbing of general responsiveness, and increased arousal (American Psychiatric Association, 2000).

Results of studies examining posttraumatic stress symptoms in survivors have been inconsistent, with some showing elevated rates of symptoms and others not. For example, several studies have found the incidence of posttraumatic stress disorder (PTSD) in survivors to be similar to that in the general population, with approximately 5-12% of survivors meeting DSM-IV criteria for PTSD (Butler, Rizzi, & Handwerger, 1996; Ericskon & Steiner, 2001; Kazak et al., 2004; Stuber et al., 1997). However, other studies have found that a significant number of survivors meet criteria for at least one of the symptoms of PTSD (Kazak et al., 2001). Kazak and colleagues (2001) found that 50% of survivors in one study met criteria for re-experiencing symptoms, and 29% met criteria for symptoms of arousal. Erickson and Steiner (2001) found that 10% of participants met full PTSD criteria and 78% met partial PTSD criteria, with at least one symptom of re-experiencing, avoidance, or increased arousal. Additionally, higher rates of PTSD have been found in young adult survivors relative to other age groups of survivors (Hobbie et al., 2000). In a study of 78 young adult survivors of childhood cancer, 20.5% met DSM criteria for PTSD at some point since the end of their treatment, with clinically significant intrusive and avoidant symptoms (Hobbie et al., 2000). Posttraumatic stress symptoms have been found to be related to subjective rating of life threat and treatment intensity, as well as anxiety (Stuber et al., 1997).
**Positive outcomes.** Although much of the focus has been on negative sequelae of childhood cancer, several studies have noted positive outcomes. For example, Elkin, Phipps, Mulhern, and Fairclough (1997) found that survivors reported significantly greater psychological health than norms of the general population. In a study of 62 survivors, 60% reported a physical disability or deformity and 25% reported vision problems, yet the majority of survivors indicated that cancer had a positive effect on their life (Gray et al., 1992). Eiser and colleagues identified a group of survivors who chose to pursue “helping” careers due to their cancer experiences (Eiser et al., 1997). Wasserman, Thompson, Wilimas, and Fairclough (1987) found that many survivors viewed having cancer as a benefit. In a study of 118 cancer survivors, 47 commented positively on their experience with cancer, while 71 commented negatively (Greenberg & Meadows, 1991). This suggests that many survivors feel that there are some positives that come as a result of surviving cancer.

**Posttraumatic growth.** The concept of perceiving positive outcomes from a negative event has been studied in multiple areas, such as natural disasters, assaults, illnesses, and bereavement. Posttraumatic growth has been defined as positive psychological change experienced as a result of the struggle with highly challenging life circumstances or traumatic events (Calhoun & Tedeschi, 1999). This concept has also been referred to as stress-related growth (Park, Cohen, & Murch, 1996). Posttraumatic growth is considered to be both a process and an outcome (Tedeschi & Calhoun, 2004).

Although young adult survivors of childhood cancer have reported positive changes as a result of their experiences with cancer (e.g., Gray et al., 1992), posttraumatic growth has not been empirically studied in this population. One study of posttraumatic growth in parents of children with leukemia used posttraumatic growth as a variable in predicting anxiety and
posttraumatic stress (Best, Streisand, Catania, & Kazak, 2001). This study found that higher posttraumatic growth scores, as measured by the Posttraumatic Growth Inventory (Tedeschi & Calhoun, 1996), predicted higher anxiety and avoidance. The authors suggested that people who are more anxious may seek meaning for their experience, but without any subsequent decrease in anxiety. However, the presence of anxiety and avoidance behaviors, indicative of some distress, does not preclude positive outcomes. In fact, Horowitz (1991) suggests that the presence of posttraumatic stress symptoms may reflect a person’s attempts to make meaning out of their experience. Similarly, the concept of posttraumatic growth necessitates the experience of some sort of trauma that is distressing, and the distress can be seen as initiating or sustaining cognitive processes that produce growth (Tedeschi & Calhoun, 2004). Consistent with this idea, several studies report a positive relationship between posttraumatic stress symptoms and posttraumatic growth (e.g., Best et al., 2001; Park et al., 1996).

For the most part, studies of posttraumatic growth following a serious illness have been conducted with adult survivors of illness (e.g., Cordova, Cunningham, Carlson, & Andrykowski, 2001; Evers et al., 2001). A study examining posttraumatic growth in adults with a history of heart disease revealed that posttraumatic growth is associated with several personality and coping variables (Sheikh, 2004). Specifically, extraversion was the most significant predictor of posttraumatic growth, with problem-focused coping partially mediating the relationship between those two variables. Studies examining the impact of length of time since event on growth have been mixed, with some reporting greater growth (e.g., Cordova et al., 2001; Evers et al., 2001), and others not (e.g., Fromm, Andrykowski, & Hunt, 1996; Milam, Ritt-Olson, & Unger, 2004).

Several studies examining the correlates of posttraumatic growth found that women tend to report greater growth than men (e.g., Park et al., 1996; Tedeschi & Calhoun, 1996). However,
other studies have not demonstrated this effect (e.g., Milam et al., 2004; Polatinsky & Esprey, 2000), suggesting that this variable needs to be further examined.

The role of individual coping strategies in relation to growth has been examined in a few studies. Some studies have found that the use of problem-solving as a coping strategy is related to greater posttraumatic growth (Sheikh, 2004; Widows, Jacobsen, Booth-Jones, & Fields, 2005). Additionally, the coping strategy of using positive reappraisal was significantly related to growth in college students (Widows et al., 2005).

Posttraumatic growth appears to be an important variable to consider, as some studies have found perceived benefits of an illness to be associated with lower distress and greater psychological health (Affleck, Tennen, Croog, & Levine, 1987; Carver & Antoni, 2004; Evers et al., 2001). A study of survivors of ovarian cancer found that spiritual well-being was positively associated with personal growth and mental health, suggesting that growth may promote well-being (Wenzel et al., 2002). Other studies have examined the potential relationship between posttraumatic growth and measures of psychopathology, such as depression, but no significant relationship has been found (Cordova et al., 2001; Milam et al., 2004).

Based on the literature presented above and other relevant literature, Tedeschi and Calhoun (2004) proposed a theoretical model of posttraumatic growth that includes individual characteristics and cognitive processes. Inherent in the model are challenges to an individual’s current beliefs and goals, as well as deliberate attempts to change in response to distress. This model broadly incorporates characteristics of the trauma and individual characteristics, with the focus being on the management of distress associated with the trauma, schema change, self-disclosure in supportive environments, and social support. The structure of the model was based on integration of results of a variety of studies in this area, and the model remains to be
empirically evaluated. This model of posttraumatic growth serves as a guide for researchers in identifying important areas to consider when investigating posttraumatic growth.

Present Study

The present study aimed to assess positive outcomes associated with having a serious childhood condition rather than solely focusing on negative outcomes. Specifically, posttraumatic growth due to a serious childhood illness was measured. To examine posttraumatic growth following a serious childhood illness, specific disease factors, individual variables, and family variables were identified based on Wallander and Varni’s (1992) disability-stress-coping model of adjustment to illness. The present study aimed to determine which disease, psychological distress, family, and individual coping factors were associated with and predictive of posttraumatic growth. Specific hypotheses include: (1) Perceived severity, perceived disruptiveness, and perceived pain during illness were expected to be associated with greater posttraumatic growth; (2) Participants who reported having recovered from their illness were expected to report greater posttraumatic growth than those who continued to have symptoms of their illness; (3) Posttraumatic stress symptoms were expected to be positively associated with posttraumatic growth, but depression and anxiety were expected to be unrelated to growth; (4) Total family functioning, balanced cohesion, balanced flexibility, and communication were expected to be related to greater posttraumatic growth; (5) Specific ways of coping (i.e., planful problem-solving and positive reappraisal) were expected to be positively associated with posttraumatic growth; and (6) Based on Wallander and Varni’s (1992) disability-stress coping model, the combination of disease factors (i.e., perceived severity, perceived disruptiveness, and perceived pain), current illness status (i.e., recovered vs. current symptoms), current distress (i.e., posttraumatic stress symptoms), family factors (i.e., total healthy functioning and
communication), and individual coping strategies (i.e., planful problem-solving and positive reappraisal) were expected to be predictive of posttraumatic growth when using hierarchical regression analyses.
CHAPTER 2

METHOD

Participants

Participants were recruited through the university research pool and flyers. Participants completed a brief screening questionnaire asking them to identify if they had been diagnosed with a serious and/or chronic medical illness during their childhood. The type of illness was not specified, but the participant had to report recollection of the impact of the illness (assessed via self-report of recollection and symptom onset or on-going effects of the illness after the age of six) to be included in the study. Sixty-two men and women expressed interest in the study, and two were excluded due to insufficient memory of the illness (n = 1) and medical problems as a result of car accident rather than illness (n = 1). Sixty participants (61.7% female) were included in the study. A range of medical diagnoses were reported, including asthma, epilepsy, diabetes, cancer, brain tumor, inflammatory infection, and gastrointestinal disorders. Mean age at diagnosis was reported to be 9.01 years ($SD = 4.85$). The average current age was reported to be 20.20 years ($SD = 2.55$). Participants reported an average cumulative GPA of 3.31 ($SD = .45$). The majority of participants identified as White (88%) and upper class (based on parents’ income level). See Table 1 for participant characteristics. Participants were compensated for their time with research credit if recruited from the research pool.

Measures

Information Sheet. Demographic information and information about disease factors were gathered using a questionnaire developed for this study. Respondents were asked to indicate their
Table 1  
*Characteristics of Participants*  

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*Note.* N = 60
date of birth, sex, college level, cumulative GPA, major, race, marital status, parents’ marital status, and parents’ income. Additionally, participants were asked to respond to a number of questions about their diagnosis and treatment, including likert-scale ratings for perceived severity and disruptiveness of illness.

*Posttraumatic Growth Inventory* (PTGI; Tedeschi & Calhoun, 1996). This 21-item scale assesses positive outcomes of traumatic experiences. Respondents were asked to indicate the degree to which a specified change has occurred as a result of their serious childhood illness on a six-point likert scale ranging from 0 (“I did not experience this change”) to 5 (“I experienced this change to a very great degree”). In the validation of this measure, factor analysis revealed five factors: New Possibilities, Relating to Others, Personal Strength, Spiritual Change, and Appreciation of Life. Internal consistency was .90 for the full scale, .84 for New Possibilities, .85 for Relating to Others, .72 for Personal Strength, .85 for Spiritual Change, and .67 for Appreciation of Life. Test-retest reliability was reported to be .71 for the full scale and ranged from .65 to .74 for the factors except for Personal Strength (.37) and Appreciation of Life (.47). Validity was tested via correlations with measures of theoretically-related constructs, such as social desirability, personality variables, and situational variables. PTGI scores were not related to social desirability, but there were many relationships between the PTGI and personality. As expected, the PTGI was positively correlated with optimism, religiosity, extraversion, openness, agreeableness, and conscientiousness, but not neuroticism. Additionally, PTGI scores were able to discriminate between responders who had experienced a traumatic event versus those who had not, as those with a history of a traumatic event scored higher on all factors except Spiritual Change. One notable finding was the tendency for women to score higher than men (Tedeschi & Calhoun, 1996).
Impact of Event Scale – Revised (IES-R; Weiss & Marmar, 1997). This 22-item self-report measure assesses symptoms of posttraumatic stress due to a specific life event (i.e., participants’ serious childhood illness). Respondents rated each item on a scale of 0 (“not at all”) to 4 (“extremely”) based on the past seven days. There are three subscales, including Intrusion, Avoidance, and Hyperarousal. Reliability of the three subscales has been found to be high, with alphas ranging from .87 to .92 for Intrusion, .84 to .86 for Avoidance, and .79 to .90 for Hyperarousal (Weiss & Marmar, 1997). Test-retest reliability has been more variable, with correlation coefficients ranging from .57 to .94 for Intrusion, .51 to .89 for Avoidance, and .59 to .92 for Hyperarousal. Good construct validity was demonstrated using the comparison between item-to-subscale correlations and cross-subscale correlations. Nineteen items showed a correlation with their assigned subscale that was greater than with the other subscales, two items showed equal correlations, and one item showed a slightly higher correlation with a different subscale (Weiss & Marmar, 1997).

Ways of Coping Questionnaire (WAYS; Folkman & Lazarus, 1980). This 66-item self-report measure assesses thoughts and actions that individuals use to cope with a specific stressful encounter. Respondents were asked to indicate on a scale of 0 (“does not apply or not used”) to 3 (“used quite a bit”) the extent to which they used a strategy during a self-identified stressful situation that they encountered in the past week. Principal factor analysis resulted in the WAYS being divided into eight factors: Confrontative Coping, Distancing, Self-Controlling, Seeking Social Support, Accepting Responsibility, Escape-Avoidance, Planful Problem Solving, and Positive Reappraisal. The two subscales of interest in this study were Planful Problem Solving, which pertains to deliberate problem-focused and analytical approaches to the problem, and Positive Reappraisal, which refers to efforts to create a positive meaning. The subscales
demonstrate good internal consistency, ranging from .61 to .79 (Folkman & Lazarus, 1980). Validity evidence is based on the results of studies being consistent with the theoretical predictions that coping consists of both problem-focused and emotion-focused strategies, and that coping is a process that changes in relation to the demands and constraints of a stressful encounter.

*Flexibility and Cohesion Evaluation Scales – Fourth Edition* (FACES-IV; Gorall, Tiesel, & Olson, 2004). This 42-item self-report measure assesses family functioning according to the Circumplex Model of Marital and Family Systems. The two primary dimensions measured are cohesion (“emotional bonding” among family members) and flexibility (“the amount of change in family leadership, role relationships, and relationship rules;” p. 5). The Circumplex Model proposes that cohesion and flexibility each have a curvilinear relationship with family functioning, with moderate levels of cohesion and flexibility being associated with healthy family functioning and very high and very low levels of cohesion and flexibility being associated with problematic family functioning. In order to capture this curvilinear relationship, the FACES-IV produces six subscales: two balanced scales of cohesion (“balanced cohesion”) and flexibility (“balanced flexibility”), which are associated with healthy family functioning, and four unbalanced scales of cohesion (“disengaged” – very low cohesion; “enmeshed” – very high cohesion) and flexibility (“rigid” – very low flexibility; “chaotic” – very high flexibility), which are associated with problematic family functioning. The FACES-IV also yields summary scores, which represent the level of functional versus dysfunctional behavior. Three summaries scores are obtained: one for the domain of cohesion; one for the domain of flexibility; and one for total healthy family functioning.
The FACES-IV also provides a communication scale, which is derived from an additional 10 items. Respondents were asked to indicate how specific items described their family on a Likert scale ranging from 1 (“does not describe our family at all”) to 5 (“very well describes our family”). The FACES-IV has demonstrated good reliability and validity using the Self-Report Family Inventory, Family Assessment Device, and Family Satisfaction Scale. Internal consistencies for the six 7-item scales were reported to be good, with Cronback alpha ranging from .77 to .89 for each scale. Test-retest correlations were not reported. Discriminate analysis demonstrated poor predictive validity for the enmeshed and rigid scales, performing at chance. Despite this limitation, the FACES-IV demonstrates many strengths. In particular, the total healthy family functioning, balanced cohesion, and balanced flexibility ratio scores provide comprehensive measures of family functioning.

*State-Trait Anxiety Inventory* (STAI Form Y; Spielberger, 1983). This self-report inventory is comprised of two sets of 20-items designed to measure symptoms of state and trait anxiety, including feelings of apprehension, tension, and worry. The items for the State subscale require endorsement regarding the intensity of the feeling at the moment on a four-point Likert scale (i.e., (1) “not at all” to (4) “very much so.” The items for the Trait subscale require endorsement regarding the frequency of anxiety feelings in general on a four-point Likert scale, ranging from (1) “almost never” to (4) “almost always.” Internal-consistency reliabilities for the two subscales were above .90 on the standardization samples (Spielberger, 1983). Test-retest reliability coefficients ranged from .65 to .86 for Trait anxiety and .16 to .62 for State anxiety, which would be expected due to the transitory nature of state anxiety. External validity was demonstrated via correlations with other measures of anxiety (e.g., .80 with Taylor Manifest Anxiety Scale).
Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996). This 21-item self-report questionnaire assesses the severity of symptoms of depression. Each item required respondents to endorse one of four statements regarding the severity of a depressive symptom. The BDI-II has demonstrated good reliability and validity. Coefficient alpha estimates of reliability were .92 for a clinical outpatient sample and .93 for a nonclinical sample. Test-retest reliability over a period of one week was .93. Validity was demonstrated via strong correlations between the BDI-II and other measures of depression such as the Hamilton Psychiatric Rating Scale for Depression - Revised ($r = .71$) and the Beck Hopelessness Scale ($r = .68$).

Procedure

Participants were greeted by the experimenter in the laboratory and introduced to the format of the study. The experimenter obtained informed consent and then administered the paper-and-pencil measures to each participant. At the end of the session, the experimenter awarded research credit to participants (if applicable) as compensation for their time. The experimenter also provided participants with a list of psychological service referrals in the event that they would like to seek services due to any issues that arose when responding to the questions of the study.
CHAPTER 3

RESULTS

Overview

Preliminary analyses were performed to determine the relationships among demographic variables and posttraumatic growth. One-way analyses of variance (ANOVAs) were conducted to examine potential differences in posttraumatic growth due to the demographic variables of sex, race, college level, income category, and parental marital status. The results of each of these preliminary analyses were non-significant, demonstrating that demographic variables were not related to posttraumatic growth in this sample.

The goals of this study were to examine (1) the association among a disease factors, distress factors, family functioning, and individual coping and posttraumatic growth and (2) predictors of posttraumatic growth derived from a theoretical model of coping with stress. Pearson correlations were conducted to examine the association between posttraumatic growth and measures of psychological distress, family functioning, individual coping methods, and the disease factors of perceived severity, total days hospitalized due to illness, length of treatment, perceived disruptiveness, perceived pain during illness, age at diagnosis, and time since diagnosis. In addition, differences in posttraumatic growth between the participants who have recovered from their illness versus participants who currently experience symptoms of their illness status were examined using a one-way ANOVA. Predictors of posttraumatic growth were evaluated using hierarchical regression analyses, with order of entry of variables determined by Wallander and Varni’s (1992) disability-coping-stress model.
Associations among Factors and Posttraumatic Growth

One-tailed Pearson correlations (given the directional nature of the hypotheses) and a one-way ANOVA were conducted. The intercorrelations among variables are presented in Table 2. In regards to disease factors, posttraumatic growth was significantly related to perceived severity of illness, \( r(60) = .45, p = < .01 \); days hospitalized, \( r(50) = .25, p = .04 \); perceived pain during illness, \( r(60) = .42, p < .01 \); and perceived disruptiveness of illness, \( r(60) = .48, p < .01 \). Posttraumatic growth was negatively related to length of treatment, \( r(47) = -.24, p = .05 \). Age at diagnosis, \( r(60) = .11, p = .20 \), and time since diagnosis, \( r(60) = -.03, p = .41 \), were not significantly correlated with posttraumatic growth.

Current illness status (recovered vs. ongoing symptoms) was also related to posttraumatic growth, as participants who have recovered from their illness \((M = 57.90, SD = 23.00)\) reported significantly greater growth than those who currently continue to have symptoms of their illness \((M = 43.45, SD = 19.26)\), \( F(1, 58), = 6.91, p = .011 \).

In regards to psychological distress variables, posttraumatic growth was positively related to posttraumatic stress symptoms, \( r(60) = .45, p = < .01 \). Symptoms of anxiety \( r(60) = -.21, p = .06 \), and depression \( r(60) = -.19, p = .08 \), were not significantly correlated with growth.

Examination of the family functioning variables indicated that the following aspects of family functioning were positively associated with posttraumatic growth: total healthy family functioning, \( r(60) = .32, p = < .01 \); balanced flexibility, \( r(60) = .34, p = < .01 \); and family communication, \( r(60) = .27, p = .02 \). The family’s level of balanced cohesiveness, \( r(60) = .19, p = .07 \), was not significantly related to posttraumatic growth.
Table 2
Intercorrelations among Variables, and Means and Standard Deviations

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\*p<.05 \**p<.01, 1-tailed. \(n=50. \)\(n=47.\)
In regards to individual coping strategies, planful problem-solving was positively correlated with posttraumatic growth, $r(60) = .24, p = .03$, as expected. Positive reappraisal, $r(60) = .02, p = .43$, was not significantly correlated with posttraumatic growth.

In summary, posttraumatic growth correlated in the expected directions with several disease factors (i.e., perceived severity of illness, total days hospitalized, perceived pain during illness, perceived disruptiveness of illness, and length of treatment), posttraumatic stress symptoms, family factors (i.e., total healthy family functioning, balanced flexibility, and family communication), and the individual’s use of planful problem-solving as a coping strategy. Additionally, participants who have recovered from their illness reported greater growth than participants who continue to experience symptoms of their illness.

Hierarchical Regression Analyses

Those factors which were significantly associated with posttraumatic growth in the prior analyses were included in the regression analyses. Two factors, total days hospitalized and length of treatment, were excluded due to missing data for these factors. One of the family variables, balanced flexibility, was excluded because it is a subscale of the total healthy family functioning variable, which was included in the regression equation.

The order of entry for the factors was determined using Wallander and Varni’s (1992) disability-stress-coping model. Disease factors (i.e., perceived severity of illness, pain during illness, and perceived disruptiveness of illness) were entered first into the equation, followed by current illness status (i.e., current symptoms vs. recovered) at the second step. Symptoms of posttraumatic stress were entered at the third step and family variables (i.e., total healthy family functioning and communication) were entered at the fourth step. The more proximal variable of individual coping (i.e., planful problem-solving) was entered at the fifth step. After each set of
variables was entered, the model was trimmed by excluding non-significant predictors. As can be seen in Table 3, the final model includes the disease factors of pain during illness and perceived disruptiveness, current illness status, posttraumatic stress symptoms, and total healthy family functioning. The trimmed model accounts for a significant amount of variance (53%) in posttraumatic growth ($R^2 = .53, F(5, 54) = 12.09, p < .01$).

Table 3
*Final Model Predicting Posttraumatic Growth Using Hierarchical Regression Analysis*

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<th>$\Delta R^2$</th>
<th>$F$</th>
<th>$df$</th>
<th>$B$</th>
<th>SE $B$</th>
<th>$\beta$</th>
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<td>.22*</td>
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<td>12.16**</td>
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<td>.71</td>
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<td><strong>Step 4: Family Factors</strong></td>
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<td>2.35</td>
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*Note. $F$ = significance for the model at each step. $B$, SE $B$, and $\beta$ are for the final model.

*p $\leq .05$, **$p < .01$
CHAPTER 4
DISCUSSION

The results of this study indicate that several disease, distress, and family factors contribute to the amount of posttraumatic growth experienced by individuals who had a serious and/or chronic childhood illness. The variables of perceived disruptiveness, perceived pain during illness, current illness status, posttraumatic stress symptoms, and total healthy family functioning accounted for 53% of the variance in posttraumatic growth. Identification of these variables is important for understanding the process of psychological growth following a traumatic event (i.e., childhood illness).

In the interest of helping people achieve positive outcomes following a traumatic illness experience, it is important to understand how each variable contributes to posttraumatic growth and whether each is malleable or fixed. Four out of the five variables (i.e., perceived disruptiveness, perceived pain during illness, posttraumatic stress symptoms, and healthy family functioning) identified as contributing to posttraumatic growth are potentially malleable, with the current status of one’s illness being fixed.

In examining posttraumatic growth as both a process and an outcome, the positive correlation between posttraumatic growth and stress symptoms may reflect an on-going process of coping that produces both feelings of distress and growth simultaneously. Since there are many negative aspects to having a serious illness during childhood, it is conceivable that the process of coping would coexist with feelings of distress. It is important, however, that positive feelings are also present. As suggested by Horowitz (1991), the presence of posttraumatic stress
symptoms may reflect a person’s attempts to make meaning out of their experience. Cognitive theories of processing traumatic experiences also suggest that the amount of perceived disruptiveness may reflect the way the person’s illness challenged their beliefs about themselves and the world (Calhoun & Tedeschi, 1999). If one’s beliefs are challenged more, at least to some optimal point, there is greater potential for growth. Tedeschi and Calhoun (1995) propose that cognitive processing is a key component of posttraumatic growth. It is likely that individual and family coping processes also influence the way an individual integrates their trauma experiences into their belief system, which may explain the positive correlations found in this study between posttraumatic growth and healthy family functioning and planful problem solving.

Examining the correlations among the different disease, distress, family, and individual coping factors also provides information regarding posttraumatic growth. One important finding was that individuals who have recovered from their illness reported significantly greater posttraumatic growth relative to individuals who continue to struggle with the demands of their illness. The greater growth following recovery suggests that one must overcome the daily demands of the illness to perceive positive psychological change as a result of the illness. Intuitively, it makes sense that one can derive greater meaning from a challenge which has been faced and overcome, rather than a challenge which continues to place demands on the individual and may seem unconquerable. This does not, however, preclude growth, and the results of this study indicated that all individuals reported at least some positive psychological growth as a result of their illness (i.e., no individual reported a score of zero on the measure of posttraumatic growth).

The disease factors of perceived severity, perceived disruptiveness, perceived pain, days hospitalized, and length of treatment were all correlated with posttraumatic growth in the
expected directions. Days hospitalized might be considered a measure of severity and disruptiveness of illness, as greater amount of days spent in a hospital are likely to reflect greater severity of the illness and greater disruption from normal activities, such as school. The length of treatment may be considered a measure of chronicity of illness, and in this sample was highly correlated with current illness status. Thus, greater length of treatment was associated with current illness symptoms. In sum, the relationships between these disease factors and posttraumatic growth indicate that the more severe and disruptive an illness is perceived to be, the greater amount of growth derived from the experience.

In this study, age at diagnosis and time since diagnosis were not related to growth. This is consistent with some of the literature (e.g., Milam et al., 2004), but other studies have suggested that longer time since the event is related to greater posttraumatic growth (e.g., Cordova et al., 2001). However, it should be noted that the group in the present study varied greatly in the time since diagnosis and type of diagnosis. It is possible that time since diagnosis may be differentially important depending on the type of diagnosis. Additionally, time since diagnosis may be more important in the immediate aftermath of a trauma, which is consistent with the finding in the present study that being recovered from the illness/trauma is associated with greater growth than continuing to cope with daily demands of the illness. In the study by Cordova and colleagues (2001), all participants were within 5 years of being diagnosed and treated for breast cancer, which is a much shorter range of time than included in the present study. The discrepancy in the literature regarding the importance of time since diagnosis requires further examination through longitudinal studies that include both the time at diagnosis as well as the on-going stressors of the illness.
Similar to the time since diagnosis discrepancy, several studies in the literature have found that women tend to report greater growth than men (e.g., Park et al., 1996; Tedeschi & Calhoun, 1996). In the present study, there were no significant differences found in posttraumatic growth reported by women versus men. This finding is consistent with one study of posttraumatic growth in adolescents (Milam et al., 2004) and in parents who lost a child (Polatinsky & Esprey, 2000).

Examination of measures of distress indicated that posttraumatic growth was correlated with posttraumatic stress symptoms, but was not significantly correlated with depression or anxiety. As mentioned previously, the correlation with posttraumatic stress symptoms may reflect the person’s ongoing cognitive processing of the traumatic illness experience. The report of posttraumatic stress symptoms in young adult survivors of childhood illness is not rare, as several studies have found high rates of posttraumatic stress symptoms (up to 78% of the sample) in young adult survivors of childhood cancer (e.g., Erickson & Steiner, 2001; Kazak et al., 2001). Since the majority of the sample in the present study reported some symptoms of posttraumatic stress, it appears that individuals experience distress related to their illness for a significant amount of time following the illness (given that the age since diagnosis was greater than 1.4 years for the all participants). However, it is important to note that presence of distress symptoms does not preclude psychological growth, and in fact was correlated with greater growth. The lack of association between depression and posttraumatic growth found in the present study is consistent with previous work (Cordova et al., 2001; Milam et al., 2004).

The present study also examined the relationship between family functioning and posttraumatic growth. Healthier family functioning was associated with greater posttraumatic growth. The cross-sectional nature of the present study prohibited temporal analyses of family
functioning and growth, but it is hypothesized that healthier family coping influences individual coping and can enhance growth. The transactional link between healthy family functioning and better individual adjustment has been shown in a longitudinal study of adolescent leukemia survivors, whose levels of coping and adjustment 10-years post-treatment were best predicted by their mother’s levels of coping and adjustment (Kupst et al., 1995). Thus, healthier family adaptation at the time of illness is likely to result in more positive outcomes in the future. Since family functioning has been shown to be predictive of future individual functioning, it is likely that family functioning influences current individual functioning. Since the present study only examined current levels of family functioning, it is unclear whether healthy family functioning enhanced psychological growth or was a product of another factor that may have also contributed to growth.

Further examination of family functioning indicated that greater balanced flexibility and family communication were related to greater growth, while balanced cohesion was not significantly related to posttraumatic growth. A previous study by Barakat and Kazak (1999) indicated that family functioning appears to change over time with the demands of the illness. This study examined family functioning in college students, and the developmental demands of this period in young adults’ lives requires some shifting in roles within a family as a college student strives for greater independence. Families who are able to shift roles and rules within the family system in a healthy way are likely to demonstrate greater overall healthy functioning (as demonstrated by the significant correlation between healthy family functioning and balanced flexibility). The positive relationship between posttraumatic growth and balanced flexibility may reflect the positive influence of overall healthy family functioning.
The positive relationship between posttraumatic growth and family communication may also reflect the positive influence of overall healthy family functioning, given the high correlation between the two variables. It is also possible that better family communication serves as a mechanism for thinking about and discussing change following the traumatic illness experience, as cognitive processing of the experience is believed to be important to facilitating growth (Tedeschi and Calhoun, 1995). Thus, more opportunities to process the experience are likely to result in greater growth. According to the model of posttraumatic growth proposed by Tedeschi and Calhoun (2004), the family may serve as a social support network that conveys “empathetic acceptance of disclosures about the traumatic event and about growth-related themes” (p. 12). Consistent with the idea of the importance of social support in facilitating growth, one study of women who survived breast cancer found that prior talking about breast cancer was predictive of posttraumatic growth (Cordova et al., 2001). Future studies should further examine the link between talking with others about the traumatic experience and posttraumatic growth.

Results of the examination of individual coping strategies found that planful problem-solving was positively related to posttraumatic growth, which was expected based on prior research (e.g., Sheikh, 2004). Unexpectedly, posttraumatic growth was not related to positive reappraisal (Park et al., 1996). The positive relationship between planful problem-solving and posttraumatic growth suggests that the active process of resolving conflicts and other life challenges is associated with greater growth. It is unclear whether this coping process contributes to or is resultant of growth.
Implications

Overall, the results of the present study indicate that college students who were diagnosed with a serious and/or chronic illness during their childhood experience posttraumatic growth. The amount of growth that they experience is related to several disease, distress, family, and individual coping factors. Specifically, greater perceived severity, disruptiveness, and pain during the illness are associated with greater posttraumatic growth. Further, individuals who have recovered from their illness reported greater growth than those individuals who are currently coping with the daily demands of a chronic illness. Healthier family functioning, including balanced flexibility and communication, is also associated with greater posttraumatic growth. These family factors seem to be modifiable protective factors that provide a supportive social environment and models for effective coping. Individual planful problem-solving was also positively related to growth. Taken together, these findings lend support to expanding the use of Wallander and Varni’s (1992) disability-stress coping model to include long-term adjustment to serious illness, including the outcome of posttraumatic growth. The results of this study, particularly the positive relationship between healthy family functioning, communication, and posttraumatic growth, also lend support to Tedeschi and Calhoun’s (2004) model of posttraumatic growth.

The present study contributes to the growing body of literature in this area by extending the paradigm of posttraumatic growth into young adult survivors of a serious and/or chronic childhood illness. There are several studies that examine posttraumatic growth in middle- to late-adults who experienced a serious and/or chronic illness (e.g., Cordova et al., 2001; Pakenham, 2005), as well as studies that examine posttraumatic growth in college students who experienced a stressful negative event (e.g., Park et al., 1996; Tedeschi & Calhoun, 1996). Although young
adult survivors of a childhood illness have been studied in terms of posttraumatic stress symptoms (e.g., Erickson & Steiner, 2001; Stuber et al., 1997), this is the first study to our knowledge to empirically examine posttraumatic growth in this population.

The results of this study provide several potentially modifiable factors that are predictive of posttraumatic growth, including perceived disruptiveness of illness, perceived pain during illness, posttraumatic stress symptoms, and healthy family functioning. Current illness status (i.e., recovered vs. current symptoms) also emerged as a predictor, but cannot be easily modified. As Tedeschi and Calhoun (2004) advocate, posttraumatic growth should not be expected from all individuals who experience a trauma. However, identification of influential variables can help facilitate growth. The variables identified as predictors of growth in the present study emphasize the importance of cognitive processing and construction of the illness experience, and interventions can be implemented to aid individuals in processing their illness experience. Similarly, the family may be an important vehicle for facilitating growth, potentially through modeling of effective coping behavior, providing social support for the young adult, or providing an accepting environment in which the young adult can discuss their illness and growth-related experiences.

One of the major limitations of this study is the retrospective nature of participants’ report. Specifically, participants were asked to report their perceptions of various disease factors (e.g., severity, disruptiveness, etc.) related to a serious illness that was diagnosed at some point during their childhood. Participants were also asked to report their current level of posttraumatic growth in reference to their illness. It may be difficult for participants to accurately recollect all of the information required. However, the present study provides us with important information regarding college students’ perceptions of their illness experience and how they have made sense
of their illness experience. It has been argued that subjective perceptions are more important than objective measures of severity in examining an individual’s adjustment to illness (Kazak et al., 2003), and indeed perceptions and believes are key components of Tedeschi and Calhoun’s model of posttraumatic growth (2004). Further, the results of this study suggest that perceptions of disease factors such as severity and disruptiveness are related to psychological outcomes and should be examined.

A related limitation is the cross-sectional and retrospective nature of the present study. Although links are being made between distal experiences (i.e., childhood illness and current posttraumatic growth), there is a possibility that other variables not measured have influenced posttraumatic growth. A prospective, longitudinal study would help determine the temporal relationship among the variables studied.

Another limitation is that the present study relied on a single source of data – the individual who experienced the serious and/or chronic illness. The validity of posttraumatic growth has been criticized in the literature as being inaccurate due to individuals’ motivation to self-enhance (McFarland & Alvaro, 2000). A few studies have attempted to validate individuals’ reports of growth by obtaining reports from significant others, with moderate correlations between reporters (e.g., Park et al., 1996). Convergence of report is one method of testing validity, and future studies may benefit from examining more direct behavioral indications of self-report (e.g., greater amount of time spent engaging in activities directed towards life goals vs. mundane goals).

Finally, it should be noted that the sample used in the present study was one of convenience and results may not be generalizable. The college students in this study were generally well-functioning and accomplished, given their ability to maintain enrollment at a large
university. In fact, the general positive overall functioning of the participants may have made this sample more fertile in terms of positive outcomes of illness such as posttraumatic growth. However, it should be noted that the socioeconomic status of the majority of participants was upper class, and the majority of students were White. Given the small variation in these demographic characteristics, the results of this study should be replicated in a more diverse sample.

In summary, the results of the present study identify several factors that are predictive of posttraumatic growth. However, the cross-sectional and retrospective nature of this study prevents examination of causal or temporal relationships among variables, and the field would benefit from a prospective, longitudinal study of the process of posttraumatic growth. Considering the growing population of children experiencing a serious and/or chronic illness, posttraumatic growth and related variables should be examined in younger individuals and include multiple sources of data. Given the positive psychological and physical outcomes associated with posttraumatic growth in some studies (e.g., Affleck et al., 1987; Park et al., 1996), interventions designed to enhance posttraumatic growth should be implemented and empirically tested.
REFERENCES


