J Clin Psychol Med Settings (2010) 17:340–348
DOI 10.1007/s10880-010-9210-7

Posttraumatic Growth in Young Adults Who Experienced Serious Childhood Illness: A Mixed-Methods Approach

**Katie A. Devine · Bonney Reed-Knight ·
Kristin A. Loiselle · Nicole Fenton ·
Ronald L. Blount**

Abstract Sixty young adult survivors of a serious childhood illness completed quantitative and qualitative measures assessing the relationship between specific disease and distress factors and posttraumatic growth (PTG). Individuals who had recovered from their illness reported greater growth than those who were currently experiencing their illness. The regression model accounted for 47% of the variance in PTG, with perceived severity, illness status, and posttraumatic stress symptoms emerging as significant predictors. Qualitative analyses identified salient positive and negative factors associated with having had an illness, such as a positive shift in perspective and frequent medical requirements. Being past the daily demands of illness management may allow for greater PTG. Realization of positive aspects of having had an illness may require prompting.

Keywords Posttraumatic growth · Posttraumatic stress · Chronic illness · Young adulthood

Traditionally, there has been a focus on the negative outcomes, such as posttraumatic stress, resulting from having a serious childhood illness. This is understandable given that there are many potentially traumatic experiences associated with a serious childhood illness, beginning with the initial diagnosis and continuing throughout the course of the disease. Children with serious illnesses face stressors such as medical testing, complicated medication regimens, hospitalizations, and feelings of isolation, all of which can be traumatic. As a result, there are numerous occasions for trauma associated with the experience of a serious childhood illness. However, an exclusive focus on negative outcomes provides an incomplete picture of the potential effects of childhood illness. In addition to the clearly traumatic events, some positive outcomes, including posttraumatic growth (PTG), may emerge from negative experiences. PTG is a relatively young construct that is defined as positive psychological change experienced as a result of the struggle with highly challenging life circumstances or traumatic events (Calhoun & Tedeschi, 1999; Tedeschi & Calhoun, 1996). PTG may take the form of positive changes in personal behavior, relationships, and worldviews (Ai & Evans-Campbell, 2006), or more meaningful family relationships and greater appreciation of life (Chun & Lee, 2008).

PTG and related constructs, such as benefit finding and stress-related growth, have been studied primarily in adults in response to different stressors (e.g., illness, natural disasters, sexual trauma), with limited research on the development of PTG in children, adolescents, and young adults. Work that has been done with adolescents with cancer (Barakat, Alderfer, & Kazak, 2006), adolescents who experienced a difficult life event (Milam, Ritt-Olson, & Unger, 2004), and college students who experienced a difficult life event (Park, Cohen, & Murch, 1996) has

---

Parts of the results in this paper were presented at the 2008 National Conference on Child Health Psychology in Miami, Florida.

K. A. Devine · B. Reed-Knight · K. A. Loiselle · N. Fenton ·
R. L. Blount
University of Georgia, Athens, GA, USA

K. A. Devine (✉)
Department of Radiation Oncology, University of Rochester
Medical Center, 601 Elmwood Ave., Box 704, Rochester,
NY 14642, USA
e-mail: Katie_Devine@urmc.rochester.edu

Present Address:
N. Fenton
Department of Psychology, University of North Carolina,
Chapel Hill, NC, USA

demonstrated that PTG can occur during adolescence and young adulthood.

Although PTG is a relatively new area of research, a general model of the process of posttraumatic growth has been proposed (Tedeschi & Calhoun, 2004). This model includes several factors that influence PTG, including individual characteristics, characteristics of the traumatic event, emotional and cognitive challenges produced by the traumatic event, ways of coping with the aftermath of the trauma, and ongoing distress related to the trauma. Tedeschi and Calhoun emphasized the cognitive processes of responding to trauma. On the other hand, empirical research has focused on various factors related to the event, such as perceived severity, time since the event, and ongoing distress related to the event (e.g., Barakat et al., 2006). While there has been some consistency in finding a positive relation between threat appraisal or perceived severity of the event and PTG, there is less consistency among socio-demographic and psychological distress factors and PTG (Linley & Joseph, 2004).

In this investigation, we examined factors correlated with PTG in a group of young adults who experienced serious illness as children. Serious illnesses, such as diabetes and cancer, are likely to be composed of multiple traumas, such as the process of diagnosis, the severity of the illness, repeated treatments or procedures, the chronicity of the illness, and recovery status (currently experiencing the illness or not). Many of these elements are likely to be different between diagnostic categories as well as within a given diagnosis, given the variability of diseases. Therefore, we believe it is important to understand what elements of the trauma, as opposed to specific diagnoses, are associated with PTG. To this aim, we adopted a non-categorical approach to studying PTG resulting from a serious childhood illness (Pless & Pinkerton, 1975; Stein & Jessop, 1982). That is, we were more interested in examining generic disease factors, such as perceived severity of the illness and time since diagnosis, than diagnostic category.

The particular factors of interest were chosen based on Tedeschi and Calhoun's model of PTG and the empirical literature. Characteristics of the event as applied to childhood illness included factors such as disease severity and time since diagnosis. The importance of individuals' subjective appraisal of life threat and severity in predicting PTG has been emphasized (Cordova, Cunningham, Carlson, & Andrykowski, 2001; Cordova et al., 2007; Linley & Joseph, 2004). Since subjective appraisal of the illness and treatment severity have been shown to be better predictors of PTG than objective medical assessment (Barakat et al., 2006; Cordova et al., 2007; Taïeb, Moro, Baubet, Ravah-Lévy, & Flament, 2003), subjective appraisal was primarily examined in this study. Consistent with other studies, objective measures of severity, such as days hospitalized, were also examined.

Investigations of time since diagnosis or treatment and PTG have yielded equivocal outcomes, with some studies reporting positive relationships (e.g., Cordova et al., 2001; Evers et al., 2001) and others finding negative or nonsignificant results (e.g., Barakat et al., 2006; Cordova et al., 2007; Fromm, Andrykowski, & Hunt, 1996; Milam et al., 2004; Weiss, 2004). Although the influence of time since the event or diagnosis is inconsistent across studies, PTG has been found several years following the experience of illness. For example, Barakat et al. (2006) examined PTG in a sample of adolescents who had completed cancer treatment on average 5.3 years earlier and found that the majority of adolescents reported experiencing PTG. In addition, PTG has been reported in adults who experienced spinal cord injuries an average of 10.7 years in the past (Chun & Lee, 2008), as well as survivors of heart disease regardless of time since diagnosis (Sheikh, 2004). Thus, this study aimed to expand the current literature on PTG by evaluating not only the impact of time since diagnosis, but also current illness status (i.e., whether the patient has recovered from the illness or continues to experience the illness). Illness status has not previously been examined and may be a better predictor than time since diagnosis.

Ongoing distress related to the illness or experience was examined by measuring posttraumatic stress symptoms (PTSS). Although it may seem counterintuitive that PTSS could be positively related to PTG, the two often occur simultaneously (Barakat et al., 2006; Best, Streisand, Catania, & Kazak, 2001; Cordova & Andrykowski, 2003; Morrill et al., 2008; Park et al., 1996), with positive correlations having been found between PTSS and PTG. Trauma and distress can be seen as initiating or sustaining cognitive processes that produce growth (Horowitz, 1991), and enduring distress may enhance and maintain PTG over time (Tedeschi & Calhoun, 2004). However, PTG and PTSS have not been shown to be consistently related across the literature, as several studies have not found significant correlations between the constructs (Cordova et al., 2001, 2007).

In summary, this study aimed to address gaps in the current literature regarding the understanding of PTG for young adults with a history of serious childhood illness. The goal of the current study was to identify specific factors associated with PTG in young adults who experienced serious childhood illness. The role of several disease and enduring distress factors resulting from the illness were examined as predictors of PTG. Participants' experience of PTG was hypothesized to be positively associated with perceptions of the severity of the illness and posttraumatic stress symptoms. Further, this investigation used open-ended qualitative measures in addition to standardized questionnaires to explore young adults' reactions to their serious childhood illness. Open-ended qualitative measures were seen as an avenue for providing a richness of information regarding subjective experiences not easily captured through a forced response format, especially when investigating a new area of research in which the most important and salient themes may not yet be identified for a given population.

Method

Participants

Young adults were recruited to participate through advertisements and the university research pool. Each participant completed a brief screening questionnaire to assess if they had been diagnosed with a serious and/or chronic illness during childhood. For inclusion, participants' illness could not have resolved prior to the age of 6 years and they were required to have a recollection of the impact of the illness (determined by self-report using a Likert scale). Sixty-two individuals expressed interest in participation. Two people were excluded from the study, one because the illness resolved prior to age six and one because medical problems resulted from a car accident rather than an illness. Sixty participants (61.7% female) were included in the quantitative data analyses. One person's responses to the open-ended questions were accidentally erased. Therefore, 59 participants were included in the qualitative analyses.

The majority of participants were White (88.3%), and the remaining were African American (3.3%), Asian (3.3%), Hispanic (3.3%), and other (1.7%). Medical diagnoses included asthma (20.0%), epilepsy (15.0%), diabetes (11.7%), cancer (11.7%), brain tumor (8.3%), autoimmune diseases (8.3%; Crohn's disease, juvenile rheumatoid arthritis, lupus, alopecia), and other (25%; skeletal, cardiac, ophthalmological, rheumatic fever, hemophilia, other neurological, Lyme disease, measles, gastroesophageal disease, and cholesteatoma). Given the non-categorical approach focusing on dimensions of illness factors and previous research showing that subjective severity is more important in predicting PTG than objective severity, indices of subjective appraisal of illness characteristics rather than diagnostic category were utilized in all analyses (Barakat et al., 2006; Taïeb et al., 2003). Mean age at diagnosis was 9.01 years (SD = 4.85 years) and the average age at study participation was 20.20 years (SD = 2.55). At the time of participation, 48.3% were currently experiencing symptoms of the childhood illness, while 51.7% were recovered from the illness.

Measures

Information Sheet

Demographic and disease-related information was gathered including date of birth, gender, and race. Participants responded to questions regarding their diagnosis and treatment, and retrospectively rated their perceived disease severity (from 0 = "Not at all" to 9 = "Life threatening") and perceived disruptiveness of the illness (from 0 = "Not at all" to 9 = "Extremely") using Likert rating scales. Participants reported whether they were "recovered" from their illness or whether they continued to experience the illness at the present time.

Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996)

The PTGI is a 21-item measure that assesses positive outcomes related to traumatic experiences. Each item is rated by the respondent on a six-point Likert scale from 0 ("I did not experience this change") to 5 ("I experienced this change to a very great degree"). Examples of questions include, "I have new priorities about what is important in life" and "I appreciate each day more." Five subscales have been derived via factor analysis: Relating to Others, New Possibilities, Personal Strength, Appreciation of Life, and Spiritual Change. Ratings of internal consistency ranged from good to high, with Cronbach's $\alpha = .90$ for the full scale and subscale alphas ranging from .67 to .85 (Tedeschi & Calhoun, 1996). In the present study, $\alpha = .93$ for the full scale and subscale alphas ranged from .78 to .88. The full scale score was used in analyses.

Impact of Event Scale-Revised (IES-R; Weiss & Marmar, 1997)

The IES-R is a 22-item measure that assesses posttraumatic stress symptoms resulting from a specific life event. Participants were asked to identify how distressing each item was during the past 7 days with respect to their childhood illness on a 5-point Likert scale from 0 ("not at all") to 4 ("extremely"). High reliability has been demonstrated for the three subscales, with alphas ranging from .87 to .92 for Intrusion, .84 to .86 for Avoidance, and .59 to .92 for Hyperarousal (Weiss & Marmar, 1997). Similarly, the subscales showed good reliability in the current study, with $\alpha = .82$ for Intrusion, $\alpha = .73$ for Avoidance, and $\alpha = .82$ for Hyperarousal. The total scale score was used in analyses.

Impact of Childhood Experiences Questionnaire

This qualitative measure, developed for the current study, consists of three open-ended questions regarding the impact of having a serious and/or chronic illness as a child, with the first question being the most open-ended and each subsequent question becoming more focused. The questions were (1) "Tell us about your experience with a serious childhood illness," (2) "Describe any positive aspects of having a serious childhood illness," and (3) "Describe any negative aspects of having a serious childhood illness." Participants were presented with all questions in one document and expected to complete them in sequential order with an unlimited amount of time to type their responses.

The codebook for analyzing the participants' responses to the Impact of Childhood Experiences Questionnaire was developed based on the grounded theory method (Charmaz, 2008; Glaser & Strauss, 1967). Forty-four codes were inductively developed based on the themes that emerged from the participants' written answers to the three questions. As a result, the codes were grounded to the participants' reported experiences as opposed to being preconceived by the researchers prior to reading the participants' narratives.

After the codes were developed by the first author, each narrative was coded by two independent raters (i.e., trained doctoral psychology students and research assistants). Any discrepancies in coding between the pair of raters were resolved by an independent rater. Each assigned code was given an intensity rating to indicate the degree of its presence in the narrative (i.e., 0 = not present, 1 = mild, lacking description, 2 = moderate/severe, significant description). Infrequent codes that occurred in less than 20% of the sample were dropped, leaving 15 codes that were analyzed. Inter-rater agreement was good to excellent, with $\kappa = .60$–$.86$ (Fleiss, 1981), with the exception of the code "negative psychological reactions," $\kappa = .44$. This code was examined despite fair reliability given the exploratory nature of the qualitative analyses.

Procedure

This study was approved by the university Institutional Review Board. Informed consent was obtained prior to administration of the measures. Participants first completed quantitative paper-and-pencil measures and then responded to the qualitative measure on a computer using Microsoft Word. This order was chosen to prevent introducing any bias into the quantitative results due to the process of responding to the open-ended measures. At the end of the session, the researcher awarded university research credit to participants, if applicable, as compensation for their time. Participants were given a list of referrals for psychological services in the event that they would like to seek services for any issues that arose during the course of the study.

Data Analyses

A one-way ANOVA was utilized to examine differences in posttraumatic growth between the participants who had recovered from their illness versus participants who continue to experience their illness. Pearson correlations were conducted to examine the association among posttraumatic growth and other factors, and biserial correlations were utilized for associations among illness status and other factors. Predictors of posttraumatic growth were evaluated using a hierarchical regression analysis, with order of entry of variables determined by results of previous studies and Tedeschi and Calhoun's (2004) model of PTG. Effect sizes are reported in terms of Cohen's d with a d of .2 indicating a small effect, .5 indicating a medium effect, and .8 indicating a large effect (Cohen, 1977). Effect sizes for nonparametric analyses using the qualitative data are reported in terms of Pearson's correlation coefficient r, with an r of .1 indicating a small effect, .3 indicating a medium effect, and .5 indicating a large effect (Cohen, 1992).

Results

Preliminary analyses were performed to evaluate the relationships among demographic variables and posttraumatic growth. Using one-way analyses of variance (ANOVAs), there were no significant differences in posttraumatic growth due to race, college level, income category, parental marital status, or gender.

Associations Among Factors and Posttraumatic Growth

Current illness status (recovered versus ongoing) was 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 had their illness ($M = 43.45$, $SD = 19.26$), $F(1, 58) = 6.91$, $p = .01$, $d = .68$.

The intercorrelations among variables using two-tailed Pearson correlations are presented in Table 1. PTG was significantly related to the subjective disease factors: perceived severity of illness, $r(60) = .45$, $p = <.01$ and perceived disruptiveness of illness, $r(60) = .48$, $p < .01$. Objective disease factors, including days hospitalized, length of treatment, age at diagnosis, and time since diagnosis, were not significantly correlated with PTG. In regards to ongoing distress, PTG was positively related to PTSS, $r(60) = .44$, $p = <.01$.

Table 1 Intercorrelations among variables

	1	2	3	4	5	6	7	8	9	Mean (SD)
1. Posttraumatic growth	–	.45**	.48**	.11	.25	−.24	−.41*	−.03	.44**	50.92 (22.32)
Disease factors										
2. Perceived severity		–	.60**	.19	.25	−.05	−.28*	−.05	.04	6.14 (2.19)
3. Perceived disruptiveness			–	.17	.25	.03	−.13	−.02	.24	6.01 (2.62)
4. Age at diagnosis				–	−.07	−.23	.00	−.87**	.10	9.02 (4.85)
5. Days hospitalized					–	−.09	−.30*	.22	−.15	60.02 (171.07)
6. Length of treatment in years						–	.66**	.21	.03	6.62 (7.34)
Illness status factors										
7. Current illness status[a]							–	−.10	.03	48.3%[b]
8. Time since diagnosis in years								–	−.11	11.18 (5.12)
Distress factor										
9. Posttraumatic stress symptoms									–	1.99 (1.64)

Note: * $p < .05$. ** $p < .01$

[a] Biserial correlations

[b] Indicates percentage still experiencing illness

Hierarchical Regression Analysis

The order of entry for the factors was determined based on current literature and factors contained in Tedeschi and Calhoun's (2004) model of PTG. The disease factors (perceived severity, perceived disruptiveness of illness, current illness status) were entered first, followed by ongoing distress (posttraumatic stress symptoms) at the second step. The total model accounted for 47% of variance in posttraumatic growth, $R^2 = .47$, adjusted $R^2 = .43$, $F(4, 55) = 12.03$, $p < .01$, with perceived severity of the illness, current illness status, and posttraumatic stress symptoms emerging as significant predictors of PTG (see Table 2).

Table 2 Hierarchical regression predicting posttraumatic growth

Variable	*B*	SE *B*	*β*
Step 1: Disease factors			
Perceived severity	1.95	1.43	.19
Perceived disruptiveness	2.89	1.17	.34*
Current illness status	−11.06	4.98	−.25*
Step 2: Enduring distress			
Perceived severity	2.56	1.26	.25*
Perceived disruptiveness	1.81	1.09	.21
Current illness status	−11.39	4.48	−.26*
Posttraumatic stress symptoms	5.20	1.39	.38**

Note: $R^2 = .33$ for Step 1, $p < .01$; $\Delta R^2 = .14$ for Step 2, $p < .01$; $R^2 = .47$, adjusted $R^2 = .43$, $F(4, 55) = 12.03$, $p < .01$ for the model

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

Qualitative Analyses

Although this quantitative model accounted for a significant amount of variance in posttraumatic growth, it focused on illness and distress factors. The qualitative analyses were conducted to gain a broader understanding of the experiences of young adults with a history of childhood illness as they relate to posttraumatic growth.

Two independent raters categorized the 15 codes used in this investigation, resulting in nine that were characterized as "negative" or representing harm or adverse reactions and six characterized as "positive" or beneficial. Interrater reliability indicated 100% agreement on the valence of each of the 15 codes (see Table 3 for code definitions).

Participants responded with an average of 3.37 codes on question 1 (SD = 1.64, range = 0–8), 2.27 codes on question 2 (SD = 1.26, range = 0–5), and 2.88 codes on question 3 (SD = 1.38, range = 0–7). We were interested in determining whether participants' responses would include different amounts of negative or positive codes depending on the question prompt, with question 1 asking most generally about one's experience and questions 2 and 3 prompting for positive and negative experiences, respectively. Differences in the frequency of positive and negative codes rated across questions were examined using Wilcoxon Signed-Ranks tests. On average, participants' responses to question 1 ("tell us about your experiences with a serious childhood illness"), the most general question, were rated with significantly more negative codes ($M = 3.17$, $SD = 1.6$) than positive codes ($M = 0.20$, $SD = 0.55$), $Z = 6.54$, $p < .01$, with a large effect size ($r = .85$). When specifically prompted to discuss positive aspects of having an illness on question 2 ("describe any

Table 3 Most frequently reported codes by question

Codes	Definition	Frequency ($n = 59$)		
		Question 1	Question 2	Question 3
Negative				
Physical/health problems	Describes symptoms and physical problems; not just naming diagnosis	88%	17%	39%
Frequent medical requirements	Frequent and/or ongoing medical requirements after diagnosis (not including diagnostic tests)	71%	25%	45%
Restrictions in daily activities	Limitations in daily activities, school, roles, etc. due to illness and/or treatment	42%	0%	36%
Severity of condition	Perception that illness is severe, life-threatening	39%	10%	8%
Negative psychological reactions	Sadness, worry, anxiety, depression, anger in response to illness and/or treatment	27%	2%	54%
Feeling different and isolated	Emotional experience of isolation	10%	2%	34%
Fear about own health	Worry about own health course and/or treatment	17%	2%	20%
Embarrassment	Sense of awkwardness or humiliation, implicit or explicit	12%	3%	22%
Overt rejection from peers	Overt negative treatment from peers, loss of friendship (not due to death), ostracism	10%	3%	20%
Positive				
Positive shift in perspective	Change in worldview in more positive way, gaining maturity or insight, comparisons to the “big picture” or others to put experience in perspective	3%	36%	3%
Self-efficacy/personal strength	Feeling capable of doing things on own; recognition of personal strength/accomplishment	5%	32%	2%
Appreciation for life	Feelings of gratitude for life or awareness of fragility of life	2%	24%	2%
Increased positive peer support/closeness	Positive social support from friends/peers	5%	24%	2%
Increased family support/closeness	Positive social support from family	4%	25%	0%
Empathy for others	Compassion for others; desire to help others	2%	22%	0%

positive aspects of having a serious childhood illness”), participants reported significantly more positive codes ($M = 1.63$, SD $= 1.07$) compared to the number of positive codes scored in response to the more open-ended prompt in question 1, $Z = 5.91$, $p < .01$, with a large effect size ($r = .77$). Thus, when prompted to discuss positive aspects, participants reported more positive aspects than when prompted to discuss their experiences generally (question 1). When specifically prompted to discuss negative aspects on question 3 (“describe any negative aspects of having a serious childhood illness”), participants reported similar amounts of negative codes ($M = 2.80$, SD $= 1.32$) compared to question 1, $Z = -1.56$, $p > .05$, $r = -.20$. Table 3 shows the percentages of participants whose responses were rated with each code type.

Question 1: Tell us about your experiences with a serious childhood illness The most frequent codes were physical/health problems (88%), frequent medical requirements (71%), restrictions in daily activities (42%), severity of the condition (39%), and negative psychological reactions (27%; see Table 3). These codes are consistent with the disease factors of perceived severity and disruptiveness from our quantitative model, with the addition of emotional and physical distress.

Question 2: Describe any positive aspects of having a serious childhood illness The most frequently reported codes, presented in Table 3, were a positive shift in perspective (36%), self-efficacy/personal strength (32%), appreciation for life (24%), increased positive peer support/closeness (24%), increased family support/closeness (25%), and empathy for others (22%).

Question 3: Describe any negative aspects of having a serious childhood illness The most frequently reported codes were negative psychological reactions (54%), frequent medical requirements (45%), physical/health problems (39%), restrictions in daily activities (36%), feeling different and isolated (34%), embarrassment (22%), fear about own health (20%), and overt rejection from peers (20%; see Table 3). This pattern was very similar to the responses to question 1; however, new codes emerged relating to peer relationships, including feeling different and isolated, embarrassment, and overt rejection from peers.

Discussion

This study sought to identify specific factors that are associated with posttraumatic growth during young adulthood based on the current literature and Tedeschi and Calhoun's (2004) model of PTG. As hypothesized, results indicated that several disease and ongoing distress factors were correlated with posttraumatic growth, including perceived severity of the illness, perceived disruptiveness, and posttraumatic stress symptoms. The finding that greater perceived severity, as opposed to objective measures of severity such as days hospitalized, was associated with greater growth emphasizes the importance of individuals' appraisal regarding the impact of the illness (e.g., Barakat et al., 2006; Taïeb et al., 2003). This also provides further support for the noncategorical approach of examining general disease characteristics (e.g., perceived severity, disruptiveness, and illness status) that may influence PTG regardless of diagnostic category.

One new contribution to the PTG literature offered by this study is the finding that young adults who identified themselves as being recovered from their illness reported significantly greater growth than those who reported an ongoing illness. These results imply that moving past the daily demands of an illness and threat to one's health and perhaps life may allow for greater processing of growth. Perhaps a reduction in cognitive efforts required to plan for treatment and disease maintenance allows for greater reflection on the experience. Low levels of distress experienced after the event is over can stimulate processing of the event, allowing for the experience of growth (e.g., Horowitz, 1991). Being free of the daily demands of the illness may also allow survivors to process the distress during a time of relative safety, thus increasing the likelihood of finding positive meaning in the experience. In contrast, those who still must contend with an ongoing illness have continuing challenges that they must face. They may currently be experiencing repeated, ongoing trauma due to the illness or required treatments. In a sense, these individuals may be too involved in the vigilance required to manage an illness to let down their guard and more completely experience the potential for growth that may come with recovery from an illness.

In essence, the quantitative analyses showed that disease factors and ongoing distress "set the stage" for growth but did not reveal the processes associated with the development of growth following trauma. The qualitative data provided further, more detailed, descriptions of factors associated with growth that were most salient to young adults as a result of experiencing a serious illness. When asked to describe their experiences with a serious illness in the first, most open-ended question, participants frequently wrote about disease factors, including explanations of the physical/health problems, frequent medical requirements, the severity of the condition, restrictions in daily activities due to the illness and/or its treatment, and negative emotional responses to the experience. Few positive aspects were identified. Prompting the young adults in question 3 to identify the negative aspects of having an illness resulted in a similar pattern of responses to the first question, with the addition of reporting feelings of isolation, embarrassment, and being treated differently by peers.

The fact that very few positive aspects were reported in response to the question asking participants to describe their experiences with an illness suggests that the negative aspects are more easily accessed when asked about having a serious illness. However, when specifically prompted to identify positive aspects, several stress-processing resilience factors were noted by these young adults, including a positive shift in perspective, greater personal strength, increased family support, a greater appreciation for life, and development of empathy for others. Having a good family support group at the time of the illness could promote better adjustment and might provide adult models for adaptive coping. Further, ongoing support could encourage an individual to communicate openly about his/her experience and cognitively process the trauma through self-disclosure (Tedeschi & Calhoun, 2004).

Participants' reports of development of empathy for others, increased self-efficacy, and greater appreciation for life are consistent with several domains of PTG as measured by the Posttraumatic Growth Inventory (i.e., relational, personal strength, and appreciation for life domains of PTGI). One positive aspect that is not readily captured on the PTGI was the report of a positive shift in perspective. In response to the open-ended questions, young adults reported development of insight and the cognitive ability to frame the traumatic experiences associated with a serious illness within a broader context and perspective. This is consistent with cognitive processing resulting in a schema change (Tedeschi & Calhoun, 2004), as well as more advanced cognitive and abstract thinking abilities characteristic of young adults. However, given the limited reporting of positive aspects by these participants until they were specifically prompted, it seems that the recognition of positive aspects of having an illness may require prompting. Although posttraumatic growth should not be expected from all individuals who experience a trauma (Tedeschi & Calhoun, 2004), identification of influential variables associated with PTG allows for the possibility of arranging circumstances to facilitate growth. Future studies should empirically investigate whether greater growth can be encouraged by prompting individuals to identify positive aspects that have resulted from the traumatic event.

Although this study expands the current literature by examining PTG during young adulthood and identifying common disease characteristics such as illness status as important factors related to PTG for this developmental group, there are several limitations. The cross-sectional and retrospective nature of the study prevented identification of causal relationships. The report of current perceptions of various disease factors (e.g., severity, disruptiveness) may be different from feelings at the time of the illness. However, given the results of this study and previous research that demonstrated the utility of subjective appraisal over objective measures of severity in predicting current PTG (e.g., Barakat et al., 2006), the validity of perceptions about past medical stressors seems to be supported. Finally, the generalizability of the results may be limited because participants were attending college, indicating a high level of functioning. Additionally, the majority of participants were from White, upper-middle class families. The results of this study should be replicated in a more diverse sample, and the field would benefit from prospective, longitudinal studies of the process of posttraumatic growth.

In conclusion, the results of the present study identified several factors that are predictive of posttraumatic growth. Considering the growing population of children with a serious and/or chronic illness transitioning into adulthood, more research should be devoted to understanding posttraumatic growth and related variables during the developmental period of young adulthood. Given the positive psychological and physical outcomes associated with posttraumatic growth in some studies (e.g., Evers et al., 2001), investigations that identify factors associated with PTG will hopefully aid in the design of interventions to enhance its development.

Acknowledgments We thank Jordan L. Gilleland, Megan McCormick, Melissa Mims, Mary Payne, Patrick Gauld, Ashley Beatty, and Megan McCay for their efforts in coding the qualitative data presented in this study.

References

Ai, A. L., & Evans-Campbell, T. (2006). Faith, attitudes, mental health and personal growth following the 9/11 terrorism attacks. In S. D. Ambrose (Ed.), *Religion and psychology: New research* (pp. 73–106). New York: Nova Science Publishers.

Barakat, L., Alderfer, M., & Kazak, A. (2006). Posttraumatic growth in adolescent survivors of cancer and their mothers and fathers. *Journal of Pediatric Psychology, 31*, 413–419.

Best, M., Streisand, R., Catania, L., & Kazak, A. (2001). Parental distress during pediatric leukemia and posttraumatic stress symptoms (PTSS) after treatment ends. *Journal of Pediatric Psychology, 26*, 299–307.

Calhoun, L. G., & Tedeschi, R. G. (1999). *Facilitating posttraumatic growth: A clinician's guide*. Mahwah, NJ: Lawrence Erlbaum.

Charmaz, K. (2008). Grounded theory. In J. A. Smith (Ed.), *Qualitative psychology: A practical guide to research methods* (pp. 81–110). Los Angeles: SAGE Publications.

Chun, S., & Lee, Y. (2008). The experience of posttraumatic growth for people with spinal cord injury. *Qualitative Health Research, 18*, 877–890.

Cohen, J. (1977). *Statistical power analysis for the behavioural sciences*. New York: Academic Press.

Cohen, J. (1992). A power primer. *Psychological Bulletin, 112*, 155–159.

Cordova, M. J., & Andrykowski, M. A. (2003). Responses to cancer diagnosis and treatment: Posttraumatic stress and posttraumatic growth. *Seminar in Clinical Neuropsychiatry, 8*, 286–296.

Cordova, M. J., Cunningham, L., Carlson, C., & Andrykowski, M. (2001). The posttraumatic growth following breast cancer: A controlled comparison study. *Health Psychology, 20*, 176–185.

Cordova, M. J., Giese-Davis, J., Golant, M., Kronenwetter, C., Chang, V., & Spiegel, D. (2007). Breast cancer as trauma: Posttraumatic stress and posttraumatic growth. *Journal of Clinical Psychology in Medical Settings, 14*, 308–319.

Evers, A., Kraaimaat, F., van Lankveld, W., Jongen, P., Jacobs, J., & Bijlsma, W. J. (2001). Beyond unfavorable thinking: The Illness Cognition Questionnaire for Chronic Diseases. *Journal of Consulting and Clinical Psychology, 69*, 1026–1036.

Fleiss, J. L. (1981). *Statistical methods for rates and proportions*. New York: Wiley.

Fromm, K., Andrykowski, M. A., & Hunt, J. (1996). Positive and negative life psychosocial sequelae of bone marrow transplantation: Implications for quality of life assessment. *Journal of Behavioral Medicine, 19*, 221–240.

Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory*. Chicago: Aldine.

Horowitz, M. (1991). Person schemas. In M. Horowitz (Ed.), *Person schemas and maladaptive interpersonal patterns* (pp. 13–31). Chicago: University of Chicago Press.

Linley, P. A., & Joseph, S. (2004). Positive change following trauma and adversity: A review. *Journal of Traumatic Stress, 17*, 11–21.

Milam, J. E., Ritt-Olson, A., & Unger, J. (2004). Posttraumatic growth among adolescents. *Journal of Adolescent Research, 19*, 192–204.

Morrill, E., Brewer, N., O'Neill, S., Lillie, S., Claire Dees, E. E., Carey, L. A., et al. (2008). The interaction of post-traumatic growth and posttraumatic stress symptoms in predicting depressive symptoms and quality of life. *Psycho-Oncology, 17*, 948–953.

Park, C. L., Cohen, L. H., & Murch, R. (1996). Assessment and prediction of stress-related growth. *Journal of Personality, 64*, 71–105.

Pless, I. B., & Pinkerton, P. (1975). *Chronic childhood disorders: Promoting patterns of development*. Chicago: Year Book Medical Publishers.

Sheikh, A. (2004). Posttraumatic growth in the context of heart disease. *Journal of Clinical Psychology in Medical Settings, 11*, 265–273.

Stein, R. E., & Jessop, D. J. (1982). A noncategorical approach to chronic childhood illness. *Public Health Reports, 97*, 354–362.

Taïeb, O., Moro, M. R., Baubet, T., Revah-Lévy, A., & Flament, M. F. (2003). Posttraumatic stress symptoms after childhood cancer. *European Child and Adolescent Psychiatry, 12*, 255–264.

Tedeschi, R. G., & Calhoun, L. G. (1996). The Posttraumatic Growth Inventory: Measuring the positive legacy of trauma. *Journal of Traumatic Stress, 9*, 455–470.

Tedeschi, R. G., & Calhoun, L. G. (2004). Posttraumatic growth: Conceptual foundations and empirical evidence. *Psychological Inquiry, 15*, 1–18.

Weiss, T. (2004). Correlates of posttraumatic growth in married breast cancer survivors. *Journal of Social and Clinical Psychology, 23*, 733–746.

Weiss, D., & Marmar, C. (1997). The Impact of Event Scale—Revised. In T. Wilson & J. Keane (Eds.), *Assessing psychological trauma and PTSD* (pp. 399–411). New York: Guilford Press.