

# Life Stress Versus Traumatic Stress: The Impact of Life Events on Psychological Functioning in Children With and Without Serious Illness

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**Objective:** To determine the differential impact of potentially traumatic events (PTEs) and other stressful life events on psychological functioning in 2 groups of children: those with cancer and those without history of serious illness. **Method:** Children with cancer age 8–17 ( $n = 254$ ) and age-, sex-, and race/ethnicity-matched controls ( $n = 142$ ) completed self-report measures of stressful life events and psychological functioning. Stressful life events included those that may meet *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM-IV*; American Psychiatric Association, 2000) A1 criteria (PTEs; 9 events) and others that would likely not (other events; 21 events). **Results:** Children with cancer endorsed significantly more PTEs than control children. There were no differences between groups in number of other events experienced. Hierarchical regression analyses revealed that number of other events accounted for significant variance in psychological functioning, above and beyond group status, demographic factors (age and socioeconomic status), and number of PTEs. **Discussion:** The number of cumulative other events experienced is a significant predictor of psychological functioning in both youth with serious illness and controls. In contrast, cumulative PTEs appear to have a minor (albeit significant) impact on children's psychological functioning. Assessment of psychological functioning would benefit from a thorough history of stressful life events, regardless of their potential traumatic impact.

**Keywords:** life events, psychological functioning, potentially traumatic events, childhood cancer

Stress is frequently highlighted as a cause of or contributor to mental and physical health problems across the life span. The stress reaction can come in many forms, but is often precipitated by a life event—albeit one that can be positive or negative, traumatic or nontraumatic. Past research has suggested that negative life events are particularly indicative of the development or intensification of mental health concerns (Cameron, Palm, & Follette, 2010; Furniss, Beyer, & Müller, 2009), with some debate regarding the necessary severity of those events (Lancaster, Melka, & Rodriguez, 2009; Robinson & Larson, 2010). For example, the diagnosis of posttraumatic stress disorder (PTSD) requires a traumatic precipitating negative life event, and in particular, one that “involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others” (*Diagnostic and Statistical Manual of Mental Disorders* [4th ed.]; *DSM-IV* A1 criteria; American Psychiatric Association, 2000, p. 467). In *DSM-5*, the diagnosis of PTSD is slightly more stringent and requires “exposure to actual or threatened death, serious injury or sexual violence” (*DSM-5* A criteria; American Psychiatric Association, 2013, p. 271). However, recent research has suggested that negative life events that would not meet *DSM-IV* or *DSM-5* criteria may be just as if not more

indicative of mental health concerns than those that do (Copeland, Keeler, Angold, & Costello, 2010; Furniss et al., 2009; Gold, Marx, Soler-Baillo, & Sloan, 2005; Van Hoof, McFarlane, Baur, Abraham, & Barnes, 2009; Verlinden et al., 2013).

Children with cancer have experienced a *DSM-IV* PTSD-qualifying negative life event and as such are assumed to meet A1 criteria. (Diagnosis of a medical illness such as cancer may no longer qualify under *DSM-5*.) They have been diagnosed with an illness that is potentially life threatening, and as part of their treatment they will likely undergo numerous procedures that pose a threat to their physical integrity (e.g., surgery, chemotherapy, radiation therapy). As such, a significant body of research has suggested that they are at risk for the development of PTSD and related symptoms (see Bruce, 2006, for a review). However, numerous studies have revealed that children diagnosed with cancer demonstrate no more symptoms of PTSD than controls (Barakat et al., 1997; Phipps, Jurbergs, & Long, 2009; Phipps et al., 2014). Indeed, these studies suggest that children with cancer demonstrate increased resilience in the face of this potential trauma and may even exhibit fewer mental health symptoms than their nonaffected peers (Howard Sharp, Rowe, Russell, Long, & Phipps, 2014; Maurice-Stam et al., 2009; Phipps et al., 2014; Wechsler & Sánchez-Iglesias, 2013).

Past research has suggested that the interplay between the diagnosis of cancer and the accumulation of stressful life events may predispose children with cancer to experience symptoms of posttraumatic stress (Currier, Jobe-Shields, & Phipps, 2009). Specifically, in a study of 121 pediatric patients with cancer, the number of stressful life events experienced was a unique and significant predictor of symptoms of posttraumatic stress related to the cancer diagnosis. Notably, however, the authors did not attempt to determine the impact of events of varying severities on psychological functioning. Rather, they com-

This article was published Online First December 22, 2014.

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This work was supported in part by Grant R01 CA136782 from the National Cancer Institute to Sean Phipps and by ALSAC.

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bined their assessment of events that were both potentially traumatic (e.g., the death of a parent) and not traumatic (e.g., birth of a sibling). Additionally, Currier et al.'s (2009) sample was limited to children with cancer, and they did not have a comparison group. As such, it is difficult to determine whether their findings are reflective of all children or just those affected by a serious illness and, thus, those who have experienced a potentially traumatic event.

The objective of this article was to determine the unique and differential impact of potentially traumatic events that could meet *DSM-IV* A1 criteria and other events (nontraumatic, non-A-1) on the psychological functioning (PTSD/PTSS, anxiety and depression) of children with cancer as compared with community controls. As such, we aimed to both replicate and extend the work of Currier et al. (2009). On the basis of the extant literature, it was hypothesized that nontraumatic significant life events would have a similar impact on psychological functioning as potentially traumatic events. Second, it was hypothesized that there would be a greater impact of events, both PTEs and other events, on the psychological functioning of children with cancer compared with their healthy peers.

## Method

### Participants

**Cancer.** Children with cancer ( $n = 254$ ) were recruited from the outpatient clinics of a large children's cancer center in the

mid-South to participate in this study. Eligibility criteria included being ages 8–17 years old, being able to read and speak English, being  $\geq 1$  month from diagnosis of a malignancy, and having no significant cognitive deficits that would prevent completion of measures. Of 378 patients approached, 258 (68%) agreed to participate, and 254 provided usable data. Those who declined cited lack of interest or lack of time. There were no differences between those who participated and those who declined with regard to age, gender, race–ethnicity, and diagnosis.

**Community controls.** Children without a history of a chronic or life-threatening illness were recruited from local schools through a two-step process. First, permission slips were provided to children to create a database of possible participants. Then, children from this database were contacted on the basis of demographic match on age, sex, and race–ethnicity. Similar to cancer patients, community controls were required to be between the ages of 8 and 17, be able to read and write English, and have no significant cognitive deficits that would prevent completion of measures. Of 169 potential participants contacted, 142 (84%) agreed to participate and completed study measures.

Demographic information for all participants and diagnostic and treatment information for the cancer group is available in Table 1. There were no differences between the two groups on age, race–ethnicity, or gender. However, there was a significant difference in

Table 1  
*Demographic and Cancer-Specific Characteristics*

Variable	Cancer ( $n = 254$ )		Control ( $n = 142$ )	
	$M \pm SD$	$N$ (%)	$M \pm SD$	$N$ (%)
Age (in years)	$13.09 \pm 2.89$		$12.68 \pm 2.89$	
Gender				
Male		132 (52.0)		74 (52.1)
Female		122 (48.0)		68 (47.9)
Race/ethnicity				
White		184 (72.4)		109 (76.8)
African American		58 (22.8)		29 (20.4)
Other		12 (4.8)		4 (2.8)
Socioeconomic status <sup>a</sup>				
Groups I & II		70 (27.5)		58 (40.8)
Group III		81 (31.9)		50 (35.2)
Groups IV & V		103 (40.6)		34 (24.0)
Cancer-specific characteristics				
Age at diagnosis (in years)	$9.29 \pm 4.74$			
Months since diagnosis	$45.06 \pm 51.57$			
Diagnostic category				
ALL		61 (24.0)		
AML or APL		18 (7.1)		
Lymphoma		34 (13.4)		
Solid tumor		99 (39.0)		
Brain tumor		42 (16.5)		
Treatment intensity				
Least intensive		14 (5.5)		
Moderately intensive		83 (32.7)		
Very intensive		83 (32.7)		
Most intensive		58 (22.8)		
Treatment status				
On therapy		147 (57.9)		
Off therapy		107 (42.1)		

Note. ALL = acute lymphoblastic leukemia; AML = acute myeloid leukemia; APL = acute promyelocytic leukemia.

<sup>a</sup> Socioeconomic status was determined by the Barratt Simplified Measure of Social Status (Barratt, 2006).

socioeconomic status (SES),  $\chi^2(2) = 12.54, p < .01$ , such that there were more participants in the cancer group in the low-SES category.

## Procedure

Participants and an adult caregiver provided informed consent—assent using institutional review board-approved methods. Participants from the cancer group completed measures during a routine hospital visit. Control group participants also completed questionnaires during an individual appointment at the hospital; evening and weekend hours were available as necessary. All participants were generally able to complete questionnaires independently; however, trained research assistants were available to answer questions and to read aloud the forms if necessary. Youth were separated from their parent during questionnaire completion to prevent discussion. All participants and their caregivers were provided with a small monetary incentive for their time and participation.

## Measures

**Life Events Scale for Children.** The Life Events Scale for Children (LESC) is a 30-item measure that assesses the experience

of different stressful life events. The scale is a modified version of the Coddington Life Events Questionnaire (Coddington, 1972), which includes both positive and negative life events. It was first amended by Johnston, Steele, Herrera, and Phipps (2003) to focus exclusively on 22 negative life events. An additional eight items were added in this iteration. Children are asked to report on whether they had ever experienced the event, with the primary variable of interest being the total number of life events experienced. The 30 events include both normative significant stressful life events (e.g., argument with a parent, death of a pet, parental divorce), as well as those that would potentially meet *DSM* criteria (e.g., witnessed an act of violence, involved in a car accident). As such, additional variables of interest for our study included the number of potentially A1 events, referred to as *PTEs* (nine possible) and number of non-A1 events, referred to as *other events* (21 possible). Although the possibility of weighting individual events by severity of the event was considered, we elected to count events. Notably, in the Currier et al. (2009) study, analyses were completed with both events that were weighted by severity and with those that were simply summed. Results were very similar, suggesting that weighting events for severity did not add significant additional information. Moreover, the simple summing of events is a technique also used by the Adverse Childhood Expe-

Table 2

*List of Traumatic Stressors Spontaneously Identified and Described by Participants on the University of California Los Angeles Posttraumatic Stress Disorder Reaction Index for Diagnostic and Statistical Manual of Mental Disorders (4th ed.)*

Cancer group ( <i>n</i> = 254)	Control group ( <i>n</i> = 142)
Different events	
Cancer <sup>a</sup>	Fight with a parent
Bike wreck	Getting lost
Death of a parent	Strep throat
Witnessed a shooting	Shots
Fear of the future	Finding out needed to have surgery
Parental deployment	Hearing about an accident
Watching a scary movie	Items stolen/break-in
	Haunted house
	Accused of wrongdoing when innocent
	Punishment (being spanked, threat of punishment)
	Moving/new school
	Mission trip
	Report made to Children and Family Services
	Siblings quirks
	Potential parent divorce
	Foreclosure
	Divorce of family members (aunt/uncle, grandparents)
	Feeling that couldn't breathe (from coughing or falling)
Similar events	
Death of a family member (cousin, aunt, grandparent, great-grandparent)	
Death of a friend—family friend	
Injury or illness in a family member	
Natural disaster—severe weather (severe thunderstorm, hurricane)	
Car wreck	
Injuries/illness that required hospital visit (stitches, broken bones, asthma attack)	
Death of a pet	
School issues (testing, homework, bad grades, not being prepared, unfriendly school)	
Separation of family (sibling moved out, lived with grandparents for short time)	
Specific phobias (clowns, snakes, dogs, monsters)	
Parental divorce	
Difficulties with a relationship (break-up, fight with a friend)	

*Note.* Events are delineated by group.

<sup>a</sup>Cancer (or a related topic) was spontaneously identified by 133 (52.4%) participants in the cancer group.

riences (ACE) study (Felitti et al., 1998) and other large cohort studies (e.g., Dube, Felitti, Dong, Giles, & Anda, 2003).

**UCLA PTSD Reaction Index for DSM-IV.** The University of California, Los Angeles Posttraumatic Stress Disorder Reaction Index for DSM-IV (UCLA PTSDI; Pynoos, Rodriguez, Steinberg, Stuber, & Frederick, 1998; Steinberg, Brymer, Decker, & Pynoos, 2004) is a 22-item self-report measure of how frequently in the past month children experienced the reexperiencing, avoidance, and arousal symptoms that characterize PTSD. Children are asked to identify their most stressful or traumatic event and then are directed to respond to all questions based on this event on a 4-point Likert scale. Children with cancer were not prompted to choose cancer as their most stressful event but were allowed to independently identify an event of their choosing (as were controls; see Table 2 for events chosen by participants). The primary variable of interest was the total score; scores above 38 are considered clinically significant (Steinberg et al., 2004).

**Children's Depression Inventory.** The Children's Depression Inventory (CDI; Kovacs, 1992) is a frequently used measure of children's depressive symptoms. Respondents choose one of three items that best applies across 27 items, with scores >16 indicating clinically significant symptomatology (Timbremont, Braet, & Dreessen, 2004). The total score was used for this study.

**Screen for Child Anxiety Related Emotional Disorders.** The Screen for Child Anxiety Related Emotional Disorders (SCARED; Birmaher et al., 1997) is a 41-item measure of anxiety, with items rated using a 3-point Likert scale. Subscales assess five specific anxiety disorders (e.g., generalized anxiety disorder, school avoidance) and the measure demonstrates sound psychometric properties (Birmaher et al., 1999). A total score was used, with scores above 25 considered clinically significant (Birmaher et al., 1999).

## Analytical Plan

To assess group differences in life events, chi-square analyses were used to determine statistical differences in the proportion of youth from each group who endorsed each event. Independent sample *t* tests were conducted to determine group differences in cumulative life events, including PTEs, other events, and total events. To assess possible influences of demographic factors on life events, we conducted a multiple regression analysis to determine the impact of group status (cancer vs. control) and theoretically relevant demographic factors (age, gender, SES, race).

The differential impact of PTEs and other events on psychological functioning was assessed through a two-step approach. First, Pearson correlations were computed to determine the association between frequency of life events (PTEs, other events, total events) and psychological functioning. Analyses were completed both with the sample as a whole and separately for each group (cancer and control). Fisher's *z* comparisons were conducted to determine the difference in magnitude for correlations with PTEs and other events. Second, a series of hierarchical regression analyses were conducted to determine the impact of PTEs versus other events on psychological functioning. Order of entry was consistent for each outcome measure: (a) group status (cancer vs. control); (b) significant demographic factors from the above multiple regression; (c) number of PTEs; and (d) number of other events. Exploratory

analyses assessed the potential moderation of group status on the impact of events on psychological functioning.

## Results

### Preliminary Analyses

Preliminary analyses were completed to characterize the psychological functioning of our sample with descriptive analyses for the UCLA PTSDI, SCARED, and CDI in Table 3. Mean scores are well below the clinical cutoff and within the normative range for both groups. There was a range of levels of distress, with 6%–33% of the sample (depending on the measure) scoring above clinical cutoffs. There were no group differences across measures, with regard to both means and the proportion of the sample that was above the clinical cutoff.

### Frequency of Events

The frequency of life events is listed in Table 4. Out of 30 possible events, children with cancer indicated an average of 8.12 events ( $SD = 3.84$ , range = 2–22), whereas control children reported an average of 7.25 events ( $SD = 3.42$ , range = 0–18). It is important to note that one of the events listed is "serious illness." Because all children with cancer could endorse this event (79.5% did) and no comparison children should have endorsed this event (9.9% did), we elected to temporarily remove this item from the scale. With that item removed, the average number of events endorsed by children with cancer ( $7.33 \pm 3.76$ ) and control children ( $7.15 \pm 3.36$ ) was comparable.

Given our interest in the influence of potentially traumatic events (PTEs), the 30 life events were subdivided into events that could meet A1 criteria (PTEs; nine events) and those that would likely not (other events; 21 events). Children with cancer endorsed

Table 3  
*Descriptive Statistics of Psychological Functioning*

Variable	Cancer ( <i>n</i> = 254)	Control ( <i>n</i> = 142)
UCLA PTSDI		
<i>M</i>	18.29	18.73
<i>SD</i>	13.83	14.67
Range	0–64	0–76
No. (%) above clinical cutoff <sup>a</sup>	28 (11%)	16 (11.3%)
SCARED		
<i>M</i>	18.67	20.99
<i>SD</i>	11.89	12.04
Range	0–82	1–57
No. (%) above clinical cutoff <sup>b</sup>	72 (28.3%)	48 (33.8%)
CDI		
<i>M</i>	6.45	6.73
<i>SD</i>	5.40	5.48
Range	0–28	0–25
No. (%) above clinical cutoff <sup>c</sup>	16 (6.3%)	10 (7.0%)

*Note.* There were no significant differences in psychological functioning between groups. UCLA PTSDI = University of California Los Angeles Posttraumatic Stress Disorder Reaction Index for *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.); SCARED = Screen for Child Anxiety Related Emotional Disorders; CDI = Children's Depression Inventory.

<sup>a</sup> Clinical cutoff = 38. <sup>b</sup> Clinical cutoff = 25. <sup>c</sup> Clinical cutoff = 16.



Table 4  
Frequency of Identified Life Events, Delineated by Cancer Versus Control

Variable	Cancer ( <i>n</i> = 254)	Control ( <i>n</i> = 142)	X <sup>2</sup>
	<i>N</i> (%)	<i>N</i> (%)	
Potentially traumatic events			
A parent died	11 (4.3)	0 (0.0)	6.32*
A grandparent died	149 (58.7)	93 (65.5)	1.79
A relative/close friend died	158 (62.2)	83 (58.5)	0.54
Abused (and reported)	10 (3.9)	6 (4.2)	0.02
Witnessed shooting/act of violence	21 (8.3)	5 (3.5)	3.34
Involved in natural disaster	97 (38.2)	38 (26.8)	5.29*
Car crash or serious accident	67 (26.4)	31 (21.8)	1.01
Injured and had to go to ER	89 (35.0)	38 (26.8)	2.86
Serious illness	202 (79.5)	14 (9.9)	178.30***
Total Events [ <i>M</i> ± <i>SD</i> (Range)] <sup>a</sup>	3.16 ± 1.51 (0–7)	2.17 ± 1.17 (0–5)	6.82***
Total Events (no illness) [ <i>M</i> ± <i>SD</i> (Range)] <sup>a</sup>	2.37 ± 1.38 (0–6)	2.07 ± 3.36 (0–5)	2.22*
Other events			
A brother or sister was born	155 (61.0)	92 (64.8)	0.55
Your parents separated	89 (35.0)	38 (26.8)	2.86
Your parents divorced	66 (26.0)	36 (25.4)	0.02
Your parent remarried	52 (20.5)	23 (16.2)	1.08
A parent became sick, hospitalized	56 (22.0)	33 (23.2)	0.07
A sibling became sick, hospitalized	38 (15.0)	18 (12.7)	0.39
Learned you were adopted	6 (2.4)	1 (0.7)	1.44
Parent lost a job and was unemployed	79 (31.1)	40 (28.2)	0.37
Parent’s job changed, less time at home	44 (17.3)	38 (26.8)	4.94*
Parents began fighting	32 (12.6)	25 (17.6)	1.85
Parent went to jail	41 (16.1)	8 (5.6)	9.28***
Moved to a new city	66 (26.0)	49 (34.5)	3.21
Parents worrying more about money	90 (35.4)	67 (47.2)	5.25*
Drug–alcohol problems in family	50 (19.7)	15 (10.6)	5.52*
Bullied at school or threatened	43 (16.9)	38 (26.8)	5.41*
Pet died	173 (68.1)	82 (57.7)	4.27*
Failed an important exam	45 (17.7)	35 (24.6)	2.71
Suspended or expelled	22 (8.7)	13 (9.2)	0.03
Attend court for wrongdoing	6 (2.4)	3 (2.1)	0.03
Boy–girlfriend broke up with you	70 (27.6)	38 (26.8)	0.03
Serious argument with parents	36 (14.2)	29 (20.4)	2.59
Total events [ <i>M</i> ± <i>SD</i> (range)] <sup>a</sup>	4.96 ± 2.99 (0–16)	5.08 ± 2.84 (0–15)	0.39
All events combined			
Total events [ <i>M</i> ± <i>SD</i> (range)] <sup>a</sup>	8.12 ± 3.84 (2–22)	7.25 ± 3.42 (0–18)	2.26*
Total events (no illness) [ <i>M</i> ± <i>SD</i> (range)] <sup>a</sup>	7.33 ± 3.76 (1–21)	7.15 ± 3.36 (0–18)	0.47

<sup>a</sup> Independent sample *t* test.

\* *p* < .05. \*\* *p* < .01.

significantly more PTEs than control children ( $3.16 \pm 1.51$  vs.  $2.17 \pm 1.17$ ),  $t(394) = 6.815$ ,  $p < .001$ . This difference remained when “serious illness” was removed,  $t(394) = 2.22$ ,  $p < .03$ . Items more commonly endorsed by children with cancer included death of a parent, witnessing an act of violence, involvement in a natural disaster, and emergency room visits. No PTEs were more commonly endorsed by control children. See Table 4 for all items.

In contrast, there were no significant differences in the number of other events reported by children with cancer and control children, though there was some variability in the individual events endorsed by each group (see Table 4). Specifically, children with cancer were more likely to endorse parental separation, parent jailed, drug–alcohol problems in the family, and death of a pet. In contrast, control children were more likely to endorse a change in a parent's job, parents' increased worry about money, and bullying at school.

Given the significant difference in SES between the two participant groups, questions were raised regarding the potential impact of demographic variables on cumulative life events. As such, a multiple regression was computed with demographic variables—group status (cancer vs. control), age, gender, SES, and race—as predictors of cumulative life events. Results revealed that the overall model was significant,  $F(5, 390) = 8.94$ ,  $p < .001$ ,  $R^2 = .091$ ; however, only two individual predictors reached significance. Specifically, there was a significant impact of age at evaluation (Std  $\beta = .22$ ,  $SE = 0.06$ ),  $t(390) = 4.50$ ,  $p < .001$ , and SES (Std  $\beta = -.20$ ,  $SE = 0.02$ ),  $t(390) = -4.08$ ,  $p < .001$  such that older age and lower SES were associated with a greater number of events. When regressions were run with PTEs and other events separately, age remained a significant predictor in both models. In contrast, SES was only a significant predictor of cumulative other events, not PTEs.

## Impact of Life Events

To explore the relationship between life events and ratings of psychological functioning (PTSS, depression, anxiety), Pearson correlations were computed. As seen in Table 5, correlations were generally significant ( $r_s = .32-.36$ ) between the three psychological functioning measures and cumulative life events. However, when correlations were analyzed separately for PTEs and other events, there was only a minimal association between cumulative incidence of PTEs and psychological functioning ( $r_s = .11-.16$ ). In contrast, the magnitude of the correlations between other events and psychological functioning was significantly stronger ( $r_s = .35-.37$ ; Fisher's  $z = -3.19-3.70$ ; see Table 5). The same pattern emerged when partial correlations were computed to control for group differences in SES (data not shown).

A similar picture emerged when correlations were computed separately for the participant groups (cancer and control). Specifically, there was a minimal and largely nonsignificant association between PTEs and measures of psychological functioning in children with cancer ( $r_s$  ranged from .05–.17). In contrast, correlations were larger and moderate when psychological functioning was associated with other events ( $r_s = .29-.33$ ; see Table 5). Fisher's  $z$  analyses confirmed that correlations with other events were significantly stronger ( $z_s = -1.82-2.83$ ). The same pattern emerged when correlations were computed with only the control group (see Table 5).

To determine whether the associations between number of events and psychological functioning varied by group status, we computed Fisher's  $z$  analyses. Results revealed no significant differences between correlations computed separately with the cancer and control group ( $z_s = 0.1-1.22$ ).

Table 5

*Pearson Correlations Between Cumulative Life Events (Total Events, Potentially Traumatic Events [PTEs], and Other Events) and Measures of Psychological Functioning*

	Total events <i>r</i>	PTEs <i>r</i>	Other events <i>r</i>	Fisher's $z^a$
All patients ( $N = 396$ )				
UCLA PTSDI	.36***	.16**	.37***	-3.19***
CDI	.33***	.12*	.36***	-3.70***
SCARED	.32***	.11*	.35***	-3.57***
Cancer only ( $n = 254$ )				
UCLA PTSDI	.33***	.17*	.33***	-1.82*
CDI	.26**	.05	.29***	-2.83**
SCARED	.31***	.13	.32***	-2.27*
Control only ( $n = 142$ )				
UCLA PTSDI	.39***	.18**	.40***	-2.00*
CDI	.38***	.17**	.40***	-2.13*
SCARED	.34***	.16*	.36***	-1.88*

Note. UCLA PTSDI = University of California Los Angeles Posttraumatic Stress Disorder Reaction Index for *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.); CDI = Children's Depression Inventory; SCARED = Screen for Child Anxiety Related Emotional Disorders.

<sup>a</sup> Fisher's exact test to evaluate differences in magnitude of correlations between associations with PTEs and other events.

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

## Predictors of Psychological Functioning

Hierarchical regression analyses were conducted to determine the unique impact of PTEs versus other events on psychological functioning. Order of entry into the model was consistent across the three models, with variables entered at separate steps: (a) group status (cancer vs. control), (b) SES and age at evaluation, (c) number of PTEs, and (d) number of other events. The results of each regression are presented in Table 6.

Results of the regression models were generally consistent across the three measures. First, there was no significant impact of group status (cancer vs. control) on psychological functioning. Second, demographic factors—SES and age—did generally significantly impact psychological functioning, accounting for approximately 4% of the variance (UCLA PTSDI and SCARED; no impact for the CDI). Third, the impact of cumulative PTEs was small, but significant, with  $R^2$  values ranging from .02 (CDI) to .03 (UCLA PTSDI). Finally, the impact of cumulative other events was much larger, with  $R^2 \geq .10$ .

Finally, given our interest in the differential impact of life events on psychological functioning based on group status (cancer vs. control), we ran exploratory analyses to test for moderation. Regression models had similar outcomes regardless of the group analyzed, thus demonstrating that group status does not moderate the relationship between life events and psychological functioning.

## Discussion

The objective of this article was to examine the differential impact of potentially traumatic events and other significant life events on psychological functioning in children with cancer and community controls. Both groups demonstrated psychological functioning within normative limits; however, a proportion evidenced mean scores suggestive of clinical levels of distress. Results revealed that children with cancer endorsed more cumulative life events than controls (approximately one event). However this difference disappeared when the "serious illness" item was removed from the scale. Moreover, when life events were distinguished between PTEs and other stressful life events, children with cancer endorsed experiencing significantly more PTEs than controls. There were no group differences in other events. The overall number of cumulative life events was significantly associated with psychological functioning; however, in contrast to expectations, the magnitude of this association was dependent on the type of event evaluated. Specifically, the association between psychological functioning and other events was significantly stronger than that with PTEs. Hierarchical regression analyses confirmed this pattern, with other events accounting for approximately 10% of the variance in psychological functioning, over and above the influence of group status, demographic factors, and cumulative PTEs. This would suggest that although cumulative incidence of negative life events is associated with psychological distress, this relationship is driven by incidence of events that would not meet *DSM-IV* A1 criteria (e.g., family or school problems), rather than more potentially traumatic events. Moreover, this relationship is similar for both children with cancer and community controls, as exploratory analyses revealed that group status does not moderate this relationship. Our results both replicate and extend the prior work of Currier et al. (2009), who demonstrated that more cumulative

Table 6

*Hierarchical Regression Analyses to Evaluate the Impact of Potentially Traumatic Events (PTEs) Versus Other Events on Psychological Functioning*

	<i>Std</i> $\beta$	<i>SE</i>	<i>t</i>	<i>F</i>	$\Delta R^2$	$\Delta F$
UCLA PTSD Reaction Index for <i>DSM-IV</i> (UCLA PTSDI)						
Step 1				0.09	—	—
Cancer vs. control	.02	1.48	0.29			
Step 2				5.85**	.04	8.73***
SES	-.21	0.06	-4.13***			
Age	-.04	0.24	-0.81			
Step 3				7.72***	.03	12.79***
PTEs	.19	0.50	3.97***			
Step 4				15.94***	.10	45.32***
Other events	.35	0.25	6.73***			
Children's Depression Inventory (CDI)						
Step 1				0.25	—	—
Cancer vs. control	.02	0.57	0.50			
Step 2				2.20	.02	3.18*
SES	-.13	0.02	-2.49*			
Age	.01	0.09	0.29			
Step 3				3.18*	.02	6.03*
PTEs	.13	0.20	2.46*			
Step 4				12.44***	.11	47.96***
Other Events	.36	0.10	6.92***			
Screen for Child Anxiety Related Emotional Disorders (SCARED)						
Step 1				3.43	—	—
Cancer vs. control	.09	1.25	1.85			
Step 2				7.66***	.05	9.70***
SES	-.17	0.05	-3.36**			
Age	-.15	0.20	-2.98**			
Step 3				8.56***	.02	10.69**
PTEs	.17	0.42	3.27**			
Step 4				17.42***	.10	48.65***
Other events	.36	0.21	6.98***			

Note. SES = socioeconomic status.

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

life events was associated with greater PTSS in children with cancer.

The current findings are consistent with past research that has indicated that significant life events do not have to meet *DSM-IV* A1 criteria to be associated with psychological distress (Gold et al., 2005; Van Hooff, McFarlane, Baur, Abraham, & Barnes, 2009; Verlinden et al., 2013). Indeed, our results suggest that, even for those youth who have experienced an A1 event (e.g., our cancer patients) the impact of other events on psychological functioning is stronger than that of PTEs. Such findings are supported by recent research that suggests that a child's perception of an event (e.g., *DSM-IV* A2 criteria) is more important for the development of PTSS-PTSD than the severity or traumatic nature of the event (e.g., *DSM-IV* A1 criteria; Verlinden et al., 2013). This is perhaps ironic, given the elimination of A2 criteria from the *DSM-5* (American Psychiatric Association, 2013), ostensibly because of a lack of predictive validity. Although A2 criteria was not explicitly measured in our study, that other events were more indicative of psychological functioning than PTEs could be explained by children's perceptions of those events (e.g., A2 criteria). For example, a child could have very different perceptions of the severity of an "other" event as compared with a PTE (e.g., the death of a pet may have a significantly greater impact on their psychological distress

than the death of a grandparent they have never met). However, without knowing more about these events, we cannot explicitly evaluate this hypothesis.

Our life events measure generally captured significant events that have the potential to have a lasting impact on a child's world and thus psychological functioning as well (e.g., parental divorce, moving to a new city). These events, although not likely to meet *DSM-IV* or *DSM-5* criteria, certainly have the potential to precipitate psychological distress, and this was demonstrated in this study. In contrast, a smaller proportion of the events captured were those that may have less of a lasting impact but may also occur with more frequency and have the potential to repeat (e.g., failing a test, death of a pet, break-up of a romantic relationship). Although still significant, these latter events may be better assessed as part of a measure of daily stress or frequent stress, rather than stressful life events per se. This does not suggest that these events are not equally important but rather begs the question of the impact of daily-more frequent stressors on psychological functioning (Chamberlain & Zika, 1990).

In addition to the intensity of events, there remains the question of alternate ways to classify events that may be more predictive of or relevant to psychological functioning. One such category would be events that involve an interpersonal relationship and those that

do not. Specifically, past research (Lancaster et al., 2009) has suggested that individuals who experience traumatic events that are interpersonal in nature evidence higher levels of PTSS than those who experience noninterpersonal traumatic events. Similarly, a study of preschool-age children suggested that interpersonal events, and particularly those that involved a change to the structure of the family (e.g., parental job change, divorce, moving), were indicative of mental health outcomes (Furniss et al., 2009). Although beyond the scope of this study, examination of the LESC suggested that a large percentage of the events directly involve or affect a friend or family member. Given the importance of the family in child development, and in particular for children undergoing treatment for a serious illness like cancer, these effects warrant further attention.

Limitations to consider include lack of method variance, as all measures were self-report in nature. However, we felt it was most appropriate in our design that both life events and psychological functioning be based on youth's perceptions of these factors. Relatedly, our measures of psychological distress focused exclusively on internalizing concerns and not externalizing behaviors. Although children are often reliable reporters of their internal thoughts and feelings, they may be less dependable with regard to ratings of their behavior. Future studies may wish to examine concordance of self and parent report of stressful life events and/or psychological functioning and would benefit from the inclusion of measures of externalizing behaviors as well. Past studies using the LESC have demonstrated significant differences between parent and child report of negative life events, though adequate agreement regarding specific events was also found (Currier et al., 2009; Johnston et al., 2003). Relatedly, no additional information was gathered regarding the experiences of our sample's nine PTEs. As such, it is quite possible that many endorsed PTEs would not meet *DSM-IV* (or *DSM-5*) A criteria. However, given that our findings confirmed some prior research that non-PTEs have greater effect with regard to psychological functioning (Copeland et al., 2010; Gold et al., 2005; Verlinden et al., 2013), this reduced our concern regarding this limitation. Similarly, we did not collect information about how often each event occurred. It is certainly possible that many of the other events occurred more than once, and this may be true of some PTEs as well. Finally, our sample was not highly distressed, with mean scores falling within normative limits. However, we were still able to account for significant variance in psychological functioning.

Ultimately, our findings highlight the impact of stressful life events on psychological functioning in children, regardless of illness history. More specifically, psychological functioning appears to be most affected by likely nontraumatic events that although still significant would not necessarily qualify an individual for a diagnosis of PTSD. Given this, it would be prudent for clinicians to assess a wide range of negative life events as a potential cause of or contributor to difficulties with psychological functioning. Moreover, assessment of interpersonal life events may be particularly important, though this will require confirmation through additional research.

## References

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev.). Washington, DC: Author.

- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: Author.
- Barakat, L. P., Kazak, A. E., Meadows, A. T., Casey, R., Meeske, K., & Stuber, M. L. (1997). Families surviving childhood cancer: A comparison of posttraumatic stress symptoms with families of healthy children. *Journal of Pediatric Psychology*, 22, 843–859. <http://dx.doi.org/10.1093/jpepsy/22.6.843>
- Barratt, W. (2006). *The Barratt Simplified Measure of Social Status (BSMSS) measuring SES*. Indiana State University. Retrieved from [http://wbarratt.indstate.edu/socialclass/Barratt\\_Simplified\\_Measure\\_of\\_Social\\_Status.pdf](http://wbarratt.indstate.edu/socialclass/Barratt_Simplified_Measure_of_Social_Status.pdf)
- Birmaher, B., Brent, D. A., Chiappetta, L., Bridge, J., Monga, S., & Baugher, M. (1999). Psychometric properties of the Screen for Child Anxiety Related Emotional Disorders (SCARED): A replication study. *Journal of the American Academy of Child & Adolescent Psychiatry*, 38, 1230–1236. <http://dx.doi.org/10.1097/00004583-199910000-00011>
- Birmaher, B., Khetarpal, S., Brent, D., Cully, M., Balach, L., Kaufman, J., & Neer, S. M. (1997). The Screen for Child Anxiety Related Emotional Disorders (SCARED): Scale construction and psychometric characteristics. *Journal of the American Academy of Child & Adolescent Psychiatry*, 36, 545–553. <http://dx.doi.org/10.1097/00004583-199704000-00018>
- Bruce, M. (2006). A systematic and conceptual review of posttraumatic stress in childhood cancer survivors and their parents. *Clinical Psychology Review*, 26, 233–256. <http://dx.doi.org/10.1016/j.cpr.2005.10.002>
- Cameron, A., Palm, K., & Follette, V. (2010). Reaction to stressful life events: What predicts symptom severity? *Journal of Anxiety Disorders*, 24, 645–649. <http://dx.doi.org/10.1016/j.janxdis.2010.04.008>
- Chamberlain, K., & Zika, S. (1990). The minor events approach to stress: Support for the use of daily hassles. *British Journal of Psychology*, 81, 469–481. <http://dx.doi.org/10.1111/j.2044-8295.1990.tb02373.x>
- Coddington, R. D. (1972). The significance of life events as etiologic factors in the diseases of children. II. A study of a normal population. *Journal of Psychosomatic Research*, 16, 205–213. [http://dx.doi.org/10.1016/0022-3999\(72\)90045-1](http://dx.doi.org/10.1016/0022-3999(72)90045-1)
- Copeland, W. E., Keeler, G., Angold, A., & Costello, E. J. (2010). Post-traumatic stress without trauma in children. *The American Journal of Psychiatry*, 167, 1059–1065. <http://dx.doi.org/10.1176/appi.ajp.2010.09020178>
- Currier, J. M., Jobe-Shields, L. E., & Phipps, S. (2009). Stressful life events and posttraumatic stress symptoms in children with cancer. *Journal of Traumatic Stress*, 22, 28–35. <http://dx.doi.org/10.1002/jts.20382>
- Dube, S. R., Felitti, V. J., Dong, M., Giles, W. H., & Anda, R. F. (2003). The impact of adverse childhood experiences on health problems: Evidence from four birth cohorts dating back to 1900. *Preventive Medicine*, 37, 268–277. [http://dx.doi.org/10.1016/S0091-7435\(03\)00123-3](http://dx.doi.org/10.1016/S0091-7435(03)00123-3)
- Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., . . . Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *American Journal of Preventive Medicine*, 14, 245–258. [http://dx.doi.org/10.1016/S0749-3797\(98\)00017-8](http://dx.doi.org/10.1016/S0749-3797(98)00017-8)
- Furniss, T., Beyer, T., & Müller, J. M. (2009). Impact of life events on child mental health before school entry at age six. *European Child & Adolescent Psychiatry*, 18, 717–724. <http://dx.doi.org/10.1007/s00787-009-0013-z>
- Gold, S. D., Marx, B. P., Soler-Baillo, J. M., & Sloan, D. M. (2005). Is life stress more traumatic than traumatic stress? *Journal of Anxiety Disorders*, 19, 687–698. <http://dx.doi.org/10.1016/j.janxdis.2004.06.002>
- Howard Sharp, K. M., Rowe, A. E., Russell, K., Long, A., & Phipps, S. (2014). Predictors of psychological functioning in children with cancer: Disposition and cumulative life stressors. *Psycho-Oncology*. Advance online publication. <http://dx.doi.org/10.1002/pon.3643>



- Johnston, C. A., Steele, R. G., Herrera, E. A., & Phipps, S. (2003). Parent and child reporting of negative life events: Discrepancy and agreement across pediatric samples. *Journal of Pediatric Psychology*, 28, 579–588. <http://dx.doi.org/10.1093/jpepsy/jsg048>
- Kovacs, M. (1992). *Children's Depression Inventory, CDI Manual*. North Tonawanda, NY: Multi-Health Systems.
- Lancaster, S. L., Melka, S. E., & Rodriguez, B. F. (2009). An examination of the differential effects of the experience of *DSM-IV* defined traumatic events and life stressors. *Journal of Anxiety Disorders*, 23, 711–717. <http://dx.doi.org/10.1016/j.janxdis.2009.02.010>
- Maurice-Stam, H., Oort, F. J., Last, B. F., Brons, P. P. T., Caron, H. N., & Grootenhuis, M. A. (2009). School-aged children after the end of successful treatment of non-central nervous system cancer: Longitudinal assessment of health-related quality of life, anxiety and coping. *European Journal of Cancer Care*, 18, 401–410. <http://dx.doi.org/10.1111/j.1365-2354.2008.01041.x>
- Phipps, S., Jurbergs, N., & Long, A. (2009). Symptoms of post-traumatic stress in children with cancer: Does personality trump health status? *Psycho-Oncology*, 18, 992–1002. <http://dx.doi.org/10.1002/pon.1496>
- Phipps, S., Klosky, J. L., Long, A., Hudson, M. M., Huang, Q., Zhang, H., & Noll, R. B. (2014). Posttraumatic stress and psychological growth in children with cancer: Has the traumatic impact of cancer been overestimated? *Journal of Clinical Oncology*, 32, 641–646. <http://dx.doi.org/10.1200/JCO.2013.49.8212>
- Pynoos, R., Rodriguez, N., Steinberg, N., Stuber, M., & Frederick, C. (1998). *UCLA PTSD Index for DSM-IV*. Unpublished manual, UCLA Trauma Psychiatry Service, Los Angeles, CA.
- Robinson, J. S., & Larson, C. (2010). Are traumatic events necessary to elicit symptoms of posttraumatic stress? *Psychological Trauma: Theory, Research, Practice, and Policy*, 2, 71–76. <http://dx.doi.org/10.1037/a0018954>
- Steinberg, A. M., Brymer, M. J., Decker, K. B., & Pynoos, R. S. (2004). The University of California at Los Angeles Post-traumatic Stress Disorder Reaction Index. *Current Psychiatry Reports*, 6, 96–100. <http://dx.doi.org/10.1007/s11920-004-0048-2>
- Timbremont, B., Braet, C., & Dreessen, L. (2004). Assessing depression in youth: Relation between the Children's Depression Inventory and a structured interview. *Journal of Clinical Child and Adolescent Psychology*, 33, 149–157. [http://dx.doi.org/10.1207/S15374424JCCP3301\\_14](http://dx.doi.org/10.1207/S15374424JCCP3301_14)
- Van Hooff, M., McFarlane, A. C., Baur, J., Abraham, M., & Barnes, D. J. (2009). The stressor Criterion-A1 and PTSD: A matter of opinion? *Journal of Anxiety Disorders*, 23, 77–86. <http://dx.doi.org/10.1016/j.janxdis.2008.04.001>
- Verlinden, E., Schippers, M., Van Meijel, E. P. M., Beer, R., Opmeer, B. C., Olf, M., . . . Lindauer, R. J. L. (2013). What makes a life event traumatic for a child? The predictive values of DSM-Criteria A1 and A2. *European Journal of Psychotraumatology*, 4, 20436. <http://dx.doi.org/10.3402/ejpt.v4i0.20436>
- Wechsler, A. M., & Sánchez-Iglesias, I. (2013). Psychological adjustment of children with cancer as compared with healthy children: A meta-analysis. *European Journal of Cancer Care*, 22, 314–325. <http://dx.doi.org/10.1111/ecc.12031>

Received June 10, 2014

Revision received August 29, 2014

Accepted October 13, 2014 ■