Health Psychology
2014, Vol. 33, No. 8, 853–861

0278-6133/14/$12.00 http://dx.doi.org/10.1037/hea0000083

Children and Adolescents Coping With Cancer: Self- and Parent Reports of Coping and Anxiety/Depression

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Objective: The diagnosis and treatment of cancer present children and adolescents with significant stress. However, research on the ways that children and adolescents cope with cancer-related stress has not yielded clear findings on the efficacy of different coping strategies, and has been limited by reliance primarily on self-reports of both coping and distress. To address this gap, the current study used a control-based model of coping to examine self- and parent reports of child/adolescent coping and symptoms of anxiety and depression in a sample of children with cancer. ***Method:*** Children and adolescents (5 to 17 years old) and their parents were recruited near the time of a child's diagnosis or relapse of cancer (M = 1.30 months postdiagnosis). Child self-reports (n = 153), mother reports (n = 297), and father reports (n = 161) of children's coping and symptoms of anxiety/depression were obtained. ***Results:*** Bivariate correlations revealed significant associations for secondary control coping (efforts to adapt to source of stress; e.g., acceptance, cognitive reappraisal) and disengagement coping (e.g., avoidance, denial) with anxiety/depression within and across informants. Linear multiple regression analyses indicated that secondary control coping accounted for unique variance in symptoms of anxiety/depression both within and across informants. ***Conclusions:*** Secondary control coping appears important for children and adolescents during early phases of treatment for cancer, and it may serve as an important target for future interventions to enhance adjustment in these children.

Keywords: childhood cancer, coping, anxiety/depression, multi-informant

Over 12,000 children are faced with significant stress associated with a cancer diagnosis and treatment annually in the United States (Jemal, Siegel, Xu, & Ward, 2010). The stressful aspects of cancer for children include disruptions in daily/role functioning (e.g., missing school, disrupted peer relationships), physical effects of treatment (e.g., feeling sick from treatments), uncertainty about the disease and its treatment (e.g., not understanding medical professionals), and fears about death (e.g., Rodriguez et al., 2012; Varni & Katz, 1997). These sources of stress are associated with increased emotional distress, including symptoms of anxiety and depression, in a subgroup of patients, particularly near the time of diagnosis and early in the treatment process (e.g., Kazak, Boeving, Alderfer, Hwang, & Reilly 2005; Patenaude & Kupst, 2005; Pinquart & Shen, 2011). Thus, it is important to understand the ways that children cope with cancer-specific stress in order to inform psychosocial interventions to facilitate more adaptive coping skills for these children. Early intervention and prevention of subsequent emotional distress is predicated on knowledge about how children cope during the early weeks and months after a diagnosis and in early treatment.

Despite the potential importance of this topic, research on children's coping with cancer has not provided a clear picture of the types of coping strategies that are associated with varying levels of distress. In a meta-analytic review of research on children's coping with cancer, Aldridge and Roesch (2007) examined findings from 26 studies of the association between coping and emotional distress and other indicators of adjustment. Coping was categorized according to two taxonomies: approach versus avoidance coping and problem-focused versus emotion-focused coping. It is note-

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This research was supported by Grant R01CA118332 from the National Cancer Institute, a gift from Patricia and Rodes Hart, and intramural funding from The Research Institute at Nationwide Children's Hospital.

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worthy that only one of 24 effect sizes for the association (correlation) between coping and adjustment was statistically significant, reflecting a small *positive* association between emotion-focused coping and depressive symptoms. Several moderators of effects across these 26 studies were identified including time since diagnosis (varying from 2 to 96 months), study type (descriptive vs. intervention), and type of stressor (general cancer stress vs. specific procedural stress). The meta-analysis by Aldridge and Roesch provided a much-needed synthesis of the literature on coping in children with cancer. However, the absence of consistent associations between children's coping and emotional distress/adjustment highlights important limitations in previous studies and directions for future research. Specifically, Aldridge and Roesch noted that there is a need for greater clarity in the conceptualization of coping, use of standardized and validated measures of coping, and careful attention to methodological issues, especially the use of multiple informants and a focus on specific points in the process of diagnosis, treatment, and recovery.[1]

A recent review suggests that there has been progress in understanding the ways that children and adolescents more generally cope with chronic illness, including cancer (Compas, Jaser, Dunn, & Rodriguez, 2012). Specifically, the level of actual and perceived controllability of illness-related stress is important for understanding the ways that children and adolescents cope with chronic illness. Drawing on Weisz and colleagues' (e.g., Band & Weisz, 1990; Han, Weisz, & Weiss, 2001; Rothbaum, Weisz, & Snyder, 1982; Rudolph, Dennig, & Weisz, 1995; Weisz, Rothbaum, & Blackburn, 1984) model of child/adolescent perceived control (i.e., the capacity to cause an intended outcome), three types of coping can be distinguished—primary control coping, secondary control coping, and disengagement coping (Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001; Compas et al., 2012; Connor-Smith, Compas, Wadsworth, Thomsen, & Saltzman, 2000). Primary control coping includes strategies intended to directly change the source of stress (e.g., problem solving) or one's emotional reactions to the stressor (e.g., emotional expression and emotional modulation). Secondary control coping encompasses efforts to adapt to stress (e.g., cognitive reappraisal, positive thinking, acceptance). Finally, disengagement coping includes efforts to orient away from the source of stress or one's reactions to it (e.g., avoidance, denial, wishful thinking). Confirmatory factor analyses have supported a three-factor structure that is consistent with this model with culturally diverse samples of children and adolescents coping with a range of different types of stress, including illness-related stress (e.g., Benson et al., 2011; Compas et al., 2006; Connor-Smith et al., 2000; Connor-Smith & Calvete, 2004; Wadsworth, Reickmann, Benson, & Compas, 2004; Yao et al., 2010). Further, significant associations between these three types of coping and emotional distress have been found for children coping with several pediatric conditions, including diabetes (e.g., Jaser & White, 2011) and chronic pain (e.g., Hocking et al., 2011).

The current study addresses several of the conceptual and methodological issues in the studies reviewed by Aldridge and Roesch (2007). First, building on the findings reviewed by Compas et al. (2012), this study was guided by the control-based model of coping to examine children's use of primary control, secondary control, and disengagement coping. Because a cancer diagnosis and treatment presents children with high levels of uncontrollable stress, this model may generate informative findings on the links between coping and distress, and expands on findings from previous models based on distinctions between approach-avoidance and problem-focused versus emotion-focused coping (Aldridge & Roesch, 2007). Children and adolescents with cancer must contend with stress that is mostly beyond their control, suggesting that secondary control coping may be most adaptive. Second, previous studies have relied on single informants, most often children's self-reports, to assess both coping and emotional distress (e.g., Canning, Canning, & Boyce, 1992). It will be valuable to examine parent reports about their children's coping and the associations of child coping and distress across child and parent reports (De Los Reyes, Thomas, Goodman, & Kundley, 2013). Third, the association between coping and emotional distress may vary as a function of time since diagnosis. It is important to study the relations between coping and adjustment during the initial months after diagnosis when children's levels of distress are highest. In this study, children's coping and emotional distress were assessed within the first several months after diagnosis during active treatment.

In the current study, we examined child/adolescent self-reports and parent reports of their children's coping and symptoms of anxiety and depression in a sample of children and adolescents who were recently diagnosed with cancer. We conducted descriptive analyses to examine the cross-informant correlations between parent and child reports of children's coping and emotional distress and the association of children's coping with possible demographic and medical covariates (e.g., age, diagnosis). We tested the following hypotheses: First, in bivariate analyses within and across child and parent reports, children's primary and secondary control coping would be negatively correlated with anxiety and depressive symptoms, and disengagement coping would be positively correlated with anxiety/depression. Second, in linear multivariate regression analyses within and across informants, examining all three types of coping as predictors of symptoms of anxiety/depression, unique effects would be found only for secondary control coping as a predictor of anxiety/depression symptoms.

Method

Participants

Eligible families had a child who (a) was age 5 to 17 years, (b) had been recently diagnosed with a new or relapsed cancer, (c) was receiving treatment through the oncology division, and (d) had no preexisting developmental disability. A total of 334 families of children and adolescents with cancer (ages 5 to 17 years old) provided data for this study. This sample represents 87% of 385 patients who were eligible for participation. Mothers ($n = 293$) and fathers ($n = 161$) who participated provided reports on children within the sample ages 5 to 17 years old, and we obtained self-reports for all children/adolescents ages 10 to 17 years old.

[1] Several studies have reported on children's coping with cancer since the Aldridge and Roesch (2007) meta-analysis (e.g., Engvall, Mattsson, von Essen, & Hedstrom, 2011; Hildenbrand, Clawson, Alderfer, & Marsac, 2011; Li, Chung, Ho, Chiu, & Lopez, 2011; Wu, Chin, Chen, Lai, & Tseng, 2011). However, these studies have typically used qualitative rather than quantitative methods to measure coping, and they have not reported findings on the relations between coping and standardized measures of children's emotional distress.

For all families included in the study, children were, on average, 10.6 years old ($SD = 3.9$), and 52% ($n = 170$) were male. Children had diagnoses of leukemia (37%; $n = 120$), lymphoma (26%; $n = 84$), brain tumor (8%; $n = 26$), and other solid tumors (e.g., osteosarcoma, Wilm's tumor; 30%; $n = 98$). Thirty-seven children were recruited into the study following a relapse of their original cancer. For those children who were old enough to provide self-report data (10 to 17 years-old; $n = 153$), the sample was, on average, 13.4 years old ($SD = 2.4$); 48% ($n = 76$) male; 90% ($n = 141$) White/Caucasian, 8% ($n = 12$) Black/African American, and 2% ($n = 4$) other. These children had diagnoses of leukemia (33%; $n = 51$), lymphoma (34%; $n = 53$), brain tumor (5%; $n = 7$), and other solid tumor (29%; $n = 46$). Sixteen (10%) children had relapsed disease.

Mothers were, on average, 37.2 years old ($SD = 7.09$), and fathers were 39.8 years old ($SD = 7.4$). Parents' race was 85% White/Caucasian, 10% Black/African American, 0.3% Asian American, 0.3% American Indian/Native Alaskan, and 5% other. The families had a variety of annual income levels: 27.7% earned $25,000 or less, 28% earned $25,001 to $50,000, 14.3% earned $50,001 to $75,000, 11.6% earned $75,001 to $100,000, and 14.9% earned over $100,000.

Measures

Demographic and medical data. Parents provided demographic information, including age, education level, race, family income, and marital status. Parents gave permission for the research staff to access medical data, where the child's diagnosis/relapse status was extracted.

Children's coping. The Responses to Stress Questionnaire-Pediatric Cancer version (RSQ-PC; Connor-Smith et al., 2000; Miller et al., 2009; Rodriguez et al., 2012) was used to obtain adolescents' self-reports and mothers' and fathers' reports of their children's coping with cancer. The RSQ-PC version includes a list of 12 cancer-related stressors (e.g., missing school, frequent hospital or clinic visits, changes in personal appearance), and 57 items reflecting voluntary (coping) and involuntary (automatic) stress responses of children/adolescents in response to cancer-related stressors. Because this study was focused on children's coping responses, only the three voluntary coping scales are reported. The coping scales include primary control coping (i.e., problem solving, emotional modulation, emotional expression), secondary control coping (i.e., acceptance, cognitive restructuring, positive thinking, distraction), and disengagement coping (i.e., avoidance, denial, wishful thinking). Using the standard method for scoring the RSQ, and to control for response bias and individual differences in base rates of item endorsement, proportion scores were calculated by dividing the total score for each factor by the total score for the entire RSQ (Connor-Smith et al., 2000; Osowiecki & Compas, 1998, 1999; Vitaliano, DeWolfe, Maiuro, Russo, & Katon, 1990). In the current sample, internal consistencies of children's self-reports (ages 10 to 17) were primary control, $\alpha = .81$; secondary control, $\alpha = .84$; and disengagement, $\alpha = .82$. Internal consistencies for mother and father reports, respectively, were primary control, $\alpha = .66/.74$; secondary control, $\alpha = .87/.85$; and disengagement, $\alpha = .71/.69$. The factor structure of the RSQ has been supported in confirmatory factor analytic studies with children and adolescents from a wide range of ethnic and cultural backgrounds coping with a variety of stressors (e.g., Benson et al., 2011; Compas et al., 2006; Connor-Smith et al., 2000; Wadsworth et al., 2004; Yao et al., 2010).

Children's emotional distress. Adolescent self-report symptoms of anxiety and depression were assessed using the Youth Self-Report (YSR). Reliability and validity of the YSR are well established, and normative *T* scores are based on a nationally representative sample of adolescents, ages 10 to 17 years old (Achenbach & Rescorla, 2001). Mothers' and fathers' reports of their children's symptoms of anxiety and depression were assessed with the Child Behavior Checklist (CBCL). Reliability and validity are also well established for the CBCL, and normative *T* scores are derived from a parents' reports on a nationally representative sample of children and youth ages 6 to 17 years old (Achenbach & Rescorla, 2001).

For both the YSR and CBCL, the Anxious-Depressed, Affective Problems, and Anxiety Problems scales are reported here to provide indices of children's distress. However, analyses of associations with coping are reported only for the Anxious-Depressed scale to limit the number of analyses, and because this scale does not include somatic items that may be a direct consequence of a child's cancer or treatment.

Procedure

The institutional review boards at two hospitals in the Southern and Midwestern United States approved the study protocol. Children were identified from cancer registries at the two pediatric oncology centers, and parents were approached in the clinic or hospital by a member of the research team to introduce the study. Parents who were willing to participate completed an informed consent form, and children (ages 10 to 17 years) completed an assent form. Questionnaire packets were given to participants to complete at the hospital or at home. In the case that only one parent was present, consent forms and questionnaires were sent home for the other parent. Families were approached between several weeks and months after the child's first diagnosis or relapse ($M = 1.30$ months, $SD = 0.89$). Parents and children returned the questionnaires between several weeks and months after the child's first diagnosis or relapse ($M = 2.37$ months, $SD = 1.89$). Families received compensation when at least one parent or child completed the measures.

Data Analytic Strategy and Statistical Power

Three sets of analyses were conducted using SPSS (19th ed.). First, descriptive analyses examined mean levels of children's coping and symptoms of anxiety/depression, cross-informant correlations of children's coping and anxiety/depression, and correlations of possible covariates with symptoms of anxiety/depression. Next, to test the first hypothesis, bivariate Pearson correlation analyses examined the associations of the three types of coping with symptoms of anxiety/depression within and across informants. Finally, to test the second hypothesis, linear multivariate regression analyses of the unique associations of children's coping with symptoms of anxiety/depression when all three types of coping were entered simultaneously. To control for demographic and medical variables, child gender and race, age at time of diagnosis, type of cancer diagnosis, first diagnosis versus relapse,

and time since diagnosis were entered in all of the regression analyses.

The sample sizes for the within informant analyses were $n = 153$ children, $n = 297$ mothers, and $n = 161$ fathers. A priori power analyses indicated we had power of .80 to detect associations of $r > .23$ for analyses with child self-reports, $r > .16$ for analyses with mother reports, and $r > .22$ for analyses with father reports. Sample sizes for the cross-informant analyses were $n = 143$ pairs of children and mothers, $n = 77$ pairs of children and fathers, and $n = 149$ pairs of mothers and fathers. We had power of .80 to detect correlations of $r > .23$ for analyses of child and mother reports, $r > .32$ for analyses of child and father reports, and $r > .23$ for analyses of mother and father reports. Because of the number of correlations and regressions, we set a level of $p < .01$ of significant effects.

Results

Preliminary Analyses

Descriptive statistics. Means and standard deviations are presented in Table 1 for child, mother, and father reports of children's coping on the RSQ and levels of children's anxiety/depression from the YSR (child report) and CBCL (mother and father report). Scores on these scales indicate, on average, mild to moderate levels of distress, with mean *T* scores ranging from approximately 0.36 to 0.60 standard deviations above the normative mean (i.e., a mean elevation of approximately 0.50 or a moderate effect size). The percentage of children with clinically elevated anxiety/depression ($T > 70$) scores ranged from 2% to 4.5%, according to mother (2.0%), father (1.8%), and child report (4.5%). Further, 5.5% to 9.6% of children obtained *T* scores at or above the borderline cutoff ($T > 65$) on the anxiety/depression scale, which again varied according to mother report (7.5%), father report (5.5%), and child self-report (9.6%).

Site comparisons. In a series of *t* tests, no significant differences were found between sites for age of child, $t = 0.54$, $p = .59$, type of tumor, $t = .43$, $p = .67$, time since diagnosis, $t = 1.78$, $p = .08$, CBCL anxiety/depression (mother report, $t = 0.64$, $p = .53$; father report, $t = 1.23$, $p = .22$), YSR anxiety/depression, $t = 0.96$, $p = .33$, and coping scores (primary control coping, $t = 0.14$ to 0.95, ps $> .38$; secondary control coping, $t = 0.04$ to $.0.64$, ps $> .34$; disengagement coping, $t = 0.39$ to 0.88, ps $> .53$). Therefore, all analyses included combined data from both sites.

Possible covariates. *T* tests, ANOVAs, and bivariate correlations examined the association of anxiety/depression symptoms with time since diagnosis or relapse, diagnosis type (i.e., leukemia, lymphoma, brain tumor, and other solid tumor), and relapse status (i.e., first diagnosis or relapsed disease). Days since first diagnosis or relapse was not significantly correlated with child levels of anxiety/depression as reported by parents or children (correlations ranged from $r = .06$ to $.13$; ps $> .09$). A series of one-way ANOVAs yielded no significant group differences in child levels of anxiety/depression by diagnosis type or relapse status based on father report on the CBCL (diagnosis type, $p = .15$; relapse status, $p = .67$), mother report on the CBCL (diagnosis type, $p = .39$; relapse status, $p = .19$), child report on the YSR (diagnosis type, $p = .19$; relapse status, $p = .14$). Therefore, data from children with all types of cancer, as well as children with new and relapsed disease, were retained for analysis. Further, child age was not significantly correlated with child or parent reports of symptoms of anxiety/depression. To control for the possible effects of these variables in the multivariate analyses, child gender, race, and age at time of diagnosis, type of cancer diagnosis, first diagnosis versus relapse, and time since diagnosis were all included in the regression analyses.

Cross-informant correlations of child, mother, and father reports of children's coping. Correlations between child, mother, and father reports of children's coping are presented in Table 2. All correlations between mother and father reports of child coping were significant ($r = .29$ to $.60$, $p < .001$), and all correlations between mother and child reports of child coping were also significant ($r = .22$ to $.48$, $p < .01$). Correlations between father and child reports were significant for both secondary control ($r = .53$, $p < .001$) but not for primary control coping ($r = .03$, *ns*) or disengagement coping ($r = .25$, $p = .03$). The overall mean of the cross-informant correlations for children's coping was $r = .35$;

Table 1
Means and Standard Deviations for Measures of Children's Emotional Distress and Coping

	Mothers' reports ($n = 311$)		Fathers' reports ($n = 165$)		Child/Adolescent self-report ($n = 159$)	
	M	*SD*	*M*	*SD*	*M*	*SD*
Emotional distress						
Anxiety/Depression	53.9	5.7	53.4	5.4	54.0	6.7
Anxiety problems	55.0	6.4	54.4	5.9	53.8	5.9
Affective problems	56.5	7.1	55.5	5.7	55.1	7.1
Child/Adolescent coping						
Primary control	0.19	0.03	0.18	0.03	0.18	0.04
Secondary control	0.28	0.06	0.28	0.05	0.29	0.06
Disengagement	0.14	0.03	0.15	0.03	0.15	0.03

Note. Means and standard deviations are presented for the full sample. Emotional distress scores are presented as normalized *T* scores from the Child Behavior Checklist for mothers' and fathers' reports, and from the Youth Self-Report for child/adolescents' self-reports. Scores for child/adolescent coping are presented as proportion scores on the Responses to Stress Questionnaire.

Table 2
Correlations Among Mother, Father, and Child Self-Reports of Children's Coping

	PC_M	SC_M	D_M	PC_F	SC_F	D_F	PC_C	SC_C
Mother report								
Primary control coping (PC_M)	—							
Secondary control coping (SC_M)	.24***	—						
Disengagement coping (D_M)	−.44***	−.38***	—					
Father report								
Primary control coping (PC_F)	**.29****	.05	−.21**	—				
Secondary control coping (SC_F)	.27**	**.60****	−.26**	.05	—			
Disengagement coping (D_F)	−.31***	−.29***	**.49****	−.49***	−.37***	—		
Child self-report								
Primary control coping (PC_C)	**.28****	.11	−.19*	**.03**	.07	−.06	—	
Secondary control coping (SC_C)	.23**	**.48****	−.28**	.22	**.53****	−.44***	.28***	—
Disengagement coping (D_C)	−.18*	−.11	**.24****	−.08	−.20	**.25***	−.49***	−.44***

Note. Sample sizes: $n = 157$ children; $n = 311$ mothers; $n = 165$ fathers. Cross-informant correlations are in bold.
* $p < .05$. ** $p < .01$. *** $p < .001$.

notably, the mean cross-informant correlation for secondary control coping was $r = .54$.

Hypothesis 1: Children's primary and secondary control coping will be negatively correlated with anxiety and depressive symptoms and disengagement coping will be positively correlated with anxiety/depression. Correlations between child, mother, and father reports of children's coping and child symptoms of anxiety/depression reported by all informants are presented in Table 3. Seven of nine correlations of within informant reports of child coping and symptoms of anxiety/depression were significant. Specifically, there was a consistent pattern of positive correlations between symptoms of anxiety/depression and disengagement coping (*r*s from .16 to .31, *p*s $< .005$), and negative correlations between symptoms of anxiety/depression and secondary control (*r*s from −.37 to −.41, *p*s $< .001$) coping; however, primary control coping was only significantly ($p < .001$) related to anxiety/depression based on mothers' reports.

Table 3
Correlations of Child and Parent Reports of Children's Coping With Child and Parent Reports of Children's Anxiety/Depression Symptoms

	YSR Anxiety/ Depression	Mother CBCL Anxiety/ Depression	Father CBCL Anxiety/ Depression
Child self-report			
Primary control coping	−.17*	−.16	−.18
Secondary control coping	−.37***	−.24**	−.28*
Disengagement coping	.19*	.26**	.31**
Mother report			
Primary control coping	−.14	−.22***	−.21**
Secondary control coping	−.33***	−.39***	−.27**
Disengagement coping	.18*	.16**	.20*
Father report			
Primary control coping	−.22	−.15	−.18*
Secondary control coping	−.28*	−.33***	−.41***
Disengagement coping	.40***	.23**	.31***

Note. Sample sizes: $n = 157$ children; $n = 311$ mothers; $n = 165$ fathers. YSR = Youth Self-Report; CBCL = Child Behavior Checklist.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Significant cross-informant correlations emerged between mother and father reports of children's coping and child self-reports of anxiety/depression symptoms. Both mother and father reports of children's secondary control coping were negatively correlated with child self-reports of anxiety/depression symptoms ($r = -.33$, $p < .001$, and $r = -.28$, $p < .01$, respectively). In addition, father reports of children's disengagement coping were positively correlated with child self-reports of anxiety/depression ($r = .40$, $p < .001$). Neither mother nor father reports of children's primary control coping were correlated with child self-reports of anxiety/depression symptoms.

In a similar pattern, child self-reported use of secondary control coping was negatively correlated with both mother ($r = -.24$, $p = .004$) and father ($r = -.28$, $p < .01$) reports of children's symptoms of anxiety and depression. In addition, child self-reported use of disengagement coping was positively correlated with both mother ($r = .26$, $p < .001$) and father ($r = .31$, $p = .005$) reports of child symptoms of anxiety/depression. Again, self-reported primary control coping was not significantly correlated with symptoms of anxiety/depression for both mother and father reports of emotional distress.

Multiple linear regression analyses: Hypothesis 2: Unique effects will be found only for secondary control coping as a predictor of anxiety/depression symptoms. A series of linear multiple regression analyses were conducted with children's symptoms of anxiety/depression according mother report, father report, and child self-report as the dependent variables, and reports by these informants on children's coping as the predictors (see Tables 4, 5, and 6). In each regression equation, primary control, secondary control, and disengagement coping were entered simultaneously to determine their unique associations with anxiety/depression symptoms.

Predicting child self-reports of symptoms of anxiety/depression. For the model predicting children's report of their symptoms of anxiety/depression on the YSR from child self-reported levels of coping, the overall equation was significant ($p < .001$, adjusted $R^2 = .14$). Secondary control coping ($\beta = -.33$, $p < .001$) was a significant predictor of child self-reported emotional distress; primary control and disengagement coping were not significant predictors. In terms of cross-informant reports, an equation using

Table 4
Summary of Linear Multiple Regression Analyses Predicting Child Self-Reports of Anxiety/Depression

	β	*t*
Equation 1: Child self-reports of coping		
$F(9, 144) = 3.80^{***}$; adjusted $R^2 = .14$		
New vs. relapse diagnosis	.15*	1.98
Primary control coping	−.08	−.93
Secondary control coping	−.33***	−3.79
Disenagagement coping	.01	.15
Equation 2: Mothers' reports of child coping		
$F(9, 134) = 3.09^{**}$; adjusted $R^2 = .12$		
New vs. relapse diagnosis	.16*	2.01
Primary control coping	−.03	−.28
Secondary control coping	−.33***	−3.59
Disenagagement coping	.02	.17
Equation 3: Fathers' reports of child coping		
$F(9, 68) = 5.18^{**}$; Adjusted $R^2 = .17$		
Child race	.25*	2.30
Primary control coping	.00	.03
Secondary control coping	−.12	−0.94
Disenagagement coping	.35*	2.46

Note. Child gender, child race, child age at time of diagnosis, type of cancer diagnosis, first diagnosis vs. relapse, and time since diagnosis were entered in all of the regression analyses; only significant effects are presented in the table.
* $p < .05$. ** $p < .01$. *** $p < .001$.

mother report of children's coping to predict child self-reported emotional distress was significant ($p < .001$, adjusted $R^2 = .10$). Mother report of children's secondary control coping ($\beta = -.33$, $p < .001$), but not primary control or disengagement coping, was a significant predictor of child self-reported emotional distress. An equation using father reports of children's coping to predict child self-reported emotional distress was significant ($p = .003$, adjusted $R^2 = .16$). Only disengagement coping was a significant predictor in this model ($\beta = -.35$, $p < .01$).

Table 5
Summary of Linear Multiple Regression Analyses Predicting Mothers' Reports of Child Anxiety/Depression

	β	*t*
Equation 1: Child self-reports of coping		
$F(9, 135) = 1.99^{*}$; $R^2 = .06$		
Primary control coping	−.02	−.22
Secondary control coping	−.13	−1.42
Disenagagement coping	.17	1.76
Equation 2: Mothers' reports of child coping		
$F(9, 289) = 7.58^{***}$; $R^2 = .19$		
Primary control coping	−.16**	−2.73
Secondary control coping	−.39***	−6.63
Disenagagement coping	−.08	−1.18
Equation 3: Fathers' reports of child coping		
$F(9, 139) = 2.69^{**}$; $R^2 = .09$		
Primary control coping	−.10	−1.01
Secondary control coping	−.32***	−3.62
Disenagagement coping	.07	.68

Note. Child gender, child race, child age at time of diagnosis, type of cancer diagnosis, first diagnosis vs. relapse, and time since diagnosis were entered in all of the regression analyses; only significant effects are presented in the table.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 6
Summary of Linear Multiple Regression Analyses Predicting Fathers' Reports of Children's Anxiety/Depression

	β	*t*
Equation 1: Child self-reports of coping		
$F(9, 67) = 2.68^{**}$; $R^2 = .17$		
Time since diagnosis	.34**	3.16
Primary control coping	−.11	−.85
Secondary control coping	−.21	−1.62
Disenagagement coping	.18	1.38
Equation 2: Mothers' reports of child coping		
$F(9, 139) = 2.17^{*}$; $R^2 = .07$		
Primary control coping	−.14	−1.49
Secondary control coping	−.23*	−2.57
Disenagagement coping	.04	.43
Equation 3: Fathers' reports of child coping		
$F(9, 152) = 5.80^{**}$; $R^2 = .21$		
Time since diagnosis	.21**	2.79
Primary control coping	−.09	−1.03
Secondary control coping	−.38***	−4.92
Disenagagement coping	.15	1.65

Note. Child gender, child race, child age at time of diagnosis, type of cancer diagnosis, first diagnosis vs. relapse, and time since diagnosis were entered in all of the regression analyses; only significant effects are presented in the table.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Predicting mother reports of child symptoms of anxiety/depression. For the model predicting mother reports of children's symptoms of anxiety/depression from mother reports of children's coping, the overall equation was significant ($p < .001$, adjusted $R^2 = .19$). Both primary ($\beta = -.16$, $p < .01$) and secondary ($\beta = -.39$, $p < .001$) control coping were significant negative predictors of children's emotional distress. In terms of cross-informant reports, an equation using father reports of children's coping to predict levels of mother report of symptoms of anxiety/depression was also significant ($p < .01$, adjusted $R^2 = .11$). Here, secondary control coping was the only significant predictor ($\beta = -.32$, $p < .001$). An equation using child self-report of coping to predict mother reports of children's emotional distress was significant ($p < .05$, adjusted $R^2 = .07$); however, none of the coping types accounted for unique variance.

Predicting father reports of child symptoms of anxiety/depression. For the model predicting father reports of children's symptoms of anxiety/depression from father reports of children's coping, the overall equation was significant ($p < .01$, adjusted $R^2 = .19$). Again, secondary control coping was the only significant predictor ($\beta = -.38$, $p < .001$) when all three coping types were entered in the equation. In terms of cross-informant reports, an equation using mother reports of children's coping to predict father reports of children's anxiety/depression was significant ($p < .05$, adjusted $R^2 = .08$). For this equation, secondary control coping was the only significant predictor ($\beta = -.23$, $p = .01$). An equation using child self-reported coping to predict father reports of children's emotional distress was significant ($p < .001$, adjusted $R^2 = .17$); however, none of the coping types accounted for unique variance in this equation.

Discussion

The diagnosis and treatment of cancer present children and adolescents with significant stress related to the disease, its treatment, disruptions in daily life, and fears about the future (Rodriguez et al., 2012; Varni & Katz, 1997). Understanding the ways that children cope with the stress of cancer is a high priority to provide the basis for interventions to enhance effective adaptation. Previous research, guided by models of coping that distinguish approach versus avoidant coping and problem- versus emotion-focused coping, has generated few significant findings on the association between children's coping and emotional distress (Aldridge & Roesch, 2007). The current study adds to this literature by drawing on a control-based model of coping, and by providing evidence for the association between children's coping, particularly secondary control coping, and symptoms of anxiety/depression during the initial months following a cancer diagnosis.

Levels of distress in children in the current sample reflect mild to moderate symptoms of anxiety/depression based on reports from mothers, fathers and children, with means approximately half of a standard deviation above the normative mean. This pattern is comparable with findings of a recent meta-analysis of internalizing problems in children with chronic illness (Pinquart & Shen, 2011), including studies of with children with cancer, which yielded a mean effect size of $g = .47$. Although our group means fall within the normal range, the elevated scores suggest subgroups of children with cancer that could be identified as targets for intervention soon after diagnosis. Diagnosis type, relapse status, and age were unrelated to anxiety/depression symptoms; however, children's coping may be an important target for future interventions.

Previous research on children's coping with cancer and other chronic illnesses has been limited by several problems in conceptualization and measurement (Aldridge & Roesch, 2007; Compas et al., 2012). Because children with cancer are faced with a high number of stressors that are beyond their control near the time of their diagnosis, the control-based model of coping that guided the current study may better capture the structure of children's coping with cancer than previous models that distinguished between problem- and emotion-focused or approach and avoidance coping (Aldridge & Roesch, 2007; Compas et al., 2012). This suggests that there may be a match or fit between the use of secondary control coping and the types of uncontrollable stressors faced by children with cancer. In the bivariate correlations, significant associations were found for all three types of coping with symptoms of anxiety/depression within informant for children, mothers, and fathers, with the strongest effects for secondary control coping. This pattern is consistent with previous studies using this model of children's coping with other chronic illnesses (e.g., Compas et al., 2006; Hocking et al., 2011; Jaser & White, 2011).

The current study is the first to use a standardized measure of coping to examine child, mother, and father perspectives on the coping strategies children use when faced with cancer. We found excellent correspondence in child and parent reports and mother and father reports about their children. These cross-informant associations compare favorably with previous analyses of parents' and children's reports about children's coping with other types of stress (e.g., Compas et al., 2006; Connor-Smith et al., 2000), and provide evidence for the validity of the RSQ-PC. The findings are consistent with the perspective of converging operations in the assessment of child behaviors (De Los Reyes et al., 2013). The level of convergence that we found in mother report, father report, and child self-reports may, in part, be the result of a focus on coping with a specific source of stress (cancer) and the level of parental involvement, and, therefore, awareness of how their children cope with cancer and its treatment.

In support of the first hypothesis, we found evidence for cross-informant associations between children's coping with cancer and their emotional distress. In the correlational analyses, secondary control was negatively related, and disengagement coping was positively related, to symptoms of anxiety/depression for child–mother, child–father, and mother–father correlations. These findings provide strong evidence for the association between coping and emotional distress because they control for shared method variance by assessing coping and anxiety/depression by independent informants.

In support of the second hypothesis, the results of the linear multiple regression analyses highlight the strong and unique association of secondary control coping with symptoms of anxiety/depression, both within and across informants. When examined along with primary control and disengagement coping, secondary control coping was found to have the strongest and most consistent association with emotional distress. In the cross-informant regression models, mothers' reports of children's secondary control coping were a significant predictor of children's reports of their anxiety/depression, based on the YSR and fathers' reports on the CBCL, and fathers' reports of children's secondary control coping significantly predicted mothers' reports of children's distress on the CBCL. These effects were significant even after controlling for a range of demographic and medical variables. It is noteworthy that the correlations between coping and adjustment in the first 6 months after diagnosis were nonsignificant in the Aldridge and Roesch (2007) meta-analysis. The current findings suggest that secondary control coping may be a specific important type of coping during this early phase of cancer diagnosis and treatment.

The overall pattern of findings in the correlation and regression analyses is consistent with the previous research on the importance of secondary control coping in response to the uncontrollable nature of chronic-illness-related stress for children and adolescents (Compas et al., 2012). Given relatively little opportunity for control over the stressors related to their cancer, the current findings suggest that the use of strategies including acceptance, cognitive reappraisal, and positive methods of cognitive and behavioral distraction are adaptive ways for children and adolescents to cope with stress associated with the diagnosis and treatment of cancer. In other words, secondary control coping allows children to accommodate or adapt to the stress associated with having cancer. The effect sizes for secondary control coping in the regression analyses were small to medium in magnitude, suggesting that additional variance in children's symptoms of anxiety/depression may be associated with other factors. These may include levels of stress associated with a child's cancer diagnosis and treatment, parents' emotional distress, and levels of support provided by parents (e.g., Rodriguez et al., 2012).

The current study had several limitations that will be important to address in future research. First, this study was cross-sectional and therefore cannot test the true direction of the associations between coping and distress in children with cancer. It will be important to use prospective longitudinal designs to examine the

association between coping and subsequent symptoms of anxiety/depression, as well as changes in distress over time. Second, the stresses and demands of cancer change over the course of treatment and survivorship. Future longitudinal studies are needed to determine whether the role of secondary and primary control coping changes over time. Third, our sample was somewhat limited with regard to ethnic and racial diversity; future studies of children's coping with cancer with more diverse samples are needed. Fourth, the internal consistencies for two of the coping scales on the RSQ-PC were somewhat low, and this should be addressed in further refinement of this measure. Fifth, future studies could examine the possibility of creating latent indicators of children's coping based on parent and child reports as a way of managing the use of reports from these two sources of information. And finally, future studies may benefit from focusing on more homogeneous samples of children with specific types of cancer (e.g., CNS tumors) that may present specific types of stressors.

In conclusion, these findings have potentially important implications for the development of psychological interventions to enhance and teach secondary control coping skills to children with cancer. Recent studies have shown that children and adolescents can learn secondary control coping skills as part of cognitive–behavioral preventive interventions (e.g., Compas et al., 2009, 2010, 2011; Tein, Sandler, MacKinnon, & Wolchik, 2004). The findings of the current study suggest that the development of similar interventions for children with cancer is an important priority for future research.

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Received April 30, 2013
Revision received December 24, 2013
Accepted January 26, 2014 ■