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PREDICTORS OF PARENTAL EMOTIONAL ADJUSTMENT TO CHILDHOOD CANCER

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SUMMARY

The main objective of the present study was to determine which variables predict the emotional adjustment of parents of children with cancer. Therefore, parents' emotional adjustment, in terms of depression, anxiety, feelings of loneliness, helplessness, uncertainty and positive feelings, were predicted with three models. (1) With a child model (including age of the child, time since diagnosis, being in remission or having a relapse, and depression of the child); (2) with a control strategies model (including four distinguished control strategies of parents); and (3) with a child and control strategies model (including a combination of the aforementioned variables). The four control strategies of parents of children with cancer included: the reliance on predictive control (having positive expectations); vicarious control (attributing power to the medical setting); illusory control (relying on luck and wishful thinking); and interpretative control (gaining knowledge). A total of 84 mothers and 79 fathers, of 84 children with cancer with different survival perspectives (in remission or with a relapse) participated in the study, and were assessed about the use of control strategies and adjustment. Lack of positive expectations about the course of the illness was most strongly related to negative emotions for mothers and for fathers. For mothers having a child with a relapse, predicted feelings of helplessness and uncertainty, and reported feelings of depression of the child, proved to be related to the feelings of uncertainty of the fathers. The findings demonstrate that the use of secondary control strategies contribute significantly to the emotional adjustment of parents of children with cancer. © 1997 by John Wiley & Sons, Ltd.

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INTRODUCTION

Through the years, in which survival rates for childhood cancer have improved, research focus has changed. It shifted from investigating parental adjustment to an almost certain loss of their child, to investigating parental adjustment identified by a situation dominated with uncertainty and unpredictability about the outcome of the illness in the child. Emotional adjustment of parents has most frequently been determined in terms of psychological adaptation. Within this research, attention has been given to which parents of children with cancer are at risk for developing emotional adjustment problems. Variables of the children which are predictive for parental maladjustment are number of hospitalizations (Barbarin and Chesler, 1985; Mulhern *et al*., 1992), and functional impairment of the child (Manne *et al*., 1995; Van Dongen-Melman *et al*., 1995).

Difficulties in emotional adjustment of the children, or the child's behavior problems are also predictive especially for maternal adjustment problems (Kupst *et al*., 1995; Manne *et al*., 1995; Mulhern *et al*., 1992). Time since diagnosis has been investigated in several longitudinal studies, and results show that parents adjust well over time (Fife *et al*., 1987; Kupst *et al*., 1995). With respect to variables of the parents, mothers report more emotional problems than fathers (Dahlquist *et al*., 1993; Larson *et al*., 1994). Low socio-economic status (SES), especially for the mothers, has also been associated with maladjustment

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(Baskin *et al*., 1985; Van Dongen-Melman *et al*., 1995). Altogether, because mothers participate more often in studies, little is known about the predicting variables for the emotional adjustment of fathers of children with cancer. The use of different coping strategies also contribute to parental emotional adjustment. Coping strategies used by parents of children, related to better adjustment are open communication (Koocher and O'Malley, 1981; Shapiro and Shumaker, 1987), and social support (Morrow *et al*., 1984; Magni *et al*., 1986; Speechley and Noh, 1992). However, relatively little attention has been given to the influence of coping strategies, and only a small number of studies integrated their research into a broader context about stress, appraisal and coping (Baskin *et al*., 1985; Kupst, 1994).

Childhood cancer in the family is an obvious stressful situation. The primary appraisal of this situation is threatening and will result in negative emotions (Lazarus and Folkman, 1984). With the secondary appraisal process, several components of the situation are considered and this generates the coping process. Based on the adaptational outcome of the coping process, and changes in the situation, the person constantly reappraises the situation and possibly generates other coping strategies. The outcome of the relationship between the individual and the stressful situation will therefore be dependent on characteristics of the situation, and the utilization of resources and coping strategies (Lazarus and Folkman, 1984; Frijda, 1986).

An important component of the situation which determines the coping process of parents of children with cancer, is the uncontrollability of the situation. Rothbaum *et al*. (1982) emphasise the concept of uncontrollability in their two-process model of perceived control. They distinguish primary and secondary control strategies. Primary control strategies are classified as attempts of people to gain control by bringing the environment into line with their wishes, whereas secondary control strategies are attempts of people to gain control by bringing themselves into line with environmental forces. This is similar to the classification of problem- and emotion-focused coping strategies (Lazarus and Folkman, 1984). Rothbaum *et al*. (1982) however made a further classification into four strategies, that is (1) predictive, (2) vicarious, (3) illusory and (4) interpretative control, all possibly used in primary or secondary form. Because of the emphasis on uncontrollability and the further classification of control strategies, the model of Rothbaum *et al*. (1982) seemed an applicable conceptual framework to allow better comprehension of parental reactions to childhood cancer. Furthermore, all sorts of efforts by which parents presumably modify the situation or themselves so as to achieve goodness of fit with prevailing conditions, are described without any relationship to outcome. This is important because if a coping construct is to be used to predict outcome, separation of coping efforts from their outcome is necessary (Folkman, 1984).

Parents of children with cancer have few possibilities to change the situation and will therefore be highly dependent on the use of secondary control strategies. The use of the four secondary control strategies as outlined by Rothbaum *et al*. (1982), were measured and described in Grootenhuis *et al*. (1996). Examples of secondary predictive, vicarious, illusory and interpretative control strategies, or the cognitive abilities to cope with the stresses of the illness, can be outlined as follows. Secondary predictive control is visible for instance if parents take the negative effects of the treatment into account. By accepting the worst, parents can protect themselves against disappointments. This is similar to reactions of mourning and grief prior to the death of a child, called 'anticipatory mourning'. A sense of control may also be manifested as a perception that others, such as the medical caregivers, can exert control, which is an example of secondary vicarious control. Hoping for a miracle or wishful thinking are illustrations of secondary illusory control. Using information to help to understand emotional reactions or derive meaning from the situation are examples of secondary interpretative control. Mothers appeared to rely more on interpretative and illusory control than fathers. That women may be more likely to use emotion-focused coping strategies is consistent with other research findings (Billings and Moos, 1981; Pearlin and Schooler, 1978). Parents of children with cancer in remission relied more on vicarious control and predictive control, which emerged as a sense of optimism rather than anticipating disappointment, than parent of children with cancer with a relapse (Grootenhuis *et al*., 1996).

Several studies have provided evidence of the influence of the choice of coping strategies and the emotional outcome of stressful events. Some researchers have suggested that active strategies,

such as information seeking, were related to good adjustment, whereas emotion-focused strategies such as wish fulfilling were associated with adjustment problems (Baskin *et al.*, 1985; Felton and Revenson, 1984). These findings are consistent with those of Billings and Moos (1981) where women more likely to use avoidant coping showed greater impairment of functioning.

Although we have studied the efforts of parents of children with cancer to cope with the stresses of the illness in terms of secondary control strategies (Grootenhuis *et al.*, 1996), we do not know how these control strategies are related to the emotional consequences for parents of children with cancer. A relationship between the use of particular coping strategies and emotional adjustment can provide more insight into the effectiveness of the use of control strategies, and the process of coping with a life-threatening disease. This understanding may be helpful for caregivers in psychosocial oncology in directing interventions. Until now, parental adjustment to childhood cancer has mainly been predicted with illness- and child-related variables. However, we expect that both child related variables and secondary control strategies contribute to parental emotional adjustment. In the present study we therefore aimed to determine which of these variables most adequately predict emotional adjustment of mothers and fathers of children with cancer.

METHODS

Participants

Children with cancer, and their parents were recruited from the Emma Kinderziekenhuis, Academic Medical Center, in Amsterdam. Children and parents were participating in a larger study investigating emotional reactions and coping behavior. To be included, all children had to be between 8–18 years of age, and both children and parents had to be Dutch speaking. To include parents of children with different survival perspectives, two types of children with cancer were selected, one called the 'remission group' and the other the 'relapse group'.

To be eligible for the study, the children in the remission group had to meet the following criteria: (a) at least 4 years of age when they became ill; (b) at least between 1 and 5 years without treatment. The children assigned to the remission group were selected proportionally according to sex, age, and years without treatment. With regard to diagnoses (leukemia/lymphoma or solid tumors), children in the remission group were drawn on a representative basis. In total, 43 children in remission were included. End of treatment ranged from 12–71 months (M = 37.44; SD = 16.8).

Children in the relapse group had to meet the following criteria: (a) having had a relapse, a second malignancy or 'stable disease' (a status of prolonged non-remission of more than at least one year); (b) not terminally ill, meaning that curative treatment was still possible; and (c) the last treatment had not ended more than 5 years previously. It was not possible to select children proportionally according to age, sex, or diagnosis because of the small number of available patients. In the relapse group 41 children participated and the time since their last treatment ranged from 0–49 months (M = 10.17; SD = 14.3).

Finally, 163 parents of children from both conditions participated in the study, which were 43 mothers and 40 fathers of the 43 children in remission, and 41 mothers and 39 fathers of the 41 children with a relapse. For five children only the divorced mother participated in the study. Educational level of parents was divided into three categories: low (primary or secondary school, occupational and vocational training), middle (extra occupational and vocational training) and high (pre-university education, college and university). Chi-square tests and *T*-tests did not show differences between the children of both groups according to sex and diagnosis, and age and time since diagnosis. Parents of both groups did not differ in terms of age, sex and educational level based on chi-square tests and a *T*-test. Sociodemographical characteristics of the children and the parents are shown in Table 1.

Procedure

All the families of the children with cancer were approached by letter, and the child and both parents were invited to participate. After agreement, all families were visited at home by three interviewers who conducted a semi-structured interview and questionnaires, each interviewer separately with one of the three family members. The interviews and questionnaires were tested

Table 1. Characteristics of the children and the parents

	Total		Remission		Relapse	
Children	*n* = 84		*n* = 43		*n* = 41	
Mean age in years (SD)	13.06 (3.50)		12.88 (3.22)		13.24 (3.81)	
Time since diagnosis in months (SD)	51.13 (29.37)		47.95 (20.55)		54.46 (36.39)	
Sex						
Boys (%)	44 (52)		22 (51)		22 (54)	
Girls (%)	40 (48)		21 (49)		19 (46)	
Diagnosis						
Leukemia/lymphoma (%)	47 (56)		22 (51)		25 (61)	
Solid tumours (%)	37 (44)		21 (49)		16 (39)[a]	
Parents	*n* = 163		*n* = 83		*n* = 80	
Sex						
Mother (%)	84 (52)		43 (52)		41 (51)	
Father (%)	79 (48)		40 (48)		39 (49)	
Age in years						
Mothers' mean (SD)	41.38 (5.27)		41.07 (4.72)		41.71 (5.84)	
Fathers' mean (SD)	44.58 (5.88)		43.73 (4.91)		45.46 (6.69)	
Education[b]	Mothers	Fathers	Mothers	Fathers	Mothers	Fathers
Low (%)	26 (31)	27 (34)	12 (28)	14 (35)	14 (34)	13 (33)
Middle (%)	30 (36)	21 (27)	15 (35)	11 (28)	15 (37)	10 (26)
High (%)	28 (33)	31 (39)	16 (37)	15 (38)	12 (29)	16 (41)

SD = standard deviation.
[a]Only first malignancies are shown.
[b]low = primary or secondary school, occupational and vocational training.
middle = extra occupational and vocational training.
high = pre-university education, college and university.

during pilot interviews. Inclusion of the families continued until approximately 40 families agreed to participate in the two groups. The response rate in the remission group was 73%, and in the relapse group 76%. This moderate response rate is due to the fact that all three family-members had to be willing to participate. The most important expressed reason for refusal was a fear of confrontation with previous experiences and emotions. No differences within each group were found between children who participated and those who did not, according to age, age at diagnosis, and sex.

Predictors: child

Children's depression (DQC). The Depression Questionnaire for Children (De Wit, 1987) was used for measuring depression manifestations of the children. The questionnaire consists of 87 items and 20 dummies. Dummies are neutral questions not related to depression, and serve to compensate induction of a depressive response. The questionnaire has been developed for children from 9 to 12 years, but was administered to all the children in the study. The item analysis of the total scale resulted in a Cronbach alpha coefficient of 0.91 for the whole group. 0.91 for the 8–12 year old children, and also 0.91 for the 13–18 year old children. There was a significant positive correlation of the DQC with other measures assessing depression, demonstrating the content validity (De Wit, 1987). The scale ranges from 0–87.

Other child related variables. Next to the feelings of depression of the children (DQC), their age (in months), the time since diagnosis (time between diagnosis of the illness and the interview in months), and survival perspective (operationalized as being in remission or having a relapse) were included in the analyses.

Predictors: parents

Control Strategy Scale (CSS). This questionnaire assesses secondary control strategies according to the model of Rothbaum *et al.* (1982), conceptualized as attempts directed at modifying oneself to achieve feelings of control. The psychometric features of the four subscales of this questionnaire have been described in Grootenhuis *et al.* (1996). By excluding the description of the experience of any emotional feelings in the items, an attempt was made to avoid confounding with outcome in the construction of the CSS. The four subscales measure predictive control with six items (having positive expectations about the course of the illness); vicarious control with eight items (attributing power to the medical setting); illusory control with five items (relying on luck and wishful thinking); and interpretative control with five items (gaining knowledge). The consistency of response among the items as measured with Cronbach's alpha coefficient was 0.81, 0.78, 0.66 and 0.77 respectively. Parents were asked to indicate whether they agreed with a given statement on a 4-point scale (totally agree; agree; disagree; totally disagree). Scores were recoded, and therefore higher scores on all four subscales represent a stronger belief in these control strategies.

Outcome measures: parents

Beck Depression Inventory (BDI). The Dutch version of the Beck Depression Inventory translated by Bouman *et al.* (1985) was used to measure depressive symptomatology. The BDI is a 21-item self-report questionnaire, designed to assess symptoms of depression. Items are rated on a 4-point scale from 0 to 3 in terms of their severity. Previous research with the BDI in the Netherlands showed good internal consistency, with a Cronbach's alpha coefficient of at least 0.85 (Bouman, 1994), which is comparable to the internal consistency in our population: 0.83.

Trait anxiety inventory (TRAIT). To measure parental anxiety, the Dutch version of the Trait Anxiety Inventory, translated by Van Der Ploeg *et al.* (1980) was administered. The trait-scale, a 20-item self-report scale, measures relatively stable individual differences in anxiety across people. The scale ranges from 20–60 and higher scores indicate greater anxiety. The TRAIT in our population had a Cronbach's alpha coefficient of 0.93 comparable to reliability coefficients presented by Van Der Ploeg *et al.* (1980).

Situation specific emotional reaction questionnaire (SSERQ). To investigate situation-specific emotional reactions of parents of children with cancer, a questionnaire originally developed by Van Veldhuizen and Last (1991) was used. Four subscales measuring feelings of loneliness (11 items), helplessness (seven items), positive feelings (six items), and feelings of uncertainty (six items) have been distinguished (Grootenhuis and Last, in press). The four subscales had the following Cronbach's alpha coefficient 0.87, 0.86, 0.69 and 0.80 respectively. Parents were asked to indicate whether they experienced an emotional reaction on a 4-point scale (very often, often, occasionally, not at all). The scores were recoded, so higher scores reflect more experience of the emotional reactions. The subscales measuring negative emotions (feelings of loneliness, helplessness and uncertainty) all correlated significantly with the depression and anxiety measurements. The meaning of all the predictor and outcome variables are summarized in Table 2.

Statistical analysis

To investigate which variables predict parental adjustment, multiple regression analyses were performed for mothers and fathers separately. It is preferable to conduct separate analyses for the mothers and the fathers, because dependence exists between the data. Considering the number of predictors in the models, and the number of participating parents (n = 84 mothers and n = 79 fathers) no more predictors were entered into the analyses. For example, sex of the child and educational level of the parents were excluded. Neither of them had high correlations with the outcome variables. Before carrying out the regression analyses, correlations were investigated among all continuous variables, also for mothers and fathers separately.

Three predictor models were used. In the first model (Child Variables Model), only age, time since diagnosis, survival perspective and depressive feelings of the children were entered simultaneously in the regression. Secondly, only the

Table 2. Meaning of included predictors and outcome measures

Measures	Meaning
Predictors: Child	
Child age	Age of the child in months
Time since diagnosis	Time between diagnosis and interview in months
Group	Survival perspective (remission = 0, relapse = 1)
DQC	Higher scores reflect more depressive feelings of the child
Predictors: Parents	
Predictive control	Higher scores reflect having positive expectations
Vicarious control	Higher scores reflect attribution of power to medical setting
Illusory control	Higher scores reflect wishful thinking or relying on luck
Interpretative control	Higher scores reflect gaining knowledge
Outcome measures	
Depression	Higher scores reflect more feelings of depression
Anxiety	Higher scores reflect more feelings of anxiety
Loneliness	Higher scores reflect more feelings of loneliness
Helplessness	Higher scores reflect more feelings of helplessness
Positive feelings	Higher scores reflect more positive feelings
Uncertainty	Higher scores reflect more feelings of uncertainty

secondary control strategies of the parents (predictive, vicarious, illusory and interpretative control) were entered simultaneously in the regression (Control Strategies Model). Third, a combination of the child's variables and the coping strategies variables were entered simultaneously in the regression (Child and Control Strategies Model). Every model was repeated six times, for every outcome measure (depression, anxiety, loneliness, helplessness, positive feelings and uncertainty) separately. With this strategy, the contribution of the separate predictor models show which variables contribute especially to parental adjustment. By including an equal number of variables, (four) in each model, the explained variances for every outcome variable can be compared. Taking this procedure into account, this means that for mothers and for fathers, 18 regression analyses were conducted. The number of mothers, fathers and children of which data was available determined the number of included persons in every subsequent regression analysis (see Table 3). Considering the number of analyses, a significance level of 1% was used.

For each regression, the explained variance (*R* square) was determined, and it was tested using the *F*-test. *T*-values and their significance level were calculated to test the hypothesis whether the contribution (the regression coefficient (*B*)) of an entered variable significantly differed from zero.

RESULTS

Mean scores on the predictor and outcome variables

Mean scores and standard deviations for the predictor and outcome variables are presented in Table 3, for children, mothers and fathers separately. The mean scores of children with cancer on the DQC are comparable to healthy children (Grootenhuis *et al.* in press). Mean depression scores of mothers and fathers were in the non-depressive range (Beck *et al.*, 1988), and mean anxiety scores are also comparable to normative data from a random Dutch population (Van Der Ploeg *et al.*, 1980).

To get an impression of the meaning of the mean scores on the parental control and SSERQ subscales, all mean scores were divided by the number of items of every subsequent scale. This resulted in mean item scores for the control strategy scales and the scales of the SSERQ (see Table 3). Higher mean item scores on the four control strategy scales represent more agreement

Table 3. Mean scores on predictor and outcome measures for children, mothers and fathers separately

	Children		
Predictors: Child	Mean	SD	*n*
Age	13.06	3.50	84
Time since diagnosis	51.13	29.37	84
Depression (DQC)	18.04	11.43	82

	Mothers				Fathers			
Parents	Mean	SD	*n*	Mean item score	Mean	SD	*n*	Mean item score
Predictors								
CSS[a] (Number of items)								
Predictive control (6)	15.87	3.71	83	2.6	16.56	3.16	77	2.8
Vicarious control (8)	23.80	3.64	83	3.0	23.82	3.06	78	3.0
Illusory control (5)	11.74	2.67	84	2.3	10.91	2.91	78	2.2
Interpretative control (5)	17.74	2.07	84	3.5	16.17	2.19	78	3.2
Outcome measures								
Depression	8.20	6.58	84		5.82	5.64	79	
Anxiety	41.83	10.16	84		36.66	9.67	79	
SSERQ[b] (Number of items)								
Loneliness (11)	16.14	5.21	84	1.5	14.13	3.61	78	1.3
Helplessness (7)	17.17	5.68	84	2.5	15.94	5.28	78	2.3
Positive feelings (6)	15.81	3.10	84	2.6	14.54	3.10	78	2.4
Uncertainty (6)	12.10	3.69	84	2.0	11.01	3.24	78	1.8

DQC = Depression Questionnaire for Children.
CSS = Control Strategy Scale.
SSERQ = Situation Specific Emotional Reaction of Questionnaire.
[a]Mean item scores (1) total disagreement (2) disagreement (3) agreement (4) total agreement.
[b]Mean item scores (1) never (2) sometimes (3) often (4) almost all the time.

with the statements, that is a stronger reliance on these control strategies. Higher mean item scores on the SSERQ reflect the report of more emotional reactions.

Mean item scores for mothers and for fathers on the predictive and vicarious control scale represented scores indicating agreement with the statements (see Table 3). Scores on the illusory control scale for mothers and for fathers represented disagreement with the statements. Mothers' mean item scores on interpretative control indicated that mothers totally agreed with the statements. Mean item scores on the interpretative scale for fathers indicated agreement. Mean item scores on the SSERQ scale reflect that mothers reported that they often experience feelings of helplessness, but also often positive feelings. Furthermore, mothers reported that they sometimes experience feelings of uncertainty and loneliness. Feelings of uncertainty, helplessness and positive feelings are sometimes reported by fathers. Loneliness is never reported by fathers.

Correlational analyses

Pearson product moment correlations among all continuous variables are presented in Table 4 for the mothers and for the fathers together. Correlations between the predictors of the children and the predictors of the parents only show a significant correlation between age of the child and vicarious control for the fathers, whereas for the mothers increased reported feelings of depression of the child is significantly correlated with an increase of the use of vicarious, illusory and interpretative control. Correlations between the four control strategies are positive, and in

Table 4. Pearson product-moment correlations among continuous variables for mothers and fathers[a]

	1	2	3	4	5	6	7	8	9	10	11	12	13
Predictors: Child													
1. Age	–	0.22*	–0.21	–0.10	–0.24*	–0.15	–0.03	–0.15	–0.04	–0.14	–0.03	–0.02	–0.02
2. Time since diagnosis	0.22*	–	–0.05	0.06	–0.16	–0.15	–0.04	–0.20	–0.10	–0.20	–0.03	0.05	–0.13
3. DQC	–0.21	–0.05	–	0.12	0.20	0.21	–0.00	0.21	0.27*	0.31**	0.13	–0.18	0.23
Predictors: Parents													
4. Predictive control	0.02	0.08	0.06	–	0.35**	0.15	0.31**	–0.35**	–0.27*	–0.21	–0.47***	–0.08	–0.62***
5. Vicarious control	–0.19	–0.11	0.26*	0.27*	–	0.33**	0.41***	0.19	0.08	0.15	–0.08	0.02	–0.04
6. Illusory control	–0.16	0.00	0.34***	0.24	0.37**	–	0.10	0.16	0.26*	0.28*	0.11	0.22	0.17
7. Interpretative control	–0.20	0.01	0.22*	0.15	0.35**	0.13	–	0.08	–0.02	0.06	0.03	0.03	–0.04
Outcome measures													
8. Depression	–0.26*	0.01	0.12	–0.30**	0.19	0.29**	0.08	–	0.80***	0.68***	0.50***	–0.20	0.74***
9. Anxiety	–0.19	–0.09	0.20	–0.26*	0.07	0.29**	–0.08	0.74***	–	0.63***	0.45***	–0.29*	0.73***
10. Loneliness	–0.12	0.26*	0.24*	–0.05	0.11	0.26*	0.07	0.35**	0.45***	–	0.38**	–0.13	0.55***
11. Helplessness	–0.12	–0.09	0.11	–0.42***	0.03	0.10	0.17	0.39***	0.49***	0.38***	–	0.09	0.75***
12. Positive feelings	–0.11	0.15	–0.02	0.05	–0.09	–0.11	0.21	–0.12	–0.28**	0.05	–0.01	–	–0.08
13. Uncertainty	–0.20	–0.05	0.19	–0.51***	0.08	0.15	0.09	0.67***	0.79***	0.45***	0.61***	0.15	–

[a]Results mothers under diagonal and for fathers above.
DQC = Depression Questionnaire for Children.
*$p < 0.05$ **$p < 0.01$ ***$p < 0.001$.

Table 5. Simultaneous regressions (Beta) for measures of adjustment for mothers, with three predictor models[a]

	Depression	Anxiety	Loneliness	Helplessness	Positive feelings	Uncertainty
Child variables model						
R square (sign of *F*)	0.19**	0.18**	0.16**	0.17**	0.07	0.37***
Age	–0.30**	–0.17	–0.12	–0.10	–0.14	–0.23
Time since diagnosis	0.07	–0.07	0.30**	–0.10	0.20	–0.05
Group	0.33**	0.35**	0.10	0.39***	–0.17	0.56***
DQC	0.02	0.12	0.22	0.04	–0.02	0.07
Control strategies model						
R square (sign. of *F*)	0.25***	0.21**	0.09	0.26***	0.07	0.37***
Predictive control	–0.41***	–0.35**	–0.13	–0.50***	0.09	–0.61***
Vicarious control	0.16	0.06	0.03	0.03	–0.18	0.12
Illusory control	0.34**	0.37**	0.29	0.18	–0.07	0.25
Interpretative control	0.03	–0.10	0.03	0.20	0.24	0.08
Child and control strategies model						
R square (sign. of *F*)	0.32***	0.28**	0.20	0.36***	0.12	0.56***
Age	–0.22	–0.14	–0.09	–0.03	–0.11	–0.16
Time since diagnosis	0.08	–0.06	0.30**	–0.09	0.14	–0.03
Group	0.23	0.26	0.07	0.33**	–0.13	0.45***
DQC	–0.06	0.07	0.16	–0.03	–0.00	0.03
Predictive control	–0.33**	–0.23	–0.12	–0.39***	0.04	–0.45***
Vicarious control	0.15	0.02	0.05	0.01	–0.16	0.08
Illusory control	0.28	0.29	0.20	0.16	–0.07	0.17
Interpretative control	0.01	–0.12	–0.01	0.23	0.21	0.10

[a]Values reported are standardised regression coefficients (Beta) with significance of *t* with the exception of the rows presenting *R* squares with significance of *F*.
DQC = Depression Questionnaire for Children, $^{**}p < 0.01$; $^{***}p < 0.001$.

most of the cases significantly positive, indicating that parents use the four secondary control strategies simultaneously (Grootenhuis *et al.*, 1996). Outcome measures, assessing negative emotions, are correlated positively as expected. All outcome measures do not correlate, or correlate negatively with the subscale positive feelings.

Parental adjustment predicted with the Child Variables Model

For mothers, report of negative emotions (depression, anxiety, loneliness, helplessness and uncertainty) were all explained significantly (all F's > 3.8, $p < 0.01$) by the entered child variables (see Table 5). A longer time since diagnosis of the child explained feelings of loneliness for the mothers. Having a child with a relapse, and having a younger child explained feelings of depression. Having a child with a relapse explained anxiety, feelings of helplessness and uncertainty.

For fathers only feelings of loneliness, helplessness and uncertainty were explained significantly (all F's > 3.8, $p < 0.01$) by the entered child variables (see Table 6). For fathers, having a child with a relapse explained the feelings of helplessness and uncertainty.

Parental adjustment predicted with the Control Strategies Model

For mothers, the use of the four control strategies significantly explained (all F's > 5.1, $p < 0.01$) feelings of depression, anxiety, helplessness and uncertainty (see Table 5). Depression and feelings of helplessness had considerable higher explained variances than with the child variables model. Two control strategies are especially related to the report of the negative emotions, that is predictive and illusory control. The regression coefficients show that lower scores on the scale measuring predictive control (assessing negative expectations) and higher scores on

Table 6. Simultaneous regressions (Beta) for measures of adjustment for fathers, with three predictor models[a]

	Depression	Anxiety	Loneliness	Helplessness	Positive feelings	Uncertainty
Child variable model						
R square (sign of *F*)	0.14	0.12	0.18**	0.34***	0.06	0.32***
Age	–0.11	0.02	–0.07	–0.05	–0.09	0.01
Time since diagnosis	–0.21	–0.12	–0.21	–0.11	0.04	–0.20
Group	0.23	0.20	0.21	0.58***	0.13	0.51***
DQC	0.15	0.25	0.27	0.06	–0.22	0.17
Control strategies model						
R square (sign. of *F*)	0.26***	0.17**	0.17**	0.28***	0.07	0.49***
Predictive control	–0.50***	–0.36**	–0.32**	–0.55***	–0.13	–0.73***
Vicarious control	0.28	0.12	0.16	–0.01	–0.03	0.09
Illusory control	0.14	0.27	0.27	0.18	0.25	0.24
Interpretative control	0.11	0.01	0.06	0.18	0.05	0.13
Child and control strategies model						
R square (sign. of *F*)	0.31**	0.23	0.26**	0.43***	0.14	0.58***
Age	–0.08	0.02	–0.04	–0.04	–0.06	0.01
Time since diagnosis	–0.10	–0.04	–0.12	–0.01	0.11	–0.07
Group	0.01	0.05	0.10	0.42***	0.12	0.18
DQC	0.19	0.25	0.26	0.08	–0.27	0.24**
Predictive control	–0.50***	–0.34	–0.27	–0.33**	–0.06	–0.65***
Vicarious control	0.22	0.08	0.10	0.04	0.05	0.07
Illusory control	0.07	0.22	0.19	0.11	0.28	0.17
Interpretative control	0.12	0.02	0.08	0.10	–0.01	0.12

[a]Values reported are standardised regression coefficients (Beta) with significance of *t* with the exception of the rows presenting *R* squares with significance of *F*.
DQC = Depression Questionnaire for Children, $^{**}p < 0.01$; $^{***}p < 0.001$.

the scale measuring illusory control (increased wishful thinking) are related to anxiety and depression. Negative expectations, that is low scores on the predictive control scale, also explained feelings of helplessness and uncertainty.

For fathers, the report of negative emotions are all explained significantly (all F's > 3.7, $p < 0.01$) by the control strategies (see Table 6). For fathers the explained variances of depression and feelings of uncertainty are considerably higher than with the child variables model. Having negative expectations (low scores on the predictive control scale) explained the report of all the negative emotions.

Parental adjustment predicted with the Child and the Control Strategies Model

For mothers all negative emotions but loneliness were explained significantly (all F's > 3.5, $p < 0.01$) with the complete model (see Table 5). This model shows that having a child with a relapse and having negative expectations (low scores on the predictive control scale) explained feelings of helplessness and uncertainty for mothers. Predictive control also explained feelings of depression.

For fathers, all negative emotions but anxiety were explained significantly (all F's > 2.9, $p < 0.01$) by all variables entered simultaneously in the regression analyses (see Table 6). Predictive control explained depression, feelings of helplessness and uncertainty. Having a child with a relapse also explained feelings of helplessness, whereas an increased report of depressive feelings by the child also explained feelings of uncertainty.

DISCUSSION

In this study emotional adjustment of parents of children with cancer were predicted with three

models. One model only included variables of the child, the next model only included cognitive control strategies used by the parents, and finally emotional adjustment of the parents was predicted with a combination of the two models. A limitation of this study which should be taken into account are the predictors included in the models. Possible other, not included predictors, may also have influenced parental adjustment, such as financial resources, social support or supportive family relationships or the coping strategies used by the children, which in other research proved to be of importance (Kupst *et al*., 1995; Sloper and Turner, 1993; Speechley and Noh, 1992). We choose to focus on control strategies, because little is known about the relationship between secondary control strategies or emotion-focused coping strategies, and emotional adjustment of parents of children with cancer.

Consideration of the child variables model and the control strategies model separately, shows that the control strategies model in general accounts for more explained variance. Secondary predictive control, that is having negative expectations about the course of the illness, proves to be the most important variable predicting negative emotions for mothers and for fathers of children with cancer. Hence, the possible confounding between predictive control and the outcome measures should be considered. Whether negative emotions give rise to negative expectations, or negative expectations lead to the report of negative emotions is not possible to answer. However, predictive control was measured with six items which all considered beliefs and expectations about the future, and the items were not confounded with the experience of feelings of the parents. Higher scores on the predictive control scale reflect having more positive expectations. Mean item scores on the predictive control scale indicated that both mothers and fathers agreed with the items on the predictive control scale. This means that mothers and fathers of children with cancer generally have positive expectations about the course of the illness. Parents of children with cancer apparently do not anticipate disappointments, but it seems that having positive expectations, or a sense of optimism, generates the feelings of control. From our previous research we know that parents of children with cancer with a relapse had lower scores on the predictive scale (Grootenhuis *et al*., 1996). Considering the lesser survival perspectives of their children and the possible loss of the child in the future, this is an essential change of perception, and may help the parents with their mourning process. Spinetta *et al*. (1981) found that parents who had a consistent philosophy of life during the course of the illness of their child, were better adjusted after the death of the child. However, if parents of children with cancer continue to have negative expectations about the course of the illness contrary to the real survival perspective, this may have implications for intervention. In such cases it may be helpful to consult a physician for an explanation of survival chances. Such information from medical caregivers may protect parents of children with cancer from having unnecessary negative expectations, and therefore unnecessary negative emotions.

We believe that the results of our study confirm the importance of having positive expectations or having a positive outlook. Whenever parents continue to be hopeful this protects them from negative emotions. The protection of having a positive outlook, or being optimistic has been described before (Babarin and Chesler, 1984; Koocher and O'Malley, 1981; Obetz *et al*., 1980). A sense of optimism also reflects itself, in the experience of positive feelings. Mothers often reported having positive feelings, and fathers reported positive feelings sometimes. Although the experience of childhood cancer in the family concurs with feelings of helplessness and uncertainty, parents are also able to put these experiences into another perspective and are able to enjoy small things. It shows that families under stress are able to develop strengths and abilities to 'bounce back', which has been called resilience (Patterson, 1995).

Some other important findings emerge from this study. Although several authors suggest that the emotional adjustment of parents of children with cancer increases over time (Fife *et al*., 1987; Kupst *et al*., 1995), lack of prediction of time since diagnosis in our study suggests that the emotional feelings from parents maintain over time. These findings are comparable to Van Dongen-Melman *et al*. (1995). For mothers, we even found that feelings of loneliness increase if the time since diagnosis increases. Mothers of children with cancer have the feeling, that people do not understand what they are going through, even if the treatment of the child is some time ago. Of the two illness related variables studied in our design, survival perspective of the children proves to be a

risk factor for emotional problems, and especially for mothers. These findings should encourage professionals, involved in psychosocial care, to be particularly attentive for the vulnerability of the parents of children with cancer with lesser survival perspectives.

Although the adjustment of mothers and fathers was investigated separately, examination shows some differences, but these were not tested. In our study we only found impact of the age of the children, on the emotional adjustment of the mothers. The younger the children, the more feelings of depression mothers report. Mothers possibly have the feeling that younger children are more vulnerable, and therefore mothers report more feelings of depression. Because only children older than eight years of age were participating in the study, the impact of having a younger child with cancer could not be studied. Having a child with a relapse and the reported feelings of depression of the child, differentiate mothers and fathers as well. For mothers the survival perspective is more often related to their negative emotions, whereas for fathers the depression of the child predicts feelings of uncertainty. Until now, only relations between adjustment of the child and the mother were found. That emotional adjustment of the mothers is not predicted by the emotional adjustment of their children is contrary to previous research (Kupst *et al*., 1995; Manne *et al*., 1995). The correlational analyses however showed that increased depressive feelings of the children resulted in increased reliance on vicarious, illusory and interpretative control by the mothers. The mechanism of appraisal and the experience of emotional feelings for mothers and fathers should apparently be considered differently. The appraisal of lesser survival perspective seems important for mothers, whereas the appraisal of feelings of depression of the child seems important for the fathers.

Comparable to previous studies (Larson *et al*., 1994; Dahlquist *et al*., 1993), mothers report more negative emotions than fathers do. Fathers possibly feel the need to present themselves as strong and do report less negative emotions than mothers do. However, our results indicate that if their child is reporting more feelings of depression, fathers can no longer deny the significance of the situation, and this results in an increased report of feelings of uncertainty. If the child reports more feelings of depression, this possibly decreases the fathers confidence that the child can handle the situation.

Two control strategies, that is vicarious and interpretative control, only contributed slightly to the prediction of parental emotional adjustment. Mean item scores for mothers and fathers were three or higher on both scales. This indicates that parents often agreed with the items on the scales, reflecting a strong reliance on these control strategies. The need to seek information is often seen shortly after hearing the diagnosis of cancer. Because in our study no families were participating who were shortly after diagnosis, the possible benefit of interpretative control may already have been disappeared.

Apart from predictive control, also illusory control is related to the increased feelings of depression and anxiety for the mothers, but only in the control strategies model. If health caregivers come upon increased wishful thinking of mothers of children with cancer, they should be attentive for increased negative emotions as well. That emotion-focused coping strategies and wishful thinking are related to poor adjustment, has been found before (Baskin *et al* 1985; Felton and Revenson, 1984). The results considering predictive and illusory control, show that the coping process is often a vicious circle and stresses the importance of considering the reappraisal process in the study of coping. Increased feelings of for example depression possibly lead to an increased use of wishful thinking, such as increased feelings of depression may also lead to more negative expectations.

Comparable to other studies, we also did not find differences between parents of children with cancer and normative data on the measures of depression and anxiety (Fife *et al*., 1987; Speechley and Noh, 1992). Although difficult to answer, the reliance on certain control strategies may protect parents from excessive negative emotions. These findings underscore the need to account for control strategies in predicting emotional adjustment of parents of children with cancer.

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REFERENCES

Barbarin, O.A. and Chesler, M.A. (1984) Coping as interpersonal strategy: families with childhood cancer. *Fam. Sys. Med.*, **2**, 279–289.

Barbarin, O.A., Hughes, D. and Chesler, M.A. (1985) Stress, coping, and marital functioning among parents of children with cancer. *J. Marr. Fam.*, **47**, 473–480.

Baskin, C.H., Forehand, R. and Saylor, C. (1985) Predictors of psychological adjustment in mothers of children with cancer. *J. Psychosoc. Oncol.*, **3**, 43–54.

Billings, A.G. and Moos, R.H. (1981) The role of coping responses and social resources in attenuating the stress of live events. *J. Behav. Med.*, **4**, 139–157.

Bouman, T. (1994) De 'Beck Depression Inventory' (BDI). *Gedragstherapie*, **27**, 69–71.

Bouman, T.K., Luteijn, F., Albersnagel, F.A. and Van Der Ploeg, F.A.E. (1985) Enige ervaringen met de Beck Depression Inventory (BDI). *Gedrag*, **13**, 13–24.

Brown, R.T., Kaslow, N.J., Hazzard, A.P., Madan-Swain, A., Sexson, S.B., Lambert, R. and Baldwin, K. (1992) Psychiatric and family functioning in children with leukemia and their parents. *J. Am. Acad. Child Adolesc. Psychiat.*, **31**, 495–502.

Dahlquist, L.M., Czyzewski, D.I., Copeland, K.G., Jones, C.L., Taub, E. and Vaughan, J.K. (1993) Parents of children newly diagnosed with cancer: anxiety, coping, and marital distress. *J. Pediatr. Psychol.*, **18**, 365–376.

De Wit, A.M. (1987) *Depressievragenlijst voor kinderen (DVK-KDVK), handleiding en testmateriaal*, ACCO, Amersfoort-Leuven.

Felton, B.J. and Revenson, T.A. (1984) Coping with chronic illness: a study of illness controllability and the influence of coping strategies on psychological adjustment. *J. Consult. Clin. Psychol.*, **52**, 343–353.

Fife, B., Norton, J. and Groom, G. (1987) The family's adaptation to childhood leukemia. *Soc. Sci. Med.*, **24**, 159–168.

Folkman, S. (1984) Personal control and stress and coping processes: a theoretical analysis. *J. Pers. Soc. Psychol.*, **46**, 839–852.

Frijda, N.H. (1986) The Emotions. Cambridge University Press, Cambridge.

Grootenhuis, M.A., Last, B.F., De Graaf-Nijkerk, J.H. and Van Der Wel, M. (1996) Secondary control strategies used by parents of children with cancer. *Psycho-Oncol.*, **5**, 91–102.

Grootenhuis, M.A., Last, B.F., Van Der Wel, M. and De Graaf-Nijkerk, J.H. (in press) Parents' attribution of positive characteristics to their children with cancer. *Psychol. Health*.

Grootenhuis, M.A. and Last, B.F. (in press) Parents' emotional reactions related to different prospects for the survival of their children with cancer. *J. Psychosoc. Oncol.*.

Koocher, G.P. and O'Malley, J.E. (1981) *The Damocles Syndrome. Psychosocial Consequences of Surviving Childhood Cancer*. McGraw-Hill, New York.

Kupst, M.J. (1994) Coping with pediatric cancer: theoretical and research perspectives. In: D.J. Bearison and R.K. Mulhern (eds). *Pediatric Oncology. Psychosocial Perspectives on Children with Cancer*. Oxford University Press, New York, Oxford. pp. 35–60.

Kupst, M.J., Natta, M.B., Richardson, C.C., Schulman, J.L., Lavigne, J.V. and Das, L. (1995) Family coping with pediatric leukemia: ten years after treatment. *J. Pediat. Psychol.*, **20**, 601–617.

Larson, L.S., Wittrock, D.A. and Sandgren, A.K. (1994) When a child is diagnosed with cancer: I. Sex differences in parental adjustment. *J. Psychosoc. Oncol.*, **12**, 123–142.

Lazarus, R.S. and Folkman, S. (1984) *Stress, Appraisal, and Coping*. Springer Publishing Company, New York.

Magni, G., Silvestro, A., Carli, M. and De Leo, D. (1986) Social support and psychological distress of parents of children with acute lymphocytic leukaemia. *Br. J. Med. Psychol.*, **59**, 383–385.

Manne, S.L., Lesanics, D., Meyers, P., Wollner, N., Steinherz, P. and Redd, W. (1995) Predictors of depressive symptomatology among parents of newly diagnosed children with cancer. *J. Pediat. Psychol.*, **20**, 491–510.

Morrow, G.R., Carpenter, P.J. and Hoagland, A.C. (1984) The role of social support in parental adjustment to pediatric cancer. *J. Pediat. Psychol.*, **9**, 317–329.

Mulhern, R.K., Fairclough, D.L., Smith, B. and Douglas, S.M. (1992) Maternal depression, assessment methods, and physical symptoms affect estimates of depressive symptomatology among children with cancer. *J. Pediatr. Psychol.*, **17**, 313–326.

Obetz, S.W., Swenson, W.M., McCarthy, C.A., Gilchrist, G.S. and Burgert, E.O. (1980) Children who survive malignant disease: emotional adaptation of the children and their families. In: J.L. Schulman and M.J. Kupst (eds). *The Child with Cancer* C.C. Thomas, Springfield, pp. 194–210.

Patterson, J.M. (1995) Promoting resilience in families experiencing stress. *Pediatr. Clin. N. Am.* **42**, 47–63.

Pearlin, L.I. and Schooler, C. (1978) The structure of coping. *J. Health Soc. Behav.*, **19**, 2–21.

Rothbaum, F., Weisz, J.R. and Snyder, S.S. (1982) Changing the world and changing the self: a two-process model of perceived control. *J. Pers. Soc. Psychol.*, **42**, 5–37.

Shapiro, J. and Shumaker, S. (1987) Differences in emotional well-being and communication styles between mothers and fathers of pediatric cancer patients. *J. Psychosoc. Oncol.*, **5**, 121–131.

Sloper, P. and Turner, S. (1993) Risk and resistance factors in the adaptation of parents of children with

severe physical disability. *J. Child Psychol. Psyc.*, **34**, 167–188.

Speechley, K.N. and Noh, S. (1992) Surviving childhood cancer, social support, and parents' psychological adjustment. *J. Pediatr. Psychol.*, **17**, 15–31.

Spinetta, J.J., Swarner, J.A. and Sheposh, J.P. (1981) Effective parental coping following the death of a child from cancer. *J. Pediatr. Psychol.*, **6**, 251–263.

Van Der Ploeg, H.M., Defares, P.B. and Spielberger, C.D. (1980) *Handleiding bij de Zelf-Beoordelings Vragenlijst ZBV. Een Nederlandstalige bewerking van de Spielberger State-Trait Anxiety Inventory, Stai-DY* Swets and Zeitlinger, Lisse.

Van Dongen-Melman, J.E.W.M., Pruyn, J.F.A., De Groot, A., Koot, H.M., Hählen, K., and Verhulst, F.C. (1995) Late psychosocial consequences for parents of children who survived cancer. *J. Pediatr. Psychol.*, **20**, 567–586.

Van Veldhuizen, A.M. and Last, B.F. (1991) *Children with Cancer. Communication and Emotions.* Swets and Zeitlinger, Amsterdam/Lisse.

