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The Relationship Between Coping Strategies and Psychological Adjustment Among Siblings of Chronically Ill Children

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ABSTRACT

This study was designed to examine: how siblings of chronically ill children cope with decreased parental availability, disruption to daily routines, and worries about the ill sibling; whether siblings cope differently with each of these three situations; what type of coping strategies siblings perceive as effective; the relation between psychological adjustment and the use of problem-focused and emotion-focused strategies; and the incremental variance in siblings' psychological functioning accounted for by siblings' coping strategies after controlling for age and gender. The study also explored how coping differs as a function of secondary appraisal and whether there are gender differences in coping. The Cognitive Appraisal Model of stress and coping guided the study. 110 participants (56 girls and 54 boys), 8-12 years old, completed the Kidcope, the Children's Depression Inventory, and the Revised Children's Manifest Anxiety Scale, and parents completed the Child Behavior Checklist.

Results indicate that siblings' coping strategies explain a significant proportion of the variance in externalizing (14%) and internalizing (7%) behaviour problems after siblings' age and gender are controlled for, though coping is not related to child-reported symptoms of depression and anxiety. The most frequently used coping strategies are cognitive restructuring and wishful thinking. Other commonly utilized strategies are social support, distraction, problem solving, emotional regulation, and social withdrawal. Of these, social support is perceived as the most helpful in dealing with decreased parental availability and disruptions to routines, and cognitive restructuring as the most helpful in dealing with worries. Siblings employ significantly more emotion- than problem-focused strategies in dealing with all situations, though the use of problem- or emotion-focused coping is not related to secondary appraisal. Problem-focused coping in dealing with disruptions and worries is associated with higher parental reports of externalizing problems, whereas the use of emotion-focused coping in dealing with these two situations is associated with fewer such reports. There are no gender differences with regard to the relative use of problem- or emotion-focused coping. Research and clinical implications of these findings, as well as the insights and limitations of this study, are considered in the discussion.

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The Relationship Between Coping Strategies and Psychological Adjustment Among Siblings of Chronically Ill Children

Overview

This research project is grounded in three widely accepted findings of clinical research. The first is that pediatric chronic illness is potentially a significant stressor, creating difficulties and posing challenges to different family members (Cadman, Rosenbaum, Boyle, & Offord, 1991; Hamlett, Pellegrini, & Katz, 1992; Kazak, 1992; Sabbeth & Leventhal, 1984; Thompson & Gustafson, 1996; Varni, Katz, Colegrove, & Dolgin, 1994). The second finding is that the strategies people use to cope with trying situations have an impact on how well they do (Lazarus & Folkman, 1984; McCubbin & McCubbin, 1987; McCubbin et al., 1982). The final finding is that sibling relationships are an important factor in children's development. Sibling relationships offer children unique opportunities for learning about self and others, have considerable potential to affect children's well-being (Dunn, 1992; Lamb, 1982; Lobato, Faust, & Spirito, 1988), are one of the most long-lasting, powerful human relationships, characterized by a variety of emotional responses, and may take on even greater meaning when one sibling is chronically ill or has a disability (Blacher, 1993; Stoneman & Brody, 1993). The present study was designed to weave together these three threads of clinical research: to examine the relation between coping strategies and psychological adjustment among siblings of chronically ill children.

Childhood chronic illness is defined as any anatomical or physiological impairment that requires extended or sequential services and interferes with a child's ability to function fully in his or her environment (Gallo & Knafl, 1993; Menke, 1987). Chronic health problems affect a large number of children and constitute a major component of paediatric morbidity. Prevalence rates of such illnesses with and without disabilities range from 10 to 20 per cent of children in North America (Thompson & Gustafson, 1996). Chronically ill children, particularly those with associated disabilities, have been found to be at greater risk for psycho-social maladjustment than are healthy children (Cadman, Boyle, Szatmari, & Offord, 1987; Harper, 1991; Pless & Roghmann, 1971; Thompson & Gustafson, 1996).

The impact of childhood chronic illness is not limited solely to the ill child. It is well-documented that it also affects other family members and places extraordinary stress on the family system (Cadman et al.,1991; Hamlett et al.,1992; Kazak, 1992; Sabbeth & Leventhal, 1984; Thompson & Gustafson, 1996). Stressors for other members of the family include the child's daily care, time commitments that disturb family routines (such as trips to the hospital, physician, and/or clinic), changes in family activities (such as reduced options for family vacations), altered relationships with friends, the demands of caring for siblings, differences in coping behaviours and feelings of each family member, the uncertainty of the situation, and the demands of coping with change (McCubbin et al., 1982; Menke,1987).

To date, most of the work on siblings of chronically ill children has focused on the question of whether siblings of children with a chronic illness or disability are more likely to suffer psychological and social problems than are siblings of healthy children or normative samples (Howe, 1993; Lobato et al., 1988; Thompson & Gustafson, 1996). Findings with respect to this question have been contradictory, and as a result, investigators have raised questions about individual differences and have examined factors differentiating poorly and well-adjusted siblings. These factors include the age and gender of the healthy sibling, maternal physical and mental health, family environment, marital adjustment, family level of stress, differences in the family experience of healthy siblings as compared with the family experience of the chronically ill child, parental responses, availability of social support for parents, self-concept, the adjustment of the chronically ill child, time since diagnosis of pediatric chronic illness, the healthy siblings' knowledge about the illness, and the severity of the illness (Breslau, 1982; Breslau, Weitzman, & Messenger, 1981; Comber, 1995; Cowen et al., 1986; Daniels, Miller, Billings, & Moos, 1986; Daniels, Moos, Billings, & Miller, 1987; Evans, Stevens, Cushway, & Houghton, 1992; Ferrari, 1984; Fielding et al., 1985; Gallo, Breitmayer, Knafl, & Zoeller, 1992; Gardner, 1998; Horwitz & Kazak, 1990; Lavigne & Ryan, 1979; Lavigne, Traisman, Marr, & Chasnof, 1982; Lobato, Barbour, Hall, & Miller, 1987; Switzer, 1984; Tew & Lawrence, 1973; Treiber, Mabe, & Wilson, 1987; Wood et al., 1988). All but one of these factors -- illness severity -- have been found to be related to siblings' adaptation. However, due to methodological problems with many of these studies, the literature in this area is still inconclusive.

One potentially important factor which has not received systematic scrutiny is the coping mechanisms employed by healthy siblings (Gamble & Woulbroun, 1993). Where this factor has been looked at, the focus has almost always been on the chronically ill children or their parents. Thus, questions remain regarding how siblings cope with a brother's or sister's chronic illness and how their coping responses may relate to their adjustment. This gap in the existing literature has limited our understanding of the factors that facilitate successful adaptation to living with a chronically ill brother or sister and is of increasing concern for several reasons. First, as medical advances extend life expectancy, the number of children living with a chronically ill sibling is likely to rise. Second, as the onus for care of ill children shifts to the family (Lobato, 1993; McCubbin et al., 1982; Thompson & Gustafson, 1996), more and more healthy children will be affected by long-term coping challenges related to living with a chronically ill sibling. Third, as spending restraints continue to affect the health sector, the importance of well-targeted psycho-social interventions can only grow. Given the above concerns and the fact that coping efforts have been consistently linked to psychological adjustment in both adults and children (Compas, 1987b; Felton & Revenson, 1984; Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986; Forman, 1993; Horowitz & Kazak, 1990; Lazarus & Folkman, 1984), it seems only logical to examine the coping strategies of siblings of chronically ill children.

Reflecting the findings of and gaps in the literature to date, this study was designed with five primary goals in mind. The first was to determine how siblings of chronically ill children cope with three stressful situations: decreased parental availability, disruptions to daily life and routines, and worries about the ill brother or sister. These situations were chosen because they have been identified by siblings as the most difficult or challenging stressors related to a brother's or sister's chronic illness (Faux, 1991; Gallo et al., 1991; Gardner, 1998; Harder & Bowditch, 1982; Menke, 1987; Sargent et al., 1995; Tritt & Esses, 1988).

The second goal was to assess whether siblings cope differently with each of the three situations. No study to date has examined whether children cope differently with various stressful situations related to a sibling's chronic illness. The third goal was to examine what types of coping strategies siblings perceive as effective when dealing with the three situations and whether the strategies seen as effective are similar or different across the situations. The fourth goal was to evaluate the relation between psychological adjustment and use of each of the two broad forms of coping: problem-focused and emotion-focused strategies. The last of the primary goals was to test for the incremental variance in siblings' psychological adjustment accounted for by siblings' coping responses after controlling for age and gender.

In addition to the five primary goals, this study had two ancillary goals. The first was to evaluate whether coping strategies differ as a function of siblings' secondary appraisals of each of the three situations. The other ancillary goal was to examine gender differences in coping strategies (i.e., emotion-focused and problem-focused coping) employed by siblings. The literature on gender effects in children's and adolescents' coping suggest that there are some differences in how boys and girls deal with stress. Examining whether results with siblings of chronically ill children resemble the above findings could provide useful insights.

The sections which follow review relevant literature on the impact of childhood chronic illness on siblings and on the variables identified as related to siblings' adjustment. Methodological shortcomings in these two areas of research are also examined. Next, the cognitive appraisal model of coping is delineated, for it is important that descriptive research on children's coping with siblings' chronic illness be grounded in a broader conceptual model of the coping process. Finally, the literature on the relation between coping and psychological adjustment in children and adolescents is summarized.

Literature Review

Impact of Childhood Chronic Illness on Healthy Siblings

The databases used in search for studies on the effects of having a chronically ill siblings were PsychInfo and Medline. Key search words included: chronic illness, siblings, children and adolescents, and psychological adjustment. Only articles in English were selected. This search yielded 16 qualitative and 28 quantitative studies.

The review of these studies is divided into two parts. The first part summarizes findings of qualitative studies which relied upon semi-structured or structured interviews to evaluate siblings' experiences. The second part presents findings of studies employing standardized self-report measures of adjustment. The second part is, again, divided into two sections: results of single-illness studies, and results of multi-disease studies. This distinction reflects the existence of two different approaches to the study of chronic childhood illness: a categorical and a non-categorical approach (Gamble & Woulbroun, 1993; Thompson & Gustafson, 1996).

The *categorical approach* groups chronic conditions in terms of specific diseases, such as diabetes or cystic fibrosis, or in terms of particular body system/organ impairments, such as hearing disorders. The *non-categorical approach*, in contrast, assumes that it is unnecessary to narrow the focus to specific chronic diseases as there are similar life experiences that all chronically ill children and their families have to deal with. Researchers who argue for a non-categorical approach believe that although illnesses may vary along a number of dimensions (e.g., etiology, stability and predictability, threat to life, physical and social restrictions they impose), they are similar in the sense that they cannot be cured, require ongoing treatment, impose various limitations, result in regular consultation with medical staff and possible hospitalisation, and require a certain level of personal readjustment (Stallard, Mastroyannopoulou, Lewis, & Lenton, 1997; Thompson & Gustafson, 1996).

Results of Qualitative Studies

The results of 16 studies will be examined in this section: the nine studies summarized in Appendix A, as well as the results of the qualitative portions of seven studies summarized in Appendix B (Evans et al., 1992; Faux, 1991; Ferrari, 1984; Stewart, Stein, Forrest, & Clark, 1992; Tritt & Essess, 1988; Vance, Fazan, Satterwhite, & Pless, 1980; Stallard et al., 1997). Seven of these 16 studies limited their sample to siblings of children with a single chronic illness: cancer (Evans et al., 1992; Illes, 1979; Kramer, 1984; Sargent et al., 1995), cystic fibrosis (Harder & Bowditch, 1982; Phillips, Bohannon, Gayton, & Friedman, 1985) and nephrotic disease (Vance et al., 1980). The other studies included two or more chronic illnesses.

Studies have shown that siblings and parents identify both negative and positive effects of having a sister or brother with a chronic illness (Evans et al., 1992; Faux, 1991; Ferrari, 1984; Harder & Bowditch, 1982; Illess, 1979; Kramer, 1984; Sargent et al., 1995; Stewart et al., 1992; Taylor, 1980; Tritt & Essess, 1988; Williams, Lorenzo, & Borja, 1993).

Negative effects included disruption in family routines and interpersonal relationships; decreased parental attention and, as a result, increases in attention seeking behaviours or social withdrawal; decline in school performance; and a higher incidence of negative feelings such as loneliness, isolation, guilt, sadness, jealousy, and anger. Positive effects included increased nurturing, cooperation, sensitivity, empathy, and cognitive mastery; appreciation for one's own health; increased family closeness; and increased assertiveness and self-esteem. Age was found to influence children's reports of positive effects. Younger siblings (Sargent et al., 1995; Tritt & Esses, 1988) and siblings who were closer in age to the ill child (one to two years in Taylor, 1980) were far less likely to report positive effects. Younger children also felt significantly less able to talk with their parents or anyone else about their sibling's illness (Stallard et al., 1997) and tended to be more secretive with peers about it (Gallo, Breitmayer, Knafl, & Zoeller, 1991).

Not surprisingly, one finding in many of these studies was that healthy children tended to worry a great deal about their ill brother or sister (Evans et al., 1992; Faux, 1991; Gallo et al., 1991; Harder & Bowditch, 1982; Illes, 1979; Menke, 1987: Sargent et al., 1995; Stewart et al., 1992). In light of this, it is of some concern that these children seemed to keep their feelings largely to themselves (Evans et al., 1992; Faux, 1991; Stallard et al., 1997; Williams et. al., 1997), especially because this lack of communication did not seem to reflect a lack of need for discussion. Siblings participating in several studies (Evans et al., 1992; Stallard et al., 1997) indicated that they would like to know more about their brother's or sister's illness and prognosis, and get some advice on how to handle questions from outsiders. Most wanted their parents to provide them with this information.

Results of Studies Employing Standardized Self-Report Measures

Of the 28 studies that utilized objective, standardized measures of adjustment to examine the effects of having a sibling with a chronic illness (see Appendix B), all but one were clinic-based, often drawing their samples from tertiary care centres. The one exception (Cadman, Boyle, & Offord, 1988) was a general population survey of randomly selected families in the province of Ontario. Seventeen of the 28 studies limited their sample to siblings of children with a single chronic illness: inflammatory bowel disease (Wood et al., 1988), cancer (Cairns, Clark, Smith, & Lansky, 1979; Evans et al., 1992; Horowitz & Kazak, 1990), cystic fibrosis (Cowen et al., 1986; Gayton, Friedman, Tavormina, & Tucker, 1977), diabetes (Comber, 1995; Lavigne et al., 1982; Switzer, 1984), nephrotic disease (Vance et al., 1980), renal failure (Fielding et al., 1985), rheumatic disease (Daniels et al., 1986), seizure disorder (Feeman & Hagen, 1990; Hoare, 1984), sickle-cell anaemia (Noll et al., 1995; Treiber et al., 1987), and spina bifida (Tew & Laurence, 1973). The other eleven adopted a non-categorical approach and drew on two or more chronic illnesses.

A review of these studies suggests that the evidence regarding the effects of having a chronically ill or disabled sibling is mixed. Some studies report siblings of chronically ill children as being at risk for a variety of psychological and somatic complaints. Others, however, argue that siblings are not any more likely to experience problems than are children in the general population, and that some siblings actually appear to benefit from the experience.

<u>Results of single-illness studies</u>: Of the 17 single-illness studies, 10 found no evidence of particular psychological vulnerability when siblings of children with a chronic illness were compared to children in a comparison group or to a normative sample. One group of researchers found no differences on measures of social competence and peer relationships between siblings of children with sickle cell anaemia and a comparison group (Noll et al., 1995). In addition, no differences were detected on self-esteem measures between siblings of children with cancer (Cairns et al., 1979), diabetes (Comber, 1995) or with cystic fibrosis (Gayton et al., 1977) and a normative sample. In fact, one study (Switzer, 1984) found that siblings of children with diabetes had significantly higher levels of self-esteem than the normative sample. Siblings of children with sickle-cell anaemia also did not differ from a normative sample on a depression self-report measure (Treiber et al., 1987).

Similarly, no differences were reported on measures of child functioning completed by parents between siblings of diabetic children and a normative sample (Switzer, 1984; Comber, 1985), between siblings of children with cancer and a comparison group (Horowitz & Kazak, 1990), or between school-age siblings of children with cancer and a normative sample (Evans et al., 1992). Finally, no significant differences were identified on school performance between siblings of children with renal failure and a normative sample (Fielding et al., 1985), or between siblings of children with rheumatic disease and a comparison group (Daniels et al., 1986). However, with few exceptions (Cairns et al., 1979; Comber, 1985; Daniels et al., 1986; Switzer, 1984), all these investigations utilized small samples. Therefore, it is possible that the absence of significant findings is at least partly a function of a lack of power to detect all the effects. For this reason, these results need to be treated with caution.

The other seven single-illness studies found siblings to be at higher risk for emotional and/or behavioural problems than children in a comparison group or a normative sample. Feeman and Hagen (1990) found, using parental reports, that siblings of children with chronic seizure disorder had significantly more behavioural problems than did children in a comparison group. However, relying solely on parental reports when assessing children's psychological adjustment can be problematic. Research has shown that maternal level of psychological distress can influence a mother's perception of her child's behaviour (Sawyer, Streiner, & Baghurst, 1998; Thompson & Gustafson, 1996). Interestingly, on a measure of perceived self-competence, Feeman and Hagen (1990) found no significant differences between siblings and a comparison group. Another study that assessed a similar population (Hoare, 1984) also found -- based on parents' and teachers' reports -- that siblings of children with chronic epilepsy had more behavioural and academic problems than did children in a comparison group or siblings of children with newly diagnosed epilepsy.

Three other studies also relied solely on parental reports in evaluating healthy siblings' functioning. Cowen et al. (1986) found that only the preschool siblings of children with cystic fibrosis had significantly more behavioural problems than the norm. School-age siblings did, however, have an unusually large number of somatic complaints. Lavigne et al. (1982) found no group differences among the 6 to 11 year-old siblings of diabetics and children in a comparison group. However, brothers of diabetic boys in the 12 to 16 year-old range had poorer school performance than a comparison group. Wood et al. (1988) found that siblings of children with Crohn's disease had significantly more psychological problems than did both siblings of children with ulcerative colitis and a normative sample. Siblings of children with ulcerative colitis did not appear to differ from the normative sample. However, the number of siblings in the ulcerative colitis group was small and thus, this last finding cannot be viewed as conclusive.

Mixed results were reported by Vance et al. (1980), who assessed siblings of children with nephrotic syndrome. On a measure of global assessment of behaviour completed by parents, no significant differences were observed between siblings and a comparison group. However, data from an interview with parents revealed that siblings of children with nephrotic disease had poorer school performance and more emotional problems than did children in the comparison group. Teachers' ratings also confirmed significant group differences in school performance. In addition, on a child's self-report measure, siblings were found to have significantly lower scores on self-security and social confidence scales than did the comparison group.

Finally, teachers' ratings in one study (Tew & Laurence, 1973) revealed that siblings of children with spina bifida were almost four times more likely than siblings of healthy children to show evidence of maladjustment.

<u>Results of multi-disease studies</u>: Unlike single-illness studies, of the 11 multi-disease studies, all but one -- which employed a very small sample (Stewart et al., 1992) -- found some differences between siblings of children with chronic illnesses and siblings of healthy children or a normative sample. This may be due partly to the fact that studies in this category had larger sample sizes and, therefore, greater statistical power to detect differences. Several of the studies in question indicated that siblings were not more likely to be at risk for *overall* mental health problems, but rather had *specific* areas of increased vulnerability. For example, Breslau et al. (1981) and Breslau (1982) found that siblings of chronically ill children did not differ from a comparison group with respect to general symptomatology, but did display more interpersonal aggression with peers and in school than did children in the comparison group. Similarly, Cadman et al. (1988) reported from the Ontario Child Health Study that although generally siblings of chronically ill children were, by and large, at little increased risk for psychiatric disorders or social maladjustment, they were more likely than children in a comparison group to develop emotional difficulties and poor peer relationships. With a small sample size, Gallo et al.

(1992) obtained analogous results, finding that siblings did not differ from a normative sample with regard to behavioural problems, but had greater deficits in social relationships. Problems in siblings' social relationships were also identified by other researchers (Lobato et al., 1987).

Lavigne and Ryan (1979) found that siblings of chronically ill children were significantly more withdrawn and irritable than were children in a comparison group. However, the measure they used to assess parental perceptions of children's behaviour problems (i.e., Louisville Behavior Checklist) has poor validity and reliability (Lentz, 1989). Therefore, the results of this study should be viewed as inconclusive. In addition, Ferrari (1984) found no significant group differences with respect to behavioural and emotional functioning between siblings of children with diabetes, siblings of children with developmental delay, and siblings of healthy children. However, children in the first group were three times more likely than the others to have somatic complaints. This study used a small sample size; thus, the results must be considered preliminary in nature.

In contrast to studies discussed earlier which found no differences on behaviour rating scales, Tritt and Esses (1988) and Stallard et al. (1998) reported that siblings of chronically ill children were perceived by parents as experiencing significantly more behavioural adjustment problems than siblings of healthy children or a normative sample, respectively. Breslau and Prabucki (1987) also found that siblings had significantly more behavioural problems and emotional distress than children in the comparison group at a five-year follow-up.

Variations in findings can be explained in part by differences in measurement methodologies. In an attempt to control for this variable, 10 studies that used the Child Behavior Checklist (CBCL) were compared. Eight of the studies reported no significant differences with respect to behaviour problems (Comber, 1995; Cowen et al., 1986; Evans et al., 1992; Ferrari, 1984; Gallo et al., 1992; Horowitz & Kazak, 1990; Lavigne et al., 1982; Tew & Lawarence, 1973). However, three of these eight studies found that siblings of children with chronic illnesses were significantly more likely to have somatic complaints (Cowen et al., 1986; Ferrari, 1984; Lavigne et al., 1982) and one study found that siblings had greater deficits in social competence (Gallo et. al., 1992).

The two studies that found differences with respect to behaviour problems reported that siblings of children with disabilities (Lobato et al., 1987) and siblings of children with Crohn's disease (Wood et al., 1988) had significantly more behaviour problems than did a comparison group and a normative sample, respectively. This suggests that differences in measurement methods cannot fully explain variations in findings. Interestingly, in contrast to variability of results with respect to behaviour problems, the vast majority of studies that assessed self-concept reported no group differences (Cairns et al., 1979; Comber, 1995; Cowen et al., 1986; Feeman & Hagen, 1990; Ferrari, 1984; Gayton et al., 1977; Stewart et al., 1992; Tritt & Esses, 1988). One study, however, reported that siblings had higher levels of self-esteem than did the normative sample (Switzer, 1984).

The discussion to this point has dealt with the presence or absence of negative effects. This largely reflects the deficit-centred perspective that has generally dominated research in this area (Brett, 1988; Lobato et al., 1988). In fact, as researchers have begun to move beyond this relatively narrow perspective, they have found, as mentioned previously, that siblings of chronically ill children also report positive effects (Daniels et al., 1986; Faux, 1991; Ferrari, 1984; Tritt & Esses, 1988).

Summary and methodological shortcomings of studies employing standardized self-report measures: Of the 28 studies surveyed in Appendix B, 17 found evidence of increased psychological risk in siblings of chronically ill children, whereas 11 did not find such evidence. In a word, findings regarding the risk for behavioural and psychological problems in siblings of chronically ill children are less than consistent. The inconsistency of results may be partly due to methodological limitations and variations, many of which have been discussed.

Sample size was a problem in almost half of the studies reviewed: 13 of the 28 investigations listed in Appendix B had sample sizes of fewer than 35 participants. It is interesting to note, however, that contrary to what one might expect, only five of these 13 studies found no differences between siblings and either a comparison group or a normative sample on measures of global functioning (Evans et al., 1992; Fielding et al., 1985; Stewart et al., 1992; Treiber et al., 1987; Wood et al., 1988). The remaining eight of the 13 small-sample studies found siblings to have significantly more academic difficulties (Feeman & Hagen, 1990; Hoare, 1984), psychological problems (Feeman & Hagen, 1990; Hoare, 1984; Lobato et al., 1987; Tritt & Essess, 1988), and deficits in social relationships (Gallo et al., 1992). Three of the eight studies also found, however, that siblings were more kind and empathic than children in a comparison group (Faux, 1991; Ferrari, 1984; Horowitz & Kazak, 1990). The fact that significant results were obtained in 62% of the small-sample studies suggests that the effects of having a sibling with chronic illness are relatively powerful.

Another methodological problem in many studies was the inclusion in the sample of children spread across a broad age range. When researchers group children of widely varying ages, the potential effects of developmental changes in perceptions of a situation, emotional requirements, and available coping resources may be overlooked.

The sources of data regarding siblings' functioning is an additional methodological weakness in several investigations. Five of the 28 studies relied solely on data gathered from parents' questionnaires (Breslau, 1982 & Breslau et al., 1981; Gallo et al., 1992; Lavigne & Ryan, 1979; Lavigne et al., 1982; Wood et al., 1988). As noted earlier, maternal level of psychological distress has been found to influence a mother's perception of her children's behaviour: mothers with increased levels of emotional distress tend to rate their children as having higher psychological problems (Thompson & Gustafson, 1996; Tsiantis et al., 1996). It has also been shown that parents' reports of their child's behaviours can differ from children's own reports (Achenbach, McConaughy & Howell, 1987; Ferrari, 1987; Korneluk & Lee, 1998). In order to achieve an optimal mix of information and perspectives, information should ideally be collected from, at minimum, both siblings and parents.

In addition, a little over one quarter of the studies relied only on one measure to assess siblings' functioning (Breslau, 1982 & Breslau et al., 1981; Cadman et al., 1988; Gallo et al., 1992; Lavigne & Ryan, 1979; Lavigne et al., 1982; Wood et al., 1988). The use of multiple measures would undoubtedly have increased the validity of findings. No single instrument has yet proven adequate to assess the multiple dimensions of functioning. It is preferable, for both clinical and research purposes, that a broad assessment battery be used. This battery should encompass different measures, sources, and areas of functioning (e.g., affect, behaviour).

Finally, as indicated above, much of the existing research has focused on the assessment of siblings' psychopathology through the use of different behaviour problem checklists that do not take process variables into account, and thus tell us little about mechanisms that may contribute to adaptation (Kazak, 1989). The possibility of positive or more subtle effects has, until recently, been largely ignored (Drotar & Crawford, 1985; Eiser, 1993).

To summarize, sample size and differences in measurement may explain -- but only in part -- the inconsistencies of research results regarding the impact of having a chronically ill sibling. Another possibility is that healthy siblings may not uniformly be at greater risk for maladjustment; that is, they may respond to a sister's or brother's chronic illness in a variety of both positive and negative ways. Particularly notable in this connection are studies suggesting -- in line with indications from anecdotal clinical reports -- that the effects of having a sibling with a chronic illness are not entirely negative (Cadman et al., 1988). The question that naturally follows is which variables distinguish between poorly- and well-adjusted siblings.

Variables Affecting Adjustment

The identification of variables that foster adaptation as well as factors that place siblings at risk is essential to the development of informed strategies aimed at helping siblings and their families cope with chronic illness (Gallo & Knafl, 1993; Horwitz & Kazak, 1990; Lavigne & Ryan, 1979). The variables that have been examined to date in the literature can be divided into three categories: (1) siblings' characteristics (age, gender, and self-concept of the healthy sibling); (ii) family variables (maternal physical and mental health, family environment, family stress, differences in the family experience of healthy siblings as compared with the family experience of the chronically ill child, marital adjustment, availability of social support, parental responses, and the adjustment of the chronically ill child); and (iii) illness-related variables (time since diagnosis of the ill child, visibility of the disease, siblings' knowledge about the disease and illness severity).

Sibling Characteristics

Three studies have assessed the relation between gender and siblings' adjustment and all have concluded that sisters are better adjusted overall than are brothers (Ferrari, 1984; Lavigne & Ryan, 1979; Lobato et al., 1987). These results are consistent with findings in other areas, where gender differences in children's vulnerability to stress have been identified. For example, Rutter's (1983) review indicated that boys appear more vulnerable than girls to a range of stressful experiences including marital separation and divorce, birth of a sibling, and hospitalization. Because two of the three studies mentioned above (Ferrari, 1984; Lavigne & Ryan, 1979) did not provide information on gender differences in the comparison group, it is hard to tell whether gender differences observed with siblings of chronically ill children are more pronounced than usual gender differences.

Research on gender differences in coping strategies may help explain why girls are better adjusted than boys. Several studies have found that girls report seeking emotional support from other people in their surroundings significantly more frequently than boys, who tend to report coping in a more individualistic and self-reliant way (Dise-Lewis, 1988; Stark, Spirito, Williams, & Guevremont, 1989; Wertlieb, Weigel, & Feldstein, 1987). Given evidence that social support is one of the most important moderators of stress and adjustment (McCubbin & McCubbin, 1987), it could be argued that girls adjust better than boys in part because they rely more on social support as a way of dealing with stress.

With respect to age, research findings indicate that preschoolers (Cowen et al., 1986; Lavigne & Ryan, 1979) or siblings younger than the ill child (Gallo et al.,1992) are more vulnerable than are school-aged children or children older than the ill child. Results from interview studies add qualitative information that can partly explain the relation between age and adjustment. In these studies, older children were far more likely to report positive effects of sibling illness on the family and themselves (Tritt & Esses, 1988; Sargent et al., 1995), and they were also more able to give other siblings suggestions about how to cope with the stress of chronic illness (Sargent et al., 1995). Younger children were more likely to identify negative effects and often replied that nothing good had happened following the diagnosis of illness in their brothers or sisters (Sargent et al., 1995). Thus, the researchers concluded that a level of cognitive maturity and the ability to surmount daily stressors promote a more positive outlook. They also suggested that older siblings are generally less dependent on their families for activities or support and that higher levels of independence may buffer the effects of having a chronically ill sibling (Sargent et al., 1995). Although age appears to affect adjustment, it is important to note that several investigations that studied its impact in statistical terms -- along with the impact of other demographic variables such as gender, parental education, socio-economic status (SES), and marital status -- found that it accounted for a relatively low percentage of variance in adjustment (Daniels et al., 1986; Daniels et al., 1987; Ferrari, 1984).

In contrast to the consistency of results on the impact of gender and age when measured alone, the findings regarding the interactive effects of age and gender are inconsistent. Breslau et al. (1981) and Breslau (1982) found that among brothers of chronically ill children, those younger than the ill child (especially those who were less than two years younger) had more psychological difficulties than those who were older, whereas among sisters, those younger than the ill child were better off psychologically than those older. By implication, this meant that younger sisters had significantly fewer psychological difficulties than did younger brothers, whereas the opposite pattern was observed for older siblings. Among children in the comparison group, age had no interactive effects with gender and neither predicted psychological functioning.

Similarly, Lobato et al. (1987), who assessed young siblings of disabled children (3 to 7 years of age), also found that brothers had more psychosocial problems than did sisters. In contrast, Switzer (1984) found no significant differences on adjustment measures between older and younger female siblings of children with diabetes. Differences were observed only for male siblings, with younger siblings displaying significantly more behaviour problems than older ones. Finally, Lavigne and Ryan's (1979) findings contradicted those reported by Lobato et al. (1987) and Breslau (1982). In their study, younger sisters of chronically ill children showed more adjustment problems than did younger brothers, whereas older sisters showed fewer adjustment problems than did older brothers (Lavigne & Ryan, 1979). One possible explanation for the differences in findings with regard to the interactive effects of age and gender is the variations in measurement methodologies as each of the studies summarized above used a different questionnaire to assess siblings' adjustment.

Family Variables

Family environment has been found to be associated with the adjustment of preschool siblings of children with cancer (Horowitz & Kazak, 1990) and with the adjustment of siblings of children with rheumatic disease (Daniels et al., 1986, 1987). More specifically, in Horowitz and Kazak's study (1990), higher scores on cohesion and adaptability by mothers were associated with fewer behaviour problems on the CBCL (r=-0.65, -0.41 respectively), whereas in Daniels et al.'s study (1986, 1987), siblings were less adjusted in families in which the home environment was less cohesive and expressive (r= - 0.34 in the 1986 study, r= -0.40 in the 1987 study). These findings suggest that mothers who perceived their family environment to be more supportive (i.e., cohesive) and adaptive tended to view their healthy children as exhibiting fewer behavioural problems. They also highlight the importance of open family communication (i.e., expressiveness) in the process of adaptation to chronic illness. It should be noted, however, that the sample size in Horowitz and Kazak's study (1990) was small (n=25) and, as a result, the sample r may not reflect the population parameter (Skinner, 1984). Family environment has also been found to be associated with children's adjustment to parental physical illness. In a recent review of this literature, Korneluk and Lee (1998) found that a family environment characterized by high communication and cohesiveness and low conflict is related to better adjustment in children of physically ill parents.

Siblings' adjustment has also been shown to be related to maternal psychological functioning. Tew and Laurence (1973) reported that maternal functioning was significantly associated with the adjustment of siblings of children with spina bifida but they did not provide any information on the strength of this relationship. Daniels et al. (1986) reported that the adjustment of siblings of children with rheumatic disease was significantly associated with maternal functioning (r= 0.41). Similarly, Treiber et al. (1987) found that the adjustment of siblings of children with sickle-cell anaemia was related to maternal depressive symptomatology (r=0.57 for internalizing behaviours, r=0.46 for externalizing behaviours).

Comber's study (1995) demonstrated that differences in the family experience of healthy siblings as compared with the chronically ill child is another important variable in healthy siblings' adjustment. Aspects of family experience that were found to be associated with siblings' adjustment included maternal affection, maternal control, household responsibilities, and differential sibling caretaking (i.e., when healthy siblings perceived that they were more protective and did more caretaking for their diabetic siblings than these siblings did in return). More specifically, less maternal affection was significantly associated with an increase in anxiety symptoms and feelings of anger (r= -0.30; r= -0.23, respectively), and decrease in siblings' self-worth (r= 0.31). Greater maternal control was significantly related to increased anger in siblings (r= 0.26), differential sibling caretaking was related to siblings' symptoms of anxiety (r= -0.29), and additional household responsibilities were substantially related to decline in siblings' sense of self-worth (r= -0.29). Increased levels of domestic responsibilities were also associated with greater feelings of frustration, resentment and stress among siblings (Switzer, 1984).

An additional variable found to be related to healthy siblings' adaptation is parental responses (Gardner, 1998). Siblings who perceived their parents as reacting favourably to their concerns (e.g., acknowledging siblings' frustrations with decreased parental availability) reported feeling better. However, siblings who perceived their parents as responding negatively to their concerns (e.g., parents reprimanding them for being selfish when they talked about their frustration with decreased parental availability) reported feeling worse and using more catastrophic thinking (e.g., "nobody loves me").

Finally, siblings' adjustment has been found to be associated with the adjustment of the chronically ill child (r= 0.56 in Treiber et al., 1987, r=0.37 in Daniels et al., 1986, r= 0.49 in Switzer, 1984), as well as with family stressors (r=0.33 in Daniels et al., 1987). Overall, these findings suggest that when the family context is problematic (i.e., when the chronically ill child exhibits greater behaviour problems and there are more family stressors), healthy siblings are more likely to have psychological difficulties.

Illness-related Variables

Four illness-related variables have been examined in research to date: visibility of the disease, time elapsed since diagnosis, siblings' knowledge about the disease, and illness severity. The relation between visibility of the disease and siblings' adjustment was assessed by Lavigne and Ryan (1979) who found that siblings of children with visible disabilities (plastic surgery group) were significantly more withdrawn and irritable than were siblings of children with invisible illnesses such as cardiac and haematological illnesses. However, it is important to note that in this study, there were significant differences among the three groups on measures of parental level of education and estimated income, with the plastic surgery group ranking lowest on these variables. Because of this, it is possible that differences between groups were partly due to identified demographic variables rather than the effects of visibility *per se.*

The effects of time elapsed since diagnosis on siblings' adaptation was assessed by a few researchers and results were contradictory. Switzer (1984) reported that siblings' psychological adjustment did not correlate significantly with duration of diabetes. Lavigne et al. (1982) examined the relation between duration of illness -- as well as marital adjustment and level of control of diabetes as rated by physicians -- and the adjustment of healthy siblings. Only time since diagnosis correlated with siblings' adjustment, and it correlated solely with brothers' functioning (r= -0.33). However, time since diagnosis may be confounded with age. That is, longer time since diagnosis may mean older siblings and, as indicated earlier, some studies have found that older siblings were better adjusted than younger siblings. Because the researchers did not control for age, the results regarding the effects of time since diagnosis on siblings' psychological adjustment should be viewed with caution.

The impact of the level of siblings' knowledge about a brother's or sister's disease was studied by Taylor (1980) and Evans et al. (1992). Taylor (1980) concluded, based on a semi-structured interview with siblings, that frequent and complete information given to children about their ill brother or sister has positive effects. Evans and colleagues (1992) found that siblings' knowledge of cancer was significantly associated with siblings' social competence, as measured by the CBCL (r=0.53). However, again, knowledge about the disease may be confounded with age: older siblings may be provided with more information on the disease than are younger siblings. Because these researchers also did not control for age and because sample size was small, the evidence regarding the impact of this factor on siblings' psychological adjustment remains inconclusive.

Contrary to what common sense may suggest, the severity of illness does not appear to correspond to the degree of siblings' adjustment. All but one study that assessed the relation between illness severity and siblings' psychological adjustment reported no significant associations (Breslau et al., 1981; Cowen et al., 1986; Daniels et al., 1986; Fielding et al., 1985; Lavigne & Ryan, 1979; Lavigne et al., 1982; Tew & Lawrence, 1973; Wood et al., 1988). The exception was Switzer's (1984) work. She found, based on maternal reports, that siblings' adjustment was significantly related to illness severity (i.e., control of diabetes). However, the two variables were not significantly related based on paternal and healthy siblings' reports.

It is interesting to note here, that of the studies which demonstrated no significant correlation between siblings' adaptation and illness severity, two also found no significant correlations between severity of illness and psychological adjustment among chronically ill children (Fielding et al., 1985; Lavigne et al., 1982). Similar results were obtained in two reviews of the literature on variables that relate to adjustment of chronically ill children (Cohen, 1999; Thompson & Gustafson, 1996). For example, 10 out of the 11 studies reviewed by Thompson and Gustafson (1996) found no correlation between behavioural problems and severity across a number of different chronic illnesses. Similarly, measures of illness severity were not associated with the adjustment of parents of chronically ill children (Cohen, 1999). In addition, preliminary findings suggest that severity of parental illness is also unrelated to children's adjustment (Korneluk & Lee, 1998).

In an attempt to explain the lack of relation between children's illness severity and their adjustment, several investigators have suggested that it is not severity as such that affects the adjustment of chronically ill children but rather functional status, defined as the ability to perform age-appropriate roles and tasks (Thompson & Gustafson, 1996). The few studies that have assessed the impact of functional status on the adjustment of chronically ill children provide support for this argument: in these investigations functional status was correlated with adjustment (Thompson & Gustafson, 1996). On the other hand, the only study examining the impact of the ill child's functional status on healthy siblings' adjustment found no correlation between the two (Gallo et al,. 1992). However, the sample size in this study was small; therefore, results regarding the effects of functional status on healthy siblings should be treated as inconclusive.

Finally, one study examined factors from all three categories (i.e., sibling, family, and illness-related variables). Ferrari (1984) assessed siblings of children with pervasive developmental delays and diabetes and found that siblings' self-concept, followed by time since diagnosis and mother's social support, accounted for 59.9 per cent of the variance in siblings' behaviour, as measured by maternal reports on the CBCL. In predicting self-concept, mother's estimations, followed by marital adjustment and maternal rating of social support, accounted for 69.8 per cent of the variability in the siblings' behaviour.

Summary and methodological and conceptual problems

It appears that the impact of a sibling's chronic illness depends upon a host of factors. With respect to siblings' characteristics, the results regarding the interactive effects of age and gender are contradictory, but when each variable was treated separately, results were consistent: sisters were better off than brothers, and younger children, particularly preschoolers, were worse off than older ones. These findings may provide one clue as to why results regarding the risk for psychological problems in siblings have been inconsistent. Although sample size and differences in measurement may be part of the explanation, differences in the proportion of girls versus boys and younger versus older children in each study may also account for some of the variation in results.

With respect to family variables, the literature suggests that siblings' adjustment is related to family environment and stressors; maternal functioning, affection, and control; household responsibilities; and differential sibling caretaking. Findings regarding family variables imply that siblings of chronically ill children could benefit from interventions that include the whole family and are designed to improve communication between different family members. However, this literature is inconclusive due primarily to the use of small sample sizes. This limitation makes it difficult to evaluate the strength of the relationships between these family variables and siblings' functioning.

As for illness-related variables, only the impact regarding illness severity is clear: it has not been found to correlate with healthy siblings' adjustment. The effects of visibility of illness may have been confounded with demographic variables. Siblings' knowledge about the disease was examined with a sample too small to provide reliable results and both siblings' knowledge about the chronic disease and illness duration may have been confounded with age.

Although scholars have made progress since Drotar and Crawford (1985) noted how limited was our understanding of the variables which relate to siblings' adjustment, the methodological shortcomings discussed above affect the degree to which inferences relevant to clinical intervention may be drawn. In addition, the fact that most of the research in the area has been conducted without an explicit theoretical framework complicates the interpretation of results (Thompson & Gustafson, 1996). Finally, no study to date has examined the impact of siblings' coping on adjustment. Concentrating mainly on the relationship between external factors such as age, sex, or time passed since diagnosis on the one hand, and outcomes on the other, may ultimately provide less-than-satisfying information. Looking at children's coping strategies re-introduces the child's internal processes to the equation. It reminds us that the child is an individual, who processes information and struggles with challenges, and who may be able to improve his or her adaptation strategies over time. Psychological well-being is intimately linked to the ways in which people -- including very young people -- approach and deal with situations. And it is these coping strategies, in turn, which are directly shaped by factors such as sex, age, family resources, duration of illness, and so on. At a practical level, the identification of adaptive coping processes has significant implications for the design of effective prevention and therapeutic programs for siblings experiencing difficulties because coping strategies are amenable to change (Curry & Russ, 1985; Korneluk & Lee, 1998). Given the increasing consensus in the literature on adults that coping is an important moderating factor between stressful encounters and adaptation (Compas, 1987b; Folkman et al., 1986; Lazarus & Folkman, 1984), the need to fill the gap and examine the coping strategies of siblings of chronically ill children is apparent.

The Cognitive Appraisal Model of Coping

The construct of coping is very important to theory, research, and clinical practice in the field of clinical child psychology (Compas, Worsham, & Ey, 1992; Field & Prinz, 1997; Forman, 1993). Its importance stems from the growing belief that the ways in which children deal with stress significantly affects their psychological, physical, and social well-being (Compas et al., 1996). Different conceptual models have been used to guide research on the ways in which children and adolescents cope (Compas, Banez, Malcarne, & Worsham, 1991; Field & Prinz, 1997; Kupst, 1992). The most widely used models include the cognitive appraisal model (Folkman, 1984; Folkman & Lazarus, 1980; Folkman et al., 1986; Lazarus & Folkman, 1984) and the primary-secondary control model (Rothbaum, Weisz, & Snyder, 1982; Weisz, Rothbaum, & Blackburn, 1984a, 1984b). Some investigators also categorize coping responses in terms of their locus of operation: behavioural or external modes of coping versus cognitive or internal modes of coping (Curry & Russ, 1985; Siegel, 1983; Spirito, Stark, & Williams, 1988; Worchel, Copeland, & Baker, 1987).

For the purposes of the present study, the cognitive appraisal model of coping was used. As indicated earlier, it is important that descriptive research on children's coping with siblings' chronic illness be grounded in a conceptual model of the coping process, as an explicit theoretical framework can enrich interpretation of results and can make it easier to compare findings across studies. The cognitive appraisal model of coping was chosen because its relevance has been explored in numerous studies, lending to empirical support for its conceptualization of coping processes with adults (Beresford, 1994; Folkman et al., 1986), as well as to preliminary support for its conceptualization of children's coping processes (Compas et al., 1996).

The cognitive appraisal model of coping is based on the transactional theory of stress and coping developed by Folkman, Lazarus and their colleagues (Folkman, 1984; Folkman & Lazarus, 1980; Folkman et al., 1986; Lazarus & Folkman, 1984). Lazarus and Folkman (1984) conceptualized stress as an experience arising from a transaction between a person and the environment; that is, the degree to which a situation is stressful is a function of the match or mismatch between environmental demands and individual resources. The authors indicated that sources of stress are expected to have an impact on adjustment only under certain conditions. In other words, circumstances that have a high potential for stress are expected to produce poor outcomes only when the level of the protective factors (e.g. social support) is low. Lazarus and Folkman (1984) also stated that there is considerable variability across people with respect to how they appraise and cope with stressors and that these individual differences influence outcomes.

The transactional theory of stress classifies two processes as important moderators between stressors and adaptive outcomes: cognitive-appraisal and coping. *Cognitive appraisal* is defined as "the process through which the person evaluates whether a particular encounter with the environment is relevant to his or her well-being, and if so, in what ways" (Folkman et al.,1986, p.992). In other words, it is through cognitive appraisal processes that the meaning of an event is determined.

The theory differentiates between two major forms of appraisal: primary appraisal and secondary appraisal. Through *primary appraisal* a person evaluates the degree of threat in a situation. A situation can be appraised as irrelevant, benign-positive (likely to lead to a desirable outcome), or stressful. If a situation is perceived as stressful, it can then be further appraised as resulting in significant harm or loss, as potentially having negative effects in the future (threat), or as a challenge with an opportunity for gain, growth and mastery. *Secondary appraisal* involves evaluating coping resources and options that are available to the individual with respect to the demands of the situation. Coping resources include material, social, and psychological assets (Folkman, 1984). Coping options include altering the situation, accepting it, seeking more information, or holding back from acting in a counterproductive way (Folkman et al., 1986).

Secondary appraisals include judgements regarding control and efficacy. Appraisal of control includes evaluating whether the outcome of a situation is under one's control, some other person's control, or is a matter of chance. Appraisals of efficacy refer to how individuals perceive their ability to successfully carry out the strategies required to achieve the desired outcome (Thompson & Gustafson, 1996). Appraisals can influence adjustment to a stressor, the selection of coping strategies, and the nature of the coping outcome (Folkman, 1984; Folkman & Lazarus, 1980; Folkman et al., 1986; Lazarus & Folkman, 1984). From a developmental perspective, appraisal is highly dependent on cognitive abilities. For example, children's cognitive skills affect their capacity to define characteristics of the event such as its duration and intensity (Peterson, 1989). Cognitive abilities can also affect judgements of personal competence to produce the desired outcome (Compas et al., 1991).

The second key concept in the theory, *coping*, is defined as the "cognitive and behavioral efforts made to manage external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (Lazarus & Folkman, p.144). This definition has two important features. First, coping is conceptualized as a process not as a trait. That is, the relationship between the person and the environment is seen as constantly evolving and impact is bidirectional; the person and the environment each affect the other and both shape coping efforts. This approach differs from a trait-oriented approach because the latter emphasizes stability in coping rather than change. Second, coping is defined independently of its outcome and no prior assumptions are made about what constitutes adaptive or maladaptive coping. This approach to coping contrasts with popular conceptualizations of coping, in which coping implies successful management of a stressor: many stressful situations cannot be mastered, and effective coping under these circumstances is that which allows the individual to accept, ignore, minimize, or tolerate what cannot be mastered (Last & Grootenhuis, 1998). This approach also differs from psychodynamic formulations, in which some coping processes are considered inherently better or worse than others (an example of an *a priori* "worse" strategy being denial) (Folkman, 1984; Last & Grootenhuis, 1998; Lazarus & Folkman, 1984).

According to the theory, there are two general forms of coping, each with its own goals or intentions: *problem-focused coping* is utilized to change or solve some aspects of the stressors and *emotion-focused coping* is used to regulate negative emotions that arise from a stressful event or encounter. Problem-focused coping involves such responses as seeking information and generating possible solutions to a problem. Emotion-focused coping includes responses such as venting one's feelings, trying to avoid the source of stress, and seeking support from others. This distinction between strategies aimed at changing some aspects of the stressful encounter versus strategies used to regulate emotions or adjust to a situation appears in various models of coping (Aldwin, 1994; Fields & Prinz, 1997). It parallels, for example, the behavioural versus cognitive typology used by some researchers. Problem-focused strategies are often more concrete and observable (i.e., behavioural), whereas emotion-focused strategies involve the use of cognitive processes.

Studies with adults have shown that a combination of the two forms of coping is used in most stressful situations (Aldwin, 1994; Compas, 1987b; Folkman & Lazarus, 1980; Lazarus & Folkman, 1984) but their relative proportion varies according to the appraisal of the situation. When situations are appraised as controllable and changeable, individuals use more problem-focused strategies. However, when situations are perceived as uncontrollable and unchangeable, emotion-focused responses will be used more often (Folkman & Lazarus, 1980; Folkman et al., 1986). Similar results were obtained in studies conducted with children and adolescents in dealing with either chronic, or acute short-term stressors. For example, Bull and Droter (1991) examined how children and adolescents with cancer in remission cope with cancer-related situations and general life situations. They found no differences in the frequency of problem-solving and emotion-management strategies reported for general life stressful situations. However, emotion-management strategies were used more frequently in coping with cancer-related stressful events. The investigators attributed this difference to the uncontrollable nature of many cancer-related situations. In Altshuler and Ruble's study (1989), when children and adolescents were presented with scenarios describing uncontrollable situations (e.g., waiting in the dentist's office to get a cavity filled), they reported strategies that were more likely aimed at alleviating the emotional distress than strategies aimed at changing the situation.

Studies on coping responses also indicated that high perceived control and the use of problem-focused coping were associated with lower levels of psychological distress in children, adolescents and adults coping with a variety of stressful situations, including chronic illness. The use of emotion-focused coping, on the other hand, was mostly associated with poorer psychological adjustment across ages and stressful situations, including chronic illness (Compas et al., 1996; Delamater, 1992). In addition, one study found that maladaptive coping strategies of suicidal adolescents were much more likely to be classified as emotion-focused coping (Wilson et al., 1995).

One may assume that because many of the stressful situations related to chronic illness may be uncontrollable, healthy siblings are more likely to employ emotion-focused coping. However, this relationship may not be as evident as with adults or adolescents. Research has shown that the choice of coping strategies changes as a function of age. Problem-focused strategies or primary-control strategies are used more often than emotion-focused strategies by younger children. The use of emotion-focused strategies or cognitive strategies (similar to emotion-focused strategies) increase with age (Altshuler & Ruble, 1989; Brotman Band & Weisz, 1988; Bull & Droter, 1991; Compas, Forsythe, & Wagner, 1988; Compas et al., 1996; Curry & Russ, 1985; Elwood, 1987; Wertlieb et al,. 1987) or with cognitive developmental level (Brotman Band, 1990; Brotman Band & Weisz, 1990). This developmental increase in emotion-focused coping has been found in reports of coping with diverse stressful situations including medical, dental, and interpersonal situations. Given the findings that emotion-focused coping is positively correlated with age, it seems reasonable to assume that the choice of coping responses in siblings (i.e., emotion-focused or problem-solving) will depend, in part, on the individual's developmental level. Indeed, the literature suggests that an important developmental task for children as they mature is learning to discriminate between situations where perseverance (which can be viewed as similar to continued use of problem-focused coping strategies) pays off versus situations where it does not (Compas et al., 1991).

Although the Cognitive Appraisal Model of Coping has been very influential in the field of adult and child psychology and has advanced our understanding of the coping process, a number of researchers have begun to criticize its usefulness in studying the effects of coping efforts with children and adolescents (Compas et al., 1996; Compas, Connor, Saltzman, Harding-Thomsen, & Wadsworth, 1999; Sandler, Wolchik, MacKinnon, Ayers, & Roosa, 1997). The aspect of the model challenged most by these researchers is the two broad dimensions of problem-focused and emotion-focused coping. These investigators argued that by relying exclusively on the very general distinction between problem-focused and emotion-focused coping, one may miss important information about the effectiveness of coping responses. A recent comprehensive review of studies that assessed the relation between coping and adjustment in children and adolescents provides some support for this argument (Compas et al., 1999). The next section will summarize this literature.

The Relation Between Coping and Psychological Adjustment in Children and Adolescents

Given that research on siblings of chronically ill children has paid little attention to siblings' coping efforts and the relation between coping and siblings' adjustment, a review of related literature is warranted. This section will first highlight the findings of Compas and his colleagues (1999) as they have provided an excellent synthesis of 58 studies dealing with children's and adolescents' coping published between 1988 and 1998. Next, the literature on coping with chronic illness and adjustment will be reviewed. Finally, selected articles which have examined relations between coping strategies and children's adjustment to parental conflict and divorce will be discussed. Parental conflict, like chronic illness, is not a discrete event; rather, it requires a child to deal with multiple related stressors under conditions of relatively low personal control (Grych & Finchman, 1997). Parental conflict also has the potential to be a long lasting, chronic-like stressful situation. Therefore, this literature may have implications for research on children's coping with sibling chronic illness.

Literature Reviewed by Compas and Colleagues

Studies summarized by Compas et al. (1999) examined the association between coping and psychological adjustment in children and adolescents with respect to a variety of stressful situations, including personal or parental illness, family economic strain, parental divorce, parental or family conflict, peer or academic stress, adoption, sexual abuse, natural disaster, missile bombardment, and other self-selected stressful situations. The majority of these studies used cross-sectional designs and obtained information on coping and adjustment via self-report questionnaires. Several important patterns emerged from this review. First, the majority of studies which examined engagement coping or problem-focused coping found them to be associated with fewer internalizing and externalizing symptoms and higher social competence. Specific kinds of engagement and problem-focused coping strategies that have been consistently related to better adaptation include cognitive restructuring, positive appraisal of the stressor, and problem-solving. Several studies, however, found opposite trends: engagement and problem-focused coping were related to greater internalizing and externalizing symptoms and engagement coping was associated with lower social competence.

Second, in most studies, disengagement coping and emotion-focused coping were related to more internalizing and externalizing symptoms and lower competence. Coping responses frequently associated with poorer adjustment included social withdrawal, wishful thinking, self-criticism and self-blame, cognitive and behavioural avoidance, emotional ventilation or discharge and resigned acceptance. A few studies again found the converse; that is, a relation between disengagement coping and fewer internalizing and externalizing problems.

Third, the association of engagement or problem-focused coping with poorer adjustment and the relation of disengagement strategies or emotion-focused coping with better adjustment were reported in studies in which children and adolescents were coping with relatively uncontrollable situations (e.g., parental conflict, sexual abuse). Compas and his colleagues (1999) concluded that these results suggest that the relative efficacy of problem- and emotion-focused coping depends on the actual or perceived controllability of the stressor: problem-focused coping strategies are better matched with controllable situations while emotion-focused coping strategies are more effective in uncontrollable situations (the "goodness of fit" hypothesis). These findings also emphasize the importance of taking into account the context of coping and of assessing, in future studies, the perceived controllability of the stressor.

The Relation Between Coping and Adjustment to Chronic Illness

In a search for literature on coping responses of siblings of chronically ill children only one study was found. It was an exploratory investigation carried out with 10 siblings of children with chronic illness ages 10 to 15 (Gardner, 1998). In this study, Gardner (1998) used grounded theory to explore siblings' appraisals of stressful events and coping strategies employed to deal with illness-related stressors. She identified several categories of coping strategies, including seeking social support, aggression (verbal and physical), avoidance behaviour (sleep, ignoring, distraction), cognitive reappraisal, crying, rumination, and resignation (doing nothing). Of these, avoidance strategies were used very often. Gardner did not statistically explore the relation between coping and siblings' adaptation. However, she pointed out that the data suggested that if a child perceived a coping strategy as helpful, regardless of what the strategy was, the impact of the stressor seemed to decrease and the child reported no longer being upset.

The majority of the work on the relations between coping and adjustment to chronic illness has been conducted with diverse groups of chronically ill children, their parents, and children of chronically ill parents. This line of research highlights the importance of coping strategies in the process of adaptation (Brett, 1988; Brotman Band, 1990; Brotman Band & Weisz, 1990; Canam, 1993; Compas et al., 1996; Gil, Williams, Thompson & Kinney, 1991; Kliewer, 1997; Kovacs et al., 1990; Kupst, 1992; Rose, Firestone, Heick, & Faught, 1983; Spirito, Stark, & Tyc, 1994). In general, studies with chronically ill children have suggested that active problem-focused strategies are related to decreased distress with medical procedures, whereas emotion-focused strategies, particularly avoidance behaviours, are associated with increased symptomatology. These associations are fairly robust and apply to psychological and physiological outcome measures (Kliewer, 1997). For example, Gil et al. (1991) examined pain coping strategies in 72 children and adolescents with sickle-cell disease and found that the strategies used were strongly predictive of participants' visits to the emergency room. Those who reported using passive coping (e.g., hoping and praying) had more emergency room visits than those who used active coping strategies (e.g., calming self-statements, diverting attention). This finding held even after controlling for frequency of painful episodes. Moreover, those who used negative thinking and passive adherence experienced more distress during painful episodes. Gil et al. (1991) also found that parental coping affected children's coping. Parents who were low on passive adherence and high on coping attempts had children who reported using more active coping strategies and less negative thinking. Similar results were obtained in a study conducted with adults who suffered from sickle-cell disease (Gil, Abrams, Phillips, & Keefe, 1989). In this research, coping strategies utilized to deal with pain were also important predictors of pain level, activity level, utilization of health care, and psychological distress.

In addition, several studies have found a relationship between coping strategies and metabolic control in diabetic children and adolescents. Delamater and his colleagues (reported in Delamater, 1992) found that worse metabolic control in diabetic children was associated with more frequent use of wishful thinking, avoidance, and self-blame, which are classified as emotion-focused coping. In contrast, more primary (versus secondary) styles of coping, which involve vital self-care behaviours, were associated with better medical and socio-behavioural adjustment among diabetic adolescents (Brotman Band, 1990; Brotman Band & Weisz, 1990). Improved metabolic control was also observed among adolescents who received anxiety management training, which incorporated teaching active problem-focused strategies (Rose et al., 1983). However, in Hanson et al.'s study (1989) coping was found to be unrelated to metabolic control, but frequent use of avoidance coping strategies (e.g., "tell yourself the problem is not important", "try to stay away from home as much as possible") and ventilation coping (e.g, "blame others for what's wrong", "get angry and yell at people") were related to non-adherence to treatment among adolescents.

Further evidence for the relation between active problem-focused coping and better adjustment emerges from research on children's coping with stressful medical procedures. More specifically, several studies reviewed by Peterson, Oliver and Saldana (1997) have demonstrated that hospitalized and non-hospitalized children who seek out information about medical procedures prior to their initiation, are observed during such procedures to be less anxious, more cooperative, and more tolerant of pain than children who avoid information. The latter are more likely to act out during painful procedures.

Another fruitful direction for research has been the evaluation of coping skills training programs: a number of empirical studies which have examined the influence of coping skills training on outcomes have shown that it is possible to improve coping strategies and reduce feelings of distress. For example, Varni, Katz, Colegrove, and Dolgin (1993) randomized 64 children ages 5 to 13 years with newly diagnosed cancer into two groups: a Social Skills Training experimental treatment group and a School Reintegration standard treatment group. The social skills training included three individual one-hour sessions and two follow-up booster sessions when children returned to school. It focused on cancer-related interpersonal difficulties (e.g., handling teasing) and assertiveness training. The results indicated that children who received social skills training had fewer behavioural problems, higher levels of school competence, and greater classmate and teacher social support.

In another study, Campbell, Berry, and Lamberti (1995) examined the effects of coping skills training in preparing children with congenital heart disease for surgery. Participants (48 child-caregiver pairs) were assigned to either a coping skills and information treatment group designed to teach children active and distraction coping strategies, or to a control group receiving routine information. Children in the coping skills treatment group were found to be more cooperative and less upset during hospitalization, and better adjusted at home and at school after discharge. Their caregivers conveyed greater confidence in their ability to care for the children both in the hospital and at home.

Coping skills training, which incorporates teaching active problem-focused strategies, has also been found to be effective in improving metabolic control in adolescents with diabetes (Rose et al., 1983). In contrast, Gross, Heiman, Shapi, and Schultz (1983) found that children with diabetes who received social skills training had enhanced social skills, but did not display better metabolic control than did participants in a comparison group. One possible explanation for the difference between these studies is that the two coping instruction programs focused on different skills.

It has also been found that children facing highly stressful medical procedures who receive coping skills training, including deep breathing, relaxation, self-instructions and imagery, tend to be more cooperative during and after treatment and to feel less anxious (Peterson et al., 1997). Furthermore, training in interpersonal and coping skills has been shown to be effective in reducing symptoms in adolescents with diabetes (Davidson, Boland, & Grey, 1997), in adult patients with diabetes (Rubin, Peyrot, & Saudek, 1993), and in adult patients with cancer (Arathuzik, 1994). In addition, five studies which have examined the effects of coping skills treatment groups for siblings of children with cancer, have found that after training, siblings report coping more effectively with the stressful situations related to their brother's or sister's illness (Heiny & Lesence, 1996).

Children's coping has also been explored in reference to parental medical illness. The majority of this literature focuses on children who are dealing with parental cancer and suggests that avoidance coping strategies hinder children's adaptation (Worsham, Compas, & Ey, 1997). For example, Compas and his colleagues (1996) examined coping in children, adolescents and young adults who were faced with the diagnosis of cancer in a parent. They found that emotion-focused coping efforts, particularly efforts to avoid thoughts about the parent's cancer, were related to greater symptoms of anxiety and depression. Dual-focused coping (emotion- and problem-focused coping) was related to greater avoidance but lower levels of intrusive thoughts. Problem-focused coping was not related to any of the measures of psychological distress. Another study indicated that avoidance coping strategies are associated with poorer adaptation among family members in which the father has haemophilia (Kotchick, Forehand, Armistead, Klien & Wierson, 1996). In contrast, strategies that appeared to decrease psychological distress among families coping with cancer included seeking information and social support, living in the present, and talking to other family members about the illness and treatment (Kupst, 1992; Walsh-Burke, 1992). The importance of open communication in the process of adaptation to chronic illness has also been highlighted in a study conducted by Lewis, Woods, Hough and Bensley (1989). This study found that introspective coping -- characterized by frequent feedback, discussion and reflection about the illness -- was related to better marital adjustment in families in which mothers had various kinds of chronic conditions.

Finally, the literature on parental coping with chronic childhood illness indicates that the strategies perceived as most helpful are: seeking and establishing social support, normalizing, mastering challenges imposed by illness, assigning meaning to the experience and having open family communication (Brett, 1988; Canam, 1993; Last & Grootenhuis, 1998).

The Relation Between Coping and Adjustment to Marital Conflict and Divorce

Parental conflict and divorce present children with a variety of stressful experiences. Examining children's coping under these conditions could provide researchers with better understanding of responses that, more generally, foster adjustment to continuing stressful situations (Grych & Fincham, 1997). Several studies have assessed the relations between post-divorce adjustment and children's coping strategies. Of these, one of the most conceptually and methodologically sophisticated was conducted by Sandler, Tien, and West (1994), who carried out a cross-sectional and longitudinal study to examine associations between coping strategies, negative life events, and psychological symptoms among children ages 7 to 13. The results of this study were consistent with findings reported previously: active coping, defined as use of behavioural and cognitive strategies to solve or understand the problem, had stress-buffering effects on child behaviour problems and predicted lower levels of depressed symptoms five and a half months later. Lower levels of depressive and anxiety symptoms were also associated with more use of distraction (i.e., engaging in another activity to avoid thinking about the problem). Again, avoidance coping (i.e., wishful thinking and trying not to think about the problem) was related to higher symptomatology. Interestingly, seeking support from others was also related to greater adjustment problems. One potential explanation for this surprising finding is related to the source of support children turn to and his or her emotional state. Parents who are going through divorce and who therefore themselves experience high levels of stress may not be able to respond effectively to children's efforts to seek comfort and support (Sandler et al., 1994). Similar results were reported in other studies: avoidance coping was found to be associated with poorer post-divorce adjustment, particularly in girls (Armistead et al., 1990), and active coping was related to social competence in children of divorce (Kliewer & Sandler, 1993).

In contrast, O'Brien, Margolin, and John (1995) found that children's reported use of problem-focused strategies that involve them in their parents' marital conflict (e.g. "I told them to stop fighting" and "I tried to change the subject") was associated with higher distress (i.e., higher levels of self-reported anxiety, depressed symptoms and hostility), lower levels of self-esteem, and parent-reported child hostility. Children's reported use of avoidance/self-rely coping (e.g., "I went into the other room", "I drew a picture", "I covered my ears"), however, was related to lower self-reported anxiety. Children's use of support seeking strategies was also negatively associated with maternal reports of children's internalizing behaviour problems.

A later investigation conducted by O'Brien and colleagues may provide one explanation regarding the differences observed across studies with respect to the nature of the associations between avoidance strategies and children's adjustment (O'Brien, Bahadur, Gee, Balto, & Erber, 1997). This investigation found that withdrawal strategies, which are a form of avoidance coping, accompanied by rumination regarding loss of parents' love, was related to higher self-reported symptoms of depression. However, withdrawal strategies accompanied by children's assertions of self-confidence in their abilities to calm themselves and/or their parents was not associated with greater psychological distress. This research demonstrates that the relation between avoidance strategies and child adjustment is complex.

The importance of coping for adjustment with parental conflict was also evident from results of hierarchical regression analyses. In O'Brien et al.'s study (1995), child coping explained a significant proportion of the variance in maternal reports of child internalizing behaviour (10%) after demographic, child life stress, and marital conflict variables were taken into account. Child coping variables also made a significant contribution to the prediction of child-reported anxiety, self-worth and hostility after demographic, child life stress, and marital conflict variables were controlled (10%, 8%, 5%, respectively). However, child coping variables did not make a significant contribution to the prediction of child reports of depressed symptoms. In contrast, a different study (O'Brien et al., 1997) found that child coping variables did contribute unique variance to the prediction of child reports of depressed symptoms (39%) after demographic and marital conflict variables were considered. Child coping variables also contributed significantly to the prediction of teacher reports of child externalizing behaviour problems (36%) once demographic and marital conflict variables were accounted for.

To summarize, the literature reviewed above suggests that, overall, the use of problem-focused coping strategies is associated with better psychological adjustment in children and adolescents, whereas certain kinds of emotion-focused coping strategies are related to poorer adjustment. There is also preliminary evidence to support the previously mentioned hypothesis of "goodness of fit" in regard to the relations between emotion- and problem-focused coping and children's adjustment. Given the methodology employed in the vast majority of the studies reviewed, one should not conclude that problem-focused coping strategies lead to better adjustment. The cross-sectional design which characterizes the bulk of the work on children's coping precludes a conclusion on the cause-effect link. It may well be that those children and adolescents who exhibit fewer behaviour problems, who are less anxious and depressed and who are more socially competent, are better able to think about different solutions to problems and to maintain a more positive outlook when dealing with stress.

Nevertheless, taken together, the studies summarized above clearly suggest that coping is a variable which deserves much closer scrutiny with respect to siblings of chronically ill children. The present study was designed to address the gap in the existing literature on variables that promote adjustment of siblings.

The Present Study

Rationale

As indicated previously, this study had five primary goals and two ancillary goals. The primary ones were: to determine how siblings of chronically ill children cope with decreased parental availability, disruptions to daily life and routines, and worries about the ill brother or sister; to assess whether siblings cope differently with each of the three situations; to examine what type of coping strategies siblings perceive as effective and whether the strategies seen as effective are similar or different across the three situations; to evaluate the relation between psychological adjustment and each of the broad forms of coping strategies (problem-focused and emotion-focused strategies); and to test for the incremental variance in siblings' psychological functioning accounted for by siblings' coping strategies after controlling for age and gender. The ancillary goals were to examine how coping differs as a function of siblings' secondary appraisals of the situation, and to assess whether there are gender differences in coping strategies (i.e., emotion-focused and problem-focused) used by siblings.

The rationale for the primary goals stem directly from the findings and the shortcomings of the research surveyed earlier. It was important to assess siblings' coping strategies, variation and similarities in coping across various stressors, the perceived effectiveness of strategies and the relation between coping strategies and siblings' psychological adjustment precisely because so little was known about the coping strategies of this population or how they might relate to adjustment. As noted earlier, researchers traditionally tended to examine the long-term consequences of having an ill brother or sister, overlooking children's ways of dealing with stressful situations related to siblings' illness. In addition, few researchers have assessed, in a single study, the ways that children cope with multiple kinds of stressful situations. Doing so allows for comparisons of the associations of coping with psychological adjustment across different types of situations.

Although for a long time, researchers paid little attention to children's coping with sibling chronic illness, over the last 10-15 years, some scholars have begun suggesting that coping responses in children may be the "missing link" in understanding differences in children's adaptation to stress (Compas, 1987a; Dise-Lewis, 1988; Gamble & Woulbroun, 1993). For example, Compas (1987a) has argued that the moderate correlations found between stressful life events and child and adolescent disorders, indicate that individual differences in coping may moderate the relationship between disorders and stressful situations.

The present study was based on the assumption that examination of coping strategies of siblings of chronically ill children would contribute to our understanding of, in general, how children deal with stressful situations and, in particular, how they respond to situations that are ongoing, affect the whole family unit, and directly influence a relationship with a significant other. This understanding is important both from the perspective of basic research and from the more applied perspective. In the context of basic research and model-building, examining siblings' coping responses advances our knowledge of broader processes including self-regulation of cognition, emotion, and behaviour. From the applied perspective, information about the nature and efficacy of coping in siblings of chronically ill children may be of assistance to health care professionals working with families with a chronically ill child.

This study did not examine whether coping strategies employed by siblings of chronically ill children moderate the association between the stressors they experience and their psychological adjustment. Unfortunately, at the present time, it is difficult to assess this issue because these is no reliable and valid measure of perceived stress designed for use with children ages 8-12. Existing measures, used to explore the relation between stress and psychological adjustment or to examine whether certain factors moderate or buffer the impact of stress, are objective measures of life events. These kinds of measures are not suitable for researchers who use a cognitive model of stress and coping. As Cohen and Williamson (1988) argued, objective measures of life events run counter to cognitive models of the stress process, because they suggest that the events themselves are the cause of psychological difficulties. Cognitive models, on the other hand, assume that stressful life events are not, in and of themselves, sufficient causes of pathology. Instead, what is at issue is whether these events are *appraised* as threatening, and whether coping resources are *perceived* as insufficient to address that threat (Lazarus & Folkman, 1984).

It was decided to examine whether coping strategies differ as a function of siblings' secondary appraisals of the situation in order to assess whether findings with siblings of chronically ill children follow similar patterns found in the literature with other populations. As noted earlier, secondary appraisal is an important concept in the cognitive appraisal model of coping (Lazarus & Folkman, 1984). It involves evaluation by the individual of coping resources and options that are available to him or her to deal with the demands of the situation. Evaluation of coping options includes appraisals about whether situations are controllable and changeable. Extensive research with adults (Folkman et al., 1986; Lazarus & Folkman, 1984) and preliminary research with children (Altshuler & Ruble, 1989; Bull & Drotar, 1991) has indicated that individuals are more likely to use cognitive or emotion-focused strategies when they perceive a situation as uncontrollable, and to use behavioural or problem-focused coping strategies when they perceive a stressful event as controllable. It would be helpful to have a clear picture of the extent to which perceived control is related to coping among siblings.

It was decided to address gender differences in siblings' coping strategies because the majority of studies have shown that such differences exist in children's coping with stress. In a recent comprehensive review of this field of research, Compas and his associates (Compas, et al., 1999) found that of the 59 studies examined, 45 studies reported gender differences in coping. The other 14 studies did not observe any gender effects in children's or adolescents' coping. Overall, studies have found that girls report using a greater number of engagement coping strategies including, problem-solving, seeking social support and cognitive restructuring. Boys in general, report utilizing a larger number of disengagement coping strategies, including social withdrawal and distraction. The majority of studies also demonstrate that girls employ more problem-focused and emotion-focused coping strategies than do boys. These results should be qualified by findings that, regardless of coping category, girls tend to endorse more coping responses overall on self-report measures. Indeed, in a number of studies that controlled for this tendency by using scores that reflect proportion of coping responses that fall into specific categories of coping rather than raw scores of strategies, gender differences were less apparent (Compas et al., 1999). Therefore, this study evaluated gender differences in the use of emotion-focused and problem-focused coping taking into account base rates of reporting.

As mentioned above, participants in this study were directed to think of their coping strategies with respect to particular kinds of stressful situations rather than allow for self-generated situations. This was done in order to facilitate rigorous examination of the impact of coping on adjustment. According to the cognitive appraisal model of coping, coping efforts may change according to situational demands. That is, children would be expected to cope differently with different situations. Therefore, having participants consider the same set of situations enhances the viability of comparisons between them.

It was also decided to gather information on siblings' coping strategies *via* structured sessions which incorporated the completion of appropriate questionnaires, rather than simply sending out questionnaires. This approach reflects Aldwin's (1994) observation that face-to-face meetings and interviews may facilitate the examination of new and very sensitive topics, and may be beneficial when research involves groups, that due to culture or age, could have different perceptions of stressors.

Siblings participating in the study were between the ages of 8 and 12 years. It should be noted, however, that seven children who had just turned 13 took part in the study. These children had been contacted while they were still 12 but due to scheduling difficulties could only be seen shortly after they had turned 13. Adolescents were excluded because research findings suggest that younger siblings of chronically ill children are more likely to display psychological problems than are older siblings (Cowen et al., 1986; Gallo et al., 1992; Lavigne & Ryan, 1979). In addition, the limited age range creates a relatively homogenous group, comprised of school-age pre-adolescent children, that controls for potential confounding effects associated with wide age differences among participants.

With regard to the condition of the ill brother or sister, a non-categorical approach (studying several chronic illnesses together) was adopted. This choice was made because researchers have concluded that examining the effects of growing up with a child with special needs on the basis of a particular illness or disability is less productive than conducting a more global evaluation (Gamble & Woulbroun, 1993; Lobato, 1990). Support for this argument comes from two lines of research. First, as noted previously, no study that assessed the relationship between illness severity and sibling adaptation has found a correlation between the two (Breslau et al., 1981; Cowen et al., 1986; Daniels et al., 1986; Gallo et al,. 1992; Fielding et al., 1985; Lavigne & Ryan, 1979; Lavigne et al., 1982; Tew & Lawrence, 1973; Wood et al., 1988). Second, Felton and Revenson (1984) have determined that the choice of coping efforts of chronically ill adults is not affected by differences in the controllability of their illness.

Research Questions

Reflecting the study's five goals, its primary research questions are as follows:

1. What type of coping responses do siblings of chronically ill children employ when dealing with decreased parental availability, disruptions to daily life and routines, and worries about the ill brother or sister?
2. Do siblings cope differently with each of the three situations?
3. What types of coping strategies do siblings perceive as effective in dealing with these situations? Are these strategies similar or different across the three situations?

4. Are siblings' coping strategies related to their psychological adjustment?
5. What is the incremental variance in siblings' psychological functioning accounted for by siblings' coping strategies after controlling for age and gender?

In addition, there were two ancillary research questions. These were:

1. How does coping differ as a function of siblings' secondary appraisals of the situation?
2. Are there gender differences in coping strategies (i.e., emotion-focused and problem-focused coping) employed by siblings?

Hypotheses

On the basis of the coping literature and the conceptual model of coping used, the following hypotheses were advanced:

1. Three competing hypotheses had been generated with regard to the second research question on whether siblings cope differently with each of the three situations. This was done in order to reflect the various ways one can approach this question.
   1a Because siblings may perceive dealing with their worries about an ill brother or sister as a situation over which they have more control (as opposed to decreased parental availability or disruptions to daily routines), it was hypothesized that they would use problem-focused strategies more frequently in dealing with this situation.
   1b Although siblings may perceive decreased parental availability and disruptions to daily life as relatively uncontrollable situations, they were predicted to use problem-focused strategies more frequently in dealing with them than in dealing with personal fears about the ill brother or sister because the first two situations provide more practical opportunities to employ problem-focused coping strategies. For example, siblings could decide to cope with these two situations by doing more household or school tasks themselves.
   1c Siblings were predicted to perceive very little control over all three situations and therefore to use emotion-focused strategies more frequently in dealing with all of them.

2. The use of problem-focused coping strategies will be associated with fewer self-reported symptoms of depression and anxiety as well as fewer parental reports of externalizing and internalizing problems. This hypothesis will be supported if the correlation coefficients are moderate to high (i.e., higher than 0.30) and negatively related.
3 The use of emotion-focused coping strategies will be associated with higher self-reported symptoms of depression and anxiety as well as more parental reports of externalizing and internalizing problems. This hypothesis will be supported if the correlation coefficients are moderate to high and positively related.

No hypotheses were generated regarding perceived effectiveness of coping strategies as there is little basis for any *a priori* assumptions on this question.

METHOD

Participants

Participants in the present study were 110 siblings of chronically ill children (56 girls and 54 boys) and one of their parents. This sample consisted of siblings of children with severe persistent asthma,[1] cancer , cystic fibrosis, diabetes and kidney disease. These illnesses were chosen because they all require ongoing medical management of the chronically ill child and they all have a risk of mortality.

Participants were recruited through the appropriate clinics at the Children's Hospital of Eastern Ontario (CHEO). This sampling method was chosen because CHEO serves most families with chronically ill children in Eastern Ontario and Western Quebec. The criteria for inclusion in the study were:

1) Healthy siblings were between the ages of 8 to 12;
2) A minimum of six months had passed since the diagnosis of childhood chronic illness in order to decrease the possibility of measuring dysfunctional behaviour associated with the acute crisis following diagnosis;
3) The chronically ill child was living with the sibling; and
4) Participants were English-speaking.

In families with more than one eligible sibling, the sibling closest in age to the chronically ill child or most available and willing to participate in the study was selected. Only one sibling from any given family was assessed, in order to avoid over-representation of a particular family in the analysis.

Based on Kraemer's (1992) suggestion to set rather liberal criteria when conducting clinical research in which the availability of subjects is limited, families were not excluded on the basis of marital status. Imposition of strict inclusion criteria with respect to family status would have likely increased the logistical problems of the study and would have restricted the

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[1] "Severe persistent" asthma is the most serious of the four possible asthma conditions outlined in the 1997 National Heart, Lung, and Blood Institute's *Expert Panel Report II: Guidelines for Diagnosis and Management of Asthma* (available on the Asthma Information Centre website of the *Journal of the American Medical Association -- http://www.ama-assn.org/special/asthma/treatmnt/guide/guidelin/guidelin.htm*). It is diagnosed when "multiple-drug therapy will be required, often with high-dose inhaled and even oral corticosteroids" (see Commentary by Dr. Harold S. Nelson at: *http://www.ama-assn.org/special/asthma/library/scan/ascom4.htm*).

generalizability of results. Instead, the intention was to conduct post hoc analysis to determine if there were group differences between siblings from single-parent households and siblings from dual-parent households. Results of t-tests show that there were no group differences on any of the outcome measures (i.e., the Child Behavior Checklist, the Children's Depression Inventory, and the Revised Children's Manifest Anxiety Scale).

Justification of sample size

The recommended sample size was determined based on guidelines provided by Cohen (1992) for regression analysis. In consideration of the number of outcome measures (i.e., the Child Behavior Checklist-Externalizing and Internalizing subscales, the Children's Depression Inventory and the Revised Children's Manifest Anxiety Scale), an alpha level of 0.01 was chosen to calculate sample size.

Effect size in studies examining the relationship between coping and psychological adjustment of chronically ill children ranges from medium (Canning et al., 1992; Thompson, Gil, Burbach, Keith, & Kinney, 1994) to large (Spirito et al., 1994; Thompson, Gil, Burbach, Keith, & Kinney, 1993a; Worchel et al., 1987). Cohen (1992) has suggested that with four independent variables (i.e., two variables related to child's coping: emotion-focused and problem-focused coping strategies; and two demographic variables: age and gender of the sibling), if we want the loss in predictive power to be less than 0.01 with probability = .80, the required sample size is 55 where there is a large effect size and 118 where there is a medium effect size. For the purpose of this study, it was decided to split the difference, which resulted in a minimum sample of 86 participants. It was understood that if differences were found on the basis of marital status, this factor would be included as an additional demographic variable, resulting in a required sample size of 92 (Cohen, 1992). In the end, the sample comprised 110 children.

Measures

Data for this study were obtained from parent and child reports. Siblings' psychological adjustment was assessed using three outcome measures: the Child Behavior Checklist-Parent Report Form (CBCL; Achenbach & Edelbrock, 1991), the Children's Depression Inventory (CDI; Kovacs, 1980), and the Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1992). The CBCL was chosen because it is designed to assess parental perceptions of their child's overall adjustment. Measures of depressed symptoms and anxiety were chosen to assess adjustment because symptoms of depression and anxiety are accepted as indices of overall emotional distress or negative affect (Compas et al., 1996). The three outcome measures are widely used in research and clinical work with children. Siblings' coping strategies and secondary appraisal were assessed using the Kidcope (Spirito et al., 1988), a self-report questionnaire.

Child Measures:

Adjustment (outcome measures)

1. The Child Behavior Checklist/ 4-18, Parent Report Form (CBCL-PRF): The CBCL-PRF (Achenbach & Edelbrock, 1991) is designed to assess in a standardized format children's behavioural problems as reported by their parents. It requires a fifth grade reading level and takes about 20 minutes to complete. The CBCL was selected for this study because of its stress on psychological areas. In addition, the behaviour problem scales of the CBCL have been extensively factor analyzed by the authors of the instrument. These analyses have yielded a series of behaviour problem sub-scales with norms for different ages and sexes. Hence, the CBCL can be used to obtain an overall score for behaviour problems or for different behaviour areas relative to the standardization data for age and sex. Two global patterns of behaviour problems can also be abstracted from the instrument: internalizing and externalizing behaviours. Internalizing behaviours are those associated with children who are fearful, shy, anxious, and inhibited. Externalizing behaviours include aggression and antisocial behaviour. These two global scales were used in this study to assess parental perceptions of siblings' adjustment.

The CBCL offers a behaviour problem score and a social competence score. Each item on the 118-item behaviour problem scale is scored on a three-point scale: not true (0), somewhat true (1), or very true (2). As indicated above, the behaviour problem scale provides scores on a wide variety of childhood behaviour problems on three global scales: total, internalizing and externalizing. The 20-item social competence scale provides a total score as well as measures for three sub-scales: child's social activities, social relationships, and school participation and performance. Scores on all scales were computed as T-scores with a mean of 50 and a standard deviation of 10. The CBCL is presented, with permission from the publisher, in Appendix J.

Test-retest reliabilities across factors have been reported to range from .61 to .96. The inter-rater reliabilities for the social competence, externalizing, and internalizing factors have been reported to range from .26 to .98, .44 to .97, .67 to .74, respectively. Evidence for construct and criterion-related validity is good. Stability data indicate that the scale is sensitive to change over three, six, and eighteen-month intervals with coefficients generally decreasing over time for the behaviour problem scale, and generally increasing over time for the social competence scale (Achenbach & Edelbrock, 1983).

2. Revised Children's Manifest Anxiety Scale (RCMAS- "What I Think and Feel"): The RCMAS (Reynolds & Richmond, 1992) is a 37-item self-report questionnaire designed to assess the presence or absence of a variety of anxiety-related symptoms in children and adolescents from 6 to 19 years of age. It consists of 28 anxiety symptoms and nine Lie scale items. The child completes the measure by responding either yes or no to each item, depending on whether it describes him or her. Responses of 'yes' on the anxiety items are summed to yield a total anxiety score. The RCMAS provides four subscales in addition to the total anxiety score, which are labeled: (a) Physiological Anxiety, (b) Worry/Oversensitivity, (c) Social Concerns/Concentration, and (d) Lie, designed to detect acquiescence, social desirability or deliberate faking of responses. Only the total anxiety score was used in the analyses. The RCMAS is presented, with permission from the publisher, in Appendix K.

The RCMAS has been found to have acceptable internal consistency (reliability estimates were in the 0.80s). Test-retest reliabilities have been reported to range from 0.68 to 0.97 for the Total Anxiety score. Evidence for construct validity is good. Factor analytic studies has provided a considerable amount of evidence suggesting that anxiety is multidimensional in nature. The RCMAS also correlates with other measures of children's anxiety and has been found to differentiate among children exhibiting different behavioural characteristics (Reynolds & Richmond, 1992). The alpha coefficients obtained with this sample was 0.8180.

3. Children's Depression Inventory (CDI): The CDI (Kovacs, 1983) is a 27-item self-report questionnaire designed to assess a variety of symptoms of depression (e.g., sleep disturbance, appetite loss, and dysphoria) in 8 to 17 year-old children. Each item consist of three sentences that describe a range from non-distressed to severe and clinically significant symptoms.

The child chooses the sentence that best describes him or her over the past two weeks. Responses are scored on a 0-2 scale; 0= the absence of symptoms, 2= the severe form of the symptom in question. However, a more formal analysis of the readability of the CDI has suggested that it can be understood by children at the first grade level who are at least of average intelligence (Siegel, 1986). Indeed, the CDI has been used successfully in research with children who were 6 to 8 years old (Compas, et al., 1996). According to the manual, it takes about 10 to 20 minutes to complete the CDI. The CDI has good internal consistency of items for clinic and non-clinic samples (Kovacs, 1983; Siegal, 1986) and test-retest reliability is moderately high (Siegel, 1986). The CDI has been found to distinguish children with general emotional distress from non-distressed school children, and to correspond well with self-report measures of self-concept (Compas et al., 1996). Thirteen of the 27 CDI items are presented in Appendix L with the permission of the publisher. The alpha coefficient obtained with this sample was 0.7629.

Child Coping:

Kidcope: The Kidcope (Spirito, Stark & Williams, 1988) is a self-report measure designed to provide a brief, clinically useful checklist to screen cognitive and behavioural coping strategies in children and adolescents. It is composed of 10 coping strategies commonly mentioned by children and adolescents. The 10 strategies of the Kidcope are: distraction, social withdrawal, cognitive restructuring, self-criticism, blaming others, problem-solving, emotional regulation, wishful thinking, social support, and resignation. For each situation two questions are posed: one inquires about the frequency with which the respondent utilizes each of the 10 coping strategies (Frequency scale) and the other inquires about the efficacy of each strategy used (Efficacy scale). On the Frequency Scale ("Did you do this?"), there are four responses: 0 = Not at all, 1 = Sometimes, 2 = A lot, and 3 = Almost all the time. On the Efficacy Scale ("How much did it help?"), there are three responses: Not at all (=0), A little (=1) and A lot (= 2). Age-appropriate versions of the Kidcope have been developed for younger (ages 7-12) and older (ages 13-18) children. The younger version of the Kidcope, which was used for this study, has 15 items (five strategies are comprised of two items each).

On the front page of the Kidcope there are nine questions. The first four are designed to evaluate how the child felt about the situation, the next four are designed to examine the child's secondary appraisal and the last one deals with the frequency with which a child needs to handle the situation. The Kidcope was preferred to other measures of children's coping because of its relative brevity (e.g., the Child Perceived Coping Questionnaire has 37 items and the Children's Coping Strategies Checklist has 44 items). It was decided that given the age of participants and the number of measures they have to complete, a shorter measure would be more appropriate. The Kidcope is presented in Appendix M.

Moderate test-retest correlation coefficients have been reported for the Kidcope for short periods of time ranging from three days to two weeks. The highest correlations were obtained when participants rated the same personal stressors three days apart (range= .56 to .75). The lowest test-retest correlations were obtained after 10 weeks when adolescents picked different personal stressors (range= .15 to .43). This does not necessarily imply poor scale construction: the fact that the Kidcope is based on a process model of coping suggests that high test-retest correlations may not be accomplished, as coping strategies for the same problem may vary over time. As Aldwin (1994) has pointed out process instruments inherently have poor reliability because they focus on variability and change. Spirito, Stark, and Williams (1988) have indicated that overall, the reliability findings for the Kidcope are in the range of test-retest reliability results for other process measures. Concurrent validity of the Kidcope has been demonstrated by moderate to high correlations of the Kidcope items with other, commonly used, coping scales (i.e, Coping Strategies Inventory-CSI which has 72 items, and Adolescent-Coping Orientation for Problem Experiences-ACOPE which has 54 items).

Secondary Appraisal:

Secondary appraisal was assessed with four questions that describe coping options (questions five to eight on the first page of the Kidcope, Appendix M). These questions were used with a yes-no response format in a study by Folkman and Lazarus (1980) and with a five-point Likert scale in a study by Folkman et al. (1986) to evaluate the relation between secondary appraisal and coping. In this study, participants indicated, using a yes-no response format, whether the situation was one "that you could change or do something about", "that you had to accept", "in which you needed to know more before you could act", and "in which you had to hold yourself back from doing what you wanted to do".

Parent Measure

General Information Questionnaire: This questionnaire was constructed for the purposes of this study to assess demographic and background characteristics of the families including, parental level of education, family income and marital status of parents. It combined questions from a demographic questionnaire developed for a study conducted by Manion, Keene, McGrath, Goodman, Humphreys, Whitings, and Cloutier (1992) and selected demographic questions from the Adult Health and Daily Living (HDL) Form. The General Information Questionnaire is presented in Appendix G. A modified form of the General Information Questionnaire was developed for families who declined to participate in the study (see General Information Questionnaire, form B, Appendix H). It was structured so that families could remain anonymous.

Procedure

Recruitment Procedures

Specific recruitment procedures were worked out with the case managers of the different CHEO clinics. The case managers of the Cystic Fibrosis, Nephrology, and Oncology clinics made the initial contact with families who met the study's criteria. Families were informed about the study and asked if they were interested in receiving more information. All the families who were approached responded positively and were subsequently contacted by the researcher. The protocol for the first telephone contact with families was very similar to the one used later by a research assistant and is presented in Appendix O. If parents agreed to participate or to consider participation, they were mailed an information package which included a consent form (Appendix C), an Information Brochure about the study (Appendix E), and a letter to the sibling (Appendix F). Parents who declined to participate were asked if they were prepared to fill in a modified General Information Questionnaire, which was structured so they would remain anonymous (Appendix H). If they agreed, a copy of this questionnaire was sent to them with a stamped envelope to facilitate return. If they declined, the case managers of the appropriate clinic filled in another version of the Information Questionnaire (Appendix I). This procedure was done in order to later examine whether there were any differences between those who agreed and those who declined to participate in the study; i.e., to assess the representativeness of the sample.

Families from the Asthma clinic were directly contacted by the researcher. The case manager of this clinic reviewed all the medical files and prepared a list of those patients who were diagnosed with severe persistent asthma. The researcher then contacted these patients' parents to inquire if they had a healthy child in the 8-12 year old age group. If families met the study's criteria, the researcher explained the goals of the study and required time commitments from participants. If parents indicated that they would like to participate or consider participation, they were mailed the information package and follow-up arrangements were made.

Given the high number of patients seen in the Diabetes Clinic (more than 500), and the lack of information in the medical files of these patients about family members, a research assistant first contacted the parents to see if their diabetic child had a sibling in the 8-12 year old age group. If parents had healthy children who were eligible for participation, they were asked if they were prepared to receive an information package about the study. They were also told that they would be contacted by the researcher shortly after receiving the package to discuss any questions they might have, as well as further steps. The protocol used by the research assistant to call families appears in Appendix. O. When parents declined to participate, the case managers of the Diabetes clinic filled in their version of the General Information Questionnaire.

Siblings in families who agreed to participate were assessed at their home or in the hospital. When siblings were assessed at their home, efforts were made to assure privacy and minimal disruption during the interview.

One parent of each child also participated in the study. Ninety-nine mothers and 11 fathers completed the General Information Questionnaire and Child Behavior Checklist while their child was interviewed and administered the remaining measures. If circumstances prevented the parent from filling in the two questionnaires while their child was interviewed, a stamped envelope was provided and the parent was asked to send the questionnaires as soon as possible.

Interview Procedures

The procedure with siblings was as follows: (a) the researcher introduced herself; (b) the general purpose of the study and the limits of confidentiality were explained; (c) the researcher read the assent form to the sibling (Appendix D) and he or she was asked to sign two copies of it (one to keep and the other to leave with the investigator); (d) 10 minutes or so were spent establishing rapport (children were asked several questions -- taken from Sattler [1992] -- about their school, friends, and interests); (e) the three self-report measures were administered in the following order: Kidcope (three times, one for each of the three situations), the Children's Depression Inventory, and the Revised Children's Manifest Anxiety Scale. In order to ensure that participants understood the protocol, the interviewers encouraged them at the beginning of the interview to ask for clarifications if they did not understand a task. Interviewers also asked participants if they understood what was required of them after introducing new tasks. If a child did not understand a word, the interviewer would give a definition as well as write it on a piece of paper.

Children were asked how they cope with the three different types of situations selected for this study in the following manner:

> "Children who have a chronically ill brother or sister have taught researchers many things. One of the things they have taught us is what some of the hardest or most challenging parts of having a brother or sister with a chronic illness are. Some children have said that what bothers them the most is the fact that their parents do not spend enough time with them because of time spent with their ill brother or sister. Other children have said that the most difficult thing for them about having a chronically ill brother or sister is disruptions to daily life and routines because of frequent visits to the clinic or hospitalization. And some children say that fears or worries about what will happen to their ill brother or sister is the hardest thing for them.
>
> Whenever stressful or difficult things happen to us, we look for ways of handling the situation, or ways of coping. Let me give you an example: let's say you and your friend got into an argument, and your friend got very upset and walked away. You are very upset about this too and there are several things you can do to deal with your upset feelings: you can go talk to your friend, you can ignore him, you can take some time to think about ways to fix the problem, you can talk to your parents or a teacher about it, and you can

> also try to calm yourself by coming home and watching TV. All these different ways of handling the situation are called ways of coping.
>
> I would like to know today how you have handled the three kinds of situations that I have just mentioned, the situations which children said were the hardest parts about having a brother or sister with a chronic illness: when parents cannot spend enough time with them, when there are disruptions to daily routines, and when they worry about what will happen to their ill brother or sister. Let's start with the first one. I would like to know all the things you do or think when your parents cannot spend enough time with you because they are busy taking care of your ill brother or sister. Here is a list of ways people handle stressful situations (interviewer presents the Kidcope). I will read you this list and for each item I read, you tell me whether you do it or think about it when your parents cannot spend enough time with you. I also want you to tell me how much each way of dealing with things helps" (The first sentence in the second paragraph was adopted from the format used by Wilson et al., 1995. The rest was constructed for the purposes of this study).

After completing the 15 Kidcope items for each of the three situations identified for the purposes of this study, participants were asked to classify the coping strategies they endorsed as problem- or emotion-focused coping. This procedure was used by Compas et al. (1996), who argued that because the distinction between problem-focused and emotion-focused coping strategies is based on the individual's intentions in the use of each, it should be the respondents who categorize their strategies. Compas and his associates (1996) employed this procedure successfully in a study with participants aged 6 to 32. Participants in the present study were introduced to this task in the following way:

> "Now I would like you to classify all the ways of coping with (indicate the type of situation) that you have just mentioned into two categories: problem-focused coping and emotion-focused coping. Problem-focused coping is trying to change or do something about the situation. Emotion-focused coping is trying to deal with your feelings about the situation" (Definitions of problem- and emotion-focused coping were adopted from Compas et al., 1996).

Written definitions of problem- and emotion-focused coping were presented to participants on bristol board during the interview. In addition, to ensure that participants understand this task, an example of what was required was given the first time the task was introduced using a strategy the child did not endorse.

> "Let me give you an example: let's say you (give an example of a strategy the child did not endorse, e.g. yell, scream, or get mad) when your parents cannot spend enough time with you because they are busy taking care of your ill brother or sister. When you (yell, scream, or get mad), are you trying to change or do something about the situation, which is problem-focused coping, or are you trying to deal with your feelings about the situation, which is emotion-focused coping? There is no right or wrong answer. It is just a question of what you are trying to do when you (yell, scream, or get mad)".

Upon completion of the classification of the coping strategies participants were asked to indicate how they cope with disruptions to daily routines:

> "Now I would like to know all the things you do or think about when you have to deal with disruptions to daily routines as a result of your brother's/sister's illness. I will read you the same list again and for each item I read, you tell me whether you do it or think about it when you have to do deal with disruptions to daily routines. I also want you to tell me how much each way of handling things helps".

If a child indicated that he or she did not understand what we meant by disruptions to daily routines, the interviewer would define disruptions to daily routines as "interruptions or changes in family rules" and "interruptions in how the family normally does things as a result of changes in your brother's or sister's illness or as a result of treatment". An example of a disruption to daily routines was given by the interviewer (e.g., being cared for by grandparents or babysitters instead of parents when the ill brother or sister was hospitalized) and participants were encouraged to think of other examples before completing the Kidcope.

The third type of situation was presented in the following manner:

> "This time I would like to know all the things you do or think about when you have to deal with fears and worries about what will happen to your ill brother or sister. I will read you the same list again and for each item I read, you tell me whether you do it or think about it when you worry about what will happen to your ill brother or sister. I also want you to tell me how much each way of handling things helps".

In addition, the nine questions which appear on the front page of the Kidcope were read to participants. The first four were designed to evaluate how the child felt about the situation, the next four were designed to examine the child's secondary appraisal, and the last dealt with the frequency with which a child needed to handle the situation (see Kidcope, Appendix M). At the end of the interview, participants were thanked for their participation, debriefed (see Debriefing Protocol, Appendix N), and told that the results of the research would be forwarded as soon as they were available.

A little over half of the interviews (54%) were conducted by the principal researcher. The other interviews were conducted by two students who were trained to administer the interview. One of the interviewers was a senior doctoral candidate in Clinical Psychology and the other was a fourth year B.A. Honours student in Psychology. Training involved the following steps: (a) reading a short form of the proposal, (b) reviewing several articles about interviews with children (Lucas, 1993; Sattler, 1992, Sommers-Flanagan & Sommers-Flanagan, 1999; Zaro, Barach, Nedelman, & Dreiblatt, 1977), (c) reading the manuals of the measures used during the interview, (d) observing the principal researcher conduct one interview, and (e) conducting two interviews under the supervision of the principal investigator. To ensure consistency, each interviewer was provided with a detailed protocol of the interview procedures. This protocol specified all the different steps of the interview and was to be applied rigorously during every interview session with participants. One-Way Analyses of Variance were conducted to examine group differences between children seen by the three interviewers. No group differences were observed on the outcome measures, the nine questions on the front page of the Kidcope, the frequency and efficacy of Kidcope strategies for all three situations, and the percentages of strategies defined as problem-focused or emotion focused coping for situation 2 (disruptions to daily routines) and situation 3 (worries about the chronically ill sibling). Group differences were observed only for percentages of strategies defined as problem-focused or emotion focused coping for situation 1 [decreased parental availability; $\underline{F}$ (2, 88) = 4.522, $\underline{p} < 0.05$]. A Post Hoc comparison using Tukey HSD reveals a significant mean difference of almost 10% between the group of siblings seen by the principal researcher and the group of children seen by the fourth year B.A. Honours student in Psychology (the mean of the group seen by the principal researcher was almost 10% less than the mean of the other group).

RESULTS

Response Rate

One hundred and forty four families met the study's inclusion criteria and were approached about participation. One hundred and ten families agreed to take part in the study. This represented a response rate of 76.4 %. The refusal rate from the different clinics was as follows: 24% from the diabetes clinic (28 families out of the 116 families contacted), 42.9% from the Cystic Fibrosis clinic (three families out of the seven families contacted), 28.6% from the Asthma clinic (two families out of the seven families contacted), and 16.7% from the Nephrology clinic (one family out of the six families contacted). All eight families contacted from the Oncology clinic agreed to participate in the study. Families declined to participate for a variety of reasons: reluctance of siblings to participate (n=8), inability to participate because of crises currently affecting the family (n=5), unwillingness of parents to let the child be interviewed without a parent being present (n=3), and concern among parents who treat diabetes as a normal part of life that a sibling's participation could trigger negative feelings (n=3). Another 15 families declined to participate without specifying a reason.

Independent-samples t-tests were conducted to examine if there were statistically significant differences between participants and non-participants on the following continuous demographic variables: maternal and paternal age, marital status and combined family income. A chi-square analysis was conducted to determine if there were group differences in parental level of education. Fisher's exact test was performed to examine if there were group differences in paternal and maternal education (a chi-square test could not be used because the expected frequencies in six cells were too small: less than five). No significant differences were found between the two groups on any of the demographic variables examined.

Data Cleaning Procedures

Prior to analyses all variables were examined for accuracy of data entry and missing values. The following demographic variables were found to have missing values for one or two participants: maternal and paternal age, maternal and paternal level of education and maternal and paternal occupation . Missing values were not replaced because demographic variables were not included in any of the main hypotheses (Tabachnick & Fidell, 1996). The variable with the highest number of missing values was combined family income. Seven missing values were recorded for participants (6.4% of all cases), and eight missing values for nonparticipants (23.5% of all cases). It should be noted, however, that demographic information on five non-participating families was provided by case managers who were unable to give information on family income. In order to determine whether missing values on income were random, we examined if missing values differed from non-missing values with regard to parental level of education. To do so, a dummy variable was constructed: cases with missing values were recorded as 1 and nonmissing variables were recorded as 2 (Tabachnick & Fidell, 1996) and an independent-samples t-test was used to examine mean differences. No significant differences were found between the two groups on maternal or paternal level of education. Missing data on combined family income appeared to be random (these results should, however, be interpreted with caution because the group of missing values was small), as such it was decided to eliminate the missing values on family income variable from further analyses (Tabachnick & Fidell, 1996).

Preliminary analyses were then conducted to examine if data adequately met the assumptions underlying multivariate analyses (Cohen & Cohen, 1983; Norman & Streiner, 1994; Tabachnick & Fidell, 1996). Variables were examined for normality, linearity and homoscedasticity, as well as for univariate and multivariate outliers. Two variables yielded univariate outliers: the coping variables for decreased parental availability (one outlying case), and the variable of depressed symptoms (i.e., T-scores of siblings on the Children's Depression Inventory-CDI). Univariate outliers were assigned the score of the highest non-outlying case in the distribution (Tabachnick & Fidell, 1996).

Two univariate outliers were found on the variable of depressed symptoms. These cases (T-scores of 60 and 64) were more than three standard deviations above the sample's mean (M= 42.5, SD=5.7). However, according to the CDI manual's norms, only one outlying case was clinically significant (i.e., T-score of 64 which fell within the above average range). The other case was not an outlier in the clinical sense. It is interesting to note here that five additional cases that fell more than two standard deviations above the sample's mean, had T-scores within the average range (n=2, T-scores of 54) or slightly above average range (n=3, one had a T-score of 57 and two had T-scores of 58). When the frequency of scores on the depression variable was examined, it was found that 38.2 % of the sample (n=42) had CDI T-scores between 35 and 39 (i.e., 'below average' range according to the CDI manual) and 29% of the sample (n=32) had CDI T-scores between 40 and 44 (i.e., 'slightly below average' category according to the CDI manual). Only 27.3% of the sample (n=30) had CDI T-scores in the average range (i.e., T-scores between 45 and 55 according to the CDI manual). These findings may clarify why one of the outliers on the CDI was not an outlier in the clinical sense: given the high proportion of low CDI scores, the sample's mean and standard deviation were lower than the values for the normative sample.

When the responses on the Lie subscale of the Revised Children's Manifest Anxiety Scale (RCMAS) were examined, it was found that 30 children (27.3% of the sample) had a scaled score equal to or above 13 (i.e., 12 children had a scaled score of 13, 13 children had a scaled score of 14, three children had a scaled score of 15, one child had a scaled score of 16, and one child had a scaled score of 17). According to the RCMAS manual, a high score on the Lie subscale (i.e., scaled score equal to or higher than 13) may be indicative of an inaccurate self-report. The RCMAS manual indicates that Lie scores must be interpreted in view of the child's age or grade because there is tendency for younger children, particularly first graders, to score higher on the Lie subscale. Therefore, the ages of the 30 subjects with high Lie scores were examined. Only one 8 year old child and two 9 year old children were found in this group. Most children were older: there were seven 10 year old children, nine 11 year old children, nine 12 year old children, and two children who has just turned 13. Given the relatively high number of children with high Lie scores in the sample (i.e., high number of potentially inaccurate scores on the anxiety variable), and the fact that younger age did not seem to be a contributing factor to having a high Lie score, we created a "Lie" variable in which each child's Lie scaled score was recorded, and controlled for this variable when we performed hierarchical multiple regression analysis with RCMAS scores as the criterion variable (Tabachnick & Fidell, 1996).

One may argue that if a child provides an inaccurate self-report on one measure, he/she could provide an inaccurate self- report on another measure. Therefore, it was decided to examine the relationship between the "Lie" variable and the CDI. The results of the Pearson correlation analysis (r= -0.22, $p<0.05$) indicated that high Lie scores were associated with low CDI scores.

When we further assessed how many of the children with high Lie scaled scores had low T-scores on the CDI, we found that 23 of the 30 children with high Lie scaled scores (76.7%) had CDI T-scores which fell within the 'slightly below average' or 'below average' categories according to the CDI manual. More specifically, slightly more than half of the children with high Lie standard scores (n=17) had CDI T-scores between 35 and 39 (i.e, 40% of the children with CDI T-scores between 35 and 39 had standard scores equal to or above 13 on the Lie subscale of the RCMAS). In addition, six children with high Lie standard scores had CDI T-scores between 40 and 44. The remaining seven children with high Lie scores had CDI T-scores which fell within the average range. The outlying cases on the CDI variable had Lie standard scores lower than 13. These findings suggest that the sample mean may potentially be higher. Therefore, we performed two hierarchical multiple regression analyses with CDI scores as the criterion variable: once controlling for the Lie variable and once without controlling for it (Tabachnick & Fidell, 1996).

As indicated earlier, after completing the Kidcope items for each of the three situations, participants were asked to classify the strategies they endorsed as either emotion-focused or problem-focused coping. Differences were observed in the rates of strategies that children reported. For example, some children employed only four coping responses in dealing with worries about the chronically ill child, others utilized six strategies, whereas some endorsed eight strategies. In order to control for different base rates of reporting of Kidcope strategies, we used scores that reflect the proportion of coping responses that were endorsed as either emotion-focused or problem-focused coping.

Sample Background Information

Table 1 summarizes demographic characteristics of participants. The sample consisted of 54 boys and 56 girls (mean age: 10 years and 9 months, SD = 1 year and 4 months, range: 8 years and 1 month-13 years). The average age of participating parents was 39 years for mothers (SD= 3.8, range: 30 years-51 years) and 42 years for fathers (SD=5.05 , range: 24 years-60 years). Most of the sample (80%) consisted of families from the Diabetes clinic due to the fact that this clinic is substantially larger than the other participating clinics. The composition of the sample may raise questions about the representativeness of the sample and the generalizability of results to the broader population of siblings of chronically ill children. These questions are addressed, partly, by findings that severity of illness is not related to siblings' adjustment and by the underlying assumptions of the non-categorical approach on which this study is based. As noted earlier this approach rests on the assumption that it is the demands and the uncertainty of caring for an ill child that are important, rather than specific medical conditions. Therefore, one may not expect to observe substantial differences between different groups of siblings in this study.

Overall, participating families were of middle-upper income: the average combined annual income was $60,000-69,000 and 70% of the families had a combined annual income equal or above $60,000. It is important to note here that according to the most recent census data (1996) the average annual income of married or common-law families in Canada was $54,583, in Ontario it was $59,830, and in Ottawa-Hull it was $69,649 (www.statcan.ca).

In addition most parents were married or living with common law partners at the time of the study (87 %). The time since diagnosis of chronic illness ranged from 6 months to 18 years and 3 months with the average time being 4 years and 8 months.

Table 1

Demographic Characteristics of Participants (N=110)

Characteristic	n	%
Gender of participants		
Male	54	49.1
Female	56	50.9
Age of participant at time of survey (years)		
8	13	11.8
9	14	12.7
10	25	22.7
11	29	26.4
12	22	20.0
13	7	6.4
Age of mother at time of survey (years)		
30-39	56	50.9
40-49	52	47.3
50-59	1	0.9
Missing	1	0.9
Age of father at time of survey (years)		
20-39	33	30.0
40-49	62	56.4
50-59	10	9.1
60-69	1	0.9
Deceased	2	1.8
Missing	2	1.8
Type of illness		
Cancer	8	7.3
Diabetes	88	80.0
Cystic Fibrosis	4	3.6
Severe Asthma	5	4.5
Kidney Disease	5	4.5
Mother's level of education		
High school or less	25	22.7
Community college	40	36.4
Some university	11	10.0
BA degree	18	16.4
Graduate degree	15	13.6
Missing	1	0.9
Father's level of education		
High school or less	30	27.3
Community college	34	30.9
Some university	15	13.6
BA degree	11	10.0
Graduate degree	18	16.4
Missing	2	1.8

Table 1. Cont'd.

Characteristic	n	%
Mother's occupation		
Managerial	15	13.6
Professional	27	24.5
Technical	5	4.5
Administrative	14	12.7
Clerical	6	5.5
Retail	7	6.4
Other	35	31.8
Missing	1	0.9
Father's occupation		
Managerial	26	23.6
Professional	24	21.8
Technical	28	25.5
Administrative	1	0.9
Clerical	3	2.7
Retail	2	1.8
Other	23	20.9
Deceased	2	1.8
Missing	1	0.9
Marital status		
Married/Common law	96	87.3
Separated	5	4.5
Divorced	7	6.4
Widowed	2	1.8
Custody arrangement		
Sole custody	4	3.6
Joint custody	7	6.4
Other	1	0.9
Combined annual income ($)		
19,000 or less	8	7.2
20,000 to 29,000	4	3.6
30,000 to 39,000	4	3.6
40,000 to 49,000	10	9.1
50,000 to 59,000	11	10.0
60,000 to 69,000	17	15.5
70,000 to 79,000	13	11.8
80,000 to 89,000	5	4.5
90,000 to 99,000	10	9.1
100,000 or more	25	22.7
Missing	7	6.4
Time since diagnosis		
Less than a year	14	12.7
1-0 to 2-11*	36	32.7
3-0 to 5-11	24	21.8
6-0 to 9-11	23	20.9
More than ten years	13	11.9

* The first numeral represents number of years and the second numeral represents number of months since diagnosis.

Preliminary Analyses

Results of Descriptive Analyses for Outcome Measures

The sample obtained a mean T-score of 46 (SD = 9.4) for Externalizing Behavior Problems, a mean T-score of 51 (SD = 9.9) for Internalizing Behavior Problems, a mean T-score of 42.5 (SD = 5.7) for the Children's Depression Inventory, and a mean T-score of 42.5 (SD = 10.3) for the Revised Children's Manifest Anxiety Scale. A correlation matrix for the outcome measures is displayed in Table 2.

Siblings' Responses to Kidcope Questions Regarding Feelings About the Three Situations

The Kidcope Questionnaire was used to assess how siblings coped with decreased parental availability (first situation), disruptions in daily routines (second situation), and worries about the chronically ill brother or sister (third situation). On the front page of the Kidcope there were nine questions. The first four were designed to evaluate how the child felt about the situation (i.e., "does this situation makes you nervous, sad, or angry?" and "overall, how upsetting is this situation for you?"). Table 3 summarizes siblings' responses to these questions. To examine whether situations differ with regard to level of emotional arousal, a chi-square analysis for each question was performed. There were significant differences in how nervous [χ^2 (4) = 23.649, $p<0.001$] or sad [χ^2 (4) = 11.758, $p<0.05$] siblings felt in dealing with the three situations. Subsequently, paired t-tests were conducted using the Holm method to adjust for multiple comparisons. The Holm method is less conservative than the Bonferroni correction and uses critical values that change with each test instead of using a fixed value of 0.05/T (where T represents the total number of tests or comparisons)[2]. Results suggested that siblings perceived coping with worries about their ill brother or sister as a situation that makes them substantially more nervous than coping with parental decreased availability [t (92)= 5.978, $p<0.017$] or disruptions to daily routines [t (103) = 5.659, $p<0.025$]. Siblings also experienced dealing with worries as a situation that makes them substantially more sad than dealing with disruptions [t (103) = 3.625, $p<0.017$] or parental decreased availability [t (92)= 2.387, $p<0.025$].

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[2] When using the Holm method, you first compare the smallest, most significant p level to 0.05/T. If your p value is smaller than this, then it is significant, and you try the next p value in your list, which is compared to 0.05/(T-1). This procedure is continued until you find a p value larger than the critical number. This p value and all larger p values are non-significant (Norman & Streiner, 2000).

No differences were observed across situations with regard to feelings of anger or overall upset feelings: yet, several findings are worth noting. First, the percentages of children who felt very angry was relatively small. In fact, the majority of siblings reported not feeling angry at all in dealing with disruptions and worries. Second, a quarter of the siblings interviewed indicated that, overall, coping with the three situations was a very upsetting experience for them. Third, there was also a small group of children who reported that they did not feel upset at all when dealing with the three coping situations. The percentages of children who did not feel upset at all were similar across the three situations (14%-17%).

Siblings' Responses to the Kidcope Question about the Frequency With Which They Needed to Handle the Three Situations

Table 4 provides information on siblings' responses to the last Kidcope question (i.e., "how often do you think you need to deal with this situation?"). As can be seen from the table, more children perceived decreased parental availability as not applicable to them. Indeed, results from a Chi-square analysis revealed that there were significant differences across situations with regard to the frequency with which siblings needed to handle them [χ^2 (4) = 15.132, $p<0.05$]. Findings from paired t-tests analyses, using the Holm method to adjust for multiple comparisons, showed that siblings reported dealing with worries more often than with decreased parental availability [t (109) = 2.630, $p<0.017$]. In addition, as can be seen in Table 4, a quarter of the sample reported dealing with worries very often and a fifth stated that they need to cope with decreased parental availability and disruptions to routine very often.

Table 2

Intercorrelations for Scores on the Outcome Measures

	1	2	3	4
1. CDI	---			
2. RCMAS	0.65**	---		
3. CBCL-INT.	0.20*	0.16	---	
4. CBCL-EXT.	0.01	- 0.03	0.44*	---

**p<0.01

* p<0.05

Note: CDI = Children's Depression Inventory; RCMAS = Revised Children's Manifest Anxiety Scale; CBCL-INT = The Child Behavior Checklist, Internalizing Scale; CBCL-EXT.- The Child Behavior Checklist, Externalizing Scale.

Table 3

Responses to Kidcope Questions 1-4

	Situation 1 Decreased parental availability		**Situation 2** Disruption in daily routines		**Situation 3** Worries about the chronically ill sibling	
	n	%	n	%	n	%
Does the situation make you nervous?						
Not at all	47	50.0	54	51.4	28	26.2
A little	23	24.5	27	25.7	29	27.1
Somewhat	14	14.9	13	12.4	21	19.6
Very much*	10	10.6	11	10.5	29	27.1
Mean	1.9		1.9		2.6	
SD	1.1		1.1		1.3	
Does the situation make you sad?						
Not at all	24	25.5	39	37.1	27	25.2
A little	42	44.7	36	34.3	27	25.2
Somewhat	13	13.8	14	13.3	23	21.5
Very much*	15	16.0	16	15.3	30	28.1
Mean	2.3		2.1		2.6	
SD	1.2		1.2		1.4	
Does the situation make you angry?						
Not at all	43	45.7	54	51.4	60	56.1
A little	31	33.0	31	29.5	26	24.3
Somewhat	11	11.7	8	7.6	12	11.2
Very much*	9	9.6	12	11.5	9	8.4
Mean	1.9		1.8		1.8	
SD	1.0		1.1		1.1	
Overall, how upsetting is this situation for you?						
Not at all	15	16.0	18	17.1	15	14.0
A little	40	42.6	41	39.0	42	39.3
Somewhat	14	14.9	19	18.1	24	22.4
Very much*	25	26.6	27	25.7	26	24.3
Mean	2.6		2.6		2.7	
SD	1.3		1.2		1.2	

Note: The categories "pretty much" and "very much" were combined into one category in this table and in the chi-square analyses.

Table 4

Responses to the Kidcope Question "How Often Do You Need to Deal with this Situation"

	Situation 1 Decreased parental availability		**Situation 2** Disruption in daily routines		**Situation 3** Worries about the chronically ill sibling	
	n	%	n	%	n	%
Not at all	16	14.5	5	4.5	3	2.7
A little	53	48.2	60	54.5	47	42.7
Somewhat	19	17.3	25	22.7	32	29.1
Very much*	22	20.0	20	18.2	28	25.5

Note: The categories "pretty much" and "very much" were combined into one category in this table and in the chi-square analysis.

Coping Strategies Employed by Siblings

The first research question addressed the type of coping strategies siblings of chronically ill children employ when dealing with decreased parental availability, disruption to daily routines and worries about the chronically ill brother or sister. To answer this question, siblings' responses on the Kidcope Frequency Scale (i.e., "Did you do this?") were evaluated (see Table 5), as well as the percentages of siblings reporting they used a strategy 'a lot' or 'almost all the time' (see Figure 1).

Qualitative Aspects: Examination of Figure 1 reveals that cognitive restructuring, wishful thinking and social support were the most frequently used strategies in dealing with decreased parental availability. Sixty five percent of siblings indicated they utilized these strategies 'a lot' or 'almost all the time'. Other strategies that siblings often used in dealing with this situation were distraction (54%), emotional regulation (49%) and social withdrawal (48%). Problem-solving (34%) and resignation (23%) were less endorsed strategies. In fact, the rates with which siblings used resignation were similar for all three coping situations. The least utilized strategies were blaming others (3%) and self criticism (2%).

The most frequently utilized strategies in coping with disruption to daily routines were cognitive restructuring (64%), distraction (64%) and wishful thinking (60%). Other strategies that siblings often employed when dealing with disruptions were emotional regulation (54%), social support (49%), social withdrawal (45%), and problem-solving (40%). The least endorsed strategy was blaming others (3%).

The two most frequently used strategies in dealing with worries about the chronically ill brother or sister were cognitive restructuring (64%) and wishful thinking (64%). Other strategies that a substantial proportion of siblings reported using 'a lot' or 'almost all the time' were emotional regulation (48%), problem-solving (48%), distraction (43%), and social withdrawal (42%). Interestingly, social support was somewhat less commonly employed for this situation (36%).

Examination of the percentages of siblings reporting they used a strategy 'a lot' or 'almost all the time' across all three situations, revealed the following: (a) Cognitive restructuring and wishful thinking were the most frequently used coping strategies; (b) the least endorsed strategies were self criticism and blaming others. In fact, the majority of siblings reported not using these strategies at all in dealing with any of the three situations; and (c) resignation was the next least frequently used strategy: about a quarter of the participants indicated that they did not do anything 'a lot' or 'almost all the time'. In addition, a relatively high proportion of participants never used resignation.

Statistical Analyses: In order to examine whether siblings utilized the various Kidcope strategies similarly or differently across situations we performed a series of Chi-square analyses (Norman & Streiner, 1997). Results indicated that only the use of social support was significantly different across situations [χ^2 (4) = 9.847, $p<0.05$]. Findings from paired t-tests analyses revealed that siblings used social support a great deal more in dealing with decreased parental availability than in coping with worries [t (109) = 3.691, p = <0.001] or disruption to daily routines [t (102) = 3.275, p=0.001].

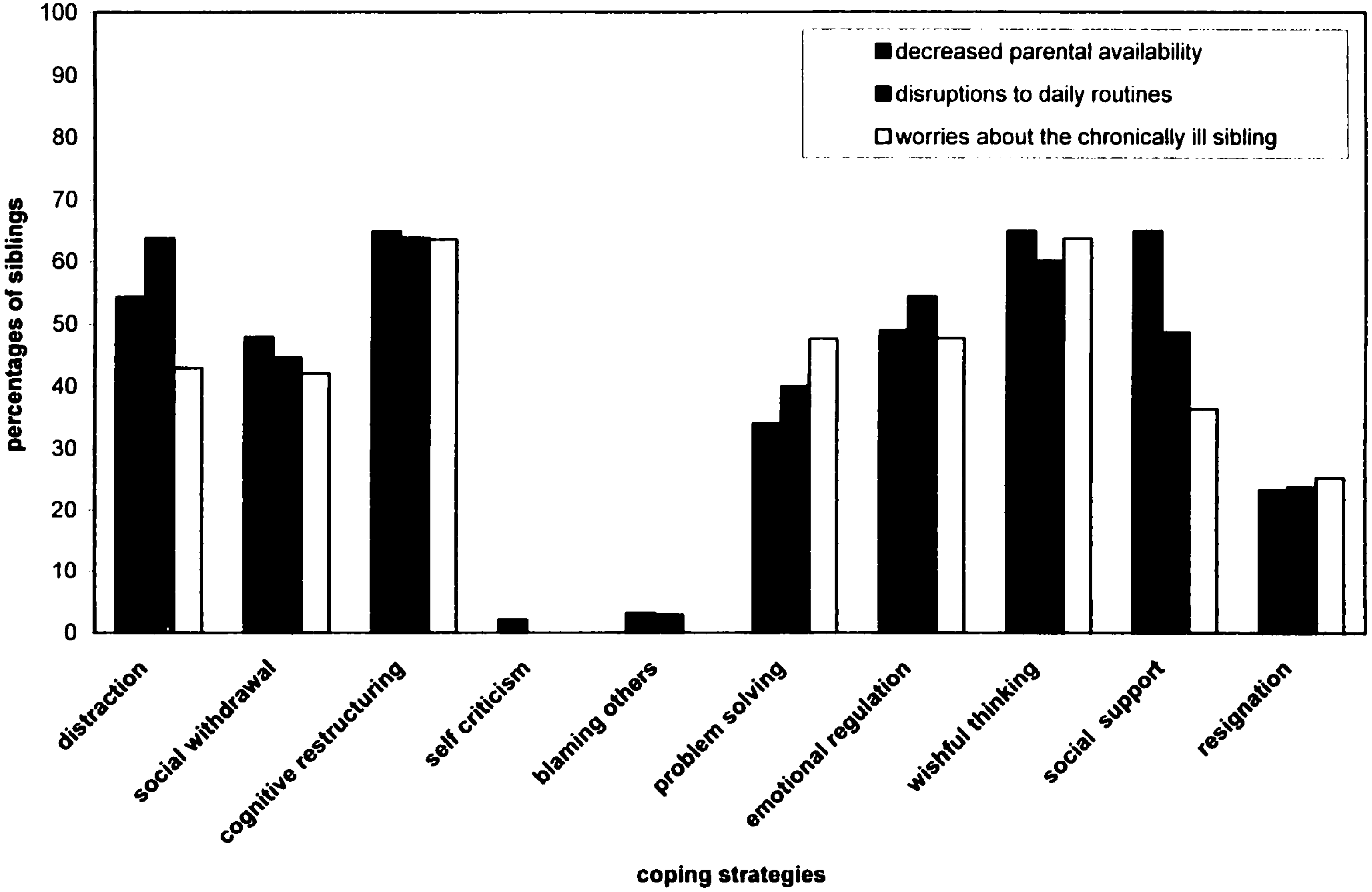
Table 5
Coping Strategies Employed by Siblings

	Situation 1 Decreased parental availability		**Situation 2** Disruption in daily routines		**Situation 3** Worries about the chronically ill sibling	
	%	(n)	%	(n)	%	(n)
Distraction						
Not at all	5.3	(5)	5.7	(6)	13.1	(14)
Sometimes	40.4	(38)	30.5	(32)	43.9	(47)
A lot	16.0	(15)	27.6	(29)	15.0	(16)
Almost all the time	38.3	(36)	36.2	(38)	28.0	(30)
Mean	2.9		2.9		2.6	
SD	1.0		1.0		1.0	
Social Withdrawal						
Not at all	12.8	(12)	10.5	(11)	21.5	(23)
Sometimes	39.4	(37)	44.8	(47)	36.4	(39)
A lot	23.4	(22)	17.1	(18)	20.6	(22)
Almost all the time	24.5	(23)	27.6	(29)	21.5	(23)
Mean	2.6		2.6		2.4	
SD	1.0		1.0		1.1	
Cognitive Restructuring						
Not at all	4.3	(4)	6.7	(7)	8.4	(9)
Sometimes	30.9	(29)	29.5	(31)	28.0	(30)
A lot	37.2	(35)	31.4	(33)	30.8	(33)
Almost all the time	27.7	(26)	32.4	(34)	32.7	(35)
Mean	2.9		2.9		2.9	
SD	0.9		0.9		1.0	
Self Criticism						
Not at all	86.2	(81)	89.5	(94)	83.2	(89)
Sometimes	11.7	(11)	10.5	(11)	10.3	(11)
A lot	1.1	(1)	0.0		2.8	(3)
Almost all the time	1.1	(1)	0.0		3.7	(4)
Mean	1.2		1.1		1.3	
SD	0.5		0.3		0.7	
Blaming Others						
Not at all	87.2	(82)	83.8	(88)	88.8	(95)
Sometimes	9.6	(9)	13.3	(14)	11.2	(12)
A lot	2.1	(2)	2.9	(3)	0.0	
Almost all the time	1.1	(1)	0.0		0.0	
Mean	1.2		1.2		1.1	
SD	0.5		0.5		0.3	

Table 5. Cont'd.

	Situation 1 Decreased parental availability		**Situation 2** Disruption in daily routines		**Situation 3** Worries about the chronically ill sibling	
	%	(n)	%	(n)	%	(n)
Problem Solving						
Not at all	8.5	(8)	9.5	(10)	9.3	(10)
Sometimes	57.4	(54)	50.5	(53)	43.0	(46)
A lot	23.4	(22)	27.6	(29)	28.0	(30)
Almost all the time	10.6	(10)	12.4	(13)	19.6	(21)
Mean	2.4		2.4		2.6	
SD	0.8		0.8		0.9	
Emotional Regulation						
Not at all	17.0	(16)	17.1	(18)	14.0	(15)
Sometimes	34.0	(32)	28.6	(30)	38.3	(41)
A lot	26.6	(25)	32.4	(34)	26.2	(28)
Almost all the time	22.3	(21)	21.9	(23)	21.5	(23)
Mean	2.5		2.6		2.6	
SD	1.0		1.0		1.0	
Wishful Thinking						
Not at all	6.4	(6)	6.7	(7)	5.6	(6)
Sometimes	28.7	(27)	33.3	(35)	30.8	(33)
A lot	25.5	(24)	26.7	(28)	21.5	(23)
Almost all the time	39.4	(37)	33.3	(35)	42.1	(45)
Mean	3.0		2.9		3.0	
SD	1.0		1.0		1.0	
Social Support						
Not at all	2.1	(2)	12.4	(13)	17.8	(19)
Sometimes	33.0	(31)	39.0	(41)	45.8	(49)
A lot	42.6	(40)	28.6	(30)	24.3	(26)
Almost all the time	22.3	(21)	20.0	(21)	12.1	(13)
Mean	2.9		2.6		2.3	
SD	0.8		1.0		0.9	
Resignation						
Not at all	36.2	(34)	35.2	(37)	39.3	(42)
Sometimes	40.4	(38)	41.0	(43)	35.5	(38)
A lot	11.7	(11)	13.3	(14)	17.8	(19)
Almost all the time	11.7	(11)	10.5	(11)	7.5	(8)
Mean	2.0		2.0		1.9	
SD	1.0		1.0		0.9	

Figure 1. Percentages of Siblings Reporting They Used a Strategy "A lot" or "Almost all the time" For All Three Situations



Siblings' Classification of Kidcope Strategies into Problem-focused or Emotion-focused Coping

As indicated previously, after completing the 15 Kidcope items for each situation, siblings were asked to classify the strategies they endorsed as either problem-focused or emotion-focused coping. No *a priori* classification was used for the Kidcope strategies as is the case with some coping measures. The rationale for this procedure was rooted in the assumption that such a classification should be based on the individual's intention in the use of each strategy (Compas et al., 1996). This assumption was supported by the data. Table 6 displays, for each strategy across all three situations, how many siblings viewed it as problem-focused and how many as emotion-focused coping. For example, in dealing with decreased parental availability (situation 1), 39 participants classified cognitive restructuring as problem-focused coping, whereas 50 participants classified it as emotion-focused coping.

As the table indicates, individuals may use the same strategy to achieve different goals. For example, some may use distraction as a way of changing or doing something about the situation (i.e., problem-focused), whereas others may employ distraction strategies as a way of dealing with their upset feelings (i.e., emotion-focused). Furthermore, a strategy such as problem-solving, which is typically classified as a problem-focused strategy, was viewed by many siblings in this study as an emotion-focused strategy. Similarly, strategies such as social withdrawal and wishful thinking, which are very often described in the literature as avoidance-type strategies, were classified by quite a few siblings in the current research as problem-focused coping.

Table 6

Number of Siblings Classifying Each Kidcope Item as Problem- or Emotion-focused Coping

	Situation 1 Decreased parental availability		**Situation 2** Disruption to daily routines		**Situation 3** Worries about the chronically ill sibling	
	Problem-focused coping	Emotion-focused coping	Problem-focused coping	Emotion-focused coping	Problem-focused coping	Emotion focused coping
Coping Strategy (Kidcope Items)*	n	n	n	n	n	n
Distraction						
(item 1)	35	41	27	59	34	42
(item 2)	34	46	41	44	30	41
Social Withdrawal						
(item 3)	8	38	20	34	21	34
(item 4)	27	44	26	55	22	51
Cognitive Restructuring						
(item 5)	39	50	46	52	45	52
Self Criticism						
(item 6)	6	8	2	9	10	8
Blaming Others						
(Item 7)	7	5	9	8	7	5
Problem Solving						
(Item 8)	54	18	55	22	56	28
(item 9)	36	35	53	32	43	38

Table 6. Cont'd.

	Situation 1 Decreased parental availability		Situation 2 Disruption to daily routines		Situation 3 Worries about the chronically ill sibling	
	Problem-focused coping	Emotion-focused coping	Problem-focused coping	Emotion-focused coping	Problem-focused coping	Emotion focused coping
Coping Strategy (Kidcope Items)*	n	n	n	n	n	n
Emotional Regulation						
(Item 10)	6	16	6	21	5	12
(item 11)	19	57	29	56	28	58
Wishful Thinking						
(item 12)	36	45	35	56	37	59
(item 13)	43	37	43	48	48	43
Social Support						
(Item 14)	39	53	43	49	41	45
Resignation						
(Item 15)	27	34	27	41	34	32

*Note: some of the 10 Kidcope strategies are comprised of two items each.

Tests of Hypotheses

The second research question asks whether siblings use problem-focused or emotion-focused strategies differently in coping with each of the three situations. Three competing hypotheses were generated with regard to this research question. Because repeated observations were made of each participant (i.e., each participant completed the Kidcope three times), we initially performed a 3(situation) X 2(coping) repeated-measures Analysis of Variance. However, it turned out to be an inappropriate analysis because the situation variable was linearly dependent and no F value appeared for it. As a result, one factor repeated-measures Analysis of Variance (ANOVA) was conducted to test for differences in problem-focused and emotion-focused coping across the three situations (Norman & Streiner, 1994). No main effects were observed. That is, there were no statistically significant differences in the use of problem-focused or emotion-focused coping across the three situations [F (2, 88) = 2.547, p = 0.84]. Table 7 presents the means and standard deviations for problem-focused and emotion-focused coping computed for each situation.

In order to examine whether there were differences in the use of emotion-focused and problem-focused coping within each situation, a paired t-test analysis was conducted for each situation. The Holm method was used to adjust for multiple comparisons (Norman & Streiner, 2000). The results showed that siblings used significantly more emotion-focused than problem-focused strategies in dealing with all three coping situations [i.e., decreased parental availability: t (93) = 3.399, $p<0.017$, disruptions in daily routines: t (104) = 3.445, $p<0.025$, and worries about the chronically ill sibling: t (104) = 1.986, $p=0.05$].

These findings provide partial support for the third competing hypothesis which stated that siblings would use emotion-focused strategies more frequently in dealing with all three situations. This hypothesis predicted that siblings would use emotion-focused strategies more frequently in dealing with all situations because siblings would perceive very little control over all situations. In an attempt to determine whether siblings indeed perceived very little control over all three situations, we examined their responses to the Kidcope question about perception of control (i.e., “in general is this situation one that you could change or do something about?”) for each situation. Table 8 displays this information, as well as the results of the chi-square test designed to determine whether differences between the observed and expected frequencies were statistically significant. No support was found for the hypothesis that siblings perceived very little control over all three situations. Instead, as the table indicates, siblings perceived very little control only when dealing with decreased parental availability and disruption to daily routines.

In addition to within-situation comparisons, differences in perceived control across situations were examined. Significant differences were found in siblings' perception of control between situation 2 (disruption to daily routines) and situation 3 (worries about the chronically ill sibling), as well as between situation 1 (decreased parental availability) and situation 3 [χ^2 (1) = 7.440, $p<0.01$; χ^2 (1) = 5.647, $p<0.05$; respectively).

The fourth research question asked whether siblings' coping strategies were related to their psychological adjustment. Two hypotheses were generated with regard to this question. Hypothesis 2 predicted that the use of problem-focused coping strategies would be associated with fewer self-reported symptoms of depression and anxiety as well as fewer parental reports of externalizing and internalizing problems. In contrast, Hypothesis 3 predicted that the use of emotion-focused coping strategies would be associated with higher self-reported symptoms of depression and anxiety as well as more parental reports of externalizing and internalizing problems. To test these hypotheses, zero-order Pearson correlations were conducted. For each of the three coping situations, bivariate associations between problem-focused or emotion-focused strategies (i.e., the proportion of total strategies that were problem- or emotion-focused) and each of the four criterion variables were examined (see Table 9). Support for Hypothesis 2 would have been obtained if the correlation coefficients had been moderate to high (i.e., higher than 0.30) and negative. Support for hypothesis 3 would have been obtained if the correlation coefficients had been moderate to high and positive.

Neither hypothesis was supported. In fact, as can be noted in Table 9, the use of problem-focused strategies in dealing with disruptions and worries was associated with higher parental reports of externalizing problems, whereas the use of emotion-focused strategies in dealing with these two situations was associated with fewer parental reports of externalizing problems. The correlations between coping and the other adjustment measures were not significant.

Table 7

Means and Standard Deviations for Problem-focused and Emotion-focused Coping Strategies for all Three Coping Situations

	Problem-Focused Coping		Emotion-Focused Coping	
	M	SD	M	SD
Situation 1 Decreased parental availability	44.0	17.0	56.0	17.0
Situation 2 Disruptions in daily routines	43.4	19.7	56.6	19.7
Situation 3 Worries about the chronically ill sibling	46.0	20.6	54.0	20.6

Note: Scores for problem-focused and emotion-focused represent percentages of the total number of strategies. This is why the SD scores are identical for problem- and emotion-focused coping.

Table 8

Responses to the Kidcope Question Regarding Perceived Control Over Each Situation

	Cannot Change or Do Something About the Situation		Can Change or Do Something About the Situation		χ^2
	n	%	n	%	
Situation 1 Decreased parental availability	63	67.0	31	33.0	11.46***
Situation 2 Disruptions in daily routines	73	69.5	32	30.5	16.01***
Situation 3 Worries about the chronically Ill sibling	54	50.5	53	49.5	0.009

***$p < .001$

Table 9

Correlations of Problem-focused Coping with Measures of Adjustment

	Problem-focused Coping - Situation 1	Problem-focused Coping - Situation 2	Problem-focused Coping - Situation 3
CDI	-0.02	0.11	0.11
RCMAS	-0.04	-0.01	0.03
CBCL-INT.	-0.14	0.06	0.02
CBCL-EXT.	0.03	0.24*	0.24*

* $p<0.05$

Note: Correlations of emotion-focused coping with measures of adjustment are of the same value but have the opposite sign.

CDI = Children's Depression Inventory; RCMAS = Revised Children's Manifest Anxiety Scale; CBCL-INT = The Child Behavior Checklist, Internalizing Scale; CBCL-EXT.- The Child Behavior Checklist, Externalizing Scale; Situation1 = Decreased parental availability; Situation 2 = Disruption in daily life and routines; Situation 3 = Worries about the chronically ill sibling.

Perceived Effectiveness of Coping Strategies

The third research question, in which no *a priori* assumptions were made, examined the type of coping strategies siblings perceived as most effective and whether these strategies differed across situations. To address this question, siblings' responses on the Kidcope Efficacy Scale (i.e., "How much did it help") were summarized (see Table 10) and the percentages of siblings reporting a strategy as very helpful were assessed (see Figure 2).

Qualitative Aspects: Siblings' perceived effectiveness of coping strategies was similar for situation 1 (decreased parental availability) and situation 2 (disruptions to daily routines). The strategy that siblings perceived as most effective was seeking social support. Other strategies reported as helping 'a lot' by a majority or near majority of participants were emotional regulation, cognitive restructuring, distraction, and problem-solving. Wishful thinking and social withdrawal were perceived as very helpful by a smaller group of siblings. Resignation was perceived as a very helpful strategy only by about a fifth of the sample. No one endorsed self criticism and blaming others as very helpful in coping with disruption to routines and only one child thought that these strategies were very helpful in dealing with decreased parental availability.

With regard to coping with worries about a chronically ill sibling, results displayed in Table 12 show that the only strategy perceived as very effective by a majority of participants was cognitive restructuring (56%). Social support, problem solving, wishful thinking, emotional regulation and distraction were reported as helping 'a lot' by 40-49 percent of siblings. Again, social withdrawal and resignation were perceived as very helpful strategies by relatively small proportions of siblings. Similar to situation 2, no one perceived self criticism and blaming others as very helpful strategies.

Statistical Analyses: In order to determine whether perceived effectiveness of coping strategies varied across the three situations, a chi-square analysis was conducted for each coping strategy, using the Holm method to adjust for multiple comparisons (Norman & Streiner, 2000). A significant difference in perceived effectiveness was observed only with regard to emotional regulation [χ^2 (2) = 9.176, $p<0.025$]. Findings from paired t-tests revealed that siblings perceived

Table 10

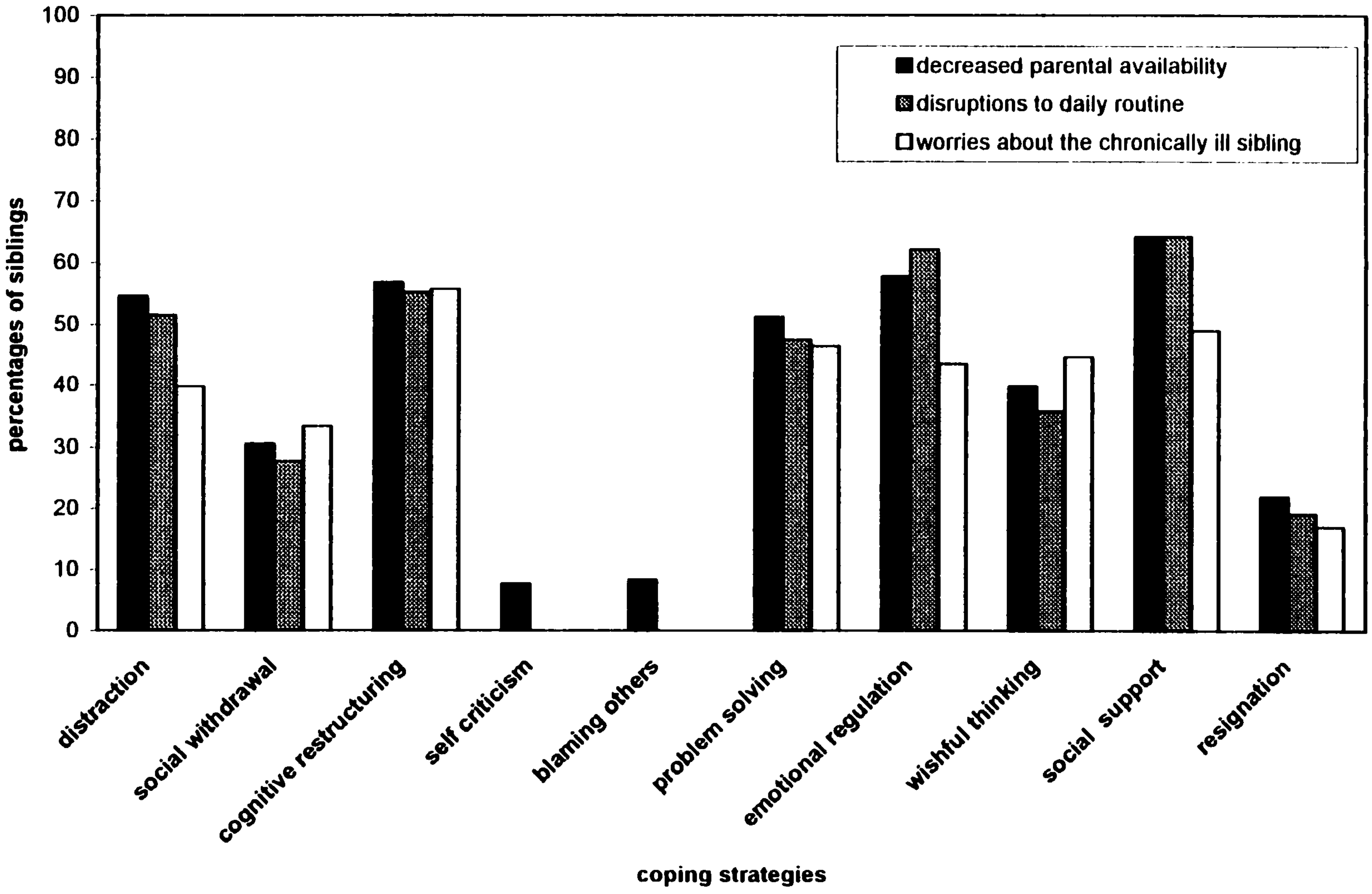
Perceived Effectiveness of Coping Strategies

	Situation 1 Decreased parental availability		**Situation 2** Disruptions in daily life and routines		**Situation 3** Worries about the chronically ill sibling	
	%	n	%	n	%	n
Distraction						
Not at all	1.1	(1)	5.1	(5)	6.5	(6)
A little	44.4	(40)	43.4	(43)	53.8	(50)
A lot	54.4	(49)	51.5	(51)	39.8	(37)
Mean	2.5		2.5		2.3	
SD	0.5		0.6		0.6	
Social Withdrawal						
Not at all	14.6	(12)	21.3	(20)	22.6	(19)
A little	54.9	(45)	51.1	(48)	44.0	(37)
A lot	30.5	(25)	27.7	(26)	33.3	(28)
Mean	2.2		2.1		2.1	
SD	0.7		0.7		0.7	
Cognitive Restructuring						
Not at all	4.4	(4)	4.1	(4)	4.0	(4)
little	38.9	(35)	40.8	(40)	40.4	(40)
A lot	56.7	(51)	55.1	(54)	55.6	(55)
Mean	2.5		2.5		2.5	
SD	0.6		0.6		0.6	
Self Criticism						
Not at all	61.5	(8)	63.6	(7)	55.6	(10)
little	30.8	(4)	36.4	(4)	44.4	(8)
A lot	7.7	(1)	0.0		0.0	
Mean	1.5		1.4		1.5	
SD	0.7		0.5		0.5	
Blaming Others						
Not at all	58.3	(7)	64.7	(11)	41.7	(5)
little	33.3	(4)	35.3	(6)	58.3	(7)
A lot	8.3	(1)	0.0		0.0	
Mean	1.5		1.4		1.6	
SD	0.7		0.5		0.5	
Problem Solving						
Not at all	2.3	(2)	3.2	(3)	6.2	(6)
little	46.5	(40)	49.5	(47)	47.4	(46)
A lot	51.2	(44)	47.4	(45)	46.4	(45)
Mean	2.5		2.4		2.4	
SD	0.6		0.6		0.6	

Table 10. Cont'd.

	Situation 1 Decreased parental availability		**Situation 2** Disruptions in daily life and routines		**Situation 3** Worries about the chronically ill sibling	
	%	n	%	n	%	n
Emotional Regulation						
Not at all	6.4	(5)	9.2	(8)	6.5	(6)
little	35.9	(28)	28.7	(25)	50.0	(46)
A lot	57.7	(45)	62.1	(54)	43.5	(40)
Mean	2.5		2.5		2.4	
SD	0.6		0.7		0.6	
Wishful Thinking						
Not at all	12.5	(11)	12.2	(12)	10.9	(11)
little	47.7	(42)	52.0	(51)	44.6	(45)
A lot	39.8	(35)	35.7	(35)	44.6	(45)
Mean	2.3		2.2		2.3	
SD	0.7		0.7		0.7	
Social Support						
Not at all	2.2	(2)	1.1	(1)	2.3	(2)
little	33.7	(31)	34.8	(32)	48.9	(43)
A lot	64.1	(59)	64.1	(59)	48.9	(43)
Mean	2.6		2.6		2.5	
SD	0.5		0.5		0.6	
Resignation						
Not at all	25.4	(15)	27.9	(19)	29.2	(19)
A little	52.5	(31)	52.9	(36)	53.8	(35)
A lot	22.0	(13)	19.1	(13)	16.9	(11)
Mean	2.0		1.9		1.9	
SD	0.7		0.7		0.7	

Figure 2. Perceived Effectiveness of Coping Strategies by Siblings for All Three Situations



emotional regulation as more helpful in coping with decreased parental availability than in dealing with worries about the chronically ill brother or sister [t (109) = 3.128, $p<0.01$]. No significant differences were observed with regard to the perceived effectiveness of other coping strategies across the three situations.

Hierarchical Multiple Regression Findings

Hierarchical multiple regression analyses were conducted to address the fifth research question regarding the incremental variance in siblings' psychological adjustment accounted for by their coping strategies. When the analyses were performed with the dependent variables of internalizing and externalizing behaviour problems, demographic variables (age and gender) were entered simultaneously on the first step to control for their effects. The coping variables (i.e., emotion-focused and problem-focused coping) for the three situations were entered simultaneously on the second step. Using a $p< 0.001$ criterion for Mahalanobis distance, no outliers were identified (Tabachnick & Fidell, 1996). Results reported in Table 11, show that the overall model accounts for significant proportions of the variance in externalizing behaviour problems ($R^2 = 0.14$, $F(3, 84) = 4.005$, $p <0.01$). Siblings' coping strategies contributed a significant incremental proportion of the variance in externalizing behaviour problems (12%) beyond that contributed jointly by age and sex group. Only siblings' coping with the second situation (disruptions to daily routines) contributed independently to the prediction of externalizing behaviour problems, based on the standardized regression coefficient. The sign of this coefficient indicated that siblings who use more problem-focused coping in dealing with disruptions to daily routines are reported as having more externalizing behaviour problems.

Siblings' coping strategies also explained a significant proportion of the variance in internalizing problems (7%) beyond that contributed jointly by age and sex group. Only siblings' coping with the first situation (decreased parental availability) was an independent contributor to their internalizing behaviour problems, based on the standardized regression coefficient. The sign of this coefficient indicated that siblings who use more problem-focused coping in dealing with decreased parental availability are reported as having fewer internalizing behaviour problems.

As indicated earlier, hierarchical multiple regression analysis relating siblings' coping strategies to the self-reported symptoms of anxiety were conducted after controlling for scores on the Lie scale . Again, demographic variables (age and gender) were entered simultaneously on

Table 11

<u>Summary of Hierarchical Multiple Regression Analyses with CBCL Internalizing and Externalizing Scales as Dependent Variables (N= 90)</u>

	Internalizing Problems				Externalizing Problems			
Step and Predictor Variable	R^2	Incremental R^2	<u>SEB</u>	β	R^2	Incremental R^2	<u>SEB</u>	β
Step 1	0.020	0.020			0.017	0.017		
Age			0.768	-0.199			0.664	0.093
Sex			2.157	-0.061			1.866	0.009
Step 2	0.094	0.074			0.140	0.123**		
Problem-focused coping, situation 1			0.088	-0.380*			0.076	-0.271
Problem-focused Coping, situation 2			0.102	0.321			0.088	0.444*
Problem-focused coping, situation 3			0.090	-0.029			0.078	0.050

<u>Note:</u> Situation 1=Decreased parental availability; Situation 2 = Disruption in daily life and routines; Situation 3 = Worries about the chronically ill sibling.

*$p<0.05$
**$p<0.01$

the first step to control for their effects. The "Lie" variable was entered on the second step, and the coping variables for the three situations were entered simultaneously on the third step.

Hierarchical multiple regression analyses relating siblings' coping strategies to the self-reported symptoms of depression were conducted twice: once controlling for scores on the Lie scale and once without controlling for it . Results of these analyses are displayed in Table 12. Using a $p < 0.001$ criterion for Mahalanobis distance, no outliers were identified (Tabachnick & Fiddell, 1996). Results summarized in Table 12 show that there were no differences in the proportion of variance on the CDI explained by coping either when scores on the Lie scale were or were not controlled for. In both cases, addition of siblings' coping strategies did not substantially improve predications (only 2%) of CDI scores beyond that afforded by age and sex. Similarly, results of hierarchical multiple regression analysis relating siblings' coping to RCMAS (see Table 13), show that the overall model accounted for small proportions of the variance (4%) on the RCMAS. Again, siblings' coping strategies only improved predictions of RCMAS scores by 2% after controlling for age and gender.

Examination of Ancillary Research Questions

An important ancillary research question pertained to how coping differed as a function of siblings' secondary appraisal of the situation. Secondary appraisal was assessed by four questions on the Kidcope: (1) In general, is this situation one that you could change or do something about? (2) In general, is this situation one that must be accepted or gotten used to? (3) In general, is this situation one in which you needed to know more before you could act? and (4) In general, is this situation one in which you had to hold yourself from doing what you wanted to do? Siblings responded with 'yes' or 'no' to each question.

The frequency of responses to the four secondary appraisal questions are summarized in Table 14 for each coping situation. To address the ancillary question stated above, a 2 x 4 within-subjects ANOVA was conducted (Jaccard & Becker, 1990; Norman & Streiner, 1994). Separate analyses were performed for each of the three coping situations. The means and standard deviations for problem-focused and emotion-focused strategies for the three coping situations are presented in Table 15. In each situation, there were no significant differences in the use of problem- or emotion-focused coping strategies between those siblings who endorsed 'yes' and those who endorsed 'no' on each of the four secondary appraisal questions. These results suggest that for this sample, the use of problem-focused or emotion-focused coping was not related to secondary appraisal of the situation.

The second ancillary question asked whether there were gender differences in coping strategies (i.e., problem-focused versus emotion-focused) employed by siblings. Independent-samples t-tests were performed to examine gender differences. Separate analyses were conducted for each of the three coping situations. No significant differences were found between boys and girls in the use of problem-focused or emotion-focused coping across all three situations. Table 16 summarizes information on the means and standard deviations for problem-focused and emotion-focused coping strategies for boys and girls across all situations. In addition, we performed chi-square analyses on the Kidcope items for each situation. Analyses were conducted only with strategies boys and girls reported using 'a lot' and 'almost all the time'. No significant gender differences were observed for any of the Kidcope items for situation 2 (disruption to daily routines) or situation 3 (worries about the chronically ill brother or sister). In dealing with decreased parental availability, significantly more girls endorsed using cognitive restructuring and emotional regulation 'almost all the time' than did boys [χ^2 (1) = 4.179, $p<0.05$; χ^2 (1) = 4.878, $p<0.05$, respectively). No significant gender differences were found for the other Kidcope items.

Table 12

Summary of Hierarchical Multiple Regression Analysis with CDI as a Dependent Variable (N= 90)

	Children's Depression Inventory (CDI)			
Step and Predictor Variable	R^2	Incremental R^2	β	SEB
Step 1	0.003 (0.004)*	0.003 (0.004)*		
Age			-0.018 (-0.046)*	0.466 (0.450)*
Sex			0.064 (0.069)*	1.282 (1.263)*
Step 2	0.025	0.22		
Lie scale			-0.146	0.236
Step 3	0.042 (0.022)*	0.018 (0.018)*		
Problem-focused coping, situation 1			-0.099 (-0.138)*	0.053 (0.051)*
Problem-focused coping, situation 2			0.060 (0.096)*	0.061 (0.060)*
Problem-focused coping, situation 3			0.124 (0.098)*	0.053 (0.052)*

---

* The numbers in brackets display the results of hierarchical multiple regression analysis when the scores on the Lie scale were not controlled for.

Note: Situation 1=Decreased parental availability; Situation 2 = Disruption to daily routines; Situation 3 = Worries about the chronically ill sibling.

Table 13

Summary of Hierarchical Multiple Regression Analysis with RCMAS as a Dependent Variable (N= 90)

	Revised Children's Manifest Anxiety Scale (RCMAS)			
Step and Predictor Variable	R^2	Incremental R^2	β	SEB
Step 1	0.023	0.023		
Age			0.018	0.875
Sex			-0.174	2.404
Step 2	0.025	0.002		
Lie scale			-0.051	0.443
Step 3	0.040	0.015		
Problem-focused coping, situation 1			0.004	0.099
Problem-focused coping, situation 2			-0.212	0.114
Problem-focused coping, situation 3			0.133	0.100

* The numbers in brackets display the results of hierarchical multiple regression analysis when the scores on the Lie scale were not controlled for.

Note: Situation 1=Decreased parental availability; Situation 2 = Disruption to daily routines; Situation 3 = Worries about the chronically ill sibling.

Table 14

Frequency Results for Secondary Appraisal Questions Across the Three Coping Situations

Secondary Appraisal Items	**Situation 1** Decreased parental availability		**Situation 2** Disruptions in daily life and routines		**Situation 3** Worries about the chronically ill sibling	
	n	%	n	%	n	%
Change						
Yes	31	33.0	32	30.5	53	49.5
No	63	67.0	73	69.5	54	49.5
Accept						
Yes	82	87.2	91	86.7	90	84.1
No	12	12.8	14	13.3	17	15.9
Know more						
Yes	65	69.1	67	63.8	74	69.2
No	29	30.9	38	36.2	33	30.8
Hold oneself						
Yes	45	47.9	54	51.4	42	39.3
No	49	52.1	51	48.6	65	60.7

Note: Change = In general, is this situation one that you could change or do something about?
Accept = In general, is this situation one that must be accepted or gotten used to?
Know more = In general, is this situation one in which you needed to know more before you could act?
Hold oneself = In general, is this situation one in which you had to hold yourself from doing what you wanted to do?

Table 15

Means and Standard Deviations for Problem-focused and Emotion-focused Strategies for Secondary Appraisal Items Across the Three Coping Situations

		Problem-Focused Coping		Emotion-Focused Coping	
		M	SD	M	SD
Situation 1	Change				
	Yes	42.6	14.9	57.4	14.9
	No	44.8	18.0	55.2	18.0
	Accept				
	Yes	42.7	16.9	57.3	16.9
	No	53.0	15.1	47.0	15.1
	Know more				
	Yes	43.4	15.3	56.6	15.3
	No	45.5	20.6	54.5	20.6
	Hold oneself				
	Yes	46.5	15.5	53.5	15.5
	No	41.7	18.2	58.3	18.2
Situation 2	Change				
	Yes	47.7	16.6	52.3	16.6
	No	41.5	20.7	58.5	20.7
	Accept				
	Yes	42.5	20.0	57.5	20.0
	No	49.3	16.6	50.7	16.6
	Know more				
	Yes	43.3	18.9	56.7	18.9
	No	43.6	21.2	56.4	21.2
	Hold oneself				
	Yes	44.5	16.9	55.5	16.9
	No	42.2	22.3	57.8	22.3
Situation 3	Change				
	Yes	45.5	17.2	54.5	17.2
	No	46.6	23.6	53.4	23.6
	Accept				
	Yes	44.0	20.9	56.0	20.9
	No	56.5	15.5	43.5	15.5
	Know more				
	Yes	44.4	18.7	55.6	18.7
	No	49.8	24.2	50.2	24.2
	Hold oneself				
	Yes	48.3	20.9	51.7	20.9
	No	44.5	20.4	55.5	20.4

Note: Because scores for problem-focused and emotion-focused represent percentages of the total number of strategies, the SD scores are identical for problem- and emotion-focused coping.

Table 16

Means and Standard Deviations for Problem-focused and Emotion-focused Coping Strategies for Boys and Girls Across All Three Coping Situations

	Problem-Focused Coping		Emotion-Focused Coping	
	M	SD	M	SD
Situation 1				
boys	47.03	16.2	53.97	16.2
girls	41.2	17.5	58.8	17.5
Situation 2				
Boys	46.5	18.8	53.5	18.8
Girls	40.2	20.2	59.8	20.2
Situation 3				
Boys	48.2	18.7	51.8	18.7
Girls	43.8	22.3	56.2	22.3

Note: Situation 1=Decreased parental availability; Situation 2 = Disruption in daily life and routines; Situation 3 = Worries about the chronically ill sibling.

Because scores for problem-focused and emotion-focused represent percentages of the total number of strategies, the SD scores are identical for problem- and emotion-focused coping.

DISCUSSION

Interpretation of Findings

Coping Strategies Employed by Siblings

The first research question addressed the type of coping strategies siblings of chronically ill children utilize when dealing with decreased parental availability, disruptions to daily routines and worries about the chronically ill brother or sister. The present study's finding that cognitive restructuring and wishful thinking were the most frequently used coping strategies across all three situations is similar to the results of other studies which reported on children who cope with uncontrollable situations (Bull & Drotar, 1991; Compas et al., 1996; O'Brien et al., 1995, 1997). Interestingly, research has shown that these two strategies relate differently to psychological adjustment. Whereas cognitive restructuring has been consistently associated with better adjustment, wishful thinking has been related to greater symptomatology (Compas et al., 1999). It can be argued, however, that the co-occurrence of cognitive restructuring and wishful thinking is understandable because both strategies involve a mental effort to shift thought away from the most unpleasant aspects of a stressful situation. Thus, though different in their effects, these two strategies may be somewhat similar in their dynamics.

The finding that social support is used less in dealing with worries than in dealing with decreased parental availability and disruption to routines is also consistent with the results of other research, which indicates that although siblings worry a great deal, they do not talk very much about their worries (Evans et al., 1992; Faux, 1991; Stallard et. al., 1997; Williams et al., 1997). The fact that social support is employed most when dealing with decreased parental availability makes some sense intuitively because, of the three situations examined, this is the one most directly connected to social support. Parents are a central source of comfort and encouragement, so it is not surprising that their reduced availability often produces a need to actively seek out support.

The finding that a comparatively high percentage of siblings never use resignation tends to support the view that rather than being passive in the face of stressful situations, children in the age range covered by this study actively attempt to deal with difficult circumstances. Moreover, the fact that siblings employ a wide array of strategies suggests a degree of resourcefulness that should not be overlooked.

Emotion-Focused and Problem-Focused Coping

Several of this study's hypotheses and research questions are related to the distinction between emotion-focused and problem-focused coping strategies. This distinction has been an accepted feature of coping models for some time. However, the results of the study raise some questions about this classificatory scheme, at least with respect to school-aged children.

Three competing hypotheses were generated with respect to the question of whether siblings of chronically ill children cope differently with each of the three situations. The third hypothesis posited that siblings would perceive all three situations as relatively uncontrollable, and therefore would employ emotion-focused strategies more frequently to deal with each of them. The study's findings showed that siblings used more emotion-focused strategies to cope with all three situations; however, it was not true that all situations were seen as uncontrollable. Although siblings perceived very little control over decreased parental availability and disruptions to daily routines, they were evenly split in terms of whether they viewed dealing with worries as a controllable situation.

This lack of linkage between the use of emotion-focused or problem-focused coping on the one hand, and perceived controllability of the situation on the other, was even more evident with respect to secondary appraisal. Previous research has suggested that adults and children are more likely to use emotion-focused strategies when they appraise a situation as uncontrollable and to use problem-focused coping strategies when they appraise a stressful situation as controllable (Altshuler & Ruble, 1989; Bull & Drotar, 1991; Folkman et al., 1986). In contrast, this study found that the use of problem-focused or emotion-focused coping was not related to secondary appraisal of the situation in general, or to perceived controllability of the situation in particular. While deviating from the hypothesis and much of the literature, this finding is consistent with research conducted with children of cancer patients in which coping and control beliefs were found to be unrelated to one another (Compas et al., 1996).

The study's findings also failed to support Hypotheses 2 and 3 that were generated with regard to the fourth research questions on whether siblings' coping strategies are related to their psychological adjustment. These hypotheses predicted that the use of problem-focused coping would be associated with less symptomatology whereas the use of emotion-focused coping would be related to higher distress. In fact, with respect to disruptions to daily routines and worries about the chronically ill sibling, the use of problem-focused coping was related to higher parental reports of externalizing problems, whereas the use of emotion-focused strategies was associated with fewer parental reports of externalizing problems. The correlations between emotion-focused and problem-focused coping and the other adjustment measures were not significant. These results are inconsistent with the majority of studies which indicate an association between problem-focused coping and fewer externalizing problems and between emotion-focused coping and more behavioral problems (Compas, Malcarne, & Fondacaro, 1988; Windle & Windle, 1996). They are, however, in line with the findings of some studies, which found positive correlations between problem-focused coping and more externalizing problems (Hoffman, Levi-Shiff, Sohlberg, & Zarizki, 1991; O'Brien et al., 1995, 1997). Two of these studies involved participants reporting on coping with a situation that is relatively uncontrollable: parental conflict (O'Brien et al., 1995, 1997). In any case, given the cross-sectional design of the present study, interpretations about the direction of the relation between adjustment and emotion-focused or problem-focused coping must be made very cautiously.

What factors might account for the fact that the study's results with respect to emotion-focused and problem-focused coping differ from the research hypotheses and from the results of earlier studies? One potential explanation for the finding that the use of problem-focused coping was related to higher parental reports of externalizing problems may be related to different raters: whereas the healthy sibling may view him/herself as actively attempting a solution, the parent, burden by the care for the chronically ill child, may rate these actions as disruptive.

One key reason for differences in this study's results might be methodological: different studies have used different techniques for classifying strategies as problem-focused or emotion-focused. In Compas et al.'s study (1996) and in the present study, participants were asked to do the categorization themselves based on their intent in the use of each strategy. In Folkman et al.'s (1986) study, however, there was *a priori* classification of coping strategies in the measure used. In two other studies (Altshuler & Ruble, 1989; Bull & Drotar, 1991), researchers themselves classified participants' coping. The results of participant classification in this study lend support to the view that strategies are not exclusively emotion-focused or problem-focused. Individuals may use the same strategy to achieve both emotion- and problem-focused goals, as the literature is increasingly acknowledging (Compas et al., 1996). For example, some participants in this study employed distraction in order to change or do something about a situation (i.e., problem-focused), whereas others used it in an attempt to cope with upset feelings (i.e., emotion-focused). Even a strategy such as problem-solving, which is typically classified by researchers and in several measures as problem-focused, was viewed by many siblings in this study as emotion-focused. Moreover, strategies such as social withdrawal and wishful thinking, which are very often described in the literature as avoidance-type emotion-focused strategies, were classified by quite a few siblings in the current research as problem-focused coping. These findings call into question any approach which relies on *a priori* assumptions about whether particular coping strategies are emotion-focused or problem-focused.

This methodological distinction is connected to differences at the level of conceptualization, which may also contribute to divergent findings. Whereas some researchers have used scales that assess emotion-focused coping narrowly because they understand it as involving primarily negative responses (Compas et al., 1999), in this study emotion-focused coping was treated more neutrally. Given the method of categorization of coping strategies, emotion-focused strategies in this research include responses generally considered less adaptive (e.g., social withdrawal, wishful thinking, self-criticism, and blaming others) and responses considered more adaptive (e.g., emotional regulation, seeking social support and cognitive restructuring). Such variances in conceptualization may be expected to affect the outcome of categorization which, in turn, naturally affect results.

More fundamentally, it might be argued that the conceptual categories themselves are deficient and tend to produce inconsistent interpretations and results. Researchers have begun to suggest that the notions of emotion-focused and problem-focused coping are too broad and thus, do not sufficiently differentiate among the various kinds and functions of coping strategies (Compas et al., 1999; Coyne & Gottlieb, 1996; Last & Grootenhuis, 1998; Sandler et al., 1997). Recent work with adolescents supports a theoretical model of coping which is based on multiple dimensions (as opposed to the simple emotion-focused/problem-focused dichotomy) with specific coping categories that differ according to their functions. Connor et al. (1999) found preliminary support for a model in which stress responses are first characterized as *voluntary coping* or *involuntary responses* which can both be further distinguished on the dimension of *engagement* versus *disengagement*. Voluntary engagement coping is then divided into *primary control coping*, which includes strategies such as problem-solving and emotional regulation, and *secondary control coping* which includes distraction, acceptance and cognitive restructuring. Disengagement coping includes avoidance, denial and wishful thinking. This tentative model needs to be validated with pre-adolescent children, but it does point to the possibility that the distinction between emotion- and problem-focused coping is insufficiently rich and complex, and that this may help account for these unexpected findings.

An additional implication of this study's results for model-building has to do with perceived controllability of situations and coping processes in children. The cognitive appraisal model of coping was developed by Lazarus and his colleagues as a result of extensive work with adults and was tested primarily with adults and adolescents. Pre-adolescent children, unlike adults or adolescents, have very limited control over most aspects of their lives. This may be one reason for the lack of association between controllability of a situation and coping, and may suggest that the concept of perceived control should not carry excessive weight in models related to children's coping. Further research on the relation between perceived control of situations and coping in children is needed in order to determine how the cognitive appraisal model might need to be adapted for application to children.

Finally, with respect to theoretical assumptions, it may be necessary to abandon preconceptions about the inherent superiority of particular types of coping and to recognize that what is critical is the match between the choice of coping strategies, the characteristics of the child, the nature of the stressful situation (e.g., duration, perceived self-harm), and the responses of significant others to the child's coping efforts. This is a proposition that will need to be addressed in future studies. In any event, the lack of correlations between emotion-focused and problem-focused coping and adjustment measures should not be taken to suggest that coping is not related to psychological adjustment in siblings. Instead, the issue is how researchers think about and "organize" the range of available coping strategies for the purposes of examining their relationship with adjustment.

Perceived Effectiveness of Coping Strategies

The third research question inquired about the type of coping strategies siblings of chronically ill children perceived as most effective and whether these strategies varied across situations. This study demonstrated that the strategy siblings perceived as most effective in dealing with decreased parental availability and disruptions to daily routines was social support. In dealing with worries about the chronically ill brother or sister, the only strategy perceived as very effective by a majority of participants was cognitive restructuring. However, social support was the next most helpful strategy in coping with worries. One possible explanation for the difference in perceived effectiveness of social support across situations is related to the nature of the challenge. At times, siblings' chronic illness leads to separation or reduced contact with parents (e.g., hospitalization of the ill sibling, treatment regimens at home). It seems logical that in these situations the presence of other supportive individuals would be particularly important for healthy siblings. However, in dealing with worries, siblings do not specifically experience reduced contact with parents. Although turning to parents to discuss worries might in principle be helpful for siblings, the literature suggests that even though healthy children often worry about their ill brother or sister, they keep their feelings largely to themselves (Evans et al., 1992; Faux, 1991; Stallard et al., 1997; Williams et al., 1997).

The findings regarding the effectiveness of social support are consistent with the literature on adaptation to chronic illness. Several researchers have indicated that parents of chronically ill children considered social support from family, friends, and health professionals as one of the most helpful factors in their own adaptation to their child's illness (Beresford, 1994; Gibson, 1986; Kupst, 1992; Last & Grootenhuis, 1998). There is also evidence to suggest that social support for parents has positive effects on the adjustment of chronically ill children (Hamlett et al., 1992) and on the adjustment of healthy siblings (Daniels et al., 1996, 1997; Ferrari, 1984; Horowitz & Kazak, 1990). Finally, research has shown that the coping strategy of seeking support has positive effects on the psychological well-being of chronically ill adults (Schreurs & DeRidder, 1997) and children (Varni et al., 1992; Varni et al., 1994).

Given that social support was perceived as the most helpful strategy in coping with two of the three situations in this study and as the second most helpful strategy in coping with the third situation, it is important to understand the mechanisms underlying the effectiveness of social support. Several explanations can be provided. First, supportive exchanges may help siblings feel less isolated and maintain a belief that they are part of a caring social environment. Second, younger siblings may lack some of the prerequisites for effective coping. Their more limited cognitive abilities may make it difficult for them to interpret parameters of the situation, such as duration or intensity. For them, parents and other supportive individuals may serve as important coping agents by modeling coping and adjusting the environment and their own responses to fit the child's temperament or level of emotional arousal. Third, parents and others (such as extended family members, neighbors and teachers) can lessen the perceived threat of a situation. For example, parents can reassure siblings that their chronically ill brother or sister is receiving good medical attention and that the chronic illness is not contagious. Fourth, other supportive agents, such as friends, siblings and relatives can provide distraction from the stressful situation (e.g., play).

As stated earlier, cognitive restructuring was perceived as the most effective strategy in dealing with worries about the chronically ill brother or sister. It was also perceived as a very helpful strategy in coping with decreased parental availability and disruptions to daily routines. How does cognitive restructuring help? From unstructured conversations with siblings after the completion of the interview, it appears that this strategy is effective because it allows siblings to feel, as one participant put it, "that things are not too bad". That is, focusing on positive aspects of a stressful situation may lessen the perceived threat of that situation and subsequently reduce one's level of emotional distress. It is interesting to note here that cognitive restructuring has been consistently associated with better adjustment in children and adolescents (Compas et al., 1999).

The results of this study suggest that emotional regulation, distraction and problem-solving are also perceived by siblings as helpful strategies. Interestingly, even wishful thinking and social withdrawal were perceived as very helpful by at least a third of the sample. These findings are of particular importance given previous reports about the relation between social withdrawal, wishful thinking and children's psychological adjustment. In a recent comprehensive review on how children cope with stress, it was noted that these strategies are associated with poorer adjustment (Compas et al., 1999). Social withdrawal and wishful thinking were also associated with greater psychological distress among adults (Lazarus & Folkman, 1984).Why, in this study, was wishful thinking perceived as very helpful by 35%-45% of participants? Again, unstructured conversations with siblings after the completion of the interview help to clarify this question. It appears that by wishing and pretending that things are better, children create an image of the situation as less distressing, fostering the illusion that things are actually not too bad. For these children, wishful thinking is in a way, a form of imagery which is a strategy that some coping skills interventions incorporate.

Social withdrawal was perceived as very effective by siblings for several reasons: it enabled them to remove themselves from the source of stress[3] (e.g., go to their room and occupy themselves with a game when their parents are busy giving an insulin injection to a sibling who objects to the procedure); by not talking about their difficulties[4], they did not have to think about them much, so the situation was experienced as less stressful; and by keeping quiet about the problem, they indirectly helped their parents. As one participant said "My parents have enough to deal with, I do not want them to start worrying about me".

These results highlight the complexity and diversity of coping processes. They also suggest that wishful thinking and social withdrawal have perceived positive merits for some children under certain conditions and should not be automatically considered negative. An important area for future research will be to clarify when social withdrawal and wishful thinking are helpful in decreasing distress and when these strategies are related to poorer adjustment. The results of one study (O'Brien et al., 1997) suggest that social withdrawal accompanied by rumination on negative thoughts was related to higher symptomatology, whereas social withdrawal accompanied by children's assertions of self-confidence in their abilities to calm themselves was not associated with greater psychological distress.

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[3] One of the item on the Kidcope for social withdrawal is "I stayed by myself".

[4] The other item on the Kidcope for social withdrawal is "I kept quiet about the problem".

Using Coping to Predict Psychological Adjustment of Siblings

The results of the multiple regression analyses, conducted to address the fifth research question, revealed that siblings' coping strategies explained a significant proportion of the variance in externalizing and internalizing problems beyond that contributed by siblings' age and gender. However, siblings' coping strategies accounted for a very small proportion of the variance in both the anxiety and the depression variables. These findings suggest that the relationship among child coping and child adjustment differs, depending on the source of information regarding child adjustment and are consistent with previous work (O'Brien et al., 1995, 1997). For example, in O'Brien et al.'s study (1995), child coping variables also did not make a significant contribution to the prediction of scores on the CDI. It is possible that because parents reported more symptoms, siblings' coping strategies are more predictive of externalizing and internalizing behaviour problems than of depressive and anxiety symptoms, that is, the lack of relations or low correlations between siblings' coping and the CDI and the RCMAS may be due to the limited range of scores on these two measures.

There is another possible interpretation for the finding that siblings' coping was not predictive of scores on the child outcome measures. The Children's Depression Inventory and the Revised Children's Manifest Anxiety Scale are more focused toward identifying pathology in siblings. As indicated previously, there were relatively high numbers of socially desirable responses in the current study suggesting that siblings were interested in presenting themselves as well adjusted. Consequently, perhaps few depression and anxiety symptoms were endorsed. Limited variation of scores on these self-report measures may have decreased the potential for demonstrating a relation between coping strategies and depressive and anxiety symptoms in siblings.

Another potential explanation for the fact that siblings' coping strategies were not predictive of their anxiety scores may be related to the specific constellation of items in the Revised Children's Manifest Anxiety Scale (RCMAS) and its theoretical background. According to the manual, the RCMAS was derived from a theory of trait anxiety, which differs from state anxiety, in that trait anxiety "is a more lasting predisposition to experience anxiety in a variety of settings" (p. 29). It is a measure of chronic manifest anxiety, independent of situational anxiety. Siblings of chronically ill children may not experience anxiety in many different settings, but rather feel anxious about certain aspects of family life that are affected by the presence of a chronic illness. Perhaps, if an anxiety measure based on state anxiety were used in this study, siblings' coping strategies would be more predictive of their anxiety scores. With regard to the Children's Depression Inventory, it is known to be fairly ineffective in discriminating between groups within the normal range of functioning (Kovacs, 1980). Therefore, it is difficult to accurately evaluate differences in depressive affect in this population with this particular measure and to relate differences to coping strategies employed by siblings.

Gender Differences in Siblings' Coping Strategies

The current study found no significant differences between boys and girls in the use of problem-focused or emotion-focused coping across all three situations. These results contradict findings obtained from the majority of studies which examined this issue. According to Compas et al. (1999), nine studies have found gender differences favouring girls for problem-focused coping, whereas only two studies have found differences favouring boys. In addition, 19 studies found gender differences favouring girls for emotion-focused coping, but only one study found differences favouring boys.

There are several potential explanations for the discrepancy between the results of this study and the results of other studies. First, as indicated earlier, the majority of studies reviewed by Compas et al. (1999) did not account for the clear tendency of girls to endorse more coping strategies on the self-report coping checklist. When this gender difference in reporting base was taken into consideration in recent studies, results showed a more balanced pattern (Connor et al., 1999). This study accounted for reporting differences by using scores that reflect the proportion of total coping strategies in each subtype of coping (i.e., emotion-focused and problem-focused coping).

Second, this study assessed children from a relatively restricted age group, whereas many studies which examined gender differences in coping included children from a much wider age range. However, grouping children spread across a broad age range in one analysis, without controlling for age, is problematic as it masks potential effects of developmental differences in cognitive abilities on coping. It also makes comparisons across studies much more difficult. It is possible that gender differences in coping are more present in adolescents than in pre-adolescent children. Future research which compares how children of different age groups cope with the same stressful situations will help clarify this issue.

Third, in this research, siblings provided reports on their coping strategies. However, some of the studies reviewed by Compas et al. (1999) collected data on children's coping from other informants, such as parents and teachers. Thus, it is possible that differences in results across studies with respect to gender effects are partly due to the use of different informants.

In addition to examining gender differences with respect to problem-focused and emotion-focused coping, this study assessed gender differences in the use of the 10 Kidcope strategies. Analyses were conducted only with strategies boys and girls reported using 'a lot' and 'almost all the time'. No significant gender differences were observed in coping with disruptions to daily routines or dealing with worries about the chronically ill brother or sister. In dealing with decreased parental availability, on the other hand, significantly more girls than boys endorsed using cognitive restructuring and emotional regulation 'almost all the time'. No significant gender differences were found for the other Kidcope strategies. The results with regard to the use of emotional regulation are consistent with patterns observed in the literature, as the vast majority of studies reported gender differences favouring girls for emotional regulation (Bull & Drotar, 1991; Eisenberg et al., 1996; Lee, Chan, & Yik, 1992; Spirito et al., 1995). The literature on gender differences with regard to the use of cognitive restructuring is not consistent. Some studies report that girls employ significantly more cognitive restructuring than do boys (Ebeta & Moos, 1994; Gamble & McHale, 1989; Phelps & Jarvis, 1994), whereas other studies have found the opposite (Bernzweig, Eisenberg, & Fabes, 1993; Spirito, Stark, Gil, & Tyc, 1995).

The results of this study suggest that gender differences are not consistent across situations. Findings also demonstrate that gender differences in school age siblings of chronically ill children are very small. These results are consistent with recent findings from quantitative analyses of gender effects. When effect sizes were calculated for those studies that provided sufficient data, gender differences were found to be less consistent and effect sizes were quite small (Compas et al., 1999).

The Psychological Adjustment of Siblings

Several aspects of psychological adjustment of siblings were assessed in this study including depressive and anxiety symptoms, as well as internalizing and externalizing behaviour problems. The findings on the standardized measures of adjustment suggested that siblings of chronically ill children are not any more likely to experience psychological problems than are children in the general population. However, the results on the anxiety and depression scales should be regarded with caution given the relatively high number of children in this sample with a social desirability bias (i.e., scaled score equal to or above 13 on the Lie Scale).

One potential explanation for the high number of children with self-report bias involves the desire of these children to be perceived as "normal" or no different than other children who do not have chronically ill siblings (Comber, 1995). Parents may also be invested in presenting themselves, their relationship, and their children as well adjusted and as no different than other families (Gordon-Walker, Manion, Cloutier, & Johnson, 1992). In conversations with parents participating in this study, several expressed concern that siblings' involvement would "put ideas in their heads". They feared that the questionnaires would make siblings focus on difficult aspects of their family life. There was a sense from each of these parents that they knew there were differences between certain aspects of their family life and those of families with no chronically ill children, but they did not want to talk or think about these differences because that might "rock the boat". Similar tendencies were noted by Comber (1995) in the recruitment phase of her study.

Taking into consideration the need to be cautious in interpreting siblings' scores on the child outcome measures, the findings of the current study are in line with previous studies which found that, in general, siblings of chronically ill children do not exhibit clinically significant levels of anxiety and depression (Comber, 1995; Stewart et al., 1992; Treiber et al., 1987). The results of parental reports on the Child Behavior Checklist (CBCL) were also similar to those observed in the literature. As indicated previously, the majority of studies that used the CBCL to assess siblings' adjustment have reported no differences in behaviour problems between siblings and a comparison group or a normative sample (Cowen et al., 1986; Evans et al., 1992; Ferari, 1984; Gallo et al., 1992; Horowitz & Kazak, 1990; Lavigne et al., 1982).

Although the present research provided clear evidence that siblings of children with chronic illness are not uniformly at heightened risk for psychological problems, it also highlighted the difficulties that a brother's or sister's chronic illness can produce. One in every five participants indicated that they need to deal with decreased parental availability and disruptions to daily routines very often, and one in every four reported coping with worries about the ill brother or sister very often. The finding that healthy children tend to worry a great deal about their ill brother or sister is consistent with findings of other research (Evans et al., 1992; Faux, 1991; Gallo et al., 1991; Harder & Bowditch, 1982; Illes, 1979; Menke, 1987: Sargent et al., 1995; Stewart et al., 1992). Notably, a quarter of the sample in this study indicated that dealing with these situations is very upsetting. The clinical implications of these findings will be discussed in the final section of this chapter.

Limitations of the Present Study

The current study addressed several methodological limitations of previous research by having adequate sample size, using several measures to assess siblings' adjustment, relying on multiple data sources, using children from a more restricted age range and using a conceptual coping model to guide the study. However, like any other study, it had several limitations as well. First, there is the issue of the representativeness of the sample and the generalizabilty of findings. There are two sample-related topics which may potentially affect generalizabilty of results. One is the clear dominance of one type of chronic illness, and the other is the socio-economic status of families involved in the research. Although the study sought to assess the coping strategies of siblings of children with several chronic illnesses, the vast majority of participants were siblings of children with diabetes. This imbalance may raise questions about the representativeness of the sample to the general population of siblings of chronically ill children. That is, one might wonder whether similar results would have been obtained if the sample was more evenly distributed on the dimension of type of illness. As indicated earlier, these concerns are, in part, addressed by consistent findings that severity of illness is not related to siblings' psychological adjustment or to the adjustment of chronically ill children, and by the underlying assumptions of the non-categorical approach on which this study is based. According to the non-categorical approach, one is unlikely to observe substantial differences between different groups of siblings. Nevertheless, this is an issue worth exploring in future studies.

With regard to socioeconomic status, results showed that the average annual income of families in this sample was higher than the national average as well as the average for the province of Ontario. Socioeconomic status is a factor that can affect results. One study illustrated that many of the differences observed between children of divorce and children of intact families disappeared when family income level was accounted for (Guidubaldi, Perry, & Cleminshaw, 1984). The issue of socioeconomic diversity is a limitation in many studies. As Compas and his colleagues (1999) have pointed out, the majority of studies on child and adolescent coping have reported on samples that are exclusively or primarily Caucasian and of middle to upper socioeconomic status. However, in families with chronic illness, socioeconomic status is usually lower not higher (Cadman et al., 1991; Gortmaker, Walker, Weitzman, & Sobol, 1990). Socioeconomic status can clearly influence parental stress and ability to adjust to the demands of caring for a chronically ill child. For example, a family with higher income can afford to draw more on caregiving services for respite and support. Parental adjustment has been shown to be related to siblings' adjustment (Daniels et al., 1986; Tew & Lawrence, 1973; Treiber et al., 1987) and as such, it is necessary to be cautious in extrapolating from the results of the present study to siblings of chronically ill children from families with substantially lower socioeconomic status. The lack of data, in general, on the relations between children's coping and socioeconomic status suggests an important area for future research.

This study is also limited by its cross-sectional design. This design presents difficulties in determining the direction of the association between coping and adjustment (Worsham et al., 1997). For example, the findings in many studies that emotion-focused coping is associated with greater emotional distress may be taken to suggest that children employ certain kinds of coping which increase negative emotions. However, these correlations may equally indicate that children who are more distressed respond with greater efforts to alleviate their negative affect (Worsham et al., 1997). Only a prospective design can untangle these relations.

Prospective designs can also address another limitation of cross-sectional designs as they allow for examination of the process of coping over time. Reliance on a cross-sectional design in studying the relation between coping and adjustment is a reasonable first step to shed light on new populations or new types of stressful situations but a prospective design is needed in order to determine how siblings' coping strategies may change over the course of their brothers' or sisters' illness. Furthermore, retrospective reports are subject to errors in recall and need to be corroborated by further research in which siblings' coping strategies are examined using a longitudinal design.

Another possible limitation of this study is the range and nature of the outcome measures employed (i.e., siblings' self report of depression and anxiety symptoms as well as parental reports of siblings' internalizing and externalizing problems). Although these measures are widely used in research, they assess mainly aspects of psychological distress. However, childhood chronic illness could affect other areas of siblings' functioning, including school performance and peer relationships. The range of outcome measures in this study, with siblings' functioning generally within the normal range, may have prevented the possibility of demonstrating relations between coping and other aspects of siblings' psychological functioning. Better understanding of the relation between coping and siblings' adjustment could be obtained if, in the future, researchers use broader-based assessment.

In addition, self-report measures of coping such as the Kidcope may be limited by the willingness of participants to report the use of strategies low in social desirability (e.g. "I yelled, screamed or got mad" or "I blamed someone else for causing the problem") or unsuccessful coping strategies. This limitation can be addressed by obtaining reports on coping from multiple informants.

The inability to assess the inter-rater reliability of the Kidcope interviews is another limitation of this study, particularly given ANOVA results in which group differences were observed for the percentages of strategies defined as problem-focused or emotion-focused coping for situation 1 (i.e., decreased parental availability). If random interviews had been tape-recorded, it would have been easier to examine whether this difference was due to chance or due to differences in interviewers' styles and attributes.

Finally, although an advantage of the Kidcope for this study was its brevity, one has to keep in mind that there is a cost involved in relying on short coping measures. First, a brief checklist prevents other means of examining reliability, such as internal consistency and factor analytic techniques, as well as making it difficult to assess content validity. It also increases the error of measurement (Streiner & Norman, 1989). Second, the Kidcope samples only 10 coping strategies and excludes some that are arguably important, such as seeking out information.

Directions for Further Research

As with most research projects, some questions were answered by the present study but many more were raised. Based on the results of this study and the limitations described above, a number of areas for future research are proposed.

In order to address concerns around generalizability of findings, the relation between coping and adjustment should be further examined with siblings of children with chronic illnesses other than diabetes and siblings from families with lower socioeconomic status. This kind of research will clarify if there are indeed differences in children's coping based on their siblings' chronic illness, as well as if there is a significant relation between coping and socioeconomic status.

Prospective studies are needed to address the limitations of cross-sectional designs. Longitudinal studies on siblings' coping can help identify the direction of relation between coping and adjustment and determine how the process of coping with a sibling's chronic illness changes over time. Healthy siblings' coping could be assessed immediately after diagnosis, six months after diagnosis, a year after, etc. Alternatively, siblings' coping strategies could be examined based on theoretical models regarding the stages of chronic illness, such as Rolland's (1987) model. According to this model, there are three stages, each with a unique set of tasks for the family. The *crisis phase* refers to the time of pre-diagnosis, diagnosis and the initial period of readjustment. Key family tasks at this stage involve understanding and accepting the illness and learning how to manage treatment procedures. The second, *chronic phase,* involves the family learning to cope with daily pressures of living with a chronic conditions while trying to maintain some degree of normal life. The third, *terminal phase,* refers to the pre-terminal stage of an illness and includes dealing with the inevitability of death. The needs of siblings and their coping strategies are likely to vary at each stage. Indeed, one study found that a shorter time since diagnosis was associated with siblings experiencing more frequent thoughts about their ill sibling, more feelings of sadness and more difficulty talking with others about the illness. It was also found that the more recent the diagnosis, the more healthy siblings felt ignored by their parents, imposed upon to do too much in the house, unable to bother their parents with their own worries, and unable to talk with their parents either generally or about school work (Stallard et al., 1997).

The relation between siblings' coping and their psychological adjustment can be further explored by including more diverse outcome measures. For example, future research can examine the association between siblings' coping and their peer relationships, relationships with the chronically ill child or academic functioning.

Our understanding of siblings's coping responses can be enriched by including other informants on siblings' coping, such as parents. Although parents might not be able to report much on their children's use of cognitive strategies, they can be a good source of information for more observable behavioural coping strategies. Obtaining information from parents can also address some of the limitations with self-report measures, such as potential unwillingness of siblings to report the use of strategies low in social desirability. In this context, parents are more likely to report behaviours such as tantrums and aggressive behaviour between siblings.

Future studies can be designed to assess the use coping strategies, their perceived effectiveness and their relation to children's adjustment with different age groups of siblings. This study was conducted with children between the ages of 8-12. However, it is likely that adolescents or preschool siblings will cope differently with decreased parental availability, disruption to daily routines and worries about the chronically ill siblings. Assessing coping strategies with siblings of different ages might provide important insights on the effects of age on coping with stressful situations. It should also allow researchers to determine whether siblings' perceived effectiveness of coping strategies differs based on age. These are questions worth clarifying particularly in the face of research on children coping with frightening media presentations, that indicated that age was related to both the kinds of strategies employed and their perceived effectiveness (Cantor & Wilson, 1988).

Given that children's coping is likely to be influenced by their parents (Gil et al., 1991), it is worth examining how parental coping relates to healthy sibling coping. Future research can evaluate how parental coping with disruptions or with worries about the chronically ill child relates to siblings' coping strategies . Similarly, mental health professionals might benefit from research efforts directed at assessing how parental responses to siblings' coping strategies affect the process of coping, as well as its impact on siblings' psychological adjustment. Gardner (1998) found that parental responses to siblings' attention seeking efforts influence the course of siblings' coping. If a parent offered reassurance and support to the healthy child when he or she complained about decreased parental availability, the child felt better. However, if the parent responded by accusing the healthy child of being selfish, the child used catastrophic thinking ("No one ever cares about me").

Future research can also examine how aspects of family environment (e.g., level of cohesion, expressiveness, organization) affect siblings' coping. Family environment has been found to be associated with siblings' adjustment (Daniels et al., 1987; Horowitz & Kazak, 1990) and with the coping responses of chronically ill children (Kliewer, 1997). Specifically, family cohesion, adaptability and expressiveness, were associated with good psychological adjustment among healthy siblings and chronically ill children, and were related to active coping in chronically ill children. Understanding the impact of the social environment on coping and adjustment is a necessary step toward the design of interventions for siblings and their families.

Psychological research that focuses on the effectiveness of siblings' support groups in reducing levels of distress and enhancing coping is needed as well (Packman, 1999). In addition, the applicability to siblings of recent coping models warrants further research. As indicated earlier in this section, coping models that rely on two broadband categories of coping (emotion-focused and problem-focused coping) have been recently criticized as less effective in understanding children's coping. An example of a conceptual model that can be used in future investigations with siblings is the model proposed by Connor and his colleagues (1999).

When considering coping efforts in siblings, it is also important to learn how siblings' temperaments interact with coping to influence adjustment. Some related questions that can be answered in future research include whether temperament relates to siblings' coping similarly or differently across different age groups, and whether temperament relates to siblings' perceived effectiveness of coping strategies.

Additional research endeavours may include assessing whether siblings cope differently with illness-related and non-illness-related stressors. Finally, researchers can also explore whether siblings' coping mediates or moderates their adjustment. In order to conduct this research, researchers will first need to develop an appropriate measure of perceived stress for children.

Clinical Implications

Healthy siblings are a group that can be easily overlooked by health care workers charged with helping families deal with the chronic illness of a child. The sick child naturally elicits sympathy and concern, and his or her well-being is often a key preoccupation. The parents, as adults, possess resources and articulation skills which help them highlight their dilemmas and needs. The healthy child, on the other hand, may inadvertently be somewhat "forgotten" as more "pressing" issues are attended to.

As the literature review indicated, this tendency has affected research to date, which has paid comparatively limited attention to healthy siblings. One of the objectives of the present study was to help fill in some of the gaps in our understanding of siblings' experiences. The study's results have a number of implications for health care professionals, including psychologists, who try to assist families with chronically ill children. Those professionals should be vigilant lest they themselves slip into the pattern of neglecting the healthy siblings. Like any other human being involved with families that include a chronically ill child, the clinician may unwittingly be inclined to concentrate on the needs of the sick individual and his or her parents. However, it is clear that healthy siblings face serious coping challenges, that they may require encouragement to speak about these challenges, and that the concern and assistance of others are likely to be associated with improved outcomes.

In addition, parents should be informed by clinicians about findings on the experiences and needs of healthy siblings. Parents can be told that a healthy child may be frustrated by decreased parental availability, unsettled by disruptions to routines and distressed about the chronically ill brother's or sister's condition. In addition, because there is sometimes a tendency to under-estimate the complexity of children's internal processes, it may be appropriate to explain to parents that children are capable of employing a wide range of coping strategies.

Parents need to know that when a healthy child has opportunities to discuss feelings, enjoy normal aspects of family life, and receive reassurance and comfort, he or she may experience fewer fears and less isolation. Open familial communication does not so much open a Pandora's box (as some parents seem to fear) as facilitate better adjustment for the healthy child.

Social support for healthy siblings is another critical issue and should therefore be fostered. There are various ways to do this. For instance, clinicians can recommend to parents, teachers, and other caregivers that effective social support networks be consciously developed and maintained for the healthy child. In some instances, this may involve turning to extended family or to friends. Clinicians working in pediatric centres and other institutional environments can also suggest to medical teams that healthy siblings be provided with a forum in which to pose questions and receive medical information about their brother's or sister's chronic illness. Siblings' groups are a means of furnishing both support and medical information, and may be particularly important shortly after a diagnosis of a pediatric chronic illness, when parents can be overwhelmed and less physically and/or emotionally available for siblings. The goals of such groups should include better understanding of the disease, a normalization of feelings of concern, a decrease in participants' sense of isolation and the provision of information on coping strategies (e.g., cognitive restructuring options could be explored with siblings of chronically ill children because this strategy is commonly employed and seen as helpful). Involvement in siblings' groups may yield indirect dividends as well, to the extent that it serves to enhance dialogue at home.

Clinicians involved in the assessment of siblings of chronically ill children should also be cautious in their choice of tools and topics. A high number of siblings appear to under-report symptoms on child self-report measures and as such, it is advisable to add other forms of data collection, such as interviews and the solicitation of information from different sources. Given the importance of social support and coping strategies, it is essential that these topics be explored in an assessment with family members of chronically ill children.

Finally, clinicians engaged in therapeutic interventions with siblings of chronically ill children should avoid premature assumptions about "what works". This does not negate the sorts of broad (and essential) insights outlined above, but it is a warning against overgeneralization. As the study's results indicated, a coping strategy which might be beneficial for one sibling might not work for another and a strategy that might be constructive in one situation might not be perceived as such in different circumstances. We can help children deal better with the challenges of having a sick sibling only if we recognize the complexity, richness and diversity of their coping processes. This, perhaps, is one of the most important lessons to emerge from this study.

Summary

This study was aimed at addressing gaps in the existing literature on siblings of chronically ill children by examining their coping with three situations: decreased parental availability, disruption to daily life and routines, and worries about the ill brother or sister. The study was designed to overcome methodological limitations of previous research in the area and, potentially, to produce results that would be helpful to clinicians, researchers, parents and, needless to say, healthy siblings themselves.

The study met a number of its objectives. In terms of practical, clinically relevant findings, it indicated that healthy siblings employ a wide array of coping strategies and perceive social support and cognitive restructuring as especially effective. This study also highlighted the complexity of the coping process in children and the need to explore the function of a particular strategy before making inferences about its utility or effectiveness. This information may be important for parents and professionals trying to guide and support children who have a chronically ill sibling.

With respect to theory and model-building, the study pointed to problems with the distinction between emotion-focused and problem-focused coping, and to the limited applicability of the notion of secondary appraisal to children in the 8 to 12 age range. These findings suggest that the cognitive appraisal model of coping requires refinement for use with children.

It is important to keep in mind that this study is a preliminary, exploratory attempt to examine how coping strategies employed by siblings of chronically ill children relate to their psychological adjustment. However, the correlational nature of the study leaves open questions with regard to causality. Future research needs to be directed towards clarifying this issue. Other matters requiring further exploration include the relevance of socioeconomic status, and the effects on siblings' coping of other factors, such as stages of chronic illness, parental coping and family environment. It is hoped that the current study has helped prepare the ground for research which moves beyond the level of description to focus on the processes and mechanisms by which coping facilitates adjustment among children facing stressful situations in general and, more specifically, among siblings of chronically ill children.

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Appendices

Appendix A

Summary of Qualitative Studies Examining the Effects of Having a Sibling with a Chronic Illness and Disabilities

Reference	**Sample**	**Measures**	**Results**
Gallo, Breitmayer, Knafl, & Zoeller (1991)	27 siblings (6-15 years): 1. 13 siblings of diabetics. 2. 5 siblings of children with chronic renal failure. 3. 3 siblings of children with juvenile rheumatoid arthritis 4. 6 other illnesses.	siblings: semi-structured interview	42% said they would not reveal to other peers the ill child's condition.. The primary reason: fears that the ill child will be teased by peers. Younger children tended to be more secretive about the sibling's illness than older ones. 41% reported that they worried about the ill child and 20% reported that they felt sorrow and sadness for them. Sibling worried mostly about the potential impact of the chronic disease on the ill child and about peer rejection and teasing. Most siblings did not report any major changes in their daily lives or in peer relationships following diagnosis. Many siblings were involved in performing some tasks for the ill child.
Harder & Bowditch (1982)	19 well siblings from 14 families of children with cystic fibrosis (7-16 years). CF children were younger than the healthy siblings.	siblings: structured interview	**Positive effects identified:** increased closeness among family members, decrease in self-centred attitudes, increased empathy and communication with the ill child, and increased sense of mastery over difficult circumstances. **Negative effects identified:** increased number of chores, parental unavailability due to time spent with the ill child, worries about the ill child and guilt feelings.
Illes (1979)	5 siblings of children with cancer (7-12 years)	siblings: semi-structured interview	Siblings worried a lot about their ill siblings and their own health. **Losses reported**: 1) disruption of interpersonal relationships with the parents, ill siblings, and peers, 2) physical distortion of the ill child, 3) disruptions in family routines due to frequent clinic visits and hospitalizations, and 4) alternations in the environment (e.g., "empty house" and the presence of parent substitutes). **Gains reported:** improvement in siblings' relationships and increased empathy and competency.
Kramer (1984)	11 siblings of children with cancer (6-16 years)	siblings: Healthy Sibling Interview Guide	Primary stressors identified: decreased parental availability, separation from parents, and disruptions to routines due to therapeutic regime. **Positive effects identified:** increased empathy and sensitivity toward the ill child and the parents, increased appreciation of their own good health, learning to make the most of each day, enhanced self-esteem, and increased closeness among family members. **Negative effects identified:** increased rivalry with the sick child, anger, frustration, rejection and guilt, feelings of loneliness, isolation, sadness, confusion and anxiety.

Reference	**Sample**	**Measures**	**Results**
Menke (1987)	72 siblings from 53 families (6-12 years): 20 siblings of cancer patients, 15 siblings of CF patients, 15 siblings of children with congenital heart disease, 12 siblings of children with myelomeningocele & 11 siblings of children with burns.	siblings & parents: structured interview	Most siblings worried about the ill child. Siblings of children with myelomeningocele worried the most and siblings of children with cancer stated that worrying about the ill child was the most difficult aspect of having a sibling with serious illness. Siblings of children with myelomeningocele identified the ill child's limitations as the most difficult aspect. Healthy children and their parents did not agree about the nature of the worries and concerns. 64% did not think that they have changed since the onset of their siblings' illness. Those who thought they had changed (34%) identified positive changes. Parents also stated that, in general, changes observed in healthy children were positive.
Phillips, Bohannon, Gayton, & Friedman (1985)	43 families of children with cystic fibrosis (CF). 1. 33 children with CF. 2. 31 siblings (5-18 years). 3. 29 fathers and 43 mothers.	parents: semi-structured interview (included 62 questions related to potential problem areas)	72% of parents reported minor problems with regard to siblings' behaviour. Problems mentioned most frequently were feeling jealous (17%) and being overprotective of the child with CF (13%). Some parents reported that the healthy siblings had received decreased attention as a result of the child's illness: this was classified as a minor problem for 12% of parents and as a major problem for 11% of parents. When parents were asked whether the siblings ever complained about inattention, 13% reported this to be a major problem, and 20% viewed it as a minor problem. .
Sargent, Sahler, Roghmann, Mulhern, Barbarian, Carpenter, Copeland, Dolgin, & Zeltzer (1995)	254 sibling of children with cancer (4-18 years)	siblings: structured interview	**Positive effects mentioned:** becoming more compassionate and family members becoming closer to each other. **Negative effects mentioned:** increased states of negative feelings such as anger and guilt, decreased parental attention, and increased family separation and disruption. Older siblings were far more likely to report positive effects than were younger siblings and were also more able to give other siblings suggestions about how to cope with the stress of cancer in the family.

Reference	Sample	Measures	Results
Taylor (1980)	25 siblings (7-12 years) of children with asthma, congenital heart disease, cystic fibrosis	siblings & parents: semi-structured interview .	Parental interview: Most parents felt that their healthy child had been affected in some ways. **Frequent negative effects described**: jealousy, increased competition and fighting among siblings, anger, hostility, social withdrawn, attention seeking behaviours, and a decline in school performance. **Positive effects described:** increased nurturing, cooperation, sensitivity and compassion. Siblings' interview: 2/3 of the statements described **negative effects**, (e.g., feelings of isolation, deprivation, inferiority, and inadequate knowledge about some aspects of their siblings' condition) and third revealed **positive effects** (e.g., cooperation, empathy, cognitive mastery, and increased self-esteem. Positive effects were correlated with frequent and complete information given to children about their ill siblings. Healthy siblings who were close in age to the ill child (1-2 years) tended to report fewer positive effects. Severity and duration of illness did not correlate with type of effects (i.e., positive vs. negative).
Williams, Lorenzo, & Borja (1993)	146 siblings of children with cardiac and neurological illnesses (6-18 years)	mothers: structured interview	Both positive and negative changes in healthy siblings' functioning were described. Mothers reported that their caretaking of healthy siblings decreased significantly after onset of chronic illness, that sibling household activities increased and that their social and school activities decreased. Age of siblings and type of illness influenced the degree of change in sibling social activities: adolescents and siblings of children with neurologic conditions experienced greater decreases in social activities.

Appendix B

Summary of Studies Examining the Effects of Having a Sibling with a Chronic Illness and Disabilities

Reference	Sample	Measures	Results
Breslau, Weitzman, & Messenger (1981)	1. 239 siblings (6-18 years) : Cystic fibrosis (49); Cerebral palsy (79); Myelodysplasia (54); Multiple disabilities (57). 2. 1034 children in a comparison group (6-18 years)	mothers: Psychiatric Screening Inventory (PSI); Level of Disability Scale (LDS); Perceived Effects on Sibling Scale.	PSI: Siblings of chronically ill children scored significantly higher on two scales, measuring interpersonal aggression with peers and in school. LDS: Siblings' adjustment was not related to type and severity of disability. Twenty seven percent of younger male siblings were severely impaired psychologically compared to 6% of younger female siblings. Among siblings older than the disabled child, 13% of the male and 23% of the female were found to be seriously impaired.
Breslau (1982)	1. 237 siblings: CF (49); CP (77); Myelodysplasia (54); Multiple disabilities (57). 2. comparison group (n= 248)		Younger male siblings, especially those who were less than 2 years younger than the child with disabilities, had more psychological difficulties than other male siblings. Among female siblings, those older than the disabled child had more psychological difficulties than younger female siblings.
Breslau & Prabucki (1987)	A five-year follow-up 1. 178 sibling of chronically ill children 2. 266 children in a comparison group (11-23 years)	mothers: Psychiatric Screening Inventory (PSI) siblings: National Institute of Mental Health Diagnostic Interview Schedule for Children (DISC).	PSI: Siblings displayed significantly more behavioral problems and emotional distress. Over the five-year interval (1) the rate of severe psychiatric impairment increased slightly only in the siblings' group; (2) only siblings showed increases in depressive symptoms and social isolation. The largest increases in depressive symptoms and social isolation were observed in the youngest subgroup of siblings, those who were 6-9 years old when first assessed. DISC: Siblings of chronically ill children showed significantly more depressive symptoms and oppositional acts than the comparison group, although the rates of major depression was similar in the two groups

Reference	**Sample**	**Measures**	**Results**
Cadman, **Boyle** **&** **Offord** **(1988)**	A survey: the Ontario Child Health Study - 1869 families with 3294 children (4-16 year old)	mother, child with illness, sibling, teacher (reported for children 4-11 years): Survey Diagnostic Instrument (SDI)	Siblings of children with chronic illness had a twofold risk of emotional disorders (anxiety, depression, and obsessive-compulsive disorders) and a 1.6-fold risk of poor peer relationships compared to siblings of well children. Siblings of chronically ill children were not found to be at increased risk of conduct disorders, somatization, attention deficit hyperactivity, social isolation, or low competence in activities and school. No group differences were found between siblings of children with chronic illness and disabilities and siblings of children with chronic illness but no associated disabilities.
Cairns, Clark, **Smith, &** **Lansky** **(1979)**	1. 71 children with cancer 2. Sibling of children with cancer from 71 families (6-16 years)	patients & siblings: The Piers-Harris Children's Self-Concept Scale (CSCS); The Bene-Anthony Family Relations Test (FRT); Thematic Apperception Test (TAT)- not all participants completed the three measures.	CSCS: No significant differences were found between siblings and patients and both had scores within the normal range. FRT: Boys in the patient group and female siblings did not feel that other family members had good feelings towards them. However, overall, siblings' responses were very similar to healthy children seen at the researchers institute for routine pediatric care. TAT: Older siblings showed the greatest concern about failure. In general, siblings experienced significant anxiety, fear for their own health, and social isolation from other family members and from peers.
Comber **(1995)**	81 families with one diabetic child and one healthy sibling both between the ages of 10-19	parents: Child Behavior Checklist Healthy and diabetic siblings: Sibling Inventory of differential experience (SIDE); Negative Feelings Index (NFI); Household Responsibilities Inventory (HRI); Outcome measures: Revised Children's Manifest Anxiety Scale (RCMAS); State-Trait Anger Expression Inventory (STAXI); Self-Perception Profile for Children.	SIDE & HRI: Healthy siblings perceived considerable discrepancies between their family experience and that of their diabetic siblings. Healthy siblings believed that they were given less affection and more discipline and control from parents. Diabetic children's reports supported this differential parental behaviour. Healthy siblings also reported that they had more household responsibilities and that they were more supportive of the diabetic siblings than the diabetic siblings were for them. perceptions of differences in maternal behavior toward each of the siblings were associated with variations in trait anxiety, anger, and self-esteem in the healthy siblings. Healthy siblings who perceived that they did more caretaking for their diabetic sibling also reported experiencing more anxiety. Outcome measures: no significant differences were observed between healthy siblings and a normative sample.

Reference	Sample	Measures	Results
Cowen, Mok, Corey, MacMillan, Simmons & Levison (1986)	1. 299 children with cystic fibrosis (CF) (2 years and older) 2. Parents 3. 238 siblings (2-19 years).	each family member older than 7 years: Family Assessment Measure (FAM) both parents: Family Adaptability & Cohesiveness Evaluation Scale (FACES II); Problem Inventory (PI); Preschool Behaviour Questionnaire (PBQ); Child Behavior Checklist (CBCL) children: Piers-Harris Self-Concept Scale (PHSC); Teenage Self-Concept Scale (TSCS); Cornell Medical Index (CMI)-only by patients older than 15.	FAM & FACES II: within the normal range but parents of older patients described increases in family dysfunction. PBQ: Mean PBQ scores for children with CF and their siblings were significantly higher than the norm means. Elevated siblings' scores were correlated with the amount of patient hospitalizations only for the preschoolers. CBCL: Significantly more somatic complains were reported for children with CF and siblings in all age groups. Children with CF, but not siblings, had significantly more behavioral problems. PHSC & TSCS: no significant differences between siblings of SF children and normative sample. Severity of illness was not related to psychological functioning.
Daniels, Miller, Billings & Moos (1986)	1. 72 siblings of children with rheumatic disease (RD). 2. 60 siblings of healthy children (both groups were 2-19 years).	mothers: Health and Daily Living Form (HDL); Family Effects of Illness Questionnaire; Family Environment Scale; Child-Health Assessment Questionnaire. Siblings: Health and Daily Living Form (HDL);	HDL maternal and siblings' reports: No significant group differences. However, siblings of children with RD reported having significantly more allergies and asthma than RD children, and more asthma than siblings of healthy children. Siblings' functioning was significantly associated with the RD patient adjustment, maternal physical health, and the family environment (i.e., family cohesion, expressiveness and congruence). Severity of illness and extent of disability did not predict siblings' functioning.
Evans, Stevens, Cashway & Houghton (1992)	16 siblings of children with cancer (6-15 years)	parents: Child Behavior Checklist (CBCL). parents and siblings: Semi-structured interview; "Illness Knowledge" questionnaire (IKQ).	CBCL: siblings' mean scores on the Behavior Problem Scale and the Social Competence Scale were within the normal range. IKQ: There was a high level of congruity between siblings' knowledge and parental perception of siblings' knowledge. The level of siblings' knowledge about cancer was related to the level of siblings' social competence but not to the prevalence of behavioral problems. Interview: Siblings thought a lot about the illness and these thoughts caused sad or very sad feelings. Only 25% of the siblings could talk to parents about the illness and their feelings regarding it. 44% reported that they could not talk to parents. Some siblings were able to talk to other family members about their feelings and some talk to their friends. However, a third of all siblings did not talk to anyone about their concerns. 75% of siblings said they would like to know more about the illness. The things they most likely wanted to know about were: facts about the illness, prognosis, and how to handle questions from outsiders about the illness. Most siblings wanted their parents to provide them with this knowledge. Both positive and negative effects were identified by siblings and parents.

Reference	**Sample**	**Measures**	**Results**
Faux **(1991)**	**1.** 22 siblings and mothers of children with craniofacial anomalies. **2.** 22 siblings and mothers of children with cardiac anomalies. **3.** 25 siblings and mothers in a comparison group.	mothers: Siblings Inventory of Behaviour (SIB)- assess maternal perception of siblings' relationships. mothers and siblings: semi-structured interview.	SIB: siblings of children with cardiac anomalies tended to be more kind, empathic, and accepting of their siblings than siblings in the other two groups. Children in the comparison group were viewed by their mothers as demonstrating more anger, avoidance, and embarrassment concerning their siblings than did siblings in the other two groups. Interview: 75% of the total sample described themselves as having good sibling relationships. However, both siblings and mothers in the illness group described less envy and jealousy between sibling pairs than did the children and mothers in the comparison group. A third of all siblings of chronically ill children described peer teasing related to siblings' impairment and 19% reported being embarrassed for their siblings in public. Among siblings of chronically ill children, communication concerning the impairment was limited. 75% of the siblings admitted they worried sometimes about their brothers/sisters but had never discussed these concerns with their parents or ill siblings.
Feeman **&** **Hagen** **(1990)**	**1.** 24 children with seizure disorder. **2.** 24 siblings of children with seizure disorder. **3.** 24 children in a comparison group.	children: WISC-R (only BD, Voc., DS, Info., and Compr.); Peabody Individual Achievement Test (PIAT); Perceived Self-Competence Scale for Children (SCSC). parents: Conner's Teacher Rating Scale-Revised (CTRS-R); Impact of Chronic Illness on the Family (ICIF); Family Environment Scale (FES); Parental Concerns and Interests.	WISC-R:. Overall, children with seizure disorders scored in the low average range, siblings in the average range, and children in the comparison group in the high average. PIAT: Both siblings and patients scored significantly lower on mathematics and reading comprehension scales than the comparison group. SCSC: No significant differences between siblings and the comparison group. CTRS-R: Siblings had significantly more behavioral problems than the comparison group. ICIF: Responses regarding impact varied widely. Parental assessment of the level of disruption of illness on the family was related to siblings' adjustment. FES: Parents of children in the comparison group reported placing more emphasis on expressiveness, and intellectual and recreational activities and less emphasis on control, while parents of children with seizure disorders placed more emphasis on religion and control.

Reference	Sample	Measures	Results
Ferrari (1984)	1. 30 siblings of male children with pervasive developmental delay and diabetes. 2. 16 siblings of healthy children.	children and parents: Piers-Harris Self-Concept Scale for Children (SCSC). mothers: Child Behavior Checklist (CBCL) both parents: Social Support Questionnaire; Dyadic Adjustment Scale; Interview with parents to assess overall adjustment of siblings. teachers: Modified Coopersmith's Behaviour Rating Form (BFR).	SCSC: No significant group differences on either teachers', parents' or self-ratings. However, on the happiness-satisfaction factor, male siblings of diabetics reported the lowest levels of happiness of all groups. Parents also rated them as the least happy of all groups. CBCL: No significant group differences were found on the overall profiles. However, siblings of diabetics tended to have more behavioral problems than the other groups and were three times more likely to have somatic complains. BRF: Siblings of diabetics were rated as the most prosocial of the three groups. Among siblings of diabetic and disabled children, female siblings were found to be significantly better adjusted than male siblings. In the interview parents of chronically ill and disabled children identified both negative and positive effects for healthy siblings. Age at diagnosis of the ill child, the amount of time that elapsed since diagnosis, maternal rating of social support, and dyadic adjustment were all related to the adjustment of sibling of chronically ill and disabled children.
Fielding, Moore, Dewey, Ashley, McKendrick & Pinkerton (1985)	1. 32 children with renal failure (5-20 years) 2. Siblings 3. Parents	teachers: Child Behaviour Scale (CBS) children: Eysneck Personality Questionnaire (EPQ); Family Relations Test-modified.	CBS: no significant differences on school performance were found between CI children, their siblings and a normative sample. Severity of condition was not associated with adjustment among the ill children, the siblings, and the parents.
Gallo, Breitmayer, Knafl & Zoeller (1992)	28 siblings of chronically ill children (6-16 years): diabetes (14); chronic renal failure (4); juvenile rheumatoid arthritis (3); other illnesses (7).	parents: Child Behavior Checklist (CBCL)- completed twice a year apart from each other; Functional Status - measures the ill child ability to perform day-to-day activities.	CBCL: There were no significant differences between siblings and a normative sample on the behavioral scale. However, there was greater deficits in social competence in the activities as rated by fathers and in social relationships as rated by both parents. Siblings younger than the ill child tended to display more behavioral problems than siblings older than the ill child. Siblings' adjustment was not related to the ill child's functional status.

Reference	**Sample**	**Measures**	**Results**
Gayton, **Friedman,** **Tavormina** **&** **Tucker (1977)**	43 families of children with cystic fibrosis (CF). 1. 33 children with CF. 2. 31 siblings (5-18 years). 3. 29 fathers and 43 mothers.	parents, patients, and siblings: Semi-structured interview. parents: Family-Concept Q Sort (FCQS); Minnesota Multiphasic Personality Inventory (MMPI). children: Piers-Harris Self-Concept Scale (SCS); Missouri Children's Picture Series-nonverbal test of personality (MCPS); Holtzman Inkblot Test (HIT); Tennessee Self-Concept Scale: Rotter's Locus of Control (14 and older); MMPI (14 and older).	Children's measures: no significant differences were found between children with CF and their siblings on any of the measures. Both groups were well within the normal limits of functioning. FCQS: the impact of chronic illness on the family was perceived similarly by parents. Both described decreased family satisfaction and adjustment. .
Hoare **(1984)**	1. 29 children with chronic epilepsy and their 23 siblings. 2. 29 children with newly diagnosed epilepsy and their 23 siblings 3. 23 children in the comparison group	teachers: The Rutter Teachers' Scale (RTS). parents: Rutter Parents' Scale (RPS); General Health Questionnaire (GHQ);	RTS & RPS: School age siblings of children with chronic epilepsy were significantly more disturbed than siblings of children with newly diagnosed epilepsy and children in the comparison group. Siblings of children with newly diagnosed epilepsy did not differ from the comparison group. There were no significant differences between parents of the two groups of epileptic children and normative sample.
Horwitz **&** **Kazak** **(1990)**	1. 25 siblings of children with cancer. 2. 25 children in the comparison group (3-5 years).	mothers: CBCL; Parents' Report of Prosocial Behaviour (PRPB); Global Alike-Different Scale and Sibling Attributes Scale (SAS); Family Adaptability and Cohesion Scales-Version II (FACES-II). children: The Pictorial Scale of Perceived Competence and Social Acceptance for young children (PSPC); Different-Same Game.	CBCL & PSPC: No significant group differences. PRPB: No significant group differences in total prosocial behaviour but siblings had significantly higher scores on five items: helping, giving gifts, praising, sharing, and showing affection. FACES-II: More families of children with cancer obtained either very high or very low Adaptability scores. The groups did not differ significantly in total Cohesion scores. Higher scores on cohesion and adaptability were associated with fewer reported behaviour problems. SAS: Mothers of children with cancer were more likely to describe siblings as similar.

Reference	Sample	Measures	Results
Lavigne **&** **Ryan** **(1979)**	1. 203 siblings of children with chronic condition (3-13 years): paediatric plastic surgery patients (37); cardiology (57); haematology (62). 2. 46 siblings of healthy children.	parents: Louisville Behaviour Checklist (LBCL); Family Information Form (e.g., parental education, marital status, etc.)	Siblings of chronically ill children were significantly more socially withdrawn and irritable than were children in the comparison group. Siblings of patients with visible handicaps (i.e. plastic surgery) were significantly more withdrawn and more irritable than siblings of children with invisible illness (cardiological and haematological illnesses). The two groups of siblings of children with invisible illness did not differ from one another. No group differences were noted on measures of aggression and learning problems. Younger siblings (ages 3-6) of plastic surgery patients showed the highest levels of psychopathology. Among children who were 7-13 years of age, male siblings of haematology patients were more likely to display behaviour problems than female siblings of haematology patients. There was significant age X gender interaction on scales of social withdrawn, inhibition, immaturity, and irritability: younger girls showed higher levels of adjustment problems than younger boys but older girls showed slightly fewer adjustment problems than older male siblings. Severity of illness did not correspond to the degree of problems noted among siblings.
Lavigne, **Traisman,** **Marr,** **&** **Chasnoff** **(1982)**	1. 41 diabetic children (juvenile-onset insulin-dependent) 2. 41 siblings of diabetics 3. 35 children in a comparison group 4. 35 healthy siblings of children in the comparison group (all were between 6-16 years of age)	parents: Child Behavior Checklist (CBCL);)Locke-Wallance Marital Adjustment Inventory; Family Information Form.	In the 6-11 age group: Externalizing symptoms decreased for male siblings of diabetics with length of illness. Among female siblings of diabetics the correlation between internalizing and externalizing problems and length of illness were not significant. Both female and male siblings of diabetics did not differ from children in the comparison group on behavioral problems and social competence. In the 12-16 age group: Male diabetics and their male siblings had poorer school performance than children in the comparison group. Severity of illness was unrelated to adjustment in both the patient group and their siblings.
Lobato, **Barbour, Hall** **&** **Miller (1987)**	1. 24 children (3-7 years) who had siblings with a significant handicapping condition (e.g., spina bifida, cerebral palsy, Down's syndrome, profound hearing loss, blindness, etc.) 2. 22 children in a comparison group (3-7 years).	children: The Standard-binet Intelligence Scale: The Pictorial Scale of Perceived Competence and Social Acceptance': Family Role Play Assessment; Empathy/ Interpersonal Awareness. mothers: Child Behavior Checklist (CBCL); Home Routines Questionnaire.	Children's measures: Sibling of children with disabilities did not differ from children in the comparison group on measures of perceived self-competence and acceptance, empathy, verbalized affect towards parents or siblings, and understanding of disability terms. CBCL: Male siblings of handicapped children were perceived as displaying significantly more depressive symptoms and behaviour problems than either female siblings or children in the comparison group. Sisters of handicapped children were perceived as being more aggressive than sisters of normally developing children. Female siblings of handicapped children had significantly more child-care responsibilities than male siblings of handicapped children.

Reference	Sample	Measures	Results
Noll, Yosua, Vannatta, Kalinyak, Bukowski, & Davies (1995)	1. 37 siblings of children with sickle cell anaemia 2. 37 children in a comparison group (8-18 years)	teachers, siblings, peers: Revised Class Play (RCP). siblings, peers: Three Best Friends; Liking Rating Scale - all three were measures of social competence and peer relationships.	No significant differences were observed between the groups on any of the measures.
Stallard, Mastroyanno-poulou, Lewis, & Lenton (1997)	52 siblings of children with life-threatening conditions (5-19 years)	siblings: Semi-structured interview which included the administration of The Sibling Perception Questionnaire, and the Sibling Questionnaire. Parents: The Rutter Child Scale A	Rutter A: Overall rate of possible psychological problems was almost twice that reported in community surveys. Semi-structured interview: 77% of siblings were thinking of their brother's or sister's illness daily and the dominant feeling they experienced was sadness (75%). Almost half talked with no one about the their brother's or sister's illness. Boys and younger children were less able to talk about their siblings' illness with their parents or anyone else. 76% of participants wanted to know more about their siblings illness, with 49% wanted this information to come from their parents.
Stewart, Stein, Forrest, Clark (1992)	1. 10 siblings of children with chronic life-threatening illnesses: muscular dystrophy (5); cystic fibrosis (1); pulmonary atresia (1); San Fillipo Syndrome (1); non-ketotic hyperglycaemia (1); severe brain damage (1). 2. 10 children in a comparison group (6-17 years)	parents: Ruter A2 Questionnaire. siblings: Piers-Harris Self-Concept Scale (SCS); Spielberger Anxiety Rating Scale (SARS); Birleson Depressive Rating Scale (BDRS); Bene-Anthony Family Relation Test (FRT); Semi-structured interview with siblings of chronically ill children.	Siblings' outcome measures and Rutter A2: No significant group differences were found. FRT: Siblings of chronically ill children expressed more negative emotions than positive emotions. The reverse pattern occurred in the comparison group. SAS: Mothers of chronically ill children were less involved in social activities and fathers of chronically ill children had less involvement with their extended families compared with the comparison group. Semi-structured interview: Siblings described both negative and positive effects.
Switzer (1984)	70 siblings of children with diabetes (4-21 years)	parents: Missouri Children's Behavior Checklist (MCBCL); Family Functioning Index (FFI); Langer Screening Inventory (LSI); Stien Impact on Sibling Scale (SISS). Sibling: Piers-Harris Children's Self-Concept (PHCSC).	PHCSC: Siblings had significantly higher levels of self esteem than a normative sample. MCBCL: no significant differences were observed between siblings and the normative group. Higher levels of psychological adjustment were not related to longer duration of diabetes. Maternal and physical mental health , and maternal perceptions of the impact of diabetes were correlated with siblings' adjustment. Severity of Diabetes was not related to sibling's self-esteem or paternal reports on the MCBCL. However, maternal reports on the MCBCL indicated that mothers reporting high levels of sibling psychological adjustment have diabetic children in good diabetic control.

Reference	Sample	Measures	Results
Tew **&** **Laurence (1973)**	**1.** 59 children with spina bifida (SB) **2.** 44 siblings of children with SB **3.** 59 matched comparison **4.** 63 siblings of children in the comparison group	teachers: Bristol Social Adjustment Guide (BSAG). mothers: Malaise Inventory (based on the Cornell Medical Index); Child Behaviour Checklist (CBCL)	BSAG: Siblings of children with spina bifida were almost 4 times more likely to show evidence of maladjustment than the siblings of children in the comparison group. No significant differences were found on measures of emotional adjustment between siblings of spina bifida children who lived at home and siblings of spina bifida children who were in a residential school. No relationship was found between severity of handicap and maladjustment in the siblings. Healthy siblings' adjustment was associated with mothers' mental and physical health.
Treiber, Mabe **&** **Wilson (1987)**	**1.** 13 children with sickle-cell anaemia (SCA) **2.** 13 well siblings (both groups were 8-17 years)	parents: Spielberger State Anxiety Inventory (SAI); Beck Depression Inventory (BDI); children and parents: Children's Depression Inventory (CDI); Impact of Event Scale (IOES); SNAP (assesses four areas of children's behaviour: motor activity, impulsivity, inattention, and negative peer interaction).	CDI: No significant differences were found between children with SCA, their siblings, and normative sample, although the mean for healthy siblings were above the national mean. Healthy siblings, when compared with SCA children, were found to experience greater emotional problems and behavioral difficulties. Psychological distress among healthy children was associated with their SCA siblings' own level of distress and with their mothers' reported levels of depression and anxiety.
Tritt **&** **Esses (1988)**	**1.** 27 siblings of chronically ill children: diabetes (11); juvenile rheumatoid arthritis (JRA) (10); gastrointestinal disorders (GID) (6). **2.** 27 siblings of healthy children.	parents: Behaviour Problem Checklist (BPC) children: The Self-Appraisal Inventory (SAI); What I Think and Feel Questionnaire (WITF); Semi-structured interview- only with siblings of chronically ill children.	BPC: Siblings of chronically ill children were perceived as experiencing significantly more behavioral adjustment problems than siblings of healthy children. SAI and WITF: No significant differences on self-concept were found between the two groups. Interview: Many siblings felt that they had more chores and responsibilities as a result of the illness and resented that. Many healthy siblings reported feeling abandoned and distress. Family members identified by well siblings as the most unhappy because of the chronic illness were: healthy siblings (33%), mothers (22%), fathers (22%), other or combination (23%). Some of the older siblings identified positive effects, such as increased patience, understanding, sensitivity and awareness about how to deal with someone who is sick.

Reference	Sample	Measures	Results
Vance, Fazan, Satterwhite & Pless (1980)	1. 79 siblings of 36 children with Nephrotic disease (ND) 2. 79 healthy children in a comparison group	parents: Structured interview; Behaviour Rating Questionnaire (BRQ). teachers: Questions regarding the child's achievement, ability, and behaviour using a Likert-type scales. children: Self- Observation Scales (SOS)	Interview: Siblings of children with NS were reported to have poorer school performance, and more emotional problems than were children in the comparison group. Teachers' ratings also confirmed significant group differences in school performance. There was a higher proportion of siblings of children with ND underachieving (20.7% vs. 9.4% in the comparison group). However, there was also a difference in favour of overachieving in the group of siblings of children with ND (9.4% vs. 0 in the comparison group). Behaviour ratings completed by parents and teachers: No significant group differences. SOS: siblings of children with ND were found to have significantly lower scores on self-security and social confidence scales when compared with the comparison group.
Wood, Boyle, Watkins, Nogueira, Zimand & Carroll (1988)	1. 41 siblings (6-17 years) of children with Crohn's disease (CD) 2. 24 siblings (6-17 years) of children with ulcerative colitis (UC)	parents: Child Behavior Checklist (CBCL)	Siblings of children with CD had significantly more psychological problems compared to a normative sample and sibling of children with UC. Siblings of the sickest UC patients had lower behavioral problem scores than siblings of the healthiest CD patients. Siblings of children with UC did not differ from the norm. As a group, siblings of the sickest CD patients displayed more internalizing symptoms, whereas siblings of the healthiest CD patients displayed more externalizing behaviours. In contrast, an increased rate of externalizing behaviours were observed in siblings of UC patients, regardless of whether their siblings were in the sickest or healthiest groups. Acute activity of disease does not appear to affect the level of psychological functioning of siblings.

Appendix C
Information Sheet and Parent Consent Form

COPING EFFORTS AND SOURCES OF SUPPORT IN BROTHERS AND SISTERS OF CHILDREN WITH CHRONIC ILLNESS

Dear Parent,

This study is being conducted by Dr. John Goodman, School of Psychology and School of Medicine, University of Ottawa, and Zohar Streiner, a doctoral student in clinical psychology at the University of Ottawa, in conjunction with the (Diabetes Clinic at the)[5] Children's Hospital of Eastern Ontario. Its goal is to improve understanding of what children do to deal with the effects of a brother's or sister's illness. We are also interested in siblings' reports regarding social support from several kinds of people in their life. (We are approaching all the families from the Diabetes Clinic who meet the study's criteria and inviting them to take part in the study. The criteria for participation in the study appear on the second page of the attached Information Brochure).

Most of the studies on brothers and sisters of chronically ill children have focussed on the question: are these children more likely than siblings of healthy children to suffer psychological and social problems? The results of these studies have been contradictory, with some finding that siblings of chronically ill children have more psychological problems than siblings of healthy children, and others reporting no differences. As a result, a number of researchers have started examining factors that differentiate between poorly and well-adjusted siblings. Although these studies have increased our understanding of what facilitates siblings' adjustment, there are still some significant gaps in our knowledge.

Two potentially important factors which have received little attention to date are siblings' coping strategies and siblings' sources of support. Your child's participation in this study will contribute to a better understanding of the impact of these factors. This information will be beneficial to parents and health professionals seeking to meet the needs of healthy siblings, in part because coping strategies and sources of support are both areas where change for the better is possible.

There are no known risks from participation in the study. However, if after talking to your child, we have any concerns about him or her, you will be contacted and these concerns will be raised with you.

Participation in the study will require you to complete two parental questionnaires and will involve one meeting between the researcher and your healthy child at your home or, if you prefer, at the Children's Hospital of Eastern Ontario, at a time convenient to you and your child. The interviewer will ask your child some questions and help him or her complete several questionnaires. The visit will take approximately an hour to an hour and a half.

---

[5] The sentences which appear in brackets in the first paragraph and the signature of Dr. Lawson on the next page were only added to consent forms sent to families from the Diabetes Clinic.

All information we receive from you and your child is confidential. Only the researchers involved in this study will be permitted to access information that you and your child provide, and the questionnaires that you both complete will be identified only by a number code. Your identity will not be revealed without your written consent. However, there are three exceptions for which the law says we must share information with others, even if you do not agree. The exceptions are: (1) if your child tell us that he or she is in danger of harming him/herself or somebody else; (2) if your child tell us about any possible child abuse; (3) if there is ever a court case and a judge asks for our records.

Your participation in the project is very important. However, you are free to withdraw from the study at any time. Your participation is not in any way related to the treatment your child receives at CHEO and no treatment will be altered or withheld if you decide not to participate in this study or to withdraw at any point. Furthermore, your participation in this study will not affect any future treatment that your family receives.

You will be given $10 if there have been expenses through your participation in this study (e.g., parking expenses at CHEO).

If your healthy child is between 8 and 12 and you decide to participate in this research, please sign both copies of the attached consent form. You should keep one copy and return the other copy to the researcher. The two parental questionnaires will be handed to you at the time of your child's interview. Completing these questionnaires takes about 25 minutes. If you wish, the results of the study will be sent to you when they become available.

If you have any questions concerning this research you can contact Ms. Zohar Streiner at 722-6662 or Dr. John T. Goodman at 238-2144. You may also contact the Chair of the Research Ethics Committee for information regarding patient's rights in research studies at 738-3272; however, this person cannot provide any medical information with regard to this study.

Thank you very much for helping us learn more about how children cope with some of the challenges of a brother's or sister's chronic illness. Your participation is greatly appreciated.

Zohar Streiner, M.A.
Doctoral Student
Clinical Psychology
Program,
University of Ottawa
(613) 722-6662.

John T. Goodman, Ph.D., C. Psych.,
Research Supervisor
School of Psychology
School of Medicine
University of Ottawa
(613) 238-2144

Margaret Lawson, M.D., F.R.C.P.(C)
Pediatric Endocrinologist
Director, Diabetes Clinic
CHEO
(613) 737-2411

Declaration of Informed Consent

Name of participant: ____________________________________
(please print your name)

I have read the above information and agree to participate in this research project. I have been informed as follows:

(1) All information will remain completely confidential and will not be released to my child's health care professionals.

(2) My participation in this study involves completing two questionnaires, which should take about 25 minutes. My child's participation will involve an interview in which several questionnaires will be completed, and will take about an hour to an hour and a half.

(3) My child's participation in this study is voluntary and we both may withdraw from the study at any time and for any reason without consequences.

(4) My participation in this study will not affect my child's current or future medical/health treatments in any way.

I have discussed this study with my child, __________________________, and believe that s/he is participating voluntarily. (please print your child's name)

Name: ____________________ Date: __________________

Witness: ____________________ Date: __________________
(please print name)

Witness' relationship to child: ______________________

If you are interested in receiving the results of the study, please print your name and address clearly below:

Name: ____

Address: ____

____

____

Appendix D
Information Sheet and Child Assent Form

Dear Participant,

Thank you very much for agreeing to take part in this project. Your participation will help us a lot. We are doing this project because we want to understand what children do to deal with having a brother or a sister with a chronic illness. We also want to learn about how people in your life help you.

Our meeting should take about an hour or an hour and a half. I will ask you some questions and give you some sheets to complete. If you do not understand a question, please let me know and I will explain it to you.

You should know that all information you give me will remain private (confidential). I will not talk about it with other people. You are free to stop participating in this project at any time without any consequences for you or anyone in your family.

When we finish the project, we will send you a summary of the results.

Thank you very much for helping us learn more about how children deal with a brother's or a sister's chronic illness.

* * *

I have read and understand this letter and agree to participate in this project.

Name: ______________________________

Date: ______________________________

Assent of Participant: ______________________________

Witness: __________________ **Witness' signature**: __________________
(please print name)

Witness' relationship to child: ______________________

Appendix E
Information Brochure about the Study

Information Brochure

STUDY ON BROTHERS AND SISTERS OF CHRONICALLY ILL CHILDREN

Study approved by the:

Children's Hospital of Eastern Ontario &
The Department of Psychology, University of Ottawa

Reason for the Study

Historically, most studies on brothers and sisters of chronically ill children have focussed on the question: are such children more likely to develop psychological and social problems than siblings of healthy children? These studies have yielded inconsistent results. In other words, some studies have found brothers and sisters of chronically ill children to be at higher risk for emotional and/or behavioural problems than siblings of healthy children, whereas others have not found any differences. As a result, a number of researchers have recently started examining factors which might account for differences in adjustment. However, there is still a significant gap in our understanding of the factors which affect children's adjustment to a brother's or sister's chronic illness.

This study looks at two important factors which have received little attention in research to date: siblings' coping strategies and siblings' social support. It is our hope that by learning more about how healthy siblings cope and what they find helpful, this study will provide information on successful adaptation to the challenges of living with a chronically ill brother or sister.

Goals of the Study

- To determine how brothers and sisters of chronically ill children cope with some of the challenging situations related to a sibling's illness.
- To examine what types of coping healthy siblings use most frequently and what types of coping they see as most helpful.
- To assess the effects of healthy siblings' coping strategies and social support on their psychological adjustment.

Criteria for Participation in the Study

The study will survey siblings of children with the following chronic illnesses: severe persistent asthma, cancer, cystic fibrosis, diabetes, and kidney disease. Families who have the following characteristics are invited to participate:

○ The healthy sibling is between the ages of 8 to 12.
○ A minimum of six months have passed since the diagnosis of a brother's or sister's illness.
○ The chronically ill child is living in the same home as the healthy sibling.
○ The healthy sibling can speak English.

Study's Procedure

Participation in the study will require one parent to complete two questionnaires and will involve one meeting between an interviewer and the healthy child at either the child's home or at the Children's Hospital of Eastern Ontario, at a time convenient to the family. The interviewer will ask the child some questions and help him or her to complete several questionnaires. The visit will take approximately an hour to an hour and a half.

Benefits to Parents

A short summary of the study's results will be sent to all interested parents. We hope that this will give parents useful information which may make it easier for them to help their healthy children deal better with a brother's or sister's chronic illness.

Benefits to Participating Children

The results of the study, explained in a straightforward language, will also be sent to all children who participate in the study. Each family will be invited to contact the researcher if they have further questions after reading the results. We hope that this will help participating children learn about the experiences of other children with a chronically ill brother or sister, and that they will find this helpful.

Benefits for Research

A better understanding of:

○ ways in which children respond to stressors that are ongoing, affect the whole family, and influence a relationship with a significant other.
○ factors that facilitate successful adaptation to living with a chronically ill brother or sister.

Benefits to Health Professionals

The identification of factors that foster adjustment among healthy siblings will contribute to the design of intervention and prevention programs aimed at helping healthy siblings and their parents deal more effectively with some of the challenges of chronic illness situations.

If you would like more information about the study, or if you are interested in participation, please contact:

Ms. Zohar BenDavid-Streiner, M.A.
Doctoral Student
Clinical Psychology Program, University of Ottawa
Tel: (613) 722-6662

Appendix F
Cover Letter to Participating Children

Date: ____________________

Dear (Sibling's first name) ,

I am writing you this letter to tell you about a research project that we are doing at the Children's Hospital of Eastern Ontario with brothers and sisters of children who are seen in several clinics, including the (clinic where the chronically ill brother or sister is seen).

We are doing this project because we want to understand what children do to deal with having a brother or a sister who has a chronic illness. We also want to learn about how people in your life help you. If we know, for example, what ways of coping help children deal better with a brother's or sister's illness, we can suggest these ways to families in which a child has just been diagnosed with a chronic illness.

When we meet, I will ask you some questions, and help you fill 4 sheets. Our meeting should take about an hour or an hour and a half.

You should know that all information you give me will remain private. I will not talk about it with other people.

When we finish the project, we will send you a summary of the results. After you receive the results, you will be able to call me if you have any further questions.

Your participation will help us **A LOT**. I hope that you could take part in this project.

Thank you and all the best,

Zohar BenDavid-Streiner
University of Ottawa
Tel: (613) 722-6662

Appendix G
General Information Questionnaire (Form A)*

Please answer each question as accurately as you can by placing an "X" in the box next to the answer that you selected , by circling the appropriate answer or by entering information in the space provided.

All your answers are strictly confidential.

Thank you very much for your cooperation in this study.

This questionnaire was filled out by : ☐ child's father ☐ child's mother

INFORMATION ABOUT YOUR CHILD WHO PARTICIPATE IN THE STUDY

1. Child's Name: ______________________________

2. Child's Date of Birth : ____/_____/____
day month year

3. Child's Sex : ☐ Male ☐ Female

4. Child's Grade:______________

5. Please list any medical or psychological problems experienced by your child:
____
____
____

6. Please list any services or programs that your child is receiving or involved in other than school:
____
____
____

7. Please describe any problems or difficulties that you may presently be experiencing with your child:
____
____
____

---

* Note: Form A was designed for families who participated in the study

PARENTAL INFORMATION

1. **Mother's Name**: ______________________________

2. **Father's Name:** ______________________________

3. **Home Address**: ______________________________

____

____

4. **Home Phone Number**: ______________

5. **Business Phone Numbers**: Mother: ____________ Father: ____________

6. **Age:** Mother: ___________(years) Father: ______________(years)

7. **Education**: Which of the following best describes your education and your spouse's/partner's education?

Your Education:	**Your Spouse's/Partner's Education:**
a. High school or less	a. High school or less
b. Community college	b. Community college
c. Some university	c. Some university
d. B.A. degree	d. B.A. degree
e. Graduate degree	e. Graduate degree

8. **Occupation:** Which of the following categories best fits the work you and your spouse/partner do?

You Do:	**Your Spouse/Partner Does:**
a. Managerial	a. Managerial
b. Professional	b. Professional
c. Technical	c. Technical
d. Administrative	d. Administrative
e. Clerical	e. Clerical
f. Retail	f. Retail
g. Other________	g. Other________

9. Combined Family Income (per year): Which of the following best describes your combined family income per year before taxes?

a. Less than $10,000
b. $10,000 to 19, 000
c. $20,000 to 29,000
d. $30,000 to 39,000
e. $40,000 to 49,000
f. $50,000 to 59,000
g. $60,000 to 69,000
h. $70,000 to 79,000
i. $80,000 to 89,000
j. $90,000 to 99,000
k. $100,000 or more

10. Present Marital Status: Which of the following categories best describe your marital status?

☐ Married /Common law
☐ Separated
☐ Divorced

If separated or divorced please circle the custody arrangement :

☐ Sole custody
☐ Joint-custody
☐ Other: (please specify) ____________

INFORMATION ABOUT YOUR CHRONICALLY ILL CHILD

1. Child's Date of Birth : ____/____/____
day month year

2. Child's Sex : ☐ Male ☐ Female

3. Child's illness/diagnosis: ______________________________ (If there is more than one diagnosis, please list them all).

4. Number of Years and Months Child Has Been Ill: ________________

5. Please list any medical and psychological problems currently experienced by your child:

____

____

____

FAMILY HOUSEHOLD MEMBERS BY AGE AND RELATIONSHIP TO THE CHRONICALLY ILL CHILD:

1. ____

Age Relationship

2. ____

Age Relationship

3. ____

Age Relationship

4. ____

Age Relationship

5. ____

Age Relationship

What is today's date? _______/_________/_________

day month year

This completes the questionnaire. Thank you very much for your help in our study.

Appendix H
General Information Questionnaire (Form B)*

Completing this questionnaire should take about 10 minutes. It would be a great help to us if you could return it as soon as possible in the addressed stamped envelope provided.

Please be assured that all information you provide will be kept strictly confidential. This questionnaire is structured so you can remain anonymous.

Please answer the questions as accurately as you can by placing an "X" in the box next to the answer that you selected , by circling the appropriate answer or by entering information in the space provided.

Thank you very much for taking the time to fill out this questionnaire.

This questionnaire was filled out by : ☐ The father ☐ The mother

INFORMATION ABOUT YOUR CHRONICALLY ILL CHILD

1. Child's Age : ______(years) _______(months)

2. Child's Sex : ☐ Male ☐ Female

3. Child's illness/diagnosis: ________________________________ **(If there is more than one diagnosis, please list them all).**

4. Number of Years or Months Child Has Been Ill: ________________

5. Please list any medical and psychological problems currently experienced by your child:

____

____

____

____

---

* Note: Form B is designed for families who declined to participate

PARENTAL INFORMATION

1. Age: Mother: ____________(years) Father: ________________(years)

2. Education: Which of the following best describes your education and your spouse's/partner's education?

Your Education:	**Your Spouse's/Partner's Education:**
a. High school or less	a. High school or less
b. Community college	b. Community college
c. Some university	c. Some university
d. B.A. degree	d. B.A. degree
e. Graduate degree	e. Graduate degree

3. Occupation: Which of the following categories best fits the work you and your spouse/partner do?

You Do:	**Your Partner Does:**
a. Managerial	a. Managerial
b. Professional	b. Professional
c. Technical	c. Technical
d. Administrative	d. Administrative
e. Clerical	e. Clerical
f. Retail	f. Retail
g. Other________	g. Other________

4. Combined Family Income (<u>per year</u>): Which of the following best describes your combined family income **<u>per year before taxes</u>**?

a. Less than $10,000
b. $10,000 to 19, 000
c. $20,000 to 29,000
d. $30,000 to 39,000
e. $40,000 to 49,000
f. $50,000 to 59,000
g. $60,000 to 69,000
h. $70,000 to 79,000
i. $80,000 to 89,000
j. $90,000 to 99,000
k. $100,000 or more

5. Present Marital Status: Which of the following categories best describe your marital status?

☐ Married /Common law ☐ Separated ☐ Divorced

If separated or divorced please circle the custody arrangement :

☐ Sole custody ☐ Joint-custody ☐ Other: (please specify) ____________

FAMILY HOUSEHOLD MEMBERS BY AGE AND RELATIONSHIP TO THE CHRONICALLY ILL CHILD:

1. ____
Age Relationship

2. ____
Age Relationship

3. ____
Age Relationship

4. ____
Age Relationship

5. ____
Age Relationship

What is today's date? ________/__________/__________
day month year

This completes the questionnaire. Thank you very much for completing this questionnaire.

Appendix I

Information Questionnaire filled by Case Managers

Please answer by placing an "X" in the box next to the answer that you selected or by entering information in the space provided. Thank you very much for your help in this study.

This questionnaire was filled out by : ______________________________
First name Family name

INFORMATION ABOUT THE CHRONICALLY ILL CHILD

1. Child's Date of Birth : ____/______/____
day month year

2. Child's Sex : ☐ Male ☐ Female

3. Child's illness/diagnosis: ______________________________ **(If there is more than one diagnosis, please list them all).**

4. Date of diagnosis: ____/______/____
day month year

5. Please list any medical problems currently experienced by the child:

____
____
____
____

☐ I am not aware of any medical problems currently experienced by the child.

6. Please list any psychological problems experience by the child:

____
____
____
____

☐ I am not aware of any psychological problems experienced by the child.

INFORMATION ABOUT PARENTS

1. **Present Marital Status of Parents:**

☐ Married /Common law ☐ Separated ☐ Divorced
☐ I do not know the parents' marital status

If separated or divorced please circle the custody arrangement :

☐ Sole custody ☐ Joint-custody
☐ I do not know the family's custody arrangement.

2. **Age:** Mother ________ (years) Father _________ (years)

☐ I do not know the mother's age.
☐ I do not know the father's age.

3. **Education**: Which of the following best describes the parents' education?

Mother's Education:	**Father's Education:**
a. High school or less	a. High school or less
b. Community college	b. Community college
c. Some university	c. Some university
d. B.A. degree	d. B.A.. degree
e. Graduate degree	e. Graduate degree

☐ I do not know mother's level of education.
☐ I do not know father's level of education.

4. **Occupation:** Which of the following categories best fits the work the parents do?

Mother Does:	**Father Does:**
a. Managerial	a. Managerial
b. Professional	b. Professional
c. Technical	c. Technical
d. Administrative	d. Administrative
e. Clerical	e. Clerical
f. Retail	f. Retail
g. Other________	g. Other________

☐ I do not know what is the mother's occupation.
☐ I do not know what is the father's occupation.

4. Combined Family Income (<u>per year</u>): Which of the following categories best fit the combined family income **<u>per year before taxes</u>**?

a. Less than $10,000
b. $10,000 to 19, 000
c. $20,000 to 29,000
d. $30,000 to 39,000
e. $40,000 to 49,000
f. $50,000 to 59,000
g. $60,000 to 69,000
h. $70,000 to 79,000
i. $80,000 to 89,000
j. $90,000 to 99,000
k. $100,000 or more

☐ I do not know the family's income.

<u>FAMILY HOUSEHOLD MEMBERS BY AGE AND RELATIONSHIP TO THE CHRONICALLY ILL CHILD:</u>

1. ____
Age Relationship

2. ____
Age Relationship

3. ____
Age Relationship

4. ____
Age Relationship

5. ____
Age Relationship

☐ I do not know the family's household members.

Comments:

____
____
____

Today's date _______/_________/___________
day month year

This completes the questionnaire. We greatly appreciate your help in the study.

Appendix J
Child Behavior Checklist for Ages 4-18
Copyright T. M. Achenbach, Reproduced by Permission*.

*Note: A copy of the CBCL is included in the original thesis.
The publisher denied permission to reprint on microfilm.

*<u>Note:</u> A copy of the CBCL is included in the original thesis.
The publisher denied permission to reprint on microfilm.

*Note: A copy of the CBCL is included in the original thesis.
The publisher denied permission to reprint on microfilm.

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The publisher denied permission to reprint on microfilm.

Appendix K

Revised Children's Manifest Anxiety Scale (What I think and Feel)

(RCMAS; Cecil R. Reynolds, Ph.D., and Bert O. Richmond, Ed.D.)

*Note: A copy of the RCMAS is included in the original thesis.
The publisher denied permission to reprint on microfilm.

*<u>Note:</u> A copy of the RCMAS is included in the original thesis.
The publisher denied permission to reprint on microfilm.

Appendix L

Children's Depression Inventory

*<u>Note:</u> A copy of the CDI is included in the original thesis.
The publisher denied permission to reprint on microfilm.

*Note: A copy of the CDI is included in the original thesis.
The publisher denied permission to reprint on microfilm.

Appendix M
Kidcope

Participant's Name: ______________________________

Date seen: ____/____/________ **Date of Birth:** ____/____/______
day month year day month year

Age: ____________ **Grade:** __________ **Gender:** ☐ Male ☐ Female

Information on the Chronically Ill Child

Illness: ____________________ **Date of Birth:** ____/____/______
day month year

Age: ____________ **Grade:** __________ **Gender:** ☐ Male ☐ Female

1. **Does this situation make you nervous?**
Not at all A little Somewhat Pretty much Very much

2. **Does this situation make you sad?**
Not at all A little Somewhat Pretty much Very much

3. **Does this situation make you angry or mad?**
Not at all A little Somewhat Pretty much Very much

4. **Overall, how upsetting is this situation for you?**
Not at all A little Somewhat Pretty much Very much

5. **In general, is this situation one that you could change or do something about?**
Yes No

6. **In general, is this situation one that must be accepted or gotten used to?**
Yes No

7. **In general, is this situation one in which you needed to know more about before you could act?**
Yes No

8. **In general, is this situation one in which you had to hold yourself from doing what you wanted to do?**
Yes No

9. **How often do you think you need to deal with this situation?**
Not at all A little Somewhat Pretty much Very much

	Did you do this?				How much did it help?		
1. I just tried to forget it	Not at all	Sometimes	A lot	Almost all the time	Not at all	A little	A lot
2. I did something like watch TV or played a game to forget it.	Not at all	Sometimes	A lot	Almost all the time	Not at all	A little	A lot
3. I stayed by myself.	Not at all	Sometimes	A lot	Almost all the time	Not at all	A little	A lot
4. I kept quiet about the problem.	Not at all	Sometimes	A lot	Almost all the time	Not at all	A little	A lot
5. I tried to see the good side of things.	Not at all	Sometimes	A lot	Almost all the time	Not at all	A little	A lot
6. I blamed myself for causing the problem.	Not at all	Sometimes	A lot	Almost all the time	Not at all	A little	A lot
7. I blamed someone else for causing the problem.	Not at all	Sometimes	A lot	Almost all the time	Not at all	A little	A lot
8. I tried to fix the problem by thinking of answers.	Not at all	Sometimes	A lot	Almost all the time	Not at all	A little	A lot
9. I tried to fix the problem by doing something or talking to someone.	Not at all	Sometimes	A lot	Almost all the time	Not at all	A little	A lot
10. I yelled, screamed or got mad.	Not at all	Sometimes	A lot	Almost all the time	Not at all	A little	A lot
11. I tried to calm myself down.	Not at all	Sometimes	A lot	Almost all the time	Not at all	A little	A lot
12. I wished the problem had never happened.	Not at all	Sometimes	A lot	Almost all the time	Not at all	A little	A lot
13. I wished I could make things different.	Not at all	Sometimes	A lot	Almost all the time	Not at all	A little	A lot
14. I tried to feel better by spending time with others like family, grownups, or friends.	Not at all	Sometimes	A lot	Almost all the time	Not at all	A little	A lot
15. I didn't do anything because the problem couldn't be fixed.	Not at all	Sometimes	A lot	Almost all the time	Not at all	A little	A lot

Kidcope Strategies

Distraction= items 1 & 2; **Social withdrawal** = items 3 & 4; **Cognitive restructuring** = item 5; **Self criticism** = item 6; **Blaming others** = item 7; **Problem-solving** = items 8 & 9: **Emotional regulation** = items 10 & 11; **Wishful thinking** = items 11 & 12; **Social support** = item 14; **Resignation** = item 15

Appendix N
Debriefing Protocol

Thank you very much again for agreeing to take part in this project. Today, you were asked many questions and filled in several sheets. The information that you gave will help us to understand how children deal with a brother's or sister's chronic illness and what ways of coping children think are helpful. The information you gave will also help us learn how people in your life help you.

This kind of information is important for people who work with families with a chronically ill child. If we know, for example, what ways of coping help children deal better with a brother's or sister's illness, we can suggest these ways to families in which a child has recently been diagnosed with a chronic illness.

In order to complete this project we will need to see about 100 children. That can take couple of months. When we finish, we will examine all the information, write a short report of what we found and send this report to all the children who participated in this study. No names will appear in the report. After you receive the report and read it, you will be able to call me if you have any further questions.

Before we finish, do you have any questions you want to ask me?

Appendix O

Research Assistant Protocol for First Telephone Contact

Hello, May I speak with Mr. or Ms._________ please?

Hello, Mr(s) ______, we received your name from (name of a case manager), one of the case managers of the __________ Clinic. My name is _________________, I am a research assistant, and I am calling about a study that we are conducting at CHEO about brothers and sisters of children with chronic illness. The study is being conducted by Dr. John T. Goodman from the University of Ottawa, and, Zohar BenDavid-Streiner who is a doctoral student in the clinical psychology program at the University of Ottawa. The study is approved by CHEO and assisted by several clinics, including the ____________ Clinic. (Other Clinics: Oncology, Asthma, Diabetes, Nephrology, Cystic Fibrosis).

The study looks at how 8 to12 year-old children cope with having a brother or a sister with a chronic illness, such as__________, what types of coping siblings use most often and what types of coping they see as most helpful. The study also looks at how social support affects adjustment. We are interested in speaking with siblings between the ages of 8 to 12 years.

Does (Name of chronically ill child from patients' list) has a brother or a sister who is between the ages of 8 to 12?

(If no): "O.K., thank you and sorry to have disturbed you. Bye"

(If yes): If you agree, we would like to send you an information package about the study. The package includes an Information Brochure which explains why we are doing the study, what participation in the study involves, and what the benefits of this study are. The package also includes a letter to your child which explains in a simple language why we are doing this study and what participation involves, and a Consent Form, which you can sign if you decide to participate in the study.

As I said before, I am the research assistant. The principal researcher, whose name is Zohar BenDavid-Streiner will contact you shortly after you receive the package to answer any questions you may have after reading the information.

When is a good time for her to contact you?
Probe

Can she call you during the day?
Can she call you at work? **(If yes, write down the phone number at work)**
Until what time in the evening can she call you?
Can she call you on the weekend? When is the best time to call you?

Can I please have (name of chronically ill child) brother's/sister's name so we can address the letter to him/her? **(Write the name of the sibling in the master list and in the cover letter)**

I just want to make sure that I have the right address. I will read you the address that I have from the __________ Clinic and, please, let me know if there is any information which is not correct **(read the address to the parent and correct any mistakes)**.

Thank you very much for taking the time to speak with me on the phone and for agreeing to receive the information package.

* * *

Information from the first phone contact with each family was recorded by the research assistant using the format below.

Date of first contact	General information
Information package was sent on __________ (Date)	1. Family name: 2. Phone Number at home: 3. Name of Chronically ill child: 4. Name of Sibling: 5. Page number where family appears in the Master list: 6. Good time to contact the family: Morning/Afternoon/Evening 6.1 Can I call the family during the day? Yes No 6.2 Can I call mother/father at work? Yes No [If yes, write phone number at work: ( )] 6.3 Until what time in the evening can I call the family? 6.4 When is the best time to call on weekends? 7. Comments: