THE PSYCHOLOGICAL EFFECTS OF PEDIATRIC ILLNESS ON
HEALTHY SIBLINGS

Thesis

Submitted to

The College of Arts and Sciences of the
UNIVERSITY OF DAYTON

In Partial Fulfillment of the Requirement for

The Degree

Master of Arts in Clinical Psychology

By

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Dayton, OH
December, 2009
The Psychological Effects of Pediatric Illness on Healthy Siblings

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This study examines the long-term psychological effects of pediatric illness on healthy siblings. Previous researchers differ substantially in their findings on how individuals are affected by having a sibling with a chronic pediatric illness. Some studies assert that chronic illness, though a stressor for healthy siblings, results in benefits such as higher levels of empathy, coping skills, and family cohesiveness. Other researchers find more negative effects such as elevations in academic and behavioral problems and declinations in parental support, and quality of life. Because the literature lacks consensus on how individuals adapt to illness in a sibling, the present research is designed to address both positive and negative effects including empathy, depression, anxiety, and the health of the sibling relationship. The sample for this research is comprised of individuals currently attending college. At present, college students as a specific demographic group have not yet been investigated as siblings of those with pediatric illnesses. Recruiting students from the University of Dayton, 30 participants with a sibling who has a chronic illness and 31 participants with healthy siblings completed a
series of questionnaires. The series included a demographics questionnaire along with measures of empathy, depression, anxiety, and sibling closeness. Results indicate that individuals with a sibling who has an illness experience higher levels of empathy. Further, participant gender was determined to be a predictor of empathy in these individuals while age of the sibling at diagnosis and sibling closeness were not. No differences in depression, anxiety, and sibling closeness existed between groups. These findings partially support the premise that pediatric chronic illness has long term effects on healthy siblings, but more research is needed to further develop our understanding of the effect of chronic illness on familial relations across time.
ACKNOWLEDGEMENTS

My special thanks to my faculty advisor Dr. Keri Kirschman and to my committee members Dr. Catherine Zois and Dr. Carolyn Phelps for their dedication, patience, and expertise which allowed me to produce this thesis. I would also like to extend my genuine gratitude to my parents for their ceaseless support and a very special acknowledgment to Father Mark F. Gruber, O.S.B. for sharing with me his insight into the human family. And finally, to Saint Joseph on whose constant intercession I rely for help.
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INTRODUCTION

Loss of health at any age is debilitating and its effects far reaching. Loss of health in childhood takes on a particular enmity because of the expectations for youth. In addition to suffering from the disease or illness itself, the child may undergo substantial restrictions in daily activities in an effort to adhere to health management requirements (Roberts, 2003). Social relations at school may be damaged when the child is obliged to miss school days or incurs difficulties maintaining participation in extracurricular activities (Celano & Geller, 1993; Frank, et al. 1998). The child with an illness may also experience changes in the dynamics of the family (Williams, et al., 1999). Management of the illness such as hospitalizations and visits to specialists necessitates excessive time constraints and often leads to financial and familial stress (Bouma & Schweitzer, 1990; Brown, et al., 2008). Consequently, pediatric childhood illness often impinges upon all members of the family, including healthy siblings.

Pediatric chronic illness has been defined as a medically diagnosed sickness lasting a period of 6 months or more that shows little improvement or slow progress (Williams et al, 1993). Pediatric illnesses occur in approximately 4 to 7 million children in America (Newacheck & Halfron, 1998). In other terms, Brown et al. (2008) estimated that 20–30% of children and adolescents in the U.S. suffer a chronic disease or illness. Sahler, et al. (1994) reported a more conservative figure of approximately 10% of U.S.
children with a chronic illness of some type. In addition to the ill child, siblings are also impacted by pediatric illness. American families have an average of two offspring. Thus, calculating from the more conservative figure, roughly 1 in 10 children can be expected to have a sibling with a pediatric chronic illness.

The impact of pediatric chronic illness on healthy siblings is significant and the ways in which it affects family life, interpersonal relationships, and daily functioning varies across individuals. Breyer, Kunin, Kalish, and Patenaude (1993) reported normal tensions between siblings are magnified when one of them undergoes a chronic illness. The modification in the relationship between the siblings arises out of a disruption in the family’s life. The differential allocation of parental time, attention, and resources may lead the healthy child to experience intense emotions of envy and jealousy toward the sibling with a pediatric illness (Breyer, et al., 1993). Additionally, Kramer (1984) reported feelings of guilt to be a common reaction expressed by the healthy child.

Chronic illness in a sibling can lead to detrimental effects, but it can also generate positive growth such as an increase in compassion and empathy (Cohen, Friedrich, Jaworski, Copeland, Pendergrass, et al., 1994). Outcomes, good and bad, in siblings of children with chronic illnesses and their processes of coping are not yet fully understood (Labay & Walco, 2004).

The introduction to the current study will begin with an examination of the function of the family as a primary environment for ill children and their siblings in the framework of family systems theory. Second, a brief history of the literature on siblings of children with pediatric chronic illnesses will be discussed. Third, researchers’ reports on healthy siblings’ adaptations, protective factors, and risk factors will be reviewed.
Finally, the purpose of the present study will be covered and the research questions introduced.

*Family Systems Perspective of Illness as Stressor*

Although conflicting outcomes abound regarding the effects of pediatric chronic illness on healthy siblings, the literature does contribute to the concept of chronic illness as a stressor affecting the entire family both as a system and as individuals (Houtzager, Grootenhuis, & Last, 2001; Lobato & Kao, 2005). Family systems theory examines the influence of the family in the development of the individual. It assumes that patterns of behaviors are developed in early family life, and the family’s functioning and emotional ties continue to assert themselves throughout the individual’s life (Walsh & Harrigan, 2003). Researchers in family systems theory have concluded that adjustment to stressors in children and their parents are interrelated (e.g., Kazak, 1997). A change in one member of the family (e.g., pediatric illness) affects all other members and in varying ways as a multitude of subsystems exists within the larger family system. For instance, when a daily medical treatment regimen is needed for a child, the dyadic subsystem of husband and wife can be strained over disagreements about how best to implement the regimen. Additionally, the subsystem of mother, ill sibling, and healthy sibling becomes stressed when the healthy sibling feels isolated and pushed aside (Kazak, 1989).

Cohen et al. (1994) explored the family system specifically in healthy siblings of patients with pediatric cancer. They reported adjustment difficulties in healthy siblings and a complex coping process involving the whole family. In regards to family cohesion, the more enmeshed (having permeable boundaries between family members with minimal personal privacy) the family was, the more well-adjusted the parents reported
the healthy child to be. Also, the highest levels of adjustment in healthy siblings were found when they were members of families who had “pathologically high” levels of adaptability (Cohen et al., 1994, p. 315). That is, normally excessive levels of flexibility may serve as beneficial while facing the multitude of adjustments necessary when a child in the family has a life threatening condition. Cohen et al. (1994) purported that the single best predictor of poor sibling adjustment was parental depression and that the most beneficial intervention for healthy siblings may be treatment for depressed parents.

Studying families, therefore, is to recognize an integrative and complex system of multiple subdivisions with ingrained patterns of behavior (Kazak, 1989; Kazak, 1997).

Families as a system tend to react in ways that attempt to maintain homeostasis. Thus, family responses to chronic pediatric illness can seem maladaptive out of an attempt to preserve stability (Kazak, 1989). Consistent with family systems theory, interrelated variables combine to influence the sibling’s adjustment to the stressor of illness in the family (Williams et. al., 2002). For instance, a warm, close relationship with a sibling normally serves as a protective factor. In the case of a childhood chronic illness, however, such a relationship actually correlates with less psychological adjustment and social competence in the healthy sibling (Labay & Walco, 2004). Labay and Walco (2004) explained that the stress of the illness is heightened as the healthy sibling more thoroughly experiences the suffering of the ill sibling and the changes their relationship endures due to this closeness.

While it is intuitive that siblings will be affected by a brother or sister with pediatric chronic illnesses, the impact can be either direct or indirect (Labay & Walco, 2004; Weiss, Schiaffino, & Ilowite, 2001). Direct effects include the aforementioned
example where a close relationship with an ill sibling may increase the level of stress in the healthy sibling. Further examples of direct effects include increased anxiety, feelings of guilt, and increased aggressive behavior (Barrera, Chung, Greenberg, & Fleming, 2002; Lobato, Kao, & Plante, 2005). Also, increased emotional distress in parents, along with a decrease in family cohesion and support may impact the healthy sibling indirectly (Cohen et al., 1994; Williams et al., 1999). The indirect effects are not simply the individuals’ reaction to the illness, but involve broader variables in the family system (Sharpe & Rossiter, 2002; Williams et al., 1999).

Brief History of Sibling Studies

Until a few decades ago, most of the literature concerning children with illnesses examined the child’s relationship with the mother (Brown et al., 2008; Gardner, 1998; Madden, Hastings, & Hoff, 2002; Sheeran, Marvin, & Pianta, 1997; Williamson, Walters, & Shaffer 2002.) Recently, multiple studies have reviewed the specific effects and concerns of healthy children who have a sibling with a pediatric illness (Alderfer, Labay, & Kazak, 2003; Barlow & Ellard, 2006; Gallo & Knafl, 1993; Gardner, 1998; Howe, 1993; Guite, Lobato, Kao, & Plante, 2004; Lobato, Faust, & Spirito, 1989; Wood, Sherman, Hamiwka, Blackman, & Wirrell, 2008). Studies of children with siblings with pediatric cancer are more prevalent than studies on any other pediatric chronic illness, yet the research remains limited and the results thus far are mixed across infirmity types regarding the emotional, psychological, and behavioral health of the siblings following the diagnosis of a pediatric chronic illness (Lobato, Faust, & Spirito, 1989; Sharpe & Rossiter, 2002). For example, Sharpe and Rossiter (2002) noted the lack of consensus across studies which ranged from viewing healthy siblings as a population at risk to
viewing them as the beneficiaries of some long-term positive effects including greater compassion.

The mother’s mental health, along with the rest of the family, remains relevant to understanding the effects on healthy siblings. Levels of depression are higher among mothers with an ill child compared with mothers who do not have an ill child (Breslau & Prabucki, 1987). Breslau and Prabucki (1987) interviewed mothers of chronically ill children five years after diagnosis. Compared to reports by mothers without a chronically ill child, the siblings of the ill children demonstrated higher scores on measures of aggression, social isolation, and depression. In their retrospective study, Sahler and colleagues (1994) collected interviews and self-report measures from the parents of 254 siblings aged 4 through 18 in a span of 6 to 42 months following diagnosis. The parents reported elevated levels of emotional and behavioral problems for siblings. Although the prevalence of problems prior to diagnosis was similar to the general population, after diagnosis the percentage of siblings with emotional or behavioral problems rose from 7.7% to 18%. Additionally, the increase in emotional and behavioral problems was negatively correlated with the general well-being and physical health of the mother (Sahler, Roghmann, Mulhern, Carpenter et al., 1997; Sahler, Roghmann, Carpenter, Mulhern, et al., 1994).

Horwitz and Kazak (1990) assessed younger children aged 3 to 6 with and without a sibling with pediatric cancer and conversely found no significant differences between the groups on standardized measures of behavioral-emotional problems, social competence, and self-perceptions. In fact, some siblings in the oncology group demonstrated higher rates of prosocial behavior. The parents of the preschoolers in the
oncology group also reported greater levels of adaptability. In addition, negative correlations between behavior problems and adaptability and cohesion were found in this same group. That is, parents of children who reported a greater amount of flexibility, consistency, and structure in their family life also reported fewer issues with behavior in the healthy siblings. This correlation may help explain how some siblings fare better than their peers and the role the family system plays in coping. If the family, as a system, is able to adapt well and pull together to manage the pediatric illness and the stress that accompanies it, the likelihood of externalizing behavior in the healthy sibling decreases (Horwitz & Kazak, 1990).

Williams and colleagues (1999) also examined maternal mood and family cohesion in families with chronically ill children, but employed more of a family systems perspective by considering the interactions between the mother, the healthy child (ages 8 to 15), and the ill child. Recruiting from a tertiary-level medical center, Williams and colleagues (1999) assessed 22 siblings of children with cancer, cystic fibrosis, diabetes, or spina bifida. The researchers measured the healthy siblings’ levels of perceived social support, self-esteem, and mood. Mothers of the participants were assessed for mood and family functioning. Williams and colleagues (1999) discovered a complex relationship among these factors in the mother, the healthy child, and the child’s social network. They found a significant positive correlation between maternal mood and family cohesion. That is, the fewer feelings of depression, anxiety, anger, confusion, and fatigue the mother experienced despite the devastating illness in her child, the better family members reported that they were able to pull together as a functioning unit. A similar positive correlation was found between maternal mood and the healthy siblings’ social support as
indicated by positive regard from teachers, peers, and friends. Unfortunately, the researchers were unable to posit an explanation for this relation. Social support, in turn, was positively correlated with self-esteem as reported by the well sibling. Thus, perceiving positive regard from the social network, the child experienced an elevation in self regard. Finally, sibling social support, self-esteem, and family cohesion were positively correlated with mood in the siblings. So, the stronger and more positive the family and social environment and the higher the self-worth, the more positive the mood state reported in the healthy sibling. Noteworthy, is that maternal mood was not directly related to sibling mood. Rather, the variables of family cohesion, social support, and self-esteem mediated the relation between maternal and sibling mood. Cohen et al., (1994) generally confirmed these findings in a sample of 129 siblings of children with pediatric cancer. Although levels of maternal mood, family cohesion, social support, self-esteem, and mood varied widely across the samples, the complex relations between variables underscore the importance of a family systems perspective when considering the impact of pediatric chronic illness on siblings.

*Positive Adaptations*

Despite the novel stress of pediatric illness, many healthy siblings are able to adjust well, demonstrating few disruptions in healthy functioning (Labay & Walco, 2004). As noted previously, some siblings experience positive changes such as higher levels of empathy, family cohesiveness, self-assurance in their ability to cope, maturity, and level of independence (Gardner, 1998; Houtzager et al., 2004). Of these, empathy seems particularly key and is found to be a significant predictor of adjustment in siblings of children with pediatric illness. Placed in a position where the child needs to process the
changes that the family system has undergone, the sibling may build and enhance empathy (Henry, Sager, & Plunkett, 1996). Additionally, early exposure to the intense suffering of others while in a period of developing personality and heightened socialization may augment compassion and empathy. Kramer (1984) performed a qualitative analysis on 11 healthy siblings (ages 6 to 16) of children with pediatric cancer. A structured interview was employed to gauge perceptions of what it meant to have a sibling with cancer. Although the participants discussed negative impacts such as higher levels of anger, frustration, guilt, and rivalry, elevations in empathy, sensitivity, and maturation were also recorded.

Illustrating the role of empathy in siblings of pediatric patients, Labay and Walco (2004) collected questionnaires in a one-time assessment from 29 healthy children and their parents while their siblings underwent active treatment for pediatric cancer. All children undergoing treatment were minimally 3 months post-diagnosis. They found healthy siblings aged 8 to 15 scored higher on measures of empathy than their peers. Those who demonstrated greater empathy underwent fewer difficulties in adjusting to their sibling’s condition. Additionally, higher levels of empathy were found to be related to less psychological problems in these participants.

Working to better comprehend empathy as a facet of adjustment, Labay and Walco (2004) suggested that the ability to identify other’s emotions may assist healthy siblings by increasing the ability to reconcile differences in the distribution of the family’s resources. For example, empathetic youth might more readily accept parents’ time and attention being diverted to the sibling undergoing treatment. They might also better understand the additional gifts the sibling received, or special privileges conferred
while ill. Moreover, Labay and Walco (2004) proposed children who have a greater capacity for empathy are better able to understand their own emotional states which may decrease reactions of impulsivity and aggression.

Strayer and Roberts (1997) also found empathy in children to be associated with psychological adjustment. Furthermore, they found the capacity for empathy was greater among females and increased with age for both sexes (Strayer & Roberts, 1997). Labay and Walco (2004) replicated and confirmed these findings utilizing an empathy scale, a behavioral-emotional problems checklist, and a questionnaire concerning the relationship with their sibling. Labay and Walco (2004) also implemented a semi-structured interview to assess the healthy siblings’ understanding of their sibling’s illness in terms of its cause, course of treatment, and prognosis. The extent of knowledge of the siblings’ illness was not directly related to adjustment but was associated with a higher level of empathy.

Negative Adaptations

Other studies have found negative effects on children who have a sibling with a pediatric chronic illness. Parents, who are overly indulgent or, conversely, have little attentional and emotional resources for healthy siblings, may create situations that foster maladjustment (Williams et al., 1999). Sahler and colleagues (1994) reported 63% of siblings of children with pediatric cancer experienced some difficulty in psychological adjustment. These negative difficulties included a diminished relationship with their ill siblings and a lower level in quality of life due to the strain on resources brought on by the illness (Houtzager et al., 2004; Weiss, Schiaffino, & Ilowite, 2001). Further negative impacts have been identified among healthy siblings of ill children, including higher levels of anxiety, catastrophic thinking, and feeling a lack of control (Barlow & Ellard,
Also recognized are fewer peer activities and lower cognitive development. (Sharpe & Rossiter, 2002).

Alderfer, Labay, and Kazak (2003) offered a different model for comprehending the internalizing problems and long-term reactions in healthy siblings. They collected self-report measures of anxiety, posttraumatic stress (PTS), and illness perceptions from 78 healthy adolescents with an adolescent sibling who survived cancer. Remarkably, 81% confirmed PTS symptoms with 49% having mild symptoms and 32% with scores within the moderate to severe range. More than half reported the experience to be difficult and frightening; however, they demonstrated similar levels of general anxiety with peers who did not have a chronically ill sibling. Alderfer, Labay, and Kazak (2003) conjectured that a model including PTSD could better inform treatment and aid in enhancing coping and adaptation. They also asserted the need to address the effects on siblings in a family perspective.

In addition to internalizing problems, the impact of such stressors may manifest in the form of externalizing behaviors such as oppositional behaviors at home and at school (Barrera, Chung, Greenberg, & Fleming, 2002). Barrera and colleagues (2002) investigated a group intervention program called Siblings Coping Together which focused on emotional and behavioral problems in healthy siblings of children with pediatric cancer. For this program, 17 healthy siblings (aged 6-17) met once a week for 2 hours over 8 weeks. Having collected data prior to and after the intervention by using a depression inventory, anxiety inventory, child behavior checklist, satisfaction questionnaire measuring contentment with the program, and the therapists’ group process log, the researchers reported a reduction in symptoms of anxiety and depression after the
intervention. Siblings, as well as parents, reported satisfaction with the intervention and the therapists’ log exhibited advances in healthy emotional expression among the group members. However, externalizing behavior including disruptive and aggressive conduct was reported in some participants but not significantly improved post intervention.

Extending the research on externalizing problems, Labay and Walco (2004) found healthy siblings had social and academic difficulties. These difficulties included lowered competence in social activities, social relationships, and school performance along with less involvement in extracurricular activities.

Further negative changes in healthy siblings were identified by Houtzager et al. (2004) who reported significantly lower levels in quality of life and emotional well-being for siblings of ill children a month after diagnosis. Their study involved 83 healthy siblings ages 7 to 19. The participants’ psychological adjustment was assessed four times at 1, 6, 12, and 24 months after the diagnosis of cancer in a sibling. At each assessment measures of anxiety, quality of life, behavioral-emotional problems, coping, family functioning and a general health questionnaire were administered. Anxiety and behavioral-emotional problems diminished over the initial six months and a general trend of stabilization was reported, but healthy siblings took two years to return to the quality of life level of the reference group (Houtzager et al, 2004).

Beyond the work of Houtzager et al. (2004), there is a very limited amount of longitudinal research, but that which is available suggests that the detrimental effects of such a diagnosis, for the most part, subside after the first six months to two years for siblings of the ill child. Such was the case with the siblings in the study by Williams, Lorenzo, and Borja (1993) who interviewed 100 mothers of pediatric patients with either
cardiac or neurological disorders. Measuring the effects of chronic illness on healthy siblings aged 6 to 18 through the mothers’ reports, Williams, Lorzenzo, and Borja (1993) described a higher rate of domestic activities such as housekeeping and childcare and a lower rate of engagement in social and school activities. These changes in household duties were more dramatic for girls than boys and remained stable over time. Additionally, school performance was negatively impacted with the first 2 years following diagnosis being most problematic for children (Williams, Lorenzo, & Borja, 1993).

*Protective and Risk Factors*

Specific outcomes in adjustment aside, researchers have agreed that pediatric chronic illness is a source of stress in healthy siblings (Houtzager, Grootenhuis, & Last, 2001). Gardner (1998) found that multiple factors alleviate the impact of the stress experienced by these siblings. He examined the siblings’ perception of the stressor as manageable and controllable, parental support, adaptive coping strategies, and “achievement of a balance between thinking of themselves and thinking of others,” which can be labeled as empathy (Gardner, 1998, p. 222). Focusing on parental support, Gardner (1998) also found that coping healthily and successfully with the illness in the family was directly related to the healthy siblings’ understanding of new and increased responsibilities and feeling that they could rely on their parents. When parents responded positively to the emotional needs of the healthy siblings and provided them with information concerning the illness, these siblings were able to better initiate their own internal resources for coping with the event (Gardner, 1998; Lobato, Kao, and Plante, 2005).
Demographic correlates. Certain demographic variables appear to contribute to a healthy sibling’s adjustment (Silver & Frohlinger-Graham, 2000; Labay & Walco, 2004). As explained, siblings can experience and demonstrate a combination of positive and negative reactions. These reactions are influenced by demographic factors such as ethnicity and socioeconomic status as well as family constellation facets such as age, gender, and birth order of the siblings. To begin with an example of the role ethnicity can play, Lobato, Kao, and Plante (2005) found Latino children to be considerably less aware than non-Latino children of what was happening to their sibling as they and their parents had limited access to information. Siblings were, in turn, affected more negatively which was demonstrated by a significant elevation in parent-reported internalizing problems when compared to non-Latino peers. Therefore, receiving age-appropriate information on the illness may help decrease worry and anxiety (Lobato, Kao, & Plante, 2005).

Additionally, Lobato, Kao, and Plante (2005) purported that Latino sibling relationships tended to be high in intimacy and companionship thus change brought on by illness may go against cultural expectations for the sibling relationship which may then play a role in emotional adjustment of the healthy Latino sibling.

In terms of socioeconomic status, the effects are generally as would be expected: Those of greater financial resources and community support fare better than those with lesser financial resources and community support (Lobato, Kao, & Plante, 2005). Silver and Frohlinger-Graham’s (2000) study of low socioeconomic status, inner city females confirmed this finding. Their research examined the psychological impact of a chronic condition in 34 sisters of pediatric patients. In relation to the ill sibling, younger sisters in
general and elder sisters of male patients reported higher rates of anxiety and feelings of hostility (Silver & Frohlinger-Graham, 2000).

Age in relation to the ill sibling, birth order, and gender also seem to be contributing factors to adaptive functioning. Older sisters, in particular, appear to be more negatively affected by a chronic illness in their younger siblings. Silver and Frohlinger-Graham (2000) found that the eldest sisters were often burdened with the role of secondary caregiver in addition to the role of sibling. This increased responsibility served to significantly heighten anxiety and interpersonal sensitivity in these young women. Houtzager et al. (2004) found higher reported rates of anxiety in girls, when compared to boys. Further, older siblings reported more anxiety than younger siblings. They found a similar positive correlation in measurements of insecurity and loneliness. That is, the older the child, the greater the insecurity and loneliness. In regard to quality of life, the older the sibling, the lower the score and the older the sibling, the higher the emotional involvement (Houtzager et al., 2004). Although birth order has been demonstrated to play a role in adaptive functioning, the number of children in the family does not seem to have a significant impact. In other words, the age in relation to the sibling is of consequence while the size of the family is not (Bouma & Schweitzer, 1990).

Finally, time since initial diagnosis may play a role in the process of how children deal with the life changes brought on by an illness in their sibling. Houtzager et al. (2004) claimed that siblings of children with cancer were most distraught shortly after the diagnosis. They reported positive changes over time in the healthy siblings such as higher levels of empathy, family cohesiveness and closeness, and fewer feelings of loneliness.

As highlighted by Sharpe and Rossiter (2002), there is a need for further investigation
into the long term effects of chronic illness in siblings. This area of the research remains extremely limited.

Present Study

To date, studies have examined the effect of chronic pediatric illness on siblings through a number of study designs considering a range of variables. Factors that have been found to relate to sibling outcome include familial coping and financial resources, parents’ ability to provide support to the healthy siblings, and demographic variables including age, ethnicity, gender, and birth order in relation to the ill sibling. Conclusions have been wide-ranging and diverse in regards to these relevant factors as well as positive and negative outcomes of this experience (Cohen et al., 1994). The positive outcomes have included higher levels of empathy, prosocial behavior, family cohesiveness, coping skills, maturity, level of independence, and the ability to reconcile the differential distribution of family resources (Gardner, 1998; Houtzager et al., 2004; Labay & Walco, 2004; Strayer & Roberts, 1997). Alternatively, an elevation in social, emotional, academic, and behavioral problems and a declination in coping, parental support, extracurricular activities, and quality of life are among the negative outcomes reported (Barrera, Chung, Greenberg, & Fleming, 2002; Houtzager et al. 2004; Lobato, Kao, & Plante, 2005; Labay & Walco, 2004; Sahler, Roghmann, Carpenter, & Mulhern, et al., 1994, Sharpe & Rossiter, 2002; Weiss, Schiaffino, & Ilowite, 2001). Despite the disagreement in terms of protective factors and outcomes, the literature is unified in finding chronic illness in a sibling to be a significant life stressor.

The results of the studies on siblings of children with a chronic illness are compelling. They have added to our understanding and have provided inspiration and
direction for further research. However, the results vary greatly across studies and a number of limitations remain unresolved. Explanations for the range of results include studies being conducted at variable lengths following a diagnosis and the lack of longitudinal data available. Additional variables contributing to the varied results are the complexity of each unique family constellation, the interpersonal relationships within the family, and the financial resources available to the family (Howe, 1993; Lobato, Faust, & Spirito, 1989; Sharpe & Rossiter, 2002; Silver & Frohlinger-Graham, 2000).

In terms of limitations, Sharpe and Rossiter (2002) cited small sample sizes and the combination of disorders and disabilities into a single group as contributing to the contradictory findings across studies. Sharpe and Rossiter (2002), in their meta-analysis of siblings of children with chronic illness, also called for research designs that include direct observation, qualitative, and longitudinal data. Specific to the current study, they also declared a need for studies investigating possible positive long-term effects in adult siblings including higher levels of empathy and a better understanding of individuals with illnesses.

The current study will attempt to investigate the familial effects of childhood illness, particularly, how healthy siblings have been affected by having a brother or sister with a chronic illness. It will investigate whether young adults with ill siblings tend to show stronger positive character traits such as empathy, sensitivity, and compassion than their peers who have not had this experience. It will also attempt to determine whether young adults who have experienced chronic pediatric illness in their family have overcome most of the psychological distress associated with the experience. It is expected that young adults with siblings who suffered from pediatric chronic illness will
have benefited from their situation over the long run in terms of character building while suffering little negative long-term effects (Bouma & Schweitzer 1990; Houtzager et al., 2004).

Young adults between the ages of 18 and 25 have been selected as the population of interest for this study for multiple reasons. As reviewed above, a gap in the research exists in that the effect of pediatric illness in siblings for those who are considered to be emerging adults has not previously been investigated. The literature is also considered lacking in research on the long-term and enduring effects of such a childhood situation (Sharpe & Rossiter, 2002; Weiss, Schiaffino, & Ilowite, 2001). The intent is to examine the established effects of illness in a sibling so as to better comprehend the long-term outcomes and clarify the mixed results of previous studies. Furthermore, there is evidence that the negative changes triggered by illness diminish overtime, most especially acting out and aggressive behaviors (Houtzager et al., 2004; Bouma & Schweitzer, 1990). Of central interest to the present research: Do positive changes, particularly a higher level of empathy, remain stable overtime?

While examining the long-term effects of pediatric chronic illness in healthy siblings, the population selected is not far removed from childhood. According to recent studies on emerging adulthood, individuals between the ages of 18 to 25 are considered to be in an extension of childhood (Arnett, 2006; Gerhardt, Vannatta, Valerius, Correll, & Noll, 2007). In many college students, for example, the continued dependence and extensive contact with parents and family contributes to this notion of emerging adulthood. Research shows that college students are not markedly removed from their familial relationships with their parents and siblings (Aquilino, 2006).
Based on prior research, as reviewed above, the following hypotheses will be examined in the present study:

H1) The group of individuals with ill siblings (hereafter referred to as the target group) will report higher levels of empathy than the group of individuals without ill siblings (hereafter referred to as the comparison group). Specifically, the target group will score significantly higher on the Multi-Dimensional Emotional Empathy Scale than the comparison group.

H2) The target group will not report internalizing symptomatology that differs from the comparison group. Specifically, there will be no differences in mean T-scores on the depression and anxiety subscales of the BASC-2 between the target group and the comparison group.

H3) The target group will report higher levels of closeness to their identified sibling than the comparison group as measured by the factor of Warmth on The Adult Sibling Relationship Questionnaire.

H4) In addition to the primary hypotheses above, a preliminary investigation of the factors that predict empathy levels in individuals who have had a history of a sibling with a chronic illness will be examined. It is hypothesized that empathy will be predicted by gender, age at time of diagnosis, and level of sibling closeness.
METHOD

Participants

Following Research and Ethics Committee approval, 30 individuals aged 18-25 with siblings who suffered chronic illness in childhood were recruited from the University of Dayton for participation in the study. These illnesses included asthma (n=12), diabetes (n=7), epilepsy (n=2), Crohn’s disease (n=2), seizure disorder (n=1), kidney birth defect (n=1), Hepatitis C (n=1), polycystic ovarian disease (n=1), and cancer (n=1). Finally, two participants were unsure of their sibling’s diagnosis. Siblings of individuals with developmental disabilities were excluded from the sample in order to improve upon earlier studies that integrated both developmental disorders and medical conditions. Thirty-one participants for the comparison group of individuals without an ill sibling were also recruited from the University of Dayton. No significant differences were found in the demographic variables between the target and comparison groups with the exception of age and year in school. These two differences likely developed because most comparison group participants were recruited from introductory psychology classes, often first year students, while wider recruitment effort across all class years was required to obtain sufficient participants for the target group. The wider search involved daily postings on a college-run listserv and was necessary because the target group participants needed to have the more stringent qualifier of having a sibling with a chronic illness.
Some students received extra credit in their classes or course credit for participation in the proposed study. Those not eligible for credit were entered into a raffle for a $25 gift card to a local restaurant.

Materials

Once informed consent forms were obtained, participants were asked to complete a packet of questionnaires. All participants completed a demographic questionnaire. Items included individual and family demographic questions as well as questions regarding the illness where appropriate. In order to make a fair comparison, individuals in the comparison group were asked to select the sibling with the birth date closest to their own regardless of year. In other words, those with a birthday in the month of June would select the sibling with a birthday in May versus one with a birthday in November. The intent was to have individuals respond to the questionnaire using a randomly selected sibling and not the one they had the strongest feelings about (See Appendix C).

Participants also completed the Multi-Dimensional Emotional Empathy Scale (Caruso & Mayer, 1998) (See Appendix D), the Behavioral Assessment for Children – Second Edition (BASC-2) – Self-Report of Personality (SRP) College 18-25 (Reynolds & Kamphaus, 2004), and the Adult Sibling Relationship Questionnaire (ASRQ) (Buhrmester & Furman, 1990) (See Appendix E). The order of the questionnaires contained in each packet was randomized using a Latin square design.

*The Multi-Dimensional Emotional Empathy Scale* (Caruso & Mayer, 1998) is a 30-item self-report scale which assesses dimensions of empathy. It makes use of a 5 point Likert-type scale ranging from “1” for “strongly disagree” to “5” for “strongly agree” (Caruso & Mayer, 1998). The internal consistency as computed by coefficient alpha is
The sample consisted of 793 participants ranging in age from 11 to 70. This study utilized all four subscales which include Empathic Suffering (alpha = .80), Positive Sharing (.71), Emotional Attention (.63) Feeling for Others (.59) to generate a total score. The total score is titled by the authors as General Empathy (.86). In terms of internal consistency reliability, Caruso and Mayer (1998) also reported that nearly 40% of the variance in their General Empathy scale was held in common with the Mehrabian-Epstein adapted scale.

The Behavioral Assessment System for Children – Second Edition (BASC-2) - Self-Report of Personality (SRP) College 18-25 is a multidimensional tool measuring positive and negative dimensions of behavior and personality using self-perceptions (Reynolds & Kamphaus, 2004). Internal consistency is reported as .90 for composites and .83 for scales. Test-retest reliability is reported as .90 for composites and .84 for scales. Responses for items 1 through 68 are “True/False,” while responses for items 69 through 185 range from “1” for “Never” to “4” for “Almost Always” on a 4 point Likert-type scale. The sample was comprised of 3,400 participants for the Self-Report of Personality questionnaires (Reynolds & Kamphaus, 2004). Of the 18 subscales, the Anxiety, Depression, Interpersonal Relations, Relations with Parents, School Maladjustment, Self-Reliance, Sense of Inadequacy, and Social Stress subscales will be used in this study.

The Adult Sibling Relationship Questionnaire (ASRQ) is an 81-item self-report questionnaire assessing the dimensions of warmth, conflict, and rivalry within the relationship between two siblings. This measure utilizes a 5-point Likert-type scale ranging from “1” for “hardly at all” or “hardly anything” through “5” for “extremely much” on all 14 scales except for the Maternal Rivalry and Paternal Rivalry scales. For
these two scales, responses range from “1” for “I am usually favored” through “5” for “This sibling is usually favored.” The normative sample consisted of 383 undergraduates and internal consistency was gauged using Cronbach’s alpha. The 14 scales combine into 3 higher-order factors of Warmth (alpha = .97), Conflict (.93), and Rivalry (.88). The factor of Warmth is comprised of the scale Similarity (.83), Intimacy (.91), Affection (.92), Admiration (.83), Emotional Support (.90), Instrumental Support (.76), Acceptance (.88), and Knowledge (.88). Conflict factor is comprised of Quarreling (.86), Antagonism (.90), Competition (.85), and Dominance (.74) scales. The third factor, Rivalry, contains the scales of Maternal Rivalry (.85) and Paternal Rivalry (.89). Test-retest reliability remained stable over 2 weeks with correlations between .75 and .93. Also, Competition and Dominance were the only two scales to significantly correlate with social desirability. The magnitude of the correlations was minimal; -.21 and -.14 respectively (Stocker, Lanthier, & Furman, 1997). The factor of Warmth and the scales of which it is comprised were utilized in this study.

**Procedures**

The study utilized a quasi-experimental design with one group which consisted of students with a history of having an ill sibling, i.e., the “target group,” and a second group which consisted of students with siblings who did not have a chronic illness, i.e., the “comparison group.” Participants were able to choose a session in which to complete the packet. A number of dates and times were available from which to choose. The materials were administered to small groups of participants in a designated classroom or lab and were completed individually. Participants required approximately 25-45 minutes to complete the packets of surveys and questionnaires. When participants reported to the
designated room, an instruction script was read and they then read and signed the informed consent document. They were also provided with a copy to retain for themselves (See Appendix A & B).

Upon signing the informed consent, participants were provided with a packet which contained a demographic questionnaire, the Behavioral Assessment System for Children – Second Edition, the Multi-Dimensional Emotional Empathy Scale, and the Sibling Relationship Questionnaire in random order. The researcher or research assistant was present and available throughout the session to provide any assistance or answer any questions. After finishing the questionnaire packet, each participant was given a debriefing statement explaining the purpose of the research (See Appendix E). Participants were informed that they were free to leave or withdraw at any point without penalty.
RESULTS

The data analyses for the present study consisted of four phases. First, descriptive statistics including frequencies, means, and standard deviations were computed for all variables. Next, a series of Analysis of Variances (ANOVAS) were run to investigate hypotheses 1-3 examining between group differences in empathy, internalizing symptomatology, and sibling closeness. The third stage included an analysis of Pearson correlation coefficients between study variables. Finally, a linear regression was run as a preliminary investigation of the factors that predict empathy levels in individuals who have had a history of a sibling with a chronic illness.

Descriptive Analyses

Data from three participants who failed to complete items or marked responses that compromised their validity index on the BASC-II were not included in the following analyses. The percentages and frequencies of the nominal and ordinal variables for this study are summarized in Table 1. Table 2 summarizes the means, standard deviations, and ranges for the continuous variables. To inspect for any significant differences in demographic variables between the target group and the comparison group, a series of independent sample t-tests were conducted. For the demographic variables of gender, ethnicity, and sibling gender chi-square tests were conducted. A chi-square analysis resulted in no significant difference in gender between groups $\chi^2(1, N = 61) = 2.94, p$
Further, all other demographic variables were nonsignificant with the exception of age ($t(1,58) = -3.110, p = .003$), and class year of the participant ($t(1,59) = -3.212, p = .002$). The target group was comprised of participants that were approximately one year older ($M = 19.63, M = 20.57$) and one class year higher ($M = 1.74, M = 2.57$).
Table 1

Descriptive Statistics for Nominal and Ordinal Level Study Measures for Participants in the Target and Comparison Groups (N=61)

<table>
<thead>
<tr>
<th>Measure</th>
<th>Target</th>
<th></th>
<th>Comparison</th>
<th></th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Freq. Mean( SD)</td>
<td>%</td>
<td>Freq. Mean( SD)</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Participants</td>
<td>30 1.70(0.47)</td>
<td>49.2%</td>
<td>31 1.48(0.51)</td>
<td>50.8%</td>
<td>-1.732</td>
</tr>
<tr>
<td>Gender</td>
<td>Male  9 30.0%</td>
<td></td>
<td>Female  21 70.0%</td>
<td></td>
<td>-1.732</td>
</tr>
<tr>
<td>Class/Year</td>
<td>Freshman 6 20.0%</td>
<td></td>
<td>Sophomore 9 30.0%</td>
<td></td>
<td>-1.732</td>
</tr>
<tr>
<td></td>
<td>Junior 7 23.3%</td>
<td></td>
<td>Senior 8 26.7%</td>
<td></td>
<td>-1.732</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>Caucasian/White 28 93.3%</td>
<td></td>
<td>African American 1 3.3%</td>
<td></td>
<td>-1.732</td>
</tr>
<tr>
<td></td>
<td>Hispanic 0 0.0%</td>
<td></td>
<td>Other 1 3.3%</td>
<td></td>
<td>-1.732</td>
</tr>
<tr>
<td>Socioeconomic Status</td>
<td>&gt; $100,000 12 41.4%</td>
<td></td>
<td>$75,000 – $100,000 4 13.8%</td>
<td></td>
<td>-1.732</td>
</tr>
<tr>
<td></td>
<td>$50,000 – $75,000 7 24.1%</td>
<td></td>
<td>$25,000 – $50,000 2 6.9%</td>
<td></td>
<td>-1.732</td>
</tr>
<tr>
<td></td>
<td>&lt; $25,000 4 13.8%</td>
<td></td>
<td></td>
<td></td>
<td>-1.732</td>
</tr>
<tr>
<td>Sibling Gender</td>
<td>Male 13 43.3%</td>
<td></td>
<td>Female 17 56.7%</td>
<td></td>
<td>-1.732</td>
</tr>
<tr>
<td>Type of Illness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

27
<table>
<thead>
<tr>
<th>Condition</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asthma</td>
<td>12</td>
<td>40.0%</td>
</tr>
<tr>
<td>Epilepsy</td>
<td>2</td>
<td>6.7%</td>
</tr>
<tr>
<td>Diabetes</td>
<td>7</td>
<td>23.3%</td>
</tr>
<tr>
<td>Seizure Disorder</td>
<td>1</td>
<td>3.3%</td>
</tr>
<tr>
<td>Other</td>
<td>8</td>
<td>26.7%</td>
</tr>
</tbody>
</table>

**Frequency of Hospitalizations**

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple/month</td>
<td>2</td>
<td>6.7%</td>
</tr>
<tr>
<td>Once a month</td>
<td>2</td>
<td>6.7%</td>
</tr>
<tr>
<td>2-3 times a year</td>
<td>3</td>
<td>10.0%</td>
</tr>
<tr>
<td>1 time a year</td>
<td>4</td>
<td>13.3%</td>
</tr>
<tr>
<td>Only once</td>
<td>14</td>
<td>46.7%</td>
</tr>
<tr>
<td>Never</td>
<td>5</td>
<td>16.7%</td>
</tr>
</tbody>
</table>

*Note. **p < .01*
Table 2

*Descriptive Statistics for Continuous Level Study Measures for Participants in the Target and Comparison Groups (N=61)*

<table>
<thead>
<tr>
<th>Measure</th>
<th>Target</th>
<th></th>
<th></th>
<th>Comparison</th>
<th></th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Range</td>
<td>Mean</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>20.57</td>
<td>1.30</td>
<td>18-23</td>
<td>19.63</td>
<td>1.00</td>
<td>-3.110**</td>
</tr>
<tr>
<td>Current Age of Sibling</td>
<td>20.07</td>
<td>4.61</td>
<td>12-28</td>
<td>18.97</td>
<td>5.75</td>
<td>-0.822</td>
</tr>
<tr>
<td>Age of Ill Sibling at Diagnosis</td>
<td>11.00</td>
<td>6.43</td>
<td>1-25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time since Diagnosis in Years</td>
<td>9.10</td>
<td>6.23</td>
<td>&lt;1-22</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* **p <.01
Relationship between Study Variables

Pearson products-moment correlations were conducted to investigate any significant relationships between study variables and group membership (i.e., target or comparison group). Results of these analyses indicated that empathy was positively correlated with having a sibling with a chronic illness as predicted, $r = .26, p = .043$. Empathy was also positively correlated with anxiety, $r = .28, p = .027$. No significant correlations were found between group membership and anxiety, depression, or warmth. Further, empathy was not significantly related to depression nor was warmth significantly related to anxiety, depression, or empathy. Finally, depression was positively correlated with anxiety, $r = .61, p < .001$ (See Table 3).

Focusing on the target group alone, a second series of Pearson product-moment correlations was conducted to explore any significant relationships between study variables. Results of these analyses were similar to the initial sequence. Specifically, a marginal positive correlation was found between empathy and anxiety, $r = .36, p = .049$. Depression was negatively correlated with warmth, $r = -.47, p = .009$ and anxiety was positively correlated with depression, $r = .62, p < .001$ (See Table 4).
Table 3

Correlations between Study Variables and Group Membership

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Group Membership(^a)</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Anxiety T-score</td>
<td>.17</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Depression T-score</td>
<td>-.08</td>
<td>.61**</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Empathy Score</td>
<td>.26*</td>
<td>.28*</td>
<td>.06</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Warmth Score</td>
<td>-.10</td>
<td>-.20</td>
<td>-.20</td>
<td>.25</td>
<td>--</td>
</tr>
</tbody>
</table>

Note. \(^a\)Group membership was divided into target and comparison groups and analyzed utilizing dummy coding. By including group membership in the table, correlations relating to whether the participant has an ill sibling can be illustrated. *\(p < .05\), **\(p < .01\)
Table 4

*Correlations between Study Variables for Target Group*

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Anxiety T-score</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Depression T-score</td>
<td>.618**</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Empathy Score</td>
<td>.362*</td>
<td>.230</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>4. Warmth Score</td>
<td>-.182</td>
<td>-.468**</td>
<td>.327</td>
<td>--</td>
</tr>
</tbody>
</table>

Note. *p < .05, **p < .01
Analyses of Study Hypotheses

The first hypothesis stated that the target group would report higher levels of empathy than the comparison group as measured by a significantly higher score on the Multi-Dimensional Emotional Empathy Scale. To examine this first hypothesis, a one-way between subjects ANOVA was conducted. The hypothesis was supported as results indicated that those participants with siblings who had a pediatric chronic illness did report significantly higher levels of empathy, $F(1, 59) = 4.29, p = .043$.

The second hypothesis was likewise supported. It stated that the target group would not report internalizing symptomatology that differed from the comparison group. Specifically, there would be no differences in mean T-scores on the depression and anxiety subscales of the BASC-2 between the target group and the comparison group. As expected, a one way between subjects multivariate analysis of variance (MANOVA) resulted in no significant differences on the anxiety subscale T-scores, $F(1,59) = 1.83, p = .181$ or the depression subscale T-scores, $F(1, 59) = .370, p = .545$.

In investigating the third hypothesis which concerned level of sibling closeness between groups, a one way between subjects ANOVA was run. It was anticipated that those in the target group would report higher levels of closeness to their identified sibling as measured by the factor of Warmth on the ASRQ, but this was not supported by the analysis, $F(1,59) = .630, p = .430$.

Exploratory Analyses

In addition to the primary hypotheses, a preliminary investigation of the factors that predict empathy levels in individuals who have had a history of a sibling with a chronic illness was examined. It was hypothesized that empathy would be predicted by
gender, age at time of diagnosis, and level of sibling closeness as gauged by the ASRQ Warmth Scale. For this investigation, a linear regression was utilized revealing that the predictors accounted for 26% of the variance in empathy which was significant, $F(3,26) = 3.05, p = .047$. Participant gender ($\beta = .40, p = .029$) demonstrated significant effects on empathy while sibling closeness approached significance ($\beta = .35, p = .051$). Age of the sibling with the illness at diagnosis ($\beta = .11, p = .537$) was not significant. These results partially support the hypothesis and designate gender as the variable most predictive of empathy level (See Table 5).
### Table 5

*Summary of Linear Regression Analysis for Variables Predicting Empathy (N = 30)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant Gender</td>
<td>.37</td>
<td>.16</td>
<td>.40</td>
<td>2.31*</td>
</tr>
<tr>
<td>Age of Sibling at Diagnosis</td>
<td>.01</td>
<td>.01</td>
<td>.11</td>
<td>.63</td>
</tr>
<tr>
<td>Warmth Score</td>
<td>.21</td>
<td>.10</td>
<td>.35</td>
<td>5.05</td>
</tr>
</tbody>
</table>

*Note. \( R^2 = .26 \)

*\( p < .05 \)
DISCUSSION

The current study was designed to assess the long-term psychological effects of pediatric illness on healthy siblings. Individuals with siblings who had a chronic pediatric illness were compared with individuals with healthy siblings, and differences in empathy were examined. Previous research on pediatric chronic illness and its effect on healthy siblings have reached mixed conclusions (Cohen et al., 1994). Gardner (1998) as well as Strayer and Roberts (1997) have asserted that chronic illness, though a stressor for healthy siblings, results in benefits such as higher levels of empathy, prosocial behavior, family cohesiveness, better coping skills, maturity, and the ability to reconcile the differential distribution of family resources.

Other researchers offer differing conclusions where more negative effects such as elevations in social, emotional, academic, and behavioral problems and declinations in coping, parental support, and quality of life result (Barrera, Chung, Greenberg, & Fleming, 2002; Houtzager et al. 2004; Lobato, Kao, & Plante, 2005; Labay & Walco, 2004; Sahler, Roghmann, Carpenter, & Mulhern, et al., 1994). A meta-analyses by Sharpe and Rossiter (2002) concluded that there is little consensus concerning long-term effects. As such, more sound research designs are needed to specifically distinguish which variables factors into adjustment over time and how.
In addressing this conclusion, the present study has narrowed the target sample to individuals currently enrolled in college with a sibling who has had a chronic pediatric illness, but not a mental or developmental disability. The researcher predicted that levels of empathy and sibling closeness would be higher among individuals with a sibling who has an illness while levels of anxiety and depression would not differ. It was also hypothesized that empathy would be predicted by gender of the participant, age of the sibling at diagnosis and sibling closeness. These hypotheses will be discussed along with limitations of the study and possible directions for future research.

*Primary Research Hypotheses*

The first primary research hypothesis anticipated that the group of individuals with a sibling who had experienced a chronic illness would report higher levels of empathy than the group without an ill sibling. The Multi-Dimensional Emotional Empathy Scale was used to measure empathy and, as anticipated, the target group did report higher levels of empathy. This correlation supports the literature that has posited chronic illness in young siblings as creating change in the family dynamic where children learn more intimately what it is like to experience illness and what support is needed to endure the infirmity (Cohen, et al., 1994; Kazak, 1997; Silver & Frohlinger-Graham, 2000).

To further investigate which negative effects are maintained over time, the researcher also explored whether internalizing symptomatology, namely anxiety and depression, would differ between the target and comparison group. Although multiple researchers have documented negative effects such anxiety and depression, others have suggested that these harmful consequences tend to dissipate over time (Barrera, Chung,
Greenberg, & Fleming, 2002; Houtzager et al., 2004; Lobato, Kao, & Plante, 2005). The hypothesis that internalizing symptomatology would not differ between the two groups of participants was supported which is in agreement with the findings that negative effects may diminish over time and does not necessarily contradict findings that negative effects do occur as a result of illness in siblings.

One plausible interpretation of these two results in the literature is that individuals with a sibling who undergoes a chronic illness in childhood experience the period of initial diagnosis and treatment as a stressor that leads to a negative impact on adaptive functioning. As time progresses, however, the constraints caused by the illness are integrated by the family and become less debilitating. The participants in the current study may have had sufficient time to adjust to the ramifications and barriers of the illness as it effects the interrelations amongst family members and interrelations with others. Difficulties related to the illness, while likely still present, may have been largely normalized and assimilated by the participants leading to reduction in negative corollaries including internalizing symptomatology.

My final primary research hypothesis has not received as much coverage in the literature and was more speculative than the others. This hypothesis proposed that a higher level of closeness or warmth to the sibling with an illness was anticipated when compared to the relationship with the identified brother or sister of participants without an illness. I had speculated that warmth in the sibling relationship might be related to empathy. Analyses of the scores on the ASRQ and of the study variables somewhat supported this speculation (See Table 3). There was a trend toward significance in the level of sibling closeness between groups. The factors involved in having a sibling with a
chronic illness seemed to generate – at least in the long run – a small increase in the warmth of the relationship. It is possible, however, that since some individuals seem to experience negative effects from the sibling’s illness while others benefit in some ways over time and still more likely experience a combination of healthy and hurtful effects, a difference in closeness may be cancelled out. Explicitly, experiencing illness in a sibling negatively (i.e., less parental attention, fewer resources) might result in less warmth between siblings than would have existed otherwise and experiencing some gain (i.e. increased independence, maturity) might lead to better sibling relations.

Related, it is interesting that a significant negative correlation existed between level of depression and warmth. Perhaps, less depressed individuals are better able to express warmth and closeness. Just as plausible, a close relationship between siblings may lighten feelings of depression. Given the known complexity of the stressor of chronic pediatric illness, perhaps sibling closeness is affected dramatically, but would need to be explored more intently. Further research would be necessary to draw any strong conclusions concerning warmth in the sibling relationship.

*Exploratory Hypothesis*

As a more exploratory step following the primary analyses, three factors were examined as possible predictors of empathy levels in individuals who have had a history of a sibling with a chronic illness. For this step, only the target group was used. Considering research positing gender and developmental stage at time of diagnosis as factors in the adaptation of healthy siblings, it was anticipated that they might also play a role in the development of empathy (Houtzager et al., 2004; Silver & Frohlinger-Graham, 2000). Silver and Frohlinger-Graham (2000) reported that girls and elder sisters, in
particular, take on the role of secondary caregiver and as such may have greater opportunity to experience empathic development. Given the possible complications surrounding the variable of sibling closeness, this factor was also included to determine if a relationship existed with empathy in a linear regression model.

As discussed in the results, gender was the only significant predictor of empathy. Specifically, females reported higher levels of empathy which is in agreement with the literature and raises an additional series of research questions concerning the role of gender in the sibling dynamic, parental expectations based on sex, and the extent to which empathy is connatural to females (Houtzager et al., 2004; Silver & Frohlinger-Graham, 2000). Numerous researchers have reported that females feel and emit more empathy than males as gauged by self-report, observation, and physiological measurements (Eisenberg & Lennon, 1983; Han, Fan, & Mao, 2008; Larden, Melin, Holst, & Langstrom, 2006; Mayberry & Espelage, 2007; Yang, Decety, Lee, Chen, & Cheng, 2009). However, it should be noted that other researchers have found contradictory findings where males reported and displayed as much or more empathy than females (Ickes, Gesn, & Graham, 2005; Klein & Hodges, 2001).

The gender differences in empathy may have biased the analysis of the current study. Specifically, the elevation in empathy among the target group may have been more a product of participant gender than the general experience of having a sibling with a chronic illness. Again, further study is necessary to more completely understand how the factors of gender and empathy interact in individuals with a chronically ill sibling. Future researchers might develop study designs that explicitly investigate the role of gender by measuring empathy across familial stressors including chronic illness in siblings, but also
cases such as illness in the parental subsystem, psychopathology in the family, and other familial crises.

*Study Limitations*

Several limitations of the present study should be addressed. To begin, one of the most often discussed suggestions for improving research designs for this area of study has been to create a less diverse illness sample (Houtzager et al., 2004; Sharpe & Rossiter, 2002). The current sample included participants with siblings who covered a wide range of ages from 5- through 35-years-old. Wide ranges also existed for the ages of the siblings when they were diagnosed with a chronic illness (i.e., 1 to 25 years) as well as for the time that had elapsed since receiving the diagnosis (i.e., less than 1 to 22 years). Observing a college sample provides a new perspective as discussed in the literature review. However, since participants varied by years in the time since diagnosis and because time plays a role in adjustment, the results must be considered possibly compromised.

In addition to these ranges, age and class year differed between study groups and sample size and array of illnesses were not ideal. As discussed above, the difference in age and class year arose because most comparison group participants were recruited from introductory psychology classes while wider recruitment efforts were required to obtain sufficient participants for the target group since they needed to have the more stringent qualifier of having a sibling with a chronic illness. Furthermore, the current sample size was smaller than ideal which limited the statistical power of the analyses. In particular, my hypothesis concerning predictors of empathy in individuals with a sibling who has a chronic illness was analyzed using a linear regression comprised of three factors as
discussed above using a minimal sample size of 30. Plus, in order to recruit the sample, it was necessary to include participants with siblings who had a range of different illnesses.

A strength of the current study involved the exclusion of siblings with physical disabilities or psychological disorders such as mental retardation as these have been reported as complicating results in the past (Sharpe & Rossiter, 2002). Nevertheless, the number of illnesses included is not ideal as it is easy to envision a significant difference in psychological effects on healthy siblings when their brother or sister has been diagnosed with asthma versus cancer.

Another area of limitation for the current study arose with regard to the skewed distribution of socioeconomic status among participants. For both groups, over forty percent of participants were members of households with an income over $100,000. It was anticipated that the socioeconomic status of participants would be inflated as recruitment occurred exclusively at a private university. Indeed, the distribution is skewed towards higher wealth and this limits generalizability. Having families with greater incomes likely affected the data by artificially reducing negative impacts of the illness. Families of higher wealth likely have more access to resources to aid in the adjustment to the chronic illness. These resources could include better access to health care and less disparity in the distribution of spending between healthy and ill siblings such that healthy siblings do not experience a considerable reduction in material needs due to the illness as might occur in poorer families. Better care and less disparity in parents’ material provisions amongst siblings could lead to the experience of less stress, anxiety, feelings of guilt, and jealousy. Since, negative symptomatology was a central
focus of the current study, the skewed distribution in wealth must be considered a limitation.

A couple additional limitations should also be covered regarding demographic characteristics. For three of the participants with a sibling who had a chronic illness, the diagnosis had been made within the past year which would presumably limit the development of any long-term effects of the illness on the healthy sibling. Although some evolution in the results of having an illness in the family may have occurred, these participants were not dealing with the condition as long as other participants. Finally, while the gender distribution of the participants without an ill sibling was nearly even with 16 males and 15 females, the group with an ill sibling contained more females; 21 to 9 males. This is a serious flaw in the study especially since, as explained above, gender is closely related to empathy. Therefore, differences in empathy between groups might have been determined by having a discrepancy in the number of female participants and not by having a chronic illness in the family.

Practical limitations should be noted as well. In recognizing the need to keep participants’ sessions concise, certain speculative assumptions were made about the sample. Specifically, the researcher assumed that having passed adolescence and currently attending college, most problem behaviors in response to the sibling’s illness were outgrown or never exhibited. Therefore measures of such behaviors as acting out, aggression toward parents, and criminal involvement were not used. As reviewed above, the literature contains studies documenting problem behavior as an outcome in siblings of children with a pediatric illness, but it was not addressed in the current study (Barrera,
Finally, and perhaps most importantly, although the present study was designed with the intent of providing information on the long-term effects of chronic pediatric illness on healthy siblings, multiple researchers (Houtzager et al., 2004; Sharpe & Rossiter, 2002) have specifically insisted upon the need for longitudinal research as opposed to cross-sectional or single point studies. Houtzager et al., (2004) insisted that the process of adapting and responding to the distress caused by illness in the family is a dynamic process which calls for observation across time. Means were not available to create a longitudinal design in the current study, but the need for future longitudinal research is recognized and encouraged.

Future Directions

Several additional directions for future research should also be discussed. To begin, roughly 1 in 10 children can be expected to have a sibling with a pediatric chronic illness. There is significant evidence that the illness works as a stressor on healthy siblings yet understanding of how the stressor functions and evolves remains elusive (Breyer, et al., 1993). Thus, there is ample reason to pursue further this area of research. In particular, future studies should focus on limiting sample variables to the extent possible. For instance, developmental delays produce an additional set of stressors that are likely not exclusive to those of a chronic illness, but complicate conclusions when included (Houtzager et al., 2004). Likewise, additional stressors such as low socioeconomic status and poor family relations add to the complexity and must be controlled for where possible. Other factors that have garnered some support in the
literature should also be recognized and controlled for when designing future studies. These factors include emotional and physical resources, parental reactions to the illness, sibling role in the family, and severity of the illness (Breyer, et al., 1993; Kazak, 1989; Kazak, 1997; Silver & Frohlinger-Graham, 2000).

In brief, the impact of pediatric chronic illness on healthy siblings is significant and the ways in which it affects family life, interpersonal relationships, and daily functioning varies across individuals (Breyer, et al., 1993). Thus, future studies should focus on recruiting very specific samples focusing on a minimal number of variables in an effort to tease apart which factors contribute to a healthy sibling’s functioning and how. Qualitative data may be especially helpful considering the individual differences in response to the stressor. As usual, larger sample sizes would be helpful in increasing statistical power and generalizability. Also, the importance of quality replication cannot be understated. Integrating the above suggestions, the best design for future research would likely be longitudinal.

This study focused specifically on college students who have experienced illness in a sibling, but individuals in every stage of life who have experienced illness in the family could likely benefit from solid findings in this area of research. Quality research could inform multiple resources in the healthy individuals’ lives including parents, health professionals, and intervention specialists as well as the individuals themselves. Consequently, better support could be provided for adjustment through understanding of the factors that might promote or inhibit growth from the experience of having a sibling with a chronic illness.
APPENDIX A

Informed Consent

Informed Consent to Participate in a Research Project

Project Title: Effects of Chronic Illness on Healthy Siblings
Investigators: Courtney Ryan, Masters Student in Psychology at UD (Faculty Sponsor: Keri Brown Kirschman, Ph.D.)

Description of Study: You are being asked to complete a number of questionnaires designed to collect information on empathy, behavioral, and emotional levels as well as coping responses, family cohesion and your relationship with one of your siblings. In addition, you will be asked to provide basic demographic information.

Adverse Effects and Risks: It is not expected that there will be any adverse effects on you from participating in this research. It is possible that some of the questions asked may arouse feelings of anger, distress, anxiety, sadness or other negative emotions. You are free to discontinue participation at any point throughout the session without penalty. If you do decide to withdrawal from the study, you would still receive any agreed-upon credit for participation.

Duration of Study: The session is expected to last approximately 45-60 minutes.

Confidentiality Of Data: Your name will only appear as you provide it on this consent form so that credit for participation can be granted. Your name will not be connected with your responses. A study identification number will be assigned and used on all data. Any written work (e.g. journal article) resulting from this research will report group responses and individual participants will not be identified.

Contact Person: If you have questions or problems regarding the research session, please contact the student investigator Courtney Ryan at 937-723-7359 or at ryancommnotes.udayton.edu. Also, you should feel free to contact my research supervisor, Keri Brown Kirschman, Ph.D. at 937-229-5404 or at kirschke@notes.udayton.edu. If you would like more information about your rights as a participant, please contact the Chair of the Research Review and Ethics Committee, Greg Elvers, Ph.D. at 937-229-
2171 or at greg.elvers@notes.udayton.edu. Furthermore, if the materials presented to you today caused any negative feelings or emotional distress, please contact the Counseling Center at 937-229-3141. The UD Counseling Center provides free, confidential services to undergraduates. The UD Counseling Center is located in Gosiger Hall at 300 College Park, Dayton, OH 45469.

**Consent to Participate:**

I have voluntarily decided to participate in this testing session. The graduate student investigator or her assistant has adequately answered any and all questions I have about this research session, the procedures involved, and my participation. I understand that the graduate student or her assistant will be available throughout this session to answer any questions. I also understand that I may voluntarily terminate my participation in this study at any time without a penalty of any kind and that I would still receive full credit. I also understand that the graduate student or her assistant may terminate my participation in this session if he/she feels that this would be in my best interest. Finally, I certify that I am 18 years of age or older.

_______________________________________________________________
Signature of Student   Student’s Name (printed)   Date

_______________________________________________________________
Signature of Witness       Date
APPENDIX B

Instruction Script

Hello and welcome. If I can have your attention for a minute, I will read through some brief instructions and we can begin. Thank you for coming. Today, you will be asked to participate in research on the long term effects in siblings of children with chronic illnesses. You will either be part of the target or comparison group depending on whether you had an ill sibling or not, respectively. Please begin by reading and signing the consent forms. Return one to me and you can keep the second copy. Then, you can proceed with answering the questions in the packet of questionnaires you have before you. When answering questions that concern siblings, please choose only one sibling and keep that person in mind throughout this session. If you have a sibling who has suffered a pediatric chronic illness, please keep that particular sibling in mind.

When you are finished, you can bring your packet up to me and I will provide you with a debriefing form. Remember that you can withdrawal from the study at any time without penalty. You would still receive full credit for participation. If you have any questions or concerns at any point throughout the session, please feel free to ask.
APPENDIX C

Demographics Questionnaire for Individuals without an Ill Sibling

Date of Birth: __________
Sex: _____ Male _____ Female
Class: _____ Freshman
       _____ Sophomore
       _____ Junior
       _____ Senior
       _____ Fifth Year
Ethnicity: _____ Caucasian
       _____ Asian
       _____ African American
       _____ Hispanic
       _____ Other (Please List): ______________________

Socioeconomic Status:
Approximate Annual Family Income
       _____ >$100,000
       _____ $75,000-$100,000
       _____ $50,000-$75,000
       _____ $25,000-$50,000
       _____ <$25,000

Highest Level of Parental Education
Father: _____ High School Graduate
       _____ Post Graduate (M.D., M.A., Ph.D.)
       _____ Did not finish High School
Mother: _____ College Graduate
       _____ Some College
       _____ Post Graduate (M.D.,
If you have more than one sibling, please choose the sibling that was born in the earliest month of the year. For example, if you have a sibling born in January, another born in June, and one in November, choose the sibling born in January (regardless of the year) and provide responses concerning that sibling.

Date of Birth of Sibling: ___/___/_____
MM /DD/YYYY

Current Age of Sibling: ________

Sex of Sibling: _____ Male _____ Female

Please take a moment and think back to your home life:
How worried do you remember your mom was about the overall welfare of your sibling?
Not at all 1 2 3 4 5 Very Much _____ I don’t remember

How worried do you remember your dad was about the overall welfare of your sibling?
Not at all 1 2 3 4 5 Very Much _____ I don’t remember
APPENDIX D

Demographics Questionnaire for Individuals with an Ill Sibling

Date of Birth: __________

Sex: _____ Male ______ Female

Class: _____ Freshman
       _____ Sophomore
       _____ Junior
       _____ Senior
       _____ Fifth Year

Ethnicity: _____ Caucasian
           _____ Asian
           _____ African American
           _____ Hispanic
           _____ Other (Please List): ______________________

Socioeconomic Status:

<table>
<thead>
<tr>
<th>Approximate Annual Family Income</th>
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<tbody>
<tr>
<td>&gt;$100,000</td>
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<tr>
<td>$75,000-$100,000</td>
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<td>$50,000-$75,000</td>
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<tr>
<td>$25,000-$50,000</td>
<td></td>
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<tr>
<td>&lt;$25,000</td>
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</table>

Highest Level of Parental Education

Father:
- _____ Post Graduate (M.D., M.A., Ph.D.)
- _____ College Graduate
- _____ Some College
- _____ High School Graduate
- _____ Did not finish High School

Mother:
- _____ Post Graduate (M.D., M.A., Ph.D.)
- _____ College Graduate
- _____ Some College
- _____ High School Graduate
- _____ Did not finish High School
Date of Birth of Ill Sibling: ___/___/_____
                      MM /DD/ YYYY
Current Age of Ill Sibling: __________
Sex of Ill Sibling: _____ Male ______ Female
Age of Ill Sibling at Diagnosis: ______
Type of Illness:
_____ Pediatric Cancer  _____ Asthma  _____ Cerebral Palsy
_____ Sickle Cell Anemia  _____ Epilepsy  _____ Cystic Fibrosis
_____ Spina Bifida  _____ Diabetes  _____ Pulmonary Problems
_____ Cardiac Problems  _____ Severe Food Allergies  _____ Seizure Disorder
_____ Hemophilia  _____ Other (please specify) _______________________
How often was your sibling hospitalized for the illness?
[ ] Multiple times/month [ ] Once/mo. [ ] 2-3 times/year [ ] 1 time/yr. [ ] Only Once [ ]  Never
Has the Ill Sibling been diagnosed with Mental Retardation: ______(Y or N)

Please pause and take a moment to think back on the period of time when your
sibling’s illness was most intense:

How worried do you remember your mom was about the welfare of your ill sibling?
Not at all 1 2 3 4 5 Very Much ______ I don’t remember.

How worried do you remember your dad was about the welfare of your ill sibling?
Not at all 1 2 3 4 5 Very Much ______ I don’t remember

How severely did the illness affect your mom emotionally?
Not at all 1 2 3 4 5 Very Much ______ I don’t remember

How severely did the illness affect your dad emotionally?
Not at all 1 2 3 4 5 Very Much ______ I don’t remember

How informed do you think you were about the illness?
Not at all 1 2 3 4 5 Very Much ______ I don’t remember
How severe do you feel the illness was during the period when it was most intense?
   Not at all   1   2   3   4   5 Very Much ______ I don’t remember

How much did you feel it disrupted family life during the period when it was most intense?
   Not at all   1   2   3   4   5 Very Much ______ I don’t remember

Please indicate an illness timeline. (e.g. My brother was diagnosed in 1997. The illness was most intense from 1998 through 2001 during which time he was hospitalized approximately 6 times. Since 2001, he has only been hospitalized 2 other times.) Approximate time periods are completely acceptable.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
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APPENDIX E

Empathy Scale

On the following items, please rate the level to which you agree or disagree with each statement:

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<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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</table>

Strongly Disagree  Strongly Agree

<table>
<thead>
<tr>
<th>Multi-Dimensional Emotional Empathy Scale (Caruso &amp; Mayer, 1998).</th>
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</thead>
<tbody>
<tr>
<td>1. I feel like crying when watching a sad movie.</td>
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<tr>
<td>2. Certain pieces of music can really move me.</td>
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<tr>
<td>3. Seeing a hurt animal by the side of the road is very upsetting.</td>
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<td>4. I don't give others' feelings much thought.</td>
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<tr>
<td>5. It makes me happy when I see people being nice to each other.</td>
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<td>6. The suffering of others deeply disturbs me.</td>
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<tr>
<td>7. I always try to tune in to the feelings of those around me.</td>
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<tr>
<td>8. I get very upset when I see a young child who is being treated meanly.</td>
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<tr>
<td>9. Too much is made of the suffering of pets or animals.</td>
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<tr>
<td>10. If someone is upset I get upset, too.</td>
</tr>
<tr>
<td>11. When I'm with other people who are laughing I join in.</td>
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<td>12. It makes me mad to see someone treated unjustly.</td>
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<td>13. I rarely take notice when people treat each other warmly.</td>
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<td>14. I feel happy when I see people laughing and enjoying themselves.</td>
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<td>2</td>
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<td>4</td>
<td>5</td>
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</table>
On the following items, please rate the level to which you agree or disagree with each statement:

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<thead>
<tr>
<th></th>
<th>Statement</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<tbody>
<tr>
<td>15.</td>
<td>It's easy for me to get carried away by other people's emotions.</td>
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<td>16.</td>
<td>My feelings are my own and don't reflect how others feel.</td>
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<td>17.</td>
<td>If a crowd gets excited about something so do I.</td>
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<td>18.</td>
<td>I feel good when I help someone out or do something nice for someone.</td>
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<td>19.</td>
<td>I feel deeply for others.</td>
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<td>20.</td>
<td>I don't cry easily.</td>
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<td>21.</td>
<td>I feel other people's pain.</td>
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<td>22.</td>
<td>Seeing other people smile makes me smile.</td>
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<td>23.</td>
<td>Being around happy people makes me feel happy, too.</td>
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<td>24.</td>
<td>TV or news stories about injured or sick children greatly upset me.</td>
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<td>25.</td>
<td>I cry at sad parts of the books I read.</td>
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<td>26.</td>
<td>Being around people who are depressed brings my mood down.</td>
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<td>27.</td>
<td>I find it annoying when people cry in public.</td>
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<td>28.</td>
<td>It hurts to see another person in pain.</td>
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<td>29.</td>
<td>I get a warm feeling for someone if I see them helping another person.</td>
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<td>30.</td>
<td>I feel other people's joy.</td>
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APPENDIX F

Adult Sibling Relationship Questionnaire

Instructions and Basic Information
This questionnaire is concerned with your relationship with one of your siblings. Each question asks you to rate how much different behaviors and feelings occur in your relationship. Try and answer each question as quickly and accurately as you can. Try and answer the questions as your relationship is now, not how it was in the past, nor how you think it might be in the future. In the remainder of the questionnaire, whenever you see THIS SIBLING or YOUR SIBLING we are talking about the specific sibling you are completing the study about. We begin by asking you some general questions about your sibling and yourself. Please circle, check, or fill in the correct response.

1a) Your age: ________

1b) This sibling’s age: ________

2a) Your gender: Male Female

2b) This sibling’s gender: Male Female

3a) Your birth order: 1 = firstborn, 2 = secondborn, 3 = thirdborn, 4 fourthborn, 5 = laterborn

3b) This sibling's birth order: 1 = firstborn, 2 = secondborn, 3 = thirdborn, 4 fourthborn, 5 = laterborn

How far does this sibling live from you? (circle the correct response)

1) same city
2) different city, less than 100 miles
3) between 100 & 200 miles
4) between 200 and 500 miles
5) between 500 and 1000 miles
6) more than 1,000 miles

How much do you and this sibling see each other?

[ ] 1 Hardly At All  [ ] 2 A Little  [ ] 3 Somewhat  [ ] 4 Very Much  [ ] 5 Extremely Much

How much does this sibling phone you?

[ ] 1 Hardly At All  [ ] 2 A Little  [ ] 3 Somewhat  [ ] 4 Very Much  [ ] 5 Extremely Much

How much do you phone this sibling?

[ ] 1 Hardly At All  [ ] 2 A Little  [ ] 3 Somewhat  [ ] 4 Very Much  [ ] 5 Extremely Much

56
How much do you and this sibling see each other for holidays and family gatherings?
- [ ] 1 Hardly At All
- [ ] 2 A Little
- [ ] 3 Somewhat
- [ ] 4 Very Much
- [ ] 5 Extremely Much

What is your relationship to this sibling?
- 1) biological sibling
- 2) twin
- 3) step sibling
- 4) half sibling
- 5) other (please explain) _______________

Now we would like some information about your other siblings
DO NOT INCLUDE THIS SIBLING HERE

<table>
<thead>
<tr>
<th>Sib #1:</th>
<th>Age</th>
<th>Gender</th>
<th>Relationship (bio, step, twin)</th>
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<tbody>
<tr>
<td>M</td>
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<td>F</td>
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<tr>
<th>Sib #3:</th>
<th>Age</th>
<th>Gender</th>
<th>Relationship (bio, step, twin)</th>
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<tbody>
<tr>
<td>M</td>
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<td>F</td>
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</table>

<table>
<thead>
<tr>
<th>Sib #5:</th>
<th>Age</th>
<th>Gender</th>
<th>Relationship (bio, step, twin)</th>
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<tr>
<td>M</td>
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<tr>
<td>F</td>
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</table>

<table>
<thead>
<tr>
<th>Sib #7:</th>
<th>Age</th>
<th>Gender</th>
<th>Relationship (bio, step, twin)</th>
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<tbody>
<tr>
<td>M</td>
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<td>F</td>
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</table>

Turn the page and begin the Adult Sibling Relationship Questionnaire
1) How much do you and this sibling have in common?
[ ] 1 Hardly Anything  [ ] 2 A Little  [ ] 3 Somewhat  [ ] 4 Very Much  [ ] 5 Extremely Much

2) How much do you talk to this sibling about things that are important to you?
[ ] 1 Hardly Anything  [ ] 2 A Little  [ ] 3 Somewhat  [ ] 4 Very Much  [ ] 5 Extremely Much

3) How much does this sibling talk to you about things that are important to him or her?
[ ] 1 Hardly At All  [ ] 2 A Little  [ ] 3 Somewhat  [ ] 4 Very Much  [ ] 5 Extremely Much

4) How much do you and this sibling argue with each other?
[ ] 1 Hardly At All  [ ] 2 A Little  [ ] 3 Somewhat  [ ] 4 Very Much  [ ] 5 Extremely Much

5) How much does this sibling think of you as a good friend?
[ ] 1 Hardly At All  [ ] 2 A Little  [ ] 3 Somewhat  [ ] 4 Very Much  [ ] 5 Extremely Much

6) How much do you think of this sibling as a good friend?
[ ] 1 Hardly At All  [ ] 2 A Little  [ ] 3 Somewhat  [ ] 4 Very Much  [ ] 5 Extremely Much

7) How much do you irritate this sibling?
[ ] 1 Hardly At All  [ ] 2 A Little  [ ] 3 Somewhat  [ ] 4 Very Much  [ ] 5 Extremely Much

8) How much does this sibling irritate you?
[ ] 1 Hardly At All  [ ] 2 A Little  [ ] 3 Somewhat  [ ] 4 Very Much  [ ] 5 Extremely Much

9) How much does this sibling admire you?
[ ] 1 Hardly At All  [ ] 2 A Little  [ ] 3 Somewhat  [ ] 4 Very Much  [ ] 5 Extremely Much

10) How much do you admire this sibling?
[ ] 1 Hardly At All  [ ] 2 A Little  [ ] 3 Somewhat  [ ] 4 Very Much  [ ] 5 Extremely Much
11) Do you think your mother favors you or this sibling more?
[ ] 1 I am usually favored
[ ] 2 I am sometimes favored
[ ] 3 Neither of us is favored
[ ] 4 This sibling is sometimes favored
[ ] 5 This sibling is usually favored

12) Does this sibling think your mother favors him/her or you more?
[ ] 1 I am usually favored
[ ] 2 I am sometimes favored
[ ] 3 Neither of us is favored
[ ] 4 This sibling is sometimes favored
[ ] 5 This sibling is usually favored

13) How much does this sibling try to cheer you up when you are feeling down?
[ ] 1 Hardly At All [ ] 2 A Little [ ] 3 Somewhat [ ] 4 Very Much [ ] 5 Extremely Much

14) How much do you try to cheer this sibling up when he or she is feeling down?
[ ] 1 Hardly At All [ ] 2 A Little [ ] 3 Somewhat [ ] 4 Very Much [ ] 5 Extremely Much

15) How competitive are you with this sibling?
[ ] 1 Hardly At All [ ] 2 A Little [ ] 3 Somewhat [ ] 4 Very Much [ ] 5 Extremely Much

16) How competitive is this sibling with you?
[ ] 1 Hardly At All [ ] 2 A Little [ ] 3 Somewhat [ ] 4 Very Much [ ] 5 Extremely Much

17) How much does this sibling go to you for help with non-personal problems?
[ ] 1 Hardly At All [ ] 2 A Little [ ] 3 Somewhat [ ] 4 Very Much [ ] 5 Extremely Much

18) How much do you go to this sibling for help with non-personal problems?
[ ] 1 Hardly At All [ ] 2 A Little [ ] 3 Somewhat [ ] 4 Very Much [ ] 5 Extremely Much

19) How much do you dominate this sibling?
[ ] 1 Hardly At All [ ] 2 A Little [ ] 3 Somewhat [ ] 4 Very Much [ ] 5 Extremely Much
20) How much does this sibling dominate you?
[ ] 1 Hardly At All   [ ] 2 A Little   [ ] 3 Somewhat   [ ] 4 Very Much   [ ] 5 Extremely Much

21) How much does this sibling accept your personality?
[ ] 1 Hardly At All   [ ] 2 A Little   [ ] 3 Somewhat   [ ] 4 Very Much   [ ] 5 Extremely Much

22) How much do you accept this sibling's personality?
[ ] 1 Hardly At All   [ ] 2 A Little   [ ] 3 Somewhat   [ ] 4 Very Much   [ ] 5 Extremely Much

23) Do you think your father favors you or this sibling more?
[ ] 1 I am usually favored
[ ] 2 I am sometimes favored
[ ] 3 Neither of us is favored
[ ] 4 This sibling is sometimes favored
[ ] 5 This sibling is usually favored

24) Does this sibling think your father favors him/her or you more?
[ ] 1 I am usually favored
[ ] 2 I am sometimes favored
[ ] 3 Neither of us is favored
[ ] 4 This sibling is sometimes favored
[ ] 5 This sibling is usually favored

25) How much does this sibling know about you?
[ ] 1 Hardly Anything   [ ] 2 A Little   [ ] 3 Somewhat   [ ] 4 Very Much   [ ] 5 Extremely Much

26) How much do you know about this sibling?
[ ] 1 Hardly Anything   [ ] 2 A Little   [ ] 3 Somewhat   [ ] 4 Very Much   [ ] 5 Extremely Much

27) How much do you and this sibling have similar personalities?
[ ] 1 Hardly At All   [ ] 2 A Little   [ ] 3 Somewhat   [ ] 4 Very Much   [ ] 5 Extremely Much

28) How much do you discuss your feelings or personal issues with this sibling?
[ ] 1 Hardly At All   [ ] 2 A Little   [ ] 3 Somewhat   [ ] 4 Very Much   [ ] 5 Extremely Much
29) How much does this sibling discuss his or her feelings or personal issues with you?
- [ ] 1 Hardly At All
- [ ] 2 A Little
- [ ] 3 Somewhat
- [ ] 4 Very Much
- [ ] 5 Extremely Much

30) How often does this sibling criticize you?
- [ ] 1 Hardly At All
- [ ] 2 A Little
- [ ] 3 Somewhat
- [ ] 4 Very Much
- [ ] 5 Extremely Much

31) How often do you criticize this sibling?
- [ ] 1 Hardly At All
- [ ] 2 A Little
- [ ] 3 Somewhat
- [ ] 4 Very Much
- [ ] 5 Extremely Much

32) How close do you feel to this sibling?
- [ ] 1 Hardly At All
- [ ] 2 A Little
- [ ] 3 Somewhat
- [ ] 4 Very Much
- [ ] 5 Extremely Much

33) How close does this sibling feel to you?
- [ ] 1 Hardly At All
- [ ] 2 A Little
- [ ] 3 Somewhat
- [ ] 4 Very Much
- [ ] 5 Extremely Much

34) How often does this sibling do things to make you mad?
- [ ] 1 Hardly At All
- [ ] 2 A Little
- [ ] 3 Somewhat
- [ ] 4 Very Much
- [ ] 5 Extremely Much

35) How often do you do things to make this sibling mad?
- [ ] 1 Hardly At All
- [ ] 2 A Little
- [ ] 3 Somewhat
- [ ] 4 Very Much
- [ ] 5 Extremely Much

36) How much do you think that this sibling has accomplished a great deal in life?
- [ ] 1 Hardly At All
- [ ] 2 A Little
- [ ] 3 Somewhat
- [ ] 4 Very Much
- [ ] 5 Extremely Much

37) How much does this sibling think that you have accomplished a great deal in life?
- [ ] 1 Hardly At All
- [ ] 2 A Little
- [ ] 3 Somewhat
- [ ] 4 Very Much
- [ ] 5 Extremely Much
38) Does this sibling think your mother supports him/her or you more?
[ ] 1 I usually get more support
[ ] 2 I sometimes get more support
[ ] 3 We are supported equally
[ ] 4 This sibling sometimes gets more support
[ ] 5 This sibling usually gets more support

39) Do you think your mother supports you or this sibling more?
[ ] 1 I usually get more support
[ ] 2 I sometimes get more support
[ ] 3 We are supported equally
[ ] 4 This sibling sometimes gets more support
[ ] 5 This sibling usually gets more support

40) How much can you count on this sibling to be supportive when you are feeling stressed?
[ ] 1 Hardly At All  [ ] 2 A Little  [ ] 3 Somewhat  [ ] 4 Very Much  [ ] 5 Extremely Much

41) How much can this sibling count on you to be supportive when he or she is feeling stressed?
[ ] 1 Hardly At All  [ ] 2 A Little  [ ] 3 Somewhat  [ ] 4 Very Much  [ ] 5 Extremely Much

42) How much does this sibling feel jealous of you?
[ ] 1 Hardly At All  [ ] 2 A Little  [ ] 3 Somewhat  [ ] 4 Very Much  [ ] 5 Extremely Much

43) How much do you feel jealous of this sibling?
[ ] 1 Hardly At All  [ ] 2 A Little  [ ] 3 Somewhat  [ ] 4 Very Much  [ ] 5 Extremely Much

44) How much do you give this sibling practical advice? (e.g. household or car advice)
[ ] 1 Hardly At All  [ ] 2 A Little  [ ] 3 Somewhat  [ ] 4 Very Much  [ ] 5 Extremely Much

45) How much does this sibling give you practical advice?
[ ] 1 Hardly At All  [ ] 2 A Little  [ ] 3 Somewhat  [ ] 4 Very Much  [ ] 5 Extremely Much

62
46) How much is this sibling bossy with you?
[ ] 1 Hardly At All    [ ] 2 A Little    [ ] 3 Somewhat    [ ] 4 Very Much    [ ] 5 Extremely Much

47) How much are you bossy with this sibling?
[ ] 1 Hardly At All    [ ] 2 A Little    [ ] 3 Somewhat    [ ] 4 Very Much    [ ] 5 Extremely Much

48) How much do you accept this sibling's lifestyle?
[ ] 1 Hardly At All    [ ] 2 A Little    [ ] 3 Somewhat    [ ] 4 Very Much    [ ] 5 Extremely Much

49) How much does this sibling accept your lifestyle?
[ ] 1 Hardly At All    [ ] 2 A Little    [ ] 3 Somewhat    [ ] 4 Very Much    [ ] 5 Extremely Much

50) Does this sibling think your father supports him/her or you more?
[ ] 1 I usually get more support
[ ] 2 I sometimes get more support
[ ] 3 We are supported equally
[ ] 4 This sibling sometimes gets more support
[ ] 5 This sibling usually gets more support

51) Do you think your father supports you or this sibling more?
[ ] 1 I usually get more support
[ ] 2 I sometimes get more support
[ ] 3 We are supported equally
[ ] 4 This sibling sometimes gets more support
[ ] 5 This sibling usually gets more support

52) How much do you know about this sibling's relationships?
[ ] 1 Hardly Anything    [ ] 2 A Little    [ ] 3 Somewhat    [ ] 4 Very Much    [ ] 5 Extremely Much

53) How much does this sibling know about your relationships?
[ ] 1 Hardly Anything    [ ] 2 A Little    [ ] 3 Somewhat    [ ] 4 Very Much    [ ] 5 Extremely Much
54) How much do you and this sibling think alike?
[ ] 1 Hardly At All [ ] 2 A Little [ ] 3 Somewhat [ ] 4 Very Much [ ] 5 Extremely Much

55) How much do you really understand this sibling?
[ ] 1 Hardly At All [ ] 2 A Little [ ] 3 Somewhat [ ] 4 Very Much [ ] 5 Extremely Much

56) How much does this sibling really understand you?
[ ] 1 Hardly At All [ ] 2 A Little [ ] 3 Somewhat [ ] 4 Very Much [ ] 5 Extremely Much

57) How much does this sibling disagree with you about things?
[ ] 1 Hardly At All [ ] 2 A Little [ ] 3 Somewhat [ ] 4 Very Much [ ] 5 Extremely Much

58) How much do you disagree with this sibling about things?
[ ] 1 Hardly At All [ ] 2 A Little [ ] 3 Somewhat [ ] 4 Very Much [ ] 5 Extremely Much

59) How much do you let this sibling know you care about him or her?
[ ] 1 Hardly At All [ ] 2 A Little [ ] 3 Somewhat [ ] 4 Very Much [ ] 5 Extremely Much

60) How much does this sibling let you know he or she cares about you?
[ ] 1 Hardly At All [ ] 2 A Little [ ] 3 Somewhat [ ] 4 Very Much [ ] 5 Extremely Much

61) How much does this sibling put you down?
[ ] 1 Hardly At All [ ] 2 A Little [ ] 3 Somewhat [ ] 4 Very Much [ ] 5 Extremely Much

62) How much do you put this sibling down?
[ ] 1 Hardly At All [ ] 2 A Little [ ] 3 Somewhat [ ] 4 Very Much [ ] 5 Extremely Much

63) How much do you feel proud of this sibling?
[ ] 1 Hardly At All [ ] 2 A Little [ ] 3 Somewhat [ ] 4 Very Much [ ] 5 Extremely Much
<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>64) How much does this sibling feel proud of you?</td>
<td>[ ] 1 Hardly At All  [ ] 2 A Little  [ ] 3 Somewhat  [ ] 4 Very Much  [ ] 5 Extremely Much</td>
</tr>
<tr>
<td>65) Does this sibling think your mother is closer to him/her or you?</td>
<td>[ ] 1 Our mother is usually closer to me</td>
</tr>
<tr>
<td></td>
<td>[ ] 2 Our mother is sometimes closer to me</td>
</tr>
<tr>
<td></td>
<td>[ ] 3 Our mother is equally close to both of us</td>
</tr>
<tr>
<td></td>
<td>[ ] 4 Our mother is sometimes closer to this sibling</td>
</tr>
<tr>
<td></td>
<td>[ ] 5 Our mother is usually closer to this sibling</td>
</tr>
<tr>
<td>66) Do you think your mother is closer to you or this sibling?</td>
<td>[ ] 1 Our mother is usually closer to me</td>
</tr>
<tr>
<td></td>
<td>[ ] 2 Our mother is sometimes closer to me</td>
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<td></td>
<td>[ ] 3 Our mother is equally close to both of us</td>
</tr>
<tr>
<td></td>
<td>[ ] 4 Our mother is sometimes closer to this sibling</td>
</tr>
<tr>
<td></td>
<td>[ ] 5 Our mother is usually closer to this sibling</td>
</tr>
<tr>
<td>67) How much do you discuss important personal decisions with this sibling?</td>
<td>[ ] 1 Hardly At All  [ ] 2 A Little  [ ] 3 Somewhat  [ ] 4 Very Much  [ ] 5 Extremely Much</td>
</tr>
<tr>
<td>68) How much does this sibling discuss important personal decisions with you?</td>
<td>[ ] 1 Hardly At All  [ ] 2 A Little  [ ] 3 Somewhat  [ ] 4 Very Much  [ ] 5 Extremely Much</td>
</tr>
<tr>
<td>69) How much does this sibling try to perform better than you?</td>
<td>[ ] 1 Hardly At All  [ ] 2 A Little  [ ] 3 Somewhat  [ ] 4 Very Much  [ ] 5 Extremely Much</td>
</tr>
<tr>
<td>70) How much do you try to perform better than this sibling?</td>
<td>[ ] 1 Hardly At All  [ ] 2 A Little  [ ] 3 Somewhat  [ ] 4 Very Much  [ ] 5 Extremely Much</td>
</tr>
</tbody>
</table>
71) How likely is it you would go to this sibling if you needed financial assistance?
[ ] 1 Hardly At All   [ ] 2 A Little    [ ] 3 Somewhat   [ ] 4 Very Much   [ ] 5 Extremely Much

72) How likely is it this sibling would go to you if he or she needed financial assistance?
[ ] 1 Hardly At All   [ ] 2 A Little    [ ] 3 Somewhat   [ ] 4 Very Much   [ ] 5 Extremely Much

73) How much does this sibling act in superior ways to you?
[ ] 1 Hardly At All   [ ] 2 A Little    [ ] 3 Somewhat   [ ] 4 Very Much   [ ] 5 Extremely Much

74) How much do you act in superior ways to this sibling?
[ ] 1 Hardly At All   [ ] 2 A Little    [ ] 3 Somewhat   [ ] 4 Very Much   [ ] 5 Extremely Much

75) How much do you accept this sibling's ideas?
[ ] 1 Hardly At All   [ ] 2 A Little    [ ] 3 Somewhat   [ ] 4 Very Much   [ ] 5 Extremely Much

76) How much does this sibling accept your ideas?
[ ] 1 Hardly At All   [ ] 2 A Little    [ ] 3 Somewhat   [ ] 4 Very Much   [ ] 5 Extremely Much

77) Does this sibling think your father is closer to him/her or you?
[ ] 1 Our father is usually closer to me
[ ] 2 Our father is sometimes closer to me
[ ] 3 Our father is equally close to both of us
[ ] 4 Our father is sometimes closer to this sibling
[ ] 5 Our father is usually closer to this sibling

78) Do you think your father is closer to you or this sibling?
[ ] 1 Our father is usually closer to me
[ ] 2 Our father is sometimes closer to me
[ ] 3 Our father is equally close to both of us
[ ] 4 Our father is sometimes closer to this sibling
[ ] 5 Our father is usually closer to this sibling
79) How much do you know about this sibling's ideas?
[ ] 1 Hardly At All  [ ] 2 A Little   [ ] 3 Somewhat  [ ] 4 Very Much   [ ] 5 Extremely Much

80) How much does this sibling know about your ideas?
[ ] 1 Hardly At All  [ ] 2 A Little   [ ] 3 Somewhat  [ ] 4 Very Much   [ ] 5 Extremely Much

81) How much do you and this sibling lead similar lifestyles?
[ ] 1 Hardly At All  [ ] 2 A Little   [ ] 3 Somewhat  [ ] 4 Very Much   [ ] 5 Extremely Much
APPENDIX G:

Participant Debriefing Statement

Thank you for participating in this research on siblings of ill children. The purpose of this UD master’s student’s thesis project is to determine whether young adults who have experienced a pediatric chronic illness in their family have overcome most of the psychological distress associated with the experience. The researcher also wished to examine whether any benefits or negative impacts have remained over time. As a participant into today’s research, you were a member of the target group if you have a sibling who suffered a childhood illness or a member of the comparison group if you do not have a sibling who was ill during childhood.

You completed a number of questionnaires including a demographics questionnaire to collect basic information about you, your family, whether a sibling had an illness, and specifics about the illness. You also completed a series of questions to measure anxiety, depression, and empathy. Additionally, some questions were directed toward gauging how your family copes and manages with such a stressor. Finally, you were asked about your relationship with a specific sibling. Research indicates that these characteristics and features differ between those individuals with a sibling who had a chronic childhood illness and those who did not. The differences, however, remain unclear as there have been conflicting results. Your participation today could help clarify the effects of chronic childhood illness on siblings.

- For questions about today’s research, please ask the student running the session.
- For any further questions or problems regarding this research session or if you want to learn more, please contact Courtney Ryan at 937-723-7359 or at ryancom@notes.udayton.edu. Or, feel free to contact my research supervisor, Keri Brown Kirschman, Ph.D. at 937-229-5404 or at kirschke@notes.udayton.edu.
- If you would like more information about your rights as a participant, please contact the Chair of the Research Review and Ethics Committee, Greg Elvers, Ph.D. at 937-229-2171 or at greg.elvers@notes.udayton.edu.
- If the materials presented to you today caused any negative feelings or distress, please contact the Counseling Center at 937-229-3141. The UD Counseling Center provides free, confidential services to undergraduates at the University.
- Please note, because your data remains anonymous, the researcher or her assistants will be unable to contact you if you indicated experiencing symptoms of depression.
- If you should like to review the current research on siblings of ill children, the following sources are suggested:

Thank you again for your participation!
REFERENCES


