

DISSERTATION

THE IMPACT OF SERIOUS PARENTAL PHYSICAL ILLNESS ON COLLEGE
ADJUSTMENT: ROLE OF RELATIONSHIP FACTORS

Submitted by

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ABSTRACT

THE IMPACT OF SERIOUS PARENTAL PHYSICAL ILLNESS ON COLLEGE ADJUSTMENT: ROLE OF RELATIONSHIP FACTORS

Little is known about the long-term impact of serious parental physical illness or the role that family and peer relationships play in predicting adjustment. This study sought to illuminate the associations between subjective impact of serious parental physical illness, change in relationship quality during the time of serious parental illness, and college adjustment. Results indicated that perceived impact of parental illness did not predict long-term adjustment outcomes. Negative changes in the quality of specific relationships (e.g., relationships with the ill parent, other parent, siblings, or peers) did not function individually as predictors of long-term outcomes, and changes in relationship quality did not predict specific subtypes of college adjustment (emotional, academic, and social). Results indicated that women are more likely to report high subjective illness impact than men, but no gender differences in college adjustment were found. These findings have interesting implications for our understandings of long-term adjustment to serious physical parental illness.

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CHAPTER I

Introduction

The psychosocial effects of an adult's serious somatic illness are not limited to that individual. The children of parents struggling with serious illness are also at increased risk for negative emotional, social, and behavioral outcomes, including depression, anxiety, reductions in self-esteem, somatization, sleeping difficulties, and impaired academic performance (Armistead, Klein, & Forehand, 1995; Birenbaum et al., 1999; Grabiak, Bender, & Puskar, 2007; Huizinga, van der Graaf, Hoekstra, & Hoekstra-Weebers, 2003; Korneluk & Lee, 1998; Romer, Barkmann, Schulte-Markwort, Thomalla, & Riedesser, 2002; Vannatta, Ramsey, Noll, & Gerhardt, 2010; Visser, Pedersen & Revenson, 2005). Little is known, however, about the relative persistence of these outcomes. Do they endure into adolescence? Into early adulthood? If the negative impact of serious parental physical illness does indeed persist into adulthood, the manifestation of that impact during one's college years may be particularly crucial, given the importance of college for success in today's world. Completion of a college degree is associated with lower rates of unemployment and significantly higher lifetime earnings (Bureau of Labor Statistics, 2011), offering a protective buffer against poverty and the vast array of negative psychosocial and health-related effects to which it has been tied.

The factors that contribute to negative outcomes in children of seriously ill parents are not well-understood. Existing research suggests that the quality of family interactions, which may be taxed by the disruption and uncertainty that so often accompany serious parental physical illness, plays a role in adjustment among children of ill parents (Faulkner & Davey, 2002; Lewis, Hammond, & Woods, 1993; Miller, 2008; Steele, Forehand, & Armistead, 1997). It has also been suggested that the nature and quality of relationships with peers may contribute to children's

adjustment to parental illness (Christ, Siegel, Freund, Langosch, Hendersen, et al., 1993; Vannatta, Grollman, Noll, & Gerhardt, 2010), although the evidence available is not conclusive (Osborn, 2007). A similarly inconclusive body of literature suggests that gender may also play a role in the manner in which children are affected by serious parental physical illness, with some support for the idea that girls (particularly adolescent girls) may be at a higher risk for poor outcomes after a parental cancer diagnosis (Osborne, 2007; Visser, Huizinga, van der Graaf, et al., 2004; Welch, Wadsworth, & Compas, 1996).

The present study sought to address some of the gaps in our understanding of the manner in which serious parental physical illness affects children's long-term adjustment, and the specific contribution of family and peer relationship factors to the association between subjective impact of physical illness and college adjustment. Overall patterns of response on both an adjustment measure and a relationship impact measure were used to provide a picture of long-term adjustment and relationship domains as affected by serious physical parental illness. General subjective impact of parental illness was expected to affect some or all domains of college adjustment, and it was planned that relationship impact scores would be used to determine whether relationship factors mediated this association.

Serious Parental Physical Illness: Prevalence and Definition

It has been estimated that 4 to 15% of children in Western societies may have a parent or parents with serious physical illness (Barkmann et al., 2007; Romer et al., 2002; Worsham, Compas, & Sydney, 1997), with a higher prevalence rate among adolescents (14-15%; Pedersen & Revenson, 2005). For example, almost three million children in the U.S. are thought to live with parents who have been diagnosed with cancer (Weaver, Rowland, Alfano, & McNeel, 2010). In light of national disease statistics, these are not surprising numbers. The American

Cancer Society projects that 1,596,670 new cancer cases will be diagnosed in the United States in 2012 (ACS, 2011). Estimates of lifetime cancer risk are distressingly high: in the U.S., about 25% of women will receive a cancer diagnosis at some point during their lives, while men have a lifetime risk rate around 44% (ACS, 2010). Over two hundred individuals, most between the ages of 20 and 50, are diagnosed with multiple sclerosis every week in the U.S. (MSF, 2009). It is estimated that 56,300 Americans are infected with HIV each year, and over half of these individuals are between the ages of 24 and 44 (AIDS.gov, 2006). Twenty-six million American adults live with chronic kidney disease (NKF, 2010). These figures represent only a subsection of severe physical diseases, but they demonstrate the extent and nature of the problem: a vast number of adults in the U.S. are living with serious physical illnesses, and many are struggling with disease during their child-rearing years.

In examining the psychosocial effects of serious parental physical illness, it is necessary to delineate what is meant by “serious physical illness.” The concept is problematic, as “serious” is obviously a highly subjective term. Physical illness differs greatly from person to person, with wide variance across onset, course, outcome, level of incapacitation, level of uncertainty, and other elements (Rolland, 1999), and individuals respond to these elements in unique ways. It is not possible to establish a completely objective “hierarchy of seriousness.” Some researchers of parental illness have employed the term “chronic illnesses,” defined by the CDC as “noncommunicable illnesses that are prolonged in duration, do not resolve spontaneously, and are rarely cured completely” (2009, p. 2), to encompass the notion of “serious” illness. However, while this definition does extend to many conditions that most individuals would consider serious (i.e., multiple sclerosis, cancer, chronic kidney disease), it also encompasses relatively non-intrusive conditions (i.e., allergies) that are unlikely to carry major psychosocial

implications (Barkmann, Romer, Watson, & Schulte-Markwort, 2007). In light of these difficulties, a definition of serious physical parental illness employed by Barkmann et al. (2007) seems most appropriate for the present study: “physical disease in one or both parents, which can be classified as life-threatening and/or having a severe impact on a patient’s quality of life” (p. 477).

Of course, such a definition does little to quantify the *nature* of serious parental physical illness, and common wisdom would suggest that particular characteristics of disease are important in predicting psychosocial outcomes. For example, Lewis et al.’s model of family coping (Korneluk & Lee, 1998; Lewis, Hammond, & Woods, 1993) suggests that somatic illnesses are individually associated with unique psychosocial demands. Similarly, Rolland (1999) proposes a family systems framework of serious parental physical illness that describes illness in terms of objective disease characteristics (i.e., onset, course, outcome) and the interaction of these characteristics with family system variables. The premise shared by these two models is not uncommon among parental illness literature: specific illnesses influence families and individuals in distinctive ways, and the objective characteristics of the illness in question help determine the nature and significance of the effects rendered.

There is, however, a convincing body of research that supports the idea that specific, objective characteristics of illness may not be particularly useful in predicting psychosocial outcomes. Compas, Worsham, Ey, and Howell (1996) found that children’s subjective perceptions of their parents’ cancer were more instrumental in predicting child distress than the prognosis or developmental stage of the cancer, a conclusion that was echoed by Romer et al. (2002). Visser et al. (2004) discovered that specific features of cancer, including cancer location, developmental stage, time since diagnosis, and “objective” levels of severity, were not predictive

of child functioning. In a study of the children of fathers with hemophilia or HIV, Kotchick, Summers, Forehand, and Steele (1997) found that subjective impact of illness was associated with psychosocial outcomes, while objective measures of illness severity were not. A study of teens' adjustment to parental illness found that perceptions of parental distress or disability were the principal risk factor for maladjustment; specific illness diagnostic category was not predictive of the adolescents' outcomes (Hirsch, Moos, & Reischl, 1985). As Korneluk and Lee (1998) noted in a review of literature examining the relationship between serious parental physical illness and children's adjustment, "the predicted role of disease severity has not been confirmed in the existing research. Instead, family members' perceptions of disease severity and stressfulness appear to be involved in child adjustment" (p. 189). In light of these findings, it appears that the *subjective* impact of parental disease, rather than a careful taxonomy of disease characteristics, is the most suitable predictor of psychosocial outcomes among children, supporting a definition of serious physical parental illness that does not delve into description of specific illness features.

Psychosocial Outcomes Associated with Parental Physical Illness

Most existing research suggests that children of parents with serious somatic illnesses are at risk for negative psychosocial outcomes (Armistead et al., 1995; Daly, 2008; Grabiak et al., 2007; Miller, 2008; Pedersen & Revenson, 2005; Romer et al., 2002; Visser et al. 2004), although we still have an inconsistent picture of these outcomes and the extent to which they are experienced. In a study of children living with parental cancer, Welch, Wadsworth, and Compas (1996) found that children's levels of distress varied widely as a function of age, gender, gender of the ill parent, time since diagnosis, and source of report. In a review of research assessing the impact of parental cancer on children's adjustment, Visser et al. (2004) found a discrepancy

between qualitative and quantitative findings: while qualitative studies reported difficulties in all domains of children's functioning in response to parental cancer, effects found in quantitative studies were generally restricted to emotional difficulties. In keeping with Visser et al.'s findings, Osborne's extensive 2007 review of parental cancer literature concluded that "evidence suggests that children and adolescents do not generally experience elevated levels of serious psychosocial difficulties compared to reference groups, but they are at a slightly increased risk for internalizing type problems" (p. 101), with higher levels of distress appearing among teenagers, especially adolescent daughters.

Some parental illness researchers have come to stronger conclusions. A review of adolescent adjustment to parental cancer by Grabiak et al. (2007), published in the same issue of *Psycho-Oncology* as Osborne's review, asserted that "adolescents who have a parent with cancer are distressed and this distress must be recognized *and* addressed by the parent diagnosed with cancer, family members, health care professionals and school personnel" (p. 135). In a comprehensive review of research examining functioning among the children of parents with serious somatic illness of all types, Romer et al. (2002) found that the children of somatically ill parents generally demonstrated elevated scores on measures of psychological maladjustment and emotional distress. A recent review of parental multiple sclerosis literature (Bogosian, Moss-Morris, & Hadwin, 2010) found that adolescents (ages 11 to 18) with a parent with MS "experienced more fear and anxiety relating to their parent's stage of illness, greater degree of separation anxiety, higher levels of depression, and increased body concern and hostility when compared with children of 'healthy' parents" (p. 792). Bogosian and colleagues (2010) also found evidence of similarly negative psychological effects among younger children of parents with MS, although effects appeared to be more consistent among adolescents.

While most researchers agree that serious parental physical illness does impact children's functioning, very little is known about how long any effects on adjustment may persist or the shape that these effects may take. Participants in a few studies of long-term adjustment reported some positive experiences as a result of parental illness (Leedham & Meyerowitz, 1999; Wong, Cavanaugh, MacLeamy, Sojourner-Nelson, & Koopman, 2009), although it is important to note that such studies were generally qualitative, relied on small sample sizes, and in the case of Leedham and Meyerowitz's 1999 study, prompted participants to describe positive growth (Wong et al., 2009). Negative long-term effects have also been observed: Osborne's 2007 review found that increasing time since cancer diagnosis did not predict improvements in children's adjustment, suggesting that parental cancer's impact may extend well beyond initial diagnosis and treatment. A small, 2009 qualitative study of adults who experienced parental cancer during childhood (Wong et al.) found that 59% of participants reported adverse consequences as a result of their parent's illness (i.e., personal health concerns, feelings of "void," worsened outlook on life, and negative impact on interpersonal relationships), while 44% reported positive growth stemming from the experience (i.e., stronger interpersonal relationships, increased appreciation for life, and "possibility of taking new paths in life"). As Wong et al. (2009) remarked, "Of note, there was only minimal overlap between positive and negative effects – four participants reported experiencing both positive and negative outcomes – with the majority of participants focused on just negative or positive outcomes" (p. 60). Thus, despite the fact that what little evidence available tentatively suggests that the long-term effects of parental cancer may vary in direction, many individuals may judge their overall experience in a rather one-sided manner, and the majority may experience negative psychosocial effects.

Parental Physical Illness and Family Relationships

The quality of family relationships may be strongly affected by serious parental physical illness. For example, Bogosian et al.'s 2010 review found that multiple sclerosis had a negative impact on children's social relationships, reduced the frequency of "cultural and intellectual activities," and resulted in reduced family cohesion and higher levels of family conflict. Many children participating in a qualitative study of the effects of terminal parental illness on the family (Christ et al., 1993) indicated that their parents (both ill and well) appeared angry, impatient, irritable, and distracted, implying deterioration of parent-child relationships. Christ et al. (1993) also reported that "the nature and quality of the children's previous relationship with both their parents significantly affected their reactions to the inevitable changes in these relationships" (p. 423); children who had a strong relationship with their ill parent prior to diagnosis and a detached relationship with their well parent "often felt particularly abandoned within the family" (p. 423). Many children also reported that their relationships with their siblings became more conflicted and distant during the time of their parent's illness – perhaps, the authors postulated, because the children could express negative feelings toward their siblings more safely than they could their parents. A qualitative study of the impact of parental terminal cancer on adolescents found similar themes (Christ, Siegel, & Sperber, 1994): teens who had initially been closer to their ill parent than their well parent were likely to report a more tense relationship with their well parent in addition to feelings of loneliness or abandonment. Leedham and Meyerowitz (1999) found that many women who had experienced parental cancer during childhood remembered difficulties in their relationship with their healthy parent, including distant, resentful feelings toward the parent and dissatisfaction with the parent's behavior (e.g.,

felt that parent demanded too much). In a review of cancer's implications for parenting and the family, Faulkner and Davey (2002) noted that

“treatment demands or preoccupation with the illness can make the parent physically or emotionally unavailable to the child or adolescent. Overall, parental illness has been found to cause parental withdrawal, indifference, unreliability, hostility, and coerciveness, which are linked to impaired adaptability of the child in the form of behavioral, social, and self-esteem problems” (p. 65).

On the other hand, some researchers have found evidence that suggests that familial relationships may actually become closer in the wake of serious parental physical illness. Leedham and Meyerowitz (1999) found that almost two thirds of adult subjects reported that their relationship with their ill parent improved during the period of diagnosis and treatment, while over a third indicated that their relationship with their healthy parent also became closer. Likewise, a qualitative pilot study of the children of British cancer patients (Nelson, Sloper, Charlton, & While, 1994) found that most children reported that their relationships with their family members did not change or grew closer after their parent's diagnosis. It would seem that the outlook is hopeful for those children who do experience improved relationships with family members during serious parental physical illness, as positive relationships in families experiencing parental illness appear to predict better child adjustment. A 2007 study of Finnish adolescents dealing with parental cancer (Lindqvist, Schmitt, Santalahti, Romer, & Piha) revealed that healthy family functioning seemed to have a protective effect: “Open communication, flexible problem solving, and an appropriate amount of affective involvement between family members predicted less psychological distress in the adolescents with a parent with cancer” (p. 349). Lewis et al. (1993) found that in families with mothers diagnosed with

breast cancer, higher-quality relationships between fathers and children predicted better child functioning. In a study utilizing data from the same sample as the Lewis et al. study, Conrad and Hammen (1993) discovered that positive perceptions of maternal parenting were associated with a lower likelihood of diagnosis of mental illness in children. Hirsch et al. (1985) also found that among the children of arthritic parents, positive family social environment was associated with better adjustment.

If strong family relationships predict better adjustment, it follows that more distant or troubled relationships, especially those with parents, may predict poorer adjustment. Low family cohesion – an indication of emotionally distant family relationships – has been associated with behavioral and emotional problems in the children of parents with serious illnesses (Huizinga, van der Graaf, Visser, Dijkstra, & Hoekstra-Weebers, 2003), and low-quality parent-child relationships have been linked to decreased self-esteem and heightened anxiety among adolescents (Lewis & Darby, 2003). In a study of the effects of paternal hemophilia, Steele et al. (1997) found that difficulties in parental relationships predicted internalizing problems, with problems in the mother-child relationship accounting for more of the variance than problems in the father-child relationship.

One theoretical model of child adjustment to parental illness suggested by Armistead et al. (1995) proposes that parental physical illness negatively impacts child functioning via disrupted parenting, which may be either a direct product of illness (i.e., parental absence due to medical requirements, reduced support from parents as a result of illness demands) or an indirect result of illness (i.e., parental depression, marital discord). The role of disrupted parenting as a mediator between serious parental physical illness and child functioning suggests that the quality of parent-child relationships may be crucial to understanding the psychosocial effects of parental

illness. Among other studies, Bogosian et al.'s review (2010), which found that parental depression moderated the impact of children's adjustment to their parent's multiple sclerosis, offers substantiation for this model. Similarly, a study of mothers with HIV found that maternal stress was indirectly associated with child behavior problems via deficits in parenting skills (Murphy, Marelich, Armistead, Herbeck, & Payne, 2010). Another framework proposed by Miller (2008) conceptualizes adolescent adjustment to parental cancer within the context of attachment theory, with security of the parent-child attachment acting as a strong mediator between the experience of parental cancer and emotional adjustment. While Miller did not find predicted differences in adjustment between adolescents who had experienced parental cancer and adolescents in a comparison group, it was observed that attachment style did predict stress response and coping, and that participants in the parental cancer group demonstrated more insecure attachments to their parents than did participants in the comparison group. It is evident that both Miller's and Armistead et al.'s models, though presented in different theoretical contexts, are quite similar in their implications: both point to the parent-child relationship as a vital intermediary between serious parental physical illness and adjustment.

While the models suggested by Armistead et al. and Miller provide a theoretical context within which the interplay between parental relationships and adjustment to parental physical illness can be understood, the research literature still leaves questions about the amount of variance in adjustment accounted for by changing relationships with either parent, the manner in which other family relationships (i.e., relationships with siblings) are affected by parental illness, and the role that other family relationships play in predicting adjustment. Child and parental variables, including child gender, child age, gender of the ill parent, also deserve further exploration. The role of child gender is a particularly interesting line of inquiry, given the nature

of findings in this area. While some of studies of serious parental physical illness have found no significant effect for gender (Howes, Hoke, Winterbottom, et al., 1994; Watson, St. James-Robers, Ashley, et al., 2006), the majority do find gender differences with regard to internalizing problems, especially among adolescents. Adolescent daughters experiencing serious parental physical illness have been shown to self-report significantly higher levels of internalizing problems, stress responses, and aggressive behavior than adolescent sons (Osborn, 2007), as well as significantly higher levels of intrusion, avoidance, and overall distress (Huizinga, Visser, van der Graaf, et al., 2005). This gender difference appears to be at its most pronounced in the context of maternal illness, with adolescent girls whose mothers have been diagnosed with cancer exhibiting the most negative psychological outcomes (Grant & Compas, 1995; Welch, Wadsworth, & Compas, 1996; Worsham, Compas, & Ey, 1997).

As many researchers have suggested, shifting burdens of household responsibilities may account for this phenomenon (Welch, Wadsworth, & Compas, 1996; Worsham, Compas, & Ey, 1997), a shift that may be especially potent when a mother is unable to function in her previous role in the household. Grant and Compas (1995) found that female adolescent study participants whose mothers were ill reported a higher frequency of stressful events related to a heavier burden of family responsibilities than boys or girls with ill fathers. As the authors note, “These responsibilities may be especially detrimental for adolescent girls because they may not have developed adaptive capacities to cope with the role of caring for others. Alternatively, adolescents may be especially vulnerable to increased family responsibilities because they come in conflict with other developmentally appropriate goals” (p. 1019). While this theory is not universally supported by available evidence (Daly, 2008), it may prove valuable to examine

gender more closely as a moderating variable in the association between the parent-child relationship and psychosocial adjustment.

The theoretical models proposed by Miller and Armistead also neglect conceptualization of the role that sibling relationships play in the family dynamic during the time of parental physical illness. Sibling relationship quality has been associated with psychosocial adjustment in general family contexts (e.g., Bank, Patterson, & Reid, 1996; Modry-Mandell, Gamble, & Taylor, 2007). For example, a study by Stocker, Burwell, and Briggs (2002) found that high levels of sibling conflict during middle childhood predicted increased anxiety, depression, and delinquency during early adolescence. A similar study by Pike, Coldwell, & Dunn (2005) found that sibling relationships in early and middle childhood predicted later psychosocial adjustment, even after controlling for parental relationship variables. Additionally, perceived sibling support during adolescence seems to have a protective effect against externalizing problems (Branje, Van Lieshout, & Van Aken, 2004), peer difficulties, depression (Kim, McHale, Crouter, et al., 2007), and stress related to family conflict (Caya & Liem, 1998).

Considering the apparent link between sibling relationship quality and child adjustment across family settings, it is surprising that sibling relationships have warranted so little interest in the literature on adjustment to serious parental physical illness. While a very few studies have attempted to assess the manner in which sibling relationships are impacted by parental illness (e.g., Christ et al., 1993), almost none have examined the way sibling relationships impact adjustment. Nelson and While (2002) found that the presence or absence of siblings was not a predictor of adjustment. Visser et al. (2006), on the other hand, found that primary school children in smaller families dealing with parental cancer (i.e., no or few siblings) fared worse in terms of internalizing problems than children from larger families. In addition to providing an

incomplete picture regarding whether or not the presence of siblings impacts adjustment to parental illness, these results tell us nothing about the role relationship *quality* might play. To the best of our knowledge, there are no existing studies examining the association between sibling relationship quality and adjustment to serious parental physical illness.

Parental Physical Illness and Peer Relationships

Peer relationships also seem to be affected by serious parental physical illness, but again, research in this area is quite limited. In Leedham and Meyerowitz's 1999 parental cancer study, nearly 40% of participants remembered experiencing difficulties with friends during their parent's illness, while another 40% endorsed improvement in peer relationships "in at least some cases" (p. 447). Vannatta et al. (2008) found that sons of mothers with cancer diagnoses were often perceived as more isolated and sensitive to criticism from peers in a matched comparison group, although few differences were observed in peer acceptance or friendship reciprocation. Other research suggests a more unidirectionally negative shift in quality of peer relationships. Children participating in Christ et al.'s 1993 study reported that they suffered from loss of peer contacts and were distressed by the reduction in extracurricular activities necessitated by the demands of their parent's illness (e.g., doctor's appointments, hospital visits, etc.). Many participants in Nelson et al.'s qualitative study (1994) indicated that they experienced a decrease in time spent with friends during the time of parental illness and also reported feelings of discomfort around telling their friends about their parent's condition.

The relationship between peer support and adjustment among children is not a matter of mystery: as Parker, Rubin, Erath, Wojslawowicz, and Buskirk (2006) put it, "It is a measure of the persuasiveness of the cumulative body of research on children's peer relationships that it has become trite to claim that peer experiences significantly shape development and the development

of psychopathology” (p. 419). Very little research, however, has specifically sought evidence for a link between quality of peer relationships and adjustment among children dealing with serious physical parental illness, although there are indications that such a link exists. For example, Nelson et al. (1994) found that sons who spent less time with their friends during parental illness had significantly higher scores on anxiety measures than boys who spent more time with peers. Global social support and social competence have also been associated with reduced risk of clinical diagnosis among children of mothers with breast cancer diagnoses (Conrad & Hammen, 1993). It seems likely that peer support is implicated in children’s adjustment to serious parental physical illness, but it is clear that more research is needed in this area.

Parental Physical Illness and College Adjustment

College enrollment has been on a steady trajectory of growth for decades. According to the National Center for Education Statistics (NCES, 2011a), enrollment in U.S. degree-granting postsecondary institutions increased by nine percent between 1989 and 1999, and jumped to 38 percent between 1999 and 2009. In the next decade, the NCES predicts another nine percent rise in enrollment for students under the age of 25, and a 23 percent increase in enrollment for students over 25. As of 2009, 70 percent of youth who completed high school in the U.S. immediately enrolled in postsecondary institutions (NCES, 2011b). College enrollment is rapidly becoming a developmental milestone expected of young adults in the United States, and one that has important long-term financial implications. Having some postsecondary education – even without earning a degree – increases individual lifetime earnings by almost a quarter of a million dollars, while individuals who attain a bachelor’s degree can expect to make 74 percent more than those with a high school diploma (Carnivale, Rose, & Cheah, 2011). Bachelor’s degree earners face lower rates of unemployment (BLS, 2011) and enjoy a host of other benefits,

including enhanced personal and professional mobility, access to more hobby and leisure activities, increased quality of life for their children, enhanced social status, and better health (Porter, 2002). With these kinds of outcomes at stake, understanding the factors that contribute to college adjustment represent a clear scientific and societal necessity. We already know that the process of transitioning to and succeeding in college can be a difficult one for many students, and one associated with a wide range of stressors in and of itself (Dyson & Renk, 2006): the transition to an adult identity, the unfamiliarity of university life, loss of former social support networks, increased rigor of academic expectations, and so on. Might the experience of serious parental physical illness prior to college make it more difficult to adapt to these stressors?

While almost nothing is known about the manner in which serious parental physical illness during childhood or adolescence impacts adjustment to college, parental attachment does seem to be an important factor in predicting adjustment: a recent study by Kolkhorst, Yazedjian, and Toews (2010) found that the quality of the parent-child relationship was a significant predictor of first-year college adjustment. A study by Hiester, Nordstrom, and Swenson (2009) had similar findings: higher parental attachment security was associated with better college outcomes for both male and female participants. When these findings are considered in light of either of the theoretical models of adjustment to parental physical illness previously discussed (Armistead et al., 1995; Miller, 2008), it seems plausible that successful adjustment to college could be threatened by disrupted parental attachment during the time of serious parental physical illness.

Current Study

The present study sought to examine the relationship between the retrospectively-reported subjective impact of parental physical illness and current levels of college adjustment.

Descriptive information was collected and analyzed to form an exploratory picture of participants' experience of their parent's illness. The internal consistency of the Subjective Impact of Parental Illness Scale (SIPIS), a simple five-item measure of perceived illness impact, was confirmed, and correlation analyses were performed to assess the construct validity of the measure and confirm the valence of the assessed impact. Regression analyses were run between total scores on this measure and both full-scale and subscale scores on the College Adjustment Questionnaire (CAQ), an instrument that measures college-level functioning in academic, emotional, and social domains. Given the body of research suggesting that girls may be more negatively impacted by parental illness than boys, correlation analyses and a subsequent one-way between-groups analysis of variance were performed to determine whether female participants reported stronger perceived impact than male participants. Mediation analyses were planned to determine the role that close relationship domains play in the association between perceived illness impact and college adjustment, should an association exist. Relationship domains of interest included the relationship with the ill parent, the relationship (if existing) with the other parent, sibling relationships (if present), and peer relationships. The level of impact on relationship quality in each of these domains was measured via scores on each subscale of the Parental Illness Relationship Impact Scale (PIRIS). It was predicted that changes in relationship quality as measured by the PIRIS would at least partially mediate the association between perceived illness impact and college adjustment. We planned to examine the mediation model and conduct additional analyses to determine whether the individual impacts in each relationship domain had additive or interactive effects. As has been made clear, very little is known about the long-term impact of serious parental physical illness, and thus, regression analyses were run to

determine whether PIRIS scores were predictive of overall college adjustment or CAQ subscale scores.

Research Questions and Hypotheses

Research questions are as follows:

1. Does the Subjective Impact of Parental Illness Scale (SIPIS) developed for the purposes of this study demonstrate acceptable reliability and construct validity?
2. Is subjective illness impact predictive of college adjustment?
 - a. If subjective illness impact predicts college adjustment, do changes in relationship quality with family and peers (as measured by the PIRIS) at least partially mediate this effect?
 - b. If subjective illness impact predicts college adjustment, does participant gender moderate (or mediate) this effect?
 - c. If subjective illness impact predicts college adjustment, do relative impacts on relationship domains (as measured by the PIRIS) have an additive or interactive effect on college adjustment?
3. Are changes in relationship quality with family and peers (as measured by the PIRIS) predictive of college adjustment?
 - a. If PIRIS scores predict college adjustment, does participant gender moderate this effect?
 - b. If PIRIS scores predict college adjustment, do relative impacts on relationship domains have an additive or interactive effect?
4. Does subjective illness impact (as measured by the SIPIS) vary significantly by gender?

Because so little research exists on long-term adjustment to serious physical parental illness, it should be noted that our hypotheses were highly tentative in nature. First, we hypothesized that the Subjective Impact of Parental Illness Scale (SIPIS) developed for the purposes of this study would demonstrate acceptable reliability and construct validity. Items included in this brief assessment were generated in accordance with the suggestions of DeVellis (2003), who recommends clear identification of the construct of interest, development of a broad item pool, determination of format of measurement, and exposure of items to an expert review and revision process. Item wording was guided by the recommendations of DeVellis (2003) and Comrey (1988): long, complex, and double-barreled items were avoided, and all items were designed to represent slight variations of a single unifying idea. We assumed that SIPIS scores would be correlated with scores on the PIRIS and with a variety of items assessing objective qualities of parental illness and the health care system's level of involvement.

Second, we hypothesized that subjective illness impact would predict college adjustment, with changes in relationship quality with family and peers (as measured by the PIRIS) at least partially mediating the relationship between subjective illness impact and college adjustment. While the body of relevant literature available is exceedingly thin, we know that subjective illness impact is far more connected to adjustment outcomes than any "objective" characteristics of serious physical illness (e.g., Korneluk & Lee, 1998; Romer et al., 2002; Visser et al., 2004), serious parental physical illness is associated with at least short-term negative psychosocial consequences (e.g., Daly, 2008; Grabiak et al., 2007; Visser et al., 2004), increasing time since cancer diagnosis does not predict improvement in children's adjustment (Osborne, 2007), and many adults who experience parental cancer during their childhood years report negative long-term personal effects (e.g., Wong et al., 2009). Family and peer relationships seem susceptible to

negative change in the wake of serious parental physical illness (e.g., Christ et al., 1993; Bogosian et al., 2010; Faulkner & Davy, 2002), and negatively impacted family relationships, especially those with parents, seem predictive of poorer outcomes in children experiencing serious parental physical illness (e.g., Armistead et al., 1995; Huizinga et al., 2003; Steele et al., 1997). The theoretical models proposed by Armistead et al. (1995) and Miller (2008) point to the parent-child relationship as an arbitrator between the experience of serious physical parental illness and child adjustment outcomes. In light of these findings, we expected to find an association between SIPIS scores and college adjustment scores, with PIRIS scores acting as a partial or full mediator.

We hypothesized that female participants would endorse higher subjective impact than male participants, and that participant gender would act as a moderator of the relationship between subjective illness impact and college adjustment (with poorly-adjusted female participants demonstrating lower adjustment scores than poorly-adjusted male participants). Girls appear to experience more distress and poorer psychosocial outcomes in response to serious parental physical illness than boys (e.g., Grant & Compas, 1995; Huizinga et al., 2005; Osborne, 2007), possibly as a result of increased family responsibilities (Grant & Compas, 1995; Worsham et al., 1997). If, as Osborne's 2007 review suggests, increasing time since a parent's diagnosis does not predict improvement in child adjustment, it seems feasible that women might experience higher subjective impact and exhibit poorer adjustment outcomes in adulthood than men.

CHAPTER II

Methods

Participants

One hundred ninety-five university students participated in data collection during September and October of 2010, and an additional 58 students participated in data collection during May of 2011. There were 253 participants in total. Data collection took place at a large public university in the western United States; participants were recruited from introductory psychology courses. The recruitment notice, which was posted via an online departmental research system, solicited voluntary participation from students who had at some time experienced serious parental physical illness as defined by Barkmann et al. (2007): a “physical disease in one or both parents, which can be classified as life-threatening and/or having a severe impact on a patient’s quality of life” (p. 477). Participants received credit toward introductory psychology course requirements in exchange for their participation. One hundred eighty-four students (72.7%) were female and 69 (27.3%) were male. The high percentage of female participants probably stems from the increasingly female composition of psychology as a field rather than any gender differences in exposure to serious parental physical illness. The U.S. Department of Education estimates that around 75% of students earning a B.A. in psychology are women (Salazar & Frincke, 2005), suggesting that this study’s sample closely represents trends in higher education.

Participants ranged in age from 17 to 47, with an average age of 19.55 ($SD = 3.99$). One hundred forty eight students (58.5%) identified as freshmen, 50 (19.8%) identified as sophomores, 35 (13.8%) identified as juniors, and 20 (7.9%) identified as seniors or beyond. Six students (2.4%) reported their ethnicity as Asian American/Asian, one (0.4%) as American Indian/Alaska Native,

four (1.6%) as African American/Black, ten (4%) as Latino, six (2.4%) as Middle Eastern, two (0.8%) as Pacific Islander, 218 (86.2%) as White Non-Hispanic, and six (2.4%) as Other. The majority of respondents (89.9%) endorsed having one or more siblings, with only 28 respondents (11.1%) describing themselves as only children.

Measures

The Subjective Impact of Parental Illness Scale (SIPIS). The SIPIS is a five-item measure of perceived illness impact developed specifically for the purposes of this study. Respondents are asked to respond to questions about the degree to which their parent's illness affected them. Responses are measured on a 5-point Likert scale with options ranging from *not at all* to *very much*, with potential total scores ranging from 5 to 25. See Appendix A for a copy of the scale.

The Parental Illness Relationship Impact Scale (PIRIS). The PIRIS (Copeland & Rosén, 2011) is a 16-item measure of illness-related change in a respondent's relationships with his or her ill parent, other parent (if a relationship is present), siblings (if any), and peers. The measure includes four subscales corresponding with the relationships of interest: Ill Parent, Other Parent, Sibling, and Peer. Response options are presented as a 7-point (1-7) Likert-type scale with responses ranging from *strongly disagree* to *strongly agree*. The PIRIS has a four-factor structure, acceptable fit indices (CFI = .956, RMSEA = .086, TLI = .946), and excellent factor loadings (.826 to .949). In a recent study (Copeland & Rosén, 2011), the PIRIS demonstrated a Chronbach's alpha of .92 and subscale reliabilities between .93 and .95. Its demonstrated reliability in the present study was similar ($\alpha = .93$, with subscale Chronbach's alpha scores between .93 and .96). Because some respondents do not have siblings or do not interact with one of their parents, a full-scale PIRIS score would not be meaningful. Total scores for each subscale,

which may range from 4 to 28, were utilized in the analyses conducted for the purposes of this study. See Appendix B for a copy of the scale.

College Adjustment Questionnaire (CAQ). The CAQ (Shirley & Rosén, 2011) is a 14-item instrument that asks students to respond to items assessing their current level of academic, social, and emotional functioning in college. Items are measured on a 5-point Likert-type scale with responses ranging from *not true* to *completely true*. The Academic Adjustment subscale assesses characteristics of academic functioning, including achievement in classes and overall academic success. The Social Adjustment subscale focuses on social engagement and satisfaction. The Emotional Adjustment subscale examines features of psychological and emotional wellness. The CAQ has a three-factor structure and strong fit indices (TLI = .925, CFI = .939, RMSEA = .070), with factor loadings ranging from .55 to .86. The CAQ demonstrates good reliability ($\alpha = .876$ in Shirley & Rosén, 2011; $\alpha = .836$ in the present study) and strong convergent validity. See Appendix C for a copy of the scale.

Demographics and Parental Illness Information Form. In addition to demographic information (e.g., gender, age, year in college, ethnicity, number of siblings), this form collected information about the nature of the illness experienced by the respondents' parent or parents, with specific attention to type of illness, prognosis, duration of illness, and the level of involvement of the health care system. Information about changes in various domains of daily life during the time of parental illness was also collected. See Appendix D for a copy of the form.

Procedure

Participants in the study electronically signed an online informed consent form that described the study, outlined potential risks of participation, and assured confidentiality. Participants completed a series of online questionnaires, including a demographics form, a

general information form including items assessing overall impact of parental illness and objective illness characteristics, the PIRIS, and the CAQ, as well as a brief selection of assessments that were used in a previous scale validation study. After completing the questionnaires, participants received web-delivered debriefing forms describing the study's purpose, offering information about available counseling services, and providing contact information for the primary investigator (see Appendix E). Participants' names were not connected to their online survey responses, and all completed questionnaires were stored in a protected electronic folder. All procedures and methods employed in this study were approved by the Colorado State University Human Subjects Committee/Institutional Review Board.

CHAPTER III

Results

Descriptive Statistics. Demographic form responses were analyzed to examine the nature and course of serious physical parental illness experienced by participants. One hundred twenty-eight respondents (50.8%) indicated that their mother or stepmother was diagnosed with a serious physical illness, while 104 (41.3%) reported that their father or stepfather was diagnosed. Twenty respondents (7.9%) indicated that both of their parents were diagnosed with a serious physical illness. (Participants were asked to respond to subsequent survey items in reference to the parent they considered most ill.) One hundred twenty-six respondents (50%) reported that they were 13 or older when their parent was diagnosed. Most respondents shared that they remembered the time of parental diagnosis, with 122 (48.4%) endorsing that they clearly remembered their parent receiving the diagnosis and 66 (26.2%) endorsing that they vaguely remembered their parent receiving the diagnosis.

Prognosis ranged widely: 24 respondents (9.5%) reported that their parent's prognosis was "very good," 54 (21.4%) endorsed a "good" prognosis, 81 (32.1%) indicated that the prognosis was "fairly good," 28 (11.1%) said that the prognosis was "fairly poor," 17 (6.7%) reported that the prognosis was "poor," 23 (9.1%) endorsed a "very poor" prognosis, and 24 (9.5%) stated that they did not know the prognosis. With regard to the duration of parental illness, 113 respondents (44.8%) indicated that their parent is currently still dealing with his or her illness. Eleven respondents (4.4%) endorsed a duration of less than three months, 29 (11.5%) endorsed a duration of more than three months but less than a year, 16 (6.3%) endorsed a duration of 1 year, 28 (11.1%) endorsed a duration of 2 years, 9 (3.6%) endorsed a duration of 3 years, 9 (3.6%) endorsed a duration of 4-5 years, 13 (5.2%) endorsed a duration of 6-10 years,

and 24 (9.5%) endorsed a duration of more than 10 years. Reported effectiveness of treatment was variable, with 61 respondents (24.2%) describing their parent's treatment as "very effective," 103 (40.9%) describing treatment as "somewhat effective," 63 (25%) describing treatment as "not very effective," 17 (6.7%) describing treatment as "completely ineffective," and 8 (3.2%) reporting that their parent did not seek treatment. Twenty-eight participants (11.1%) reported that their parent is now deceased as a result of his or her illness, while 2 participants (.8%) reported that their parent is deceased for reasons unrelated to physical illness. Sixty-one participants (24.2%) indicated that their parent is still struggling with his or her illness and that the illness has a large negative impact on their parent's day-to-day life. Eighty-one participants (32.1%) reported that their parent is still struggling with his or her illness and that the illness does not have a large negative impact on their parent's day-to-day life. Thirty-four respondents (13.5%) indicated that their parent's illness is in remission, and 46 (18.3%) reported that their parent has completely recovered.

Reliability Analyses. The internal consistency of the Subjective Impact of Parental Illness Scale (SIPIS) was assessed by calculating inter-item correlations. While cutoff levels vary, in general a Cronbach's alpha (α) between .70 and .80 can typically be considered "respectable," and values above .80 can be considered "very good" or excellent (DeVellis, 2003). By this criterion, the five-item scale exhibited excellent inter-item consistency, with a Cronbach's alpha (α) of .876. The PIRIS and CAQ also demonstrated excellent internal consistency, with Chronbach's alpha scores of .93 and .84, respectively.

SIPIS scores were normally distributed, with the majority of respondents endorsing scores near the middle of the range (\bar{x} = 15.59). CAQ scores were also normally distributed (\bar{x} =

49.67). PIRIS subscale scores were positively skewed, with subscale means ranging from 8.44 to 10.18, median scores between 7 and 8, and a modal score of 4 across all subscales.

Correlation Analyses. To assess the construct validity of the SIPIS, correlation analyses were run to examine the relationship between SIPIS scores and scores on each subscale of the PIRIS (see Table 1). SIPIS total scores were positively correlated with PIRIS Ill Parent Subscale scores ($r=.246, p=.000$), Other Parent Subscale average scores ($r = .250, p = .000$), Sibling Subscale scores ($r = .225, p = .001$), and Peer Subscale scores ($r = .345, p = .000$), offering evidence of good construct validity and strongly suggesting that respondents who reported high impact on the SIPIS were referring to a highly negative impact.

Correlations were also run between SIPIS scores and items on the demographic form assessing the participant's age and level of recall at the time of the parent's diagnosis (we assumed a basic level of awareness would be needed for the participant to recall high illness impact) and the nature of the parent's experience of illness (see Table 2). Respondent age at the time of parental diagnosis was positively correlated with total SIPIS scores ($r = .205, p = .001$), with older respondent age associated with higher perceived impact. Limited recall of the time of parental diagnosis was negatively correlated with total SIPIS scores ($r = -.276, p = .000$), such that clearer memories of the diagnosis were associated with higher perceived impact. An item assessing level of health care system involvement during the time of serious physical parental illness (where lower scores represent limited involvement and higher scores represent intrusive involvement) was positively correlated with perceived impact ($r = .376, p = .000$). Similarly, SIPIS scores were positively correlated with scores on an item assessing the level to which involvement with the health care system interfered with day to day family life ($r = .319, p = .000$), with higher health care system interference associated with higher perceived impact. SIPIS

scores were also positively correlated with scores on an item assessing the level to which involvement with the health care system influenced the family's lifestyle ($r = .327, p = .000$), such that higher health care system influence was associated with higher perceived impact. There was a negative correlation between SIPIS scores and scores on an item measuring the level to which the parent's illness impacted his or her ability to function ($r = -.393, p = .000$). Lower scores on this item (with a score of 1 representing parental death) were associated with higher perceived impact. The current status of the parent's illness (with the lowest score representing that the parent is deceased, and the highest score representing complete recovery) was negatively correlated with total SIPIS scores ($r = -.197, p = .002$). These results offered further support for the construct validity of the SIPIS.

Preliminary correlations were run between SIPIS scores and CAQ scores. SIPIS scores were not significantly correlated with total CAQ scores ($r = -.033, p = .308$) or with scores on any of the CAQ subscales. Preliminary correlations were also run between PIRIS scores and CAQ scores. Average scores on the PIRIS Sibling Subscale were significantly negatively correlated with total CAQ scores, $r = -.122, p = .038$. The remaining subscale scores were not significantly correlated with total CAQ scores.

Final correlations were run to assess whether SIPIS scores and CAQ scores were associated with gender. Gender was negatively correlated with SIPIS scores ($r = -.212, p = .001$), indicating that being female was associated with higher perceived impact. Gender and CAQ total scores were not significantly correlated, $r = -.049, p = .446$.

Simple Linear Regression Analyses. SIPIS total scores were regressed on CAQ total scores and CAQ subscale scores. Contrary to hypothesis, subjective parental illness impact did not significantly predict overall college adjustment, $B = -.071, t(237) = -.503, p = .615$. Likewise,

SIPIS scores were not significantly predictive of CAQ Emotional Subscale scores, $B = .013$, $t(244) = .206$, $p = .837$, nor did they significantly predict CAQ Social Subscale scores, $B = -.015$, $t(241) = -.231$, $p = .818$. SIPIS scores were also not significantly predictive of CAQ Academic Subscale scores, $B = -.054$, $t(245) = -.854$, $p = .394$.

Multiple Linear Regression Analyses. A multiple regression analysis was performed to determine whether changes in relationship quality as measured by the PIRIS significantly predicted college adjustment. The model was not statistically significant [$R^2 = .020$, $F(4,208) = 1.038$, $p = .389$], indicating that on the whole, negative relationship impact was not predictive of overall college adjustment. Additionally, PIRIS subscales did not individually predict total CAQ scores (see Table 3). Additional regressions were performed to assess whether PIRIS scores were predictive of individual CAQ subscales. The model predicting CAQ Academic Subscale scores from PIRIS scores was not statistically significant, [$R^2 = .095$, $F(4,214)$, $p = .747$], indicating that negative relationship impact was not predictive of academic adjustment (see Table 4). Additionally, PIRIS subscales did not individually predict CAQ Academic Subscale scores. The model predicting CAQ Social Subscale scores from PIRIS scores (see Table 5) was similarly insignificant [$R^2 = .022$, $F(4,212) = 1.166$, $p = .327$], as was the model predicting CAQ Emotional Subscale scores from PIRIS scores [see Table 6; $R^2 = .151$, $F(4,214) = 1.245$, $p = .293$]. Likewise, PIRIS subscales did not individually predict CAQ Social Subscale or Emotional Subscale scores.

One-Way Analysis of Variance. A one-way between-groups analysis of variance was conducted to explore the influence of gender on subjective parental illness impact, as measured by the SIPIS. There was a statistically significant difference in SIPIS scores between genders at the $p < .05$ level [$F(1,247) = 11.602$, $p = .001$]. Despite reaching statistical significance, the

actual difference in mean scores between the groups was small. The effect size, calculated using eta squared, was .04.

Post-Hoc Analyses. The overwhelmingly low scores on the PIRIS raised questions about what might account for the high PIRIS scores that were obtained by a minority of participants. Correlations were run to assess the relationship between PIRIS scores and demographic variables that measured the nature of parental illness and characteristics of the respondent. Respondent age at the time of parental diagnosis was positively correlated with PIRIS Other Parent Subscale scores ($r = .183, p = .004$) and with PIRIS Peer Subscale scores ($r = .225, p = .000$), with older respondent age associated with stronger negative impact on relationships with the other parent and peers. Limited recall of the time of parental diagnosis was negatively correlated with PIRIS Other Parent Subscale scores ($r = -.163, p = .01$) and with PIRIS Peer Subscale scores ($r = -.269, p = .000$), such that clear memories of the diagnosis were associated with stronger negative impact on relationships with the other parent and peers. An item assessing level of health care system involvement during the time of serious physical parental illness (where lower scores represent limited involvement and higher scores represent intrusive involvement) was positively correlated with PIRIS Other Parent Subscale scores ($r = .176, p = .006$) and with PIRIS Peer Subscale scores ($r = .221, p = .001$). Scores on an item assessing the level to which involvement with the health care system interfered with day to day family life were positively correlated with PIRIS Other Parent Subscale scores ($r = .228, p = .000$), Sibling Subscale scores ($r = .147, p = .028$), and Peer Subscale scores ($r = .137, p = .034$). Scores on an item assessing the level to which involvement with the health care system influenced the family's lifestyle were positively correlated with PIRIS Other Parent Subscale scores ($r = .209, p = .001$) and Peer Subscale scores ($r = .170, p = .009$).

There was a negative correlation between all PIRIS subscale scores and scores on an item measuring the level to which the parent's illness impacted his or her ability to function. Lower scores on this item (with a score of 1 representing parental death) were associated with higher negative impact on the relationship with the ill parent ($r = -.227, p = .000$), the other parent ($r = -.225, p = .000$), siblings ($r = -.289, p = .000$), and peers ($r = -.231, p = .000$). The current status of the parent's illness (with the lowest score representing that the parent is deceased, and the highest score representing complete recovery) was negatively correlated with scores on the PIRIS Ill Parent Subscale ($r = -.222, p = .000$), Other Parent Subscale ($r = -.213, p = .001$), and Sibling Subscale ($r = -.236, p = .000$), with a negative correlation with the Peer Subscale approaching significance ($r = -.126, p = .051$). Neither participant gender nor gender of the ill parent were significantly correlated with PIRIS subscale scores.

To determine the influence of parental death on PIRIS subscale scores, participants were divided into one of two groups according to whether or not their ill parent had survived. One-way between-groups analyses of variance were conducted to explore the influence of parental death on PIRIS subscale scores. Mean scores on the PIRIS Ill Parent Subscale did not differ by parental outcome [$F(1,247) = 1.359, p = .245$], nor did mean scores on the Peer Subscale [$F(1,238) = 3.513, p = .062$]. Participants who reported that their ill parent was deceased had significantly higher mean scores on the Other Parent Subscale than those who reported that their parent had survived, $F(1,243) = 9.878, p = .002$. Participants who lost their parent also had significantly higher mean scores on the Sibling Subscale [$F(1,221) = 5.600, p = .019$]. The effect of parental death on Other Parent Subscale scores and Sibling Subscale scores was small (effect sizes of .04 and .02 were obtained, respectively).

CHAPTER IV

Discussion

The primary goal of this study was to examine the manner in which overall subjective impact of serious parental physical illness, relationship-specific parental illness impact, and college adjustment intersected with one another. The potential role of gender as a moderating variable was also an area of interest. As hypothesized, the SIPIS was a reliable measure with good construct validity. While SIPIS items queried participants about general impact and were not focused specifically on negative impact, the positive correlations between SIPIS scores and PIRIS scores, as well as the correlations between SIPIS scores and measures of parental illness outcome and health care system involvement, indicate that the valence of SIPIS responses was negative. Thus, while some adults attribute positive outcomes to parental illness experienced during childhood, such as improved relationships or new appreciation for life (e.g., Wong et al., 2009), respondents in our study appeared to respond to SIPIS items in a manner reflective of perceived negative impact.

Contrary to expectations, results indicated that the scores obtained on the SIPIS do not appear to predict long-term adjustment in college students, nor do they seem to have any significant bearing on individual areas of adjustment (e.g., academics, emotional health, and social relationships). The overall distribution of CAQ scores was normal, suggesting that individuals who experience serious parental physical illness adjust to college with varying levels of success in a manner independent of perceived illness impact. Because our study found no significant association between subjective illness impact and college adjustment, we were unable to test the hypothesis that negative changes in relationship quality with family and peers partially mediate said association. Interestingly, changes in the quality of specific relationships (that is,

relationships in each separate domain, as measured by subscales of the PIRIS) also did not predict college adjustment, and PIRIS scores were not predictive of individual facets of college adjustment (emotional, academic, and social domains). SIPIS scores were significantly correlated with scores on all subscales of the PIRIS, suggesting that when participants recalled the level to which they were impacted by parental illness, their recollection process included an evaluation of how they experienced their relationships with family and peers during the time of parental illness.

As hypothesized, scores obtained by female respondents on the SIPIS were significantly higher than scores obtained by male respondents, a finding that mirrors the body of literature suggesting that girls experience higher distress in response to parental physical illness than boys (e.g., Grant & Compas, 1995; Huizinga et al., 2005; Osborne, 2007; Worsham et al., 1997). While the data collected for the purposes of this study were uninformative regarding the reasons for this discrepancy in perceived impact, we can speculate on the basis of previous conclusions in the field that increased burden of family responsibilities could partially account for this finding (Grant & Compas, 1995; Worsham et al., 1997). Although a review of the literature suggested that girls might be at a higher risk for poor adjustment than boys (e.g., Huizinga, Visser, van der Graaf, et al., 2005; Osborne, 2007), we found no correlation between gender and college adjustment. It appears that while female participants were more heavily impacted by parental illness than male participants, they adjusted equally well in college.

Respondents who clearly remembered the time of parental diagnosis and were older when the diagnosis was given experienced higher perceived illness impact than those who were younger at the time of diagnosis or who did not clearly remember the event. While this finding may simply reflect recency effects and the necessity of awareness for impact to be perceived, it

could also speak to a particular vulnerability in adolescence. Perhaps teenagers in the United States, already negotiating differentiation from parents and establishing increased autonomy (Beyers et al., 2003), experience greater internal conflict as a result of the demands that may be associated serious parental illness, which could translate to perceived impact. This speculation would coincide with the qualitative research of Christ et al. (1994), who found that parental illness was associated with conflict around developmentally normative separation.

Unsurprisingly, intrusive health care system involvement, higher interference with day-to-day routines as a result of the health care system, and more pronounced health care system influence on family life were associated with higher perceived impact, as were current struggles with parental illness and poorer parental functioning as a result of illness.

Our post-hoc analyses also yielded interesting results. Older respondent age at the time of parental diagnosis and clearer memories of the diagnosis were associated with stronger negative impact on relationships with the other parent and peers. Perhaps the demands of serious physical parental illness upon the child (potential increase in family responsibilities, associated reduction in time spent with friends, and reduction in time spent with either parent due to medical needs of the ill parent), which may be more salient for adolescents in the process of individuation, result in teens feel less connected to their peers and resentful of their non-ill parent (who may be perceived as a safer target for resentment than the ill parent). Interestingly, negative impact on the relationship with the other, non-ill parent was associated with all of the negative outcomes examined in post-hoc analyses (intrusive health care system involvement, high interference of health care system with everyday life, high influence of health care system involvement on family lifestyle, poor level of functioning in the ill parent, and poor current illness status), while impact on the relationship with the ill parent was only correlated with the ill parent's level of

functioning and current illness status. In general, it appears that the relationship with the other, non-ill parent is more likely to be negatively impacted in conjunction with other negative outcomes than the relationship with the ill parent.

Participants who reported that their ill parent passed away as a result of his or her illness experienced a significantly stronger negative impact on their relationships with the other parent and siblings than participants who did not lose their parent to illness. Children's adjustment to parental death appears to hinge strongly on interactions with surviving family members; as noted in a 2005 review by Trimblay and Israel, "Being able to talk freely with the surviving parent and other family members about the death appeared to protect against later depressive experiences, as did a high level of care and affection from the surviving parent." Perhaps the negative relational impact seen in our results represents some lack of communication and support from family members in the wake of parental death. For respondents who lost their parent during adolescence, it might also be speculated that these negative relational impacts could represent struggles with individuation from family (e.g., Christ et al., 1994), which could feel especially difficult to navigate during a time in which other family members may be pushing for closeness.

Our results were broadly hopeful. High perceived impact of serious parental physical illness and strongly negative impact on family and peer relationships during the time of parental illness were unrelated to college adjustment, indicating that even individuals who are impacted on a deeply negative level (relational or otherwise) by serious physical parental illness are capable of succeeding academically, emotionally, and socially in college settings. While girls may be more heavily impacted by serious parental physical illness than boys, the effect size obtained for this phenomenon was small, and women appear to be no less likely to adjust well to college than men. Similarly, although death of the ill parent was significantly associated with a

stronger negative impact on relationships with the other, non-ill parent and siblings, the rather small effect size suggests that this finding may have little “real-world” bearing. Over the long-term, individuals who have experienced serious physical parental illness appear to be quite resilient.

Limitations and Directions for Future Research

There are a number of limitations associated with this study. First, the sample was relatively small and consisted primarily of white, young, female participants who were drawn by convenience from the introductory psychology pool of one university. By necessity, participants were self-selected, and it is possible that some individuals may have avoided the study due to negative emotional responses to its subject matter. Likewise, those who did participate could have been very interested in the effects of parental illness, potentially limiting generalizability of the results. In the future, researchers who examine college adjustment in response to serious parental physical illness during childhood or adolescence would do well to recruit a larger, more diverse group of participants, with particular attention to male and minority students and students from a variety of postsecondary institutions.

It must also be noted that most respondents endorsed little or no relationship impact on the PIRIS, indicating a possible restriction of range. Those individuals whose relationships were most negatively impacted by their parent’s illness might not possess the ability to attend college for emotional, financial, or social reasons related to said illness, thus preventing them from participating in our study. Even among heavily impacted individuals who are able to attend college, a certain level of adjustment must be present for a student to successfully participate in any research study for course credit, suggesting that the worst-adjusted of those on campus may not have participated in our research. Our results must be considered with caution, as they may

not be applicable to those with very high levels of negative subjective illness impact or relationship impact.

To a large extent, data collection for this study relied on retrospective self-report, a method thought to have somewhat questionable reliability and accuracy (Stone, Bachrach, Jobe, Kurtzman, & Cain, 1999). Memory is not known for being particularly precise, and it seems that self-report might not be an ideal strategy for assessing the relational impact of serious parental physical illness. However, there are few options that *are* ideal for an examination of this construct: self-report at the time an experience takes place necessitates an awareness of personal state and an understanding of the environment that is not very well-developed in most children (Lyman & Hembree-Kigin, 1994; Pepler & Craig, 1998), and even immediate self-report instruments for adolescents and adults raise concerns about accuracy (Stone et al., 1999). Because the construct of interest is essentially a subjective one, totally objective measurement is not possible.

An anticipated criticism of the current study is that socioeconomic status was not included as a control variable. However, studies of the impact of serious parental physical illness on adjustment have consistently found that adjustment does not seem to vary significantly with socioeconomic status (Lewis, Hammond, & Woods, 1993; Nelson & While, 2002; Osborn, 2007). Overall negative life events were also considered for inclusion as a control variable, but ultimately they were not included due to concerns about the interrelated nature of serious parental physical illness and other negative life events (i.e., a parent's illness might precipitate financial struggles, parental divorce, parental death, or so on).

Our study raised questions about the nature of relational impact of serious parental physical illness within the family, which we speculatively addressed and which would benefit

from quantitative exploration. Why are those who were teenagers at the time of their ill parent's diagnosis more likely to experience negatively impacted relationships with the other, non-ill parent and peers? Does adolescent individuation influence teenagers' perceptions of their family relationships following the death of an ill parent? Our lack of attention to potential positive effects of serious parental physical illness could also be considered a limitation, given qualitative research indicating that some respondents report improvements in family relationships after diagnosis (Leedham and Meyerowitz, 1999; Nelson, Sloper, Charlton, & While, 1994). While the PIRIS only assesses lack of change or negative change in relationship quality, future studies could add something of value to the literature by developing and including a measure of positive relationship impact.

Implications/Conclusion

Existing literature has explored the negative implications of serious parental physical illness for children's adjustment and the manner in which relationships with parents and peers contribute to adjustment outcomes. This study was unique in its focus on long-term adjustment, an outcome variable that has largely been ignored in parental illness literature, and in its inclusion of sibling relationships in its examination of the association between family relationships and adjustment. While we did find evidence that family and peer relationships are likely to be negatively impacted in conjunction with a number of illness-related scenarios (intrusive health care system involvement, poor functioning in the ill parent, death of the ill parent, etc.), our results show that individuals who experience serious parental physical illness adjust to college in a manner independent of perceived illness impact and impact on relationships with family members and peers. Furthermore, college adjustment scores for participants in our study were normally distributed, with the majority endorsing scores near the middle of the range.

This finding suggests that most individuals who experience serious parental physical illness are capable of average or better-than-average adjustment, regardless of the level of subjective impact their parent's illness generated. Our results also offer hopeful implications related to gender. While girls have generally been found to be more susceptible to negative outcomes of parental illness than boys (Huizinga, Visser, van der Graaf, et al., 2005; Osborne, 2007), our findings indicate that over the long-term, boys and girls adjust equally well.

In conclusion, this study sought to clarify the associations between subjective impact of serious parental physical illness, negative change in relationship quality during the time of serious parental physical illness, and college adjustment. Our results showed that our measure of the perceived impact of parental illness did not predict college adjustment outcomes. Negative changes in the quality of specific relationships (e.g., relationships with the ill parent, other parent, siblings, or peers) do not appear to function individually as predictors of long-term outcomes, and changes in relationship quality do not seem to predict specific subtypes of college adjustment (emotional, academic, and social). Our results did support the hypothesis that women are more likely to report high subjective illness impact than men, but no gender differences in college adjustment were found. Future research can extend these results by examining adjustment among a larger, more diverse sample, examining the nature of relationship impact during the time of parental illness in a more nuanced manner, and including measurement of positive relationship impact in analyses.

Table 1.

Correlations Between SIPIS Total Scores and PIRIS Subscale Scores

	PIRIS Ill Parent Subscale	PIRIS Other Parent Subscale	PIRIS Sibling Subscale	PIRIS Peer Subscale
SIPIS Total	.246**	.250**	.225**	.345**
PIRIS Ill Parent Subscale	1	.405**	.566**	.314**
PIRIS Other Parent Subscale	.405**	1	.499**	.339**
PIRIS Sibling Subscale	.566**	.499**	1	.360**
PIRIS Peer Subscale	.314**	.339**	.225**	1

** $p < .01$

Table 2.

Correlations Between SIPIS Total Scores and Demographic Form Variables

	SIPIS Total
Respondent age	.205**
More limited recall of diagnosis	-.276**
Health care system involvement	.376**
Health care system interference with day-to-day family life	.319**
Health care system influence on family lifestyle	.327**
More limited impact on ill parent's ability to function	-.393**
More positive current status of ill parent's illness	-.197**

** $p < .01$

Table 3.

Summary of Multiple Regression Analyses for Total CAQ Scores

Predictor	B	SE(B)	β	<i>t</i>	Sig. (<i>p</i>)
PIRIS Ill Parent Subscale	.467	.475	.084	.983	.327
PIRIS Other Parent Subscale	-.107	.512	-.017	-.210	.834
PIRIS Sibling Subscale	-1.080	.641	-.152	-1.686	.093
PIRIS Peer Subscale	-.134	.446	-.023	-.300	.765

Note: $R^2 = .020$

Table 4.

Summary of Multiple Regression Analyses for CAQ Academic Subscale Scores

Predictor	B	SE(B)	β	<i>t</i>	Sig. (<i>p</i>)
PIRIS Ill Parent Subscale	-.086	.208	-.035	-.412	.681
PIRIS Other Parent Subscale	.081	.224	.029	.364	.717
PIRIS Sibling Subscale	-.278	.281	-.089	-.990	.323
PIRIS Peer Subscale	.106	.195	.041	.542	.588

Note: $R^2 = .009$

Table 5.

Summary of Multiple Regression Analyses for CAQ Emotional Subscale Scores

Predictor	B	SE(B)	β	<i>t</i>	Sig. (<i>p</i>)
PIRIS Ill Parent Subscale	.278	.224	.105	1.244	.215
PIRIS Other Parent Subscale	-.126	.241	-.042	-.522	.602
PIRIS Sibling Subscale	-.351	.302	-.104	-1.162	.246
PIRIS Peer Subscale	-.226	.210	-.080	-1.077	.283

Note: $R^2 = .022$

Table 6.

Summary of Multiple Regression Analyses for CAQ Social Subscale Scores

Predictor	B	SE(B)	β	<i>t</i>	Sig. (<i>p</i>)
PIRIS Ill Parent Subscale	.301	.176	.143	1.710	.089
PIRIS Other Parent Subscale	-.108	.190	-.046	-.569	.570
PIRIS Sibling Subscale	-.373	.237	-.140	-1.570	.118
PIRIS Peer Subscale	-.068	.165	-.031	-.415	.679

Note: $R^2 = .023$

REFERENCES

- Aids.gov. HIV/AIDS 101. Retrieved from <http://aids.gov/hiv-aids-basics/index.html>.
- American Cancer Society. *Cancer Facts & Figures 2011*. Atlanta: American Cancer Society, 2011.
- American Cancer Society. *Lifetime Risk of Developing or Dying from Cancer*. Retrieved 7 Sep. 2011 from <http://www.cancer.org/Cancer/CancerBasics/lifetime-probability-of-developing-or-dying-from-cancer>.
- Armistead, L., Klein, K., & Forehand, R. (1995). Parental physical illness and child functioning. *Clinical Psychology Review, 15*(5), 409-422.
- Barkmann, C., Romer, G., Watson, M., & Schulte-Markwort, M. (2007). Parental physical illness as a risk for psychosocial maladjustment in children and adolescents: Epidemiological findings from a national survey in Germany. *Psychosomatics: Journal of Consultation Liaison Psychiatry, 48*(6), 476-481.
- Bank, L., Patterson, G. R., & Reid, J. B. (1996). Negative sibling interaction patterns as predictors of later adjustment problems in adolescent and young adult males. In G. H. Brody (Ed.) , *Sibling relationships: Their causes and consequences* (pp. 197-229). Westport, CT US: Ablex Publishing.
- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*, 1173–1182.
- Bergner, M. (1984). The Sickness Impact Profile (SIP). In N. K. Wenger, M. E., Mattson, C. D. Furberg, & J. Elinson (Eds.), *Assessment of Quality of Life in Clinical Trials of Cardiovascular Therapies* (152-159). New York: Le Jacq.

- Beyers, W., Goossens, L., Vansant, I., & Moors, E. (2003). A structural model of autonomy in middle and late adolescence: Connectedness, separation, detachment, and agency. *Journal of Youth and Adolescence*, 32(5), 351-365.
- Birenbaum, L. K., Yancey, D. Z., Phillips, D. S., Chand, N., & Huster, G. (1999). School-age children's and adolescents' adjustment when a parent has cancer. *Oncology Nursing Forum*, 26(10), 1639-1645.
- Bogosian, A., Moss-Morris, R., & Hadwin, J. (2010). Psychosocial adjustment in children and adolescents with a parent with multiple sclerosis: a systematic review. *Clinical Rehabilitation*, 24, 789-801.
- Bureau of Labor Statistics (2011). Education pays. Retrieved from http://www.bls.gov/emp/ep_chart_001.htm.
- Carnivale, A. P., Rose, S. J., & Cheah, B. (2011). The college payoff: Education, occupations, lifetime earnings. Retrieved from <http://eric.ed.gov/PDFS/ED524299.pdf>.
- Caya, M. L., & Liem, J. H. (1998). The role of sibling support in high-conflict families. *American Journal of Orthopsychiatry*, 68(2), 327-333.
- Centers for Disease Control and Prevention. *Chronic Diseases: The Power to Prevent, the Call to Control: At a Glance 2009*. Atlanta: Centers for Disease Control and Prevention, 2009.
- Christ, G., Siegel, K., Freund, B., Langosch, D., Henderson, S., Sperber, D., et al. (1993). Impact of parental terminal cancer on latency-age children. *American Journal of Orthopsychiatry*, 63(3), 417-425.
- Christ, G., Siegel, K., & Sperber, D. (1994). Impact of parental terminal cancer on adolescents. *American Journal of Orthopsychiatry*, 64(4), 604-613.

- Cole, M. T., Rosén, L. A., & Malach, S. L. (2007). *The role of personality factors in overcoming childhood adversity: Resilience in college students*. Unpublished master's thesis, Colorado State University, Colorado.
- Cole, M. T., Rosén, L. A., & Malach, S. L. (2008). *College Student Adaptation to Childhood Adversity: A Model of Stress and Resilience*. Unpublished doctoral dissertation, Colorado State University, Colorado.
- Compas, B., Worsham, N., Ey, S., & Howell, D. (1996). When mom or dad has cancer: II. Coping, cognitive appraisals, and psychological distress in children of cancer patients. *Health Psychology, 15*(3), 167-175.
- Comrey, A. L. (1988). Factor-analytic methods of scale development in personality and clinical psychology. *Journal of Consulting and Clinical Psychology, 56*(5), 754-761.
- Conrad, M., & Hammen, C. (1993). Protective and resource factors in high- and low-risk children: A comparison of children with unipolar, bipolar, medically ill, and normal mothers. *Development and Psychopathology, 5*(4), 593-607.
- Copeland, L. Y., & Rosén, L. A. (2011). *The development of a multidimensional measure of relational change during parental illness: The Parental Illness Relationship Impact Scale*. Unpublished doctoral dissertation, Colorado State University, Colorado.
- Cynkar, A. (2007). The changing gender composition of psychology. *Monitor, 38*(6), 46.
- Daly, J. C. (2008). *The adolescent experience with parental cancer: Effects on roles and responsibilities*. Unpublished doctoral dissertation. Colorado State University, Colorado.
- DeVellis, R. F. (2003). *Scale Development Theory and Applications*. Thousand Oaks, CA: Sage.
- Devins, G. M., Dion, R., Pelletier, L. G., Shapiro, C. M., Abbey, S., Raiz, L. R., Binik, Y. M., McGowan, P., Kutner, N. G., Beanlands, H., & Edworthy, S. M. (2001). Structure of

- lifestyle disruptions in chronic disease: a confirmatory factor analysis of the Illness Intrusiveness Ratings Scale. *Medical Care*, 39(10), 1097-1104.
- Dyson, R., & Renk, K. (2006). Freshmen adaptation to university life: Depressive symptoms, stress, and coping. *Journal of Clinical Psychology*, 62(10), 1231-1244.
- Faulkner, R., & Davey, M. (2002). Children and adolescents of cancer patients: The impact of cancer on the family. *American Journal of Family Therapy*, 30(1), 63-72.
- Fritz, M. S., & MacKinnon, D. P. (2007). Required sample size to detect the mediated effect. *Psychological Science*, 18(3), 233-238.
- Gabiak, B., Bender, C., & Puskar, K. (2007). The impact of parental cancer on the adolescent: An analysis of the literature. *Psycho-Oncology*, 16(2), 127-137.
- Gest, S. D., Reed, M.G., & Masten, A. S. (1999). Measuring developmental changes in exposure to adversity: A life chart and rating scale approach. *Development and Psychopathology*, 11, 171-192.
- Grant, K. E., & Compas, B. E. (1995). Stress and anxious-depressed symptoms among adolescents: searching for mechanisms of risk. *Journal of Consulting and Clinical Psychology*, 63, 1015-1021.
- Harter, S. (1985). *Manual for the Social Support Scale for Children*. Denver: University of Denver.
- Hiester, M., Nordstrom, A., & Swenson, L. M. (2009). Stability and change in parental attachment and adjustment outcomes during the first semester transition to college life. *Journal of College Student Development*, 50(5), 521-538.
- Hirsch, B., Moos, R., & Reischl, T. (1985). Psychosocial adjustment of adolescent children of a depressed, arthritic, or normal parent. *Journal of Abnormal Psychology*, 94(2), 154-164.

- Horowitz, M., Wilner, N., & Alvarez, W. (1979). Impact of Event Scale: A measure of subjective stress. *Psychosomatic Medicine*, *41*(3), 209-218.
- Howes, M. J., Hoke, L., Winterbottom, M., & Delafield, D. (1994). Psychosocial effects of breast cancer on the patient's children. *Journal of Psychosocial Oncology*, *12*(1), 1-21.
- Huizinga, G. A., van der Graaf, W., Visser, A., Dijkstra, J. S., & Hoekstra-Weebers, J. (2003). Psychosocial consequences for children of a parent with cancer: A pilot study. *Cancer Nursing*, *26*(3), 195-202.
- Huizinga, G. A., Visser, A., van der Graaf, W. A., Hoekstra, H. J., Klip, E. C., Pras, E., & Hoekstra-Weebers, J. M. (2005). Stress response symptoms in adolescent and young adult children of parents diagnosed with cancer. *European Journal of Cancer*, *41*(2), 288-295.
- Jackson, S., Bijstra, J., Oostra, L., & Bosma, H. (1998). Adolescents' perceptions of communication with parents relative to specific aspects of relationships with parents and personal development. *Journal of Adolescence*, *21*(3), 305-322.
- Klimidis, S., Minas, I. H., Yamamoto, K. (2001). Impact of illness scale: reliability, validity, and cross-cultural utility. *Comparative Psychiatry*, *42*(5), 416-423.
- Kolkhorst, B. B., Yazedjian, A., & Toews, M. L. (2010). A longitudinal examination of parental attachment, college adjustment, and academic achievement. *Journal of the First-Year Experience & Students in Transition*, *22*(1), 9-25.
- Korneluk, Y., & Lee, C. (1998). Children's adjustment of parental physical illness. *Clinical Child and Family Psychology Review*, *1*(3), 179-193.
- Kotchick, B., Summers, P., Forehand, R., & Steele, R. (1997). The role of parental and extrafamilial social support in the psychosocial adjustment of children with a chronically ill father. *Behavior Modification*, *21*(4), 409-432.

- Leedham, B., & Meyerowitz, B. (1999). Responses to parental cancer: A clinical perspective. *Journal of Clinical Psychology in Medical Settings*, 6(4), 441-461.
- Lewis, F., & Darby, E. (2003). Adolescent adjustment and maternal breast cancer: A test of the 'faucet hypothesis'. *Journal of Psychosocial Oncology*, 21(4), 81-104.
- Lewis, F., Hammond, M., & Woods, N. (1993). The family's functioning with newly diagnosed breast cancer in the mother: The development of an explanatory model. *Journal of Behavioral Medicine*, 16(4), 351-370.
- Lichtman, R. R., Taylor, S. E., Wood, J. V., Bluming, A. Z., Dosik, G. M., & Leibowitz, R. L. (1984). Relationships with children after breast cancer: the mother-daughter relationship at risk. *Journal of Psychosocial Oncology*, 4, 1-18.
- Lindqvist, B., Schmitt, F., Santalahti, P., Romer, G. & Piha, J. (2007). Factors associated with the mental health of adolescents when a parent has cancer. *Scandinavian Journal of Psychology*, 48, 345-351.
- Loevinger, J. (1957). Objective tests as instruments of psychological theory. *Psychological Reports*, 3635-694.
- Lyman, R. D., & Hembree-Kigin, T. L. (1994). *Interventions with Preschool Children*. New York, NY: Plenum Press.
- Malecki, C. K., & Demaray, M. C. (2002). Measuring perceived social support: Development of the Child and Adolescent Social Support Scale. *Psychology in the Schools*, 39(1), 1-18.
- Malecki, C. K., Demaray, M. C., & Elliott, S. N. (2000). *A working manual on the development of the Child and Adolescent Social Support Scale*. DeKalb: Northern Illinois University.

- Masten, A. S., Neemann, J., & Andenas, S. (1994). Life events and adjustments in adolescents: The significance of event independence, desirability, and chronicity. *Journal of Research of Adolescence, 4*, 71-97.
- Miller, J. (2008). *Parental cancer: The parent-child bond at risk*. (Doctoral dissertation, University of North Carolina at Greensboro, 2008). Retrieved from <http://libres.uncg.edu/ir/uncg/listing.aspx?id=169>
- Modry-Mandell, K. L., Gamble, W. C., & Taylor, A. R. (2007). Family emotional climate and sibling relationship quality: Influences on behavioral problems and adaptation in preschool-aged children. *Journal of Child and Family Studies, 16*(1), 61-73.
- Morley, D., Selai, C., Schrag, A., Thompson, A., & Jahanshahi, M. (2010). Refinement and validation of the Parental Illness Impact Scale. *Parkinsonism & Related Disorders, 16*(3), 181-185.
- Multiple Sclerosis Foundation (2009). Who gets multiple sclerosis? Retrieved from <http://www.msfocus.org/who-gets-multiple-sclerosis.aspx>.
- Murphy, D. A., Marelich, W. D., Armistead, L., Herbeck, D. M., & Payne, D. L. (2010). Anxiety/stress among mothers living with HIV: effects on parenting skills and child outcomes. *AIDS Care, 22*(12), 1449-1458.
- National Center for Education Statistics (2011a). Fast facts: Enrollment. Retrieved from <http://nces.ed.gov/fastfacts/display.asp?id=98>.
- National Center for Education Statistics (2011b). Fast facts: Immediate transition to college. Retrieved from <http://nces.ed.gov/fastfacts/display.asp?id=51>.
- National Kidney Foundation (2010). Chronic kidney disease. Retrieved from <http://www.kidney.org/kidneydisease/ckd/index.cfm>.

- Nelson, E., Sloper, P., Charlton, A., & While, D. (1994). Children who have a parent with cancer: A pilot study. *Journal of Cancer Education, 9*(1), 30-36.
- Nelson, E., & While, D. Children's adjustment during the first year of a parent's cancer diagnosis (2002). *Journal of Psychosocial Oncology, 20*, 15-36.
- Osborn, T. (2007). The psychosocial impact of parental cancer on children and adolescents: A systematic review. *Psycho-Oncology, 16*(2), 101-126.
- Parker, J. C., Rubin, K. H., Erath, S. A., Wojslawowicz, J. C., & Buskirk, A. A. (2006). Peer relationships, child development, and adjustment: A developmental psychopathology perspective. In Cicchetti, D., & Cohen, D. A. (2006). *Developmental Psychopathology: Theory and Method*. New York: Wiley.
- Pedersen, S., & Revenson, T. A. (2005). Parental illness, family functioning, and adolescent well-being: A family ecology framework to guide research. *Journal of Family Psychology, 19*(3), 404-419.
- Pepler, D. J., & Craig, W. M. (1998). Assessing children's peer relationships. *Child Psychology and Psychiatry Review, 3*(4), 176-182.
- Pike, A., Coldwell, J., & Dunn, J. F. (2005). Sibling relationships in early/middle childhood: Links with individual adjustment. *Journal of Family Psychology, 19*(4), 523-53.
- Porter, K. (2002). The value of a college degree: ERIC digest. Retrieved from <http://www.ericdigests.org/2003-3/value.htm>.
- Robin, A. L., & Foster, S. (1989). *Negotiating parent-adolescent conflict*. New York: Guilford Press.
- Rolland, J. (1999). Parental illness and disability: a family systems framework. *Journal of Family Therapy, 21*(3), 242-266.

- Romer, G., Barkmann, C., Schulte-Markwort, M., Thomalla, G., & Riedesser, P. (2002). Children of somatically ill parents: A methodological review. *Clinical Child Psychology and Psychiatry*, 7(1), 17-38.
- Salazar, M., & Frincke, J. (2005). Yesterday, today, and tomorrow careers in psychology: 2005. What students need to know. Presentation at the Annual Convention of the Western Psychological Association, Portland, Oregon. Retrieved from <http://www.apa.org/workforce/presentations/2005-wpa.pdf>.
- Schrag, A., Morley, D., Quinn, N., & Jahanshahi, M. (2004). Development of a measure of the impact of chronic parental illness on adolescent and adult children: The Parental Illness Impact Scale. *Parkinsonism & Related Disorders*, 10(7), 399-405.
- Shirley, L., & Rosén, L. A. (2011). *Resilience to childhood abuse and neglect in college students*. Unpublished doctoral dissertation. Colorado State University, Colorado.
- Shrout, P. E., & Bolger, N. (2002). *Psychological Methods*, 7(4), 422-445.
- Steele, R., Forehand, R., & Armistead, L. (1997). The role of family processes and coping strategies in the relationship between parental chronic illness and childhood internalizing problems. *Journal of Abnormal Child Psychology*, 25(2), 83-94.
- Stocker, C. M., Burwell, R. A., & Briggs, M. L. (2002). Sibling conflict in middle childhood predicts children's adjustment in early adolescence. *Journal of Family Psychology*, 16(1), 50-57.
- Stone, A. A., Bachrach, C. A., Jobe, J. B., Kurtzman, H. S., & Cain, V. S., eds. (1999). *The Science of Self Report: Implications for Research and Practice*. London: Psychology Press.

- Su, Y., & Ryan-Wenger, N. A. (2007). Children's adjustment to parental cancer: A theoretical model development. *Cancer Nursing, 30*(5), 362-381.
- Trimblay, G. C., & Israel, A. C. (2005). Children's adjustment to parental death. *Clinical Psychology: Science and Practice, 5*(4), 424-438.
- Vannatta, K., Grollman, J., Noll, R., & Gerhardt, C. (2008). Impact of maternal breast cancer on the peer interactions of children at school. *Psycho-Oncology, 17*(3), 252-259.
- Vannatta, K., Ramsey, R. R., Noll, R. B., & Gerhardt, C. A. (2010). Associations of child adjustment with parent and family functioning: Comparison of families of women with and without breast cancer. *Journal of Developmental and Behavioral Pediatrics, 31*(9), 9-16.
- Visser, A., Huizinga, G. A., van der Graaf, W. T. A., Hoekstra, H. J., & Hoekstra-Weebers, J. E. H. M. (2004). The impact of parental cancer on children and the family: a review of the literature. *Cancer Treatment Reviews, 30*, 683-694.
- Watson, M., St. James-Roberts, I., Ashley, S., Tilney, C., Brougham, B., Edwards, L., Baldus, C., & Romer, G. (2006). Factors associated with emotional and behavioural problems among school age children of breast cancer patients. *British Journal of Cancer, 94*, 43-50.
- Weaver, K. E., Rowland, J. H., Alfano, C. M., & McNeel, T. S. (2010). Parental cancer and the family. *Cancer, 116*(18), 4395-4401.
- Welch, A. S., Wadsworth, M. E., & Compas, B. E. (1996). Adjustment of children and adolescents to parental cancer. *Cancer, 77*, 1409-1418.
- Wong, M. L., Cavanaugh, C. E., MacLeamy, J. B., Sojourner-Nelson, A., & Koopman, C. (2009). Posttraumatic growth and adverse long-term effects of parental cancer in children. *Families, Systems, and Health, 27*(1), 53-63.

Worsham, N., Compas, B., & Ey, S. (1997). Children's coping with parental illness. *Handbook of children's coping: Linking theory and intervention* (pp. 195-213). New York, NY US: Plenum Press.

Appendix A

Subjective Impact of Parental Illness Scale (SIPIS)

- 1. During the time of your parent's illness, how much did your parent's illness impact you?**
 - Not at all
 - Very Little
 - Somewhat
 - Quite a bit
 - Very much

- 2. To what extent did your way of doing things change as a result of your parent's illness?**
 - Not at all
 - Very Little
 - Somewhat
 - Quite a bit
 - Very much

- 3. During the time of your parent's illness, how much did your parent's illness affect you?**
 - Not at all
 - Very Little
 - Somewhat
 - Quite a bit
 - Very much

- 4. To what extent did your lifestyle remain the same despite your parent's illness?**
 - Not at all
 - Very Little
 - Somewhat
 - Quite a bit
 - Very much

- 5. During the time of your parent's illness, how much did your parent's illness influence your life?**
 - Not at all
 - Very Little
 - Somewhat
 - Quite a bit
 - Very much

Appendix B

Parental Illness Relationship Impact Scale (PIRIS)

The following items deal with parental illness. The items are written in past tense. If your parent currently has a serious illness, please answer on the basis of your entire experience with that parent's illness, including the present.

For the following items, consider your relationship with the parent who experienced or is experiencing serious illness. (If both of your parents have or had a serious illness, choose the parent whose illness had the strongest impact on your life and respond relative to that parent.) Choose one response for each item.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
My relationship with my ill parent worsened as a result of his or her illness.							
My relationship with my ill parent grew more distant as a result of his or her illness.							
As a result of my ill parent's illness, my relationship with my ill parent was not as good as it might have been.							
It was hard for me to connect with my ill parent because of his or her illness.							

For the following items, consider your relationship with your other parent (the parent who has not experienced serious illness). If this parent is absent or deceased, please skip to the next section. (If both of your parents have or had a serious illness, choose the parent whose illness or had the lesser impact on your life and respond relative to that parent.) Choose one response for each item.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
As a result of my ill parent's illness, my relationship with my other parent was not as good as it might have been.							
It was hard for me to connect with my other parent because of my ill parent's illness.							
My relationship with my other parent grew more distant as a result of the stresses of my ill parent's illness.							
My relationship with my other parent worsened as a result of the stresses of my ill parent's illness.							

For the following items, consider your relationships with your sibling(s) during the time of your parent's illness. If you have no siblings, please skip to the next section. (If both of your parents have or had a serious illness, choose the parent whose illness had the strongest impact on your life and respond relative to that parent.)

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
My relationship with my sibling(s) grew more distant as a result of my parent's illness.							
My relationship with my sibling(s) worsened as a result of my parent's illness.							
As a result of my parent's illness, my relationship with my sibling(s) was not as good as it might have been.							
It was hard for me to connect with my sibling(s) because of my parent's illness.							

For the following items, consider your relationships with your friends during the time of your parent's illness. (If both of your parents have or had a serious illness, choose the parent whose illness had the strongest impact on your life and respond relative to that parent.)

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
My relationships with my friends grew more distant as a result of my parent's illness.							
It was hard for me to connect with friends because of my parent's illness.							
My relationships with my friends worsened as a result of my parent's illness.							
As a result of my parent's illness, my relationships with my friends were not as good as they might have been.							

Appendix C

College Adjustment Questionnaire (CAQ)

(Grouped Version)

Listed below are some statements that describe how college students might be feeling about their experience with college. **Please use the rating scale below to indicate how accurately each statement describes you *at this point in time*.** Please read each statement carefully, and then circle the number that corresponds to how accurately the statement describes you.

Response Options

- 1: Very Inaccurate
- 2: Moderately Inaccurate
- 3: Neither Inaccurate nor Accurate
- 4: Moderately Accurate
- 5: Very Accurate

Right now:	Very Inaccurate				Very Accurate
(Academic Adjustment)					
1. I am succeeding academically	1	2	3	4	5
5. I am doing well in my classes	1	2	3	4	5
7. I am happy with the grades I am earning in my classes	1	2	3	4	5
10. I am meeting my academic goals	1	2	3	4	5
13. I have performed poorly in my classes since starting college	1	2	3	4	5
(Social Adjustment)					
2. I don't have as much of a social life as I would like	1	2	3	4	5
4. I am happy with my social life at college	1	2	3	4	5
9. I have had a hard time making friends since coming to college	1	2	3	4	5
11. I am as socially engaged as I would like to be	1	2	3	4	5
14. I am satisfied with my social relationships	1	2	3	4	5
(Emotional Adjustment)					
3. I feel that I am doing well emotionally since coming to college	1	2	3	4	5
6. I am happy with how things have been going in college	1	2	3	4	5
8. I feel that I am emotionally falling apart in college	1	2	3	4	5
12. I have felt the need to seek emotional counseling since coming to college	1	2	3	4	5

Appendix D

Demographics and Illness Information Form

The following questions will ask you about your personal characteristics and the basic characteristics of your parent's illness.

Gender: Female Male

Age: _____

Year in College: Freshman
 Sophomore
 Junior
 Senior

Ethnicity:

- American Indian or Alaska Native
- Asian
- Asian Indian
- Black
- Latino/Latina
- Middle Eastern
- Pacific Islander
- White, Non-Hispanic
- Other: _____

Is English your first language? Yes No

If *no*, please indicate how many years you have spoken English: _____

How many siblings do you have?

- 0
- 1
- 2
- 3
- 4
- 5
- More than 5

Which of your parents was diagnosed with a serious illness?

- Mother/Stepmother
- Father/Stepfather
- Both parents

With what illness was your **mother/stepmother** diagnosed? (If multiple serious illnesses were diagnosed, please check all that apply.)

<ul style="list-style-type: none"> <input type="radio"/> Not Applicable <input type="radio"/> Addison's Disease <input type="radio"/> AIDS <input type="radio"/> Amyotrophic lateral sclerosis (Lou Gehrig's Disease) <input type="radio"/> Aortic Aneurysm <input type="radio"/> Anal Cancer <input type="radio"/> Arthritis (Severe) <input type="radio"/> Asthma (Severe) <input type="radio"/> Autoimmune Hepatitis <input type="radio"/> Behcet's Disease <input type="radio"/> Basal Cell Carcinoma <input type="radio"/> Bile Duct Cancer <input type="radio"/> Bladder Cancer <input type="radio"/> Bone Cancer <input type="radio"/> Botulism <input type="radio"/> Brain Aneurysm <input type="radio"/> Brain Cancer <input type="radio"/> Brain Injury <input type="radio"/> Breast Cancer <input type="radio"/> Cancer (other) <input type="radio"/> Castleman Disease <input type="radio"/> Celiac Disease <input type="radio"/> Cervical Cancer <input type="radio"/> Churg-Strauss Syndrome <input type="radio"/> Colon Cancer <input type="radio"/> Cervical Cancer <input type="radio"/> Chronic Fatigue Syndrome <input type="radio"/> Chronic Heart Disease <input type="radio"/> Chronic Kidney Disease <input type="radio"/> Chronic Lymphocytic Leukemia <input type="radio"/> Chronic Obstructive Pulmonary Disease <input type="radio"/> Cirrhosis <input type="radio"/> Creutzfeldt-Jakob Disease <input type="radio"/> Colon Cancer <input type="radio"/> Congestive Heart Failure <input type="radio"/> Cushing's Syndrome <input type="radio"/> Crohn's Disease <input type="radio"/> Cystic Fibrosis <input type="radio"/> Diabetes <input type="radio"/> Emphysema <input type="radio"/> Encephalitis <input type="radio"/> Endocarditis 	<ul style="list-style-type: none"> <input type="radio"/> Endometrial Cancer <input type="radio"/> Epilepsy <input type="radio"/> Esophageal Cancer <input type="radio"/> Fibromyalgia <input type="radio"/> Gallbladder Cancer <input type="radio"/> Gastric Cancer <input type="radio"/> Gastroparesis <input type="radio"/> Grand Mal Seizure <input type="radio"/> Guillain-Barre Syndrome <input type="radio"/> Heart Cancer <input type="radio"/> Heart Failure <input type="radio"/> Hemophilia <input type="radio"/> Hepatitis C <input type="radio"/> HIV <input type="radio"/> Hodgkin's Lymphoma <input type="radio"/> Huntington's Disease <input type="radio"/> Incontinence <input type="radio"/> Interstitial Cystitis <input type="radio"/> Interstitial Lung Disease <input type="radio"/> Intestinal Ischemia <input type="radio"/> Invasive Lobular Carcinoma <input type="radio"/> Irritable Bowel Syndrome <input type="radio"/> Kidney Cancer <input type="radio"/> Kidney Failure <input type="radio"/> Krabbe Disease <input type="radio"/> Laryngeal Cancer <input type="radio"/> Leukemia <input type="radio"/> Liver Cancer <input type="radio"/> Lupus <input type="radio"/> Lung Cancer <input type="radio"/> Migraine Headaches (Severe) <input type="radio"/> Merkel Cell Carcinoma <input type="radio"/> Mesothelioma <input type="radio"/> Mouth Cancer <input type="radio"/> Multiple Sclerosis <input type="radio"/> Multiple System Atrophy <input type="radio"/> Muscular Dystrophy <input type="radio"/> Narcolepsy <input type="radio"/> Osteoarthritis <input type="radio"/> Osteomyelitis 	<ul style="list-style-type: none"> <input type="radio"/> Osteoporosis <input type="radio"/> Ovarian Cancer <input type="radio"/> Paget's Disease of Bone <input type="radio"/> Paget's Disease of the Breast <input type="radio"/> Parkinson's Disease <input type="radio"/> Pancreatic Cancer <input type="radio"/> Pharyngeal Cancer <input type="radio"/> Polio <input type="radio"/> Pulmonary Embolism <input type="radio"/> Pulmonary Fibrosis <input type="radio"/> Prostate Cancer <input type="radio"/> Rabies <input type="radio"/> Rectal Cancer <input type="radio"/> Rheumatoid Arthritis <input type="radio"/> Scleroderma <input type="radio"/> Severe Acute Respiratory Syndrome (SARS) <input type="radio"/> Seizures, Recurrent <input type="radio"/> Sickle Cell Anemia <input type="radio"/> Skin Cancer <input type="radio"/> Soft Tissue Sarcoma <input type="radio"/> Spinal Tumor <input type="radio"/> Stomach Cancer <input type="radio"/> Stroke <input type="radio"/> Syphilis <input type="radio"/> Takayasu's Arteritis <input type="radio"/> Testicular Cancer <input type="radio"/> Tetanus <input type="radio"/> Throat Cancer <input type="radio"/> Thyroid Cancer <input type="radio"/> Toxic Shock Syndrome <input type="radio"/> Tuberculosis <input type="radio"/> Ulcerative Colitis <input type="radio"/> Uterine Cancer <input type="radio"/> Vaginal Cancer <input type="radio"/> Ventricular Fibrillation <input type="radio"/> Vulvar Cancer <input type="radio"/> Yellow Fever <input type="radio"/> Other: _____
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With what illness was your **father/stepfather** diagnosed? (If multiple serious illnesses were diagnosed, please check all that apply.)

<ul style="list-style-type: none"> <input type="radio"/> Not Applicable <input type="radio"/> Addison's Disease <input type="radio"/> AIDS <input type="radio"/> Amyotrophic lateral sclerosis (Lou Gehrig's Disease) <input type="radio"/> Aortic Aneurysm <input type="radio"/> Anal Cancer <input type="radio"/> Arthritis (Severe) <input type="radio"/> Asthma (Severe) <input type="radio"/> Autoimmune Hepatitis <input type="radio"/> Behcet's Disease <input type="radio"/> Basal Cell Carcinoma <input type="radio"/> Bile Duct Cancer <input type="radio"/> Bladder Cancer <input type="radio"/> Bone Cancer <input type="radio"/> Botulism <input type="radio"/> Brain Aneurysm <input type="radio"/> Brain Cancer <input type="radio"/> Brain Injury <input type="radio"/> Breast Cancer <input type="radio"/> Cancer (other) <input type="radio"/> Castleman Disease <input type="radio"/> Celiac Disease <input type="radio"/> Cervical Cancer <input type="radio"/> Churg-Strauss Syndrome <input type="radio"/> Colon Cancer <input type="radio"/> Cervical Cancer <input type="radio"/> Chronic Fatigue Syndrome <input type="radio"/> Chronic Heart Disease <input type="radio"/> Chronic Kidney Disease <input type="radio"/> Chronic Lymphocytic Leukemia <input type="radio"/> Chronic Obstructive Pulmonary Disease <input type="radio"/> Cirrhosis <input type="radio"/> Creutzfeldt-Jakob Disease <input type="radio"/> Colon Cancer <input type="radio"/> Congestive Heart Failure <input type="radio"/> Cushing's Syndrome <input type="radio"/> Crohn's Disease <input type="radio"/> Cystic Fibrosis <input type="radio"/> Diabetes <input type="radio"/> Emphysema <input type="radio"/> Encephalitis <input type="radio"/> Endocarditis 	<ul style="list-style-type: none"> <input type="radio"/> Endometrial Cancer <input type="radio"/> Epilepsy <input type="radio"/> Esophageal Cancer <input type="radio"/> Fibromyalgia <input type="radio"/> Gallbladder Cancer <input type="radio"/> Gastric Cancer <input type="radio"/> Gastroparesis <input type="radio"/> Grand Mal Seizure <input type="radio"/> Guillain-Barre Syndrome <input type="radio"/> Heart Cancer <input type="radio"/> Heart Failure <input type="radio"/> Hemophilia <input type="radio"/> Hepatitis C <input type="radio"/> HIV <input type="radio"/> Hodgkin's Lymphoma <input type="radio"/> Huntington's Disease <input type="radio"/> Incontinence <input type="radio"/> Interstitial Cystitis <input type="radio"/> Interstitial Lung Disease <input type="radio"/> Intestinal Ischemia <input type="radio"/> Invasive Lobular Carcinoma <input type="radio"/> Irritable Bowel Syndrome <input type="radio"/> Kidney Cancer <input type="radio"/> Kidney Failure <input type="radio"/> Krabbe Disease <input type="radio"/> Laryngeal Cancer <input type="radio"/> Leukemia <input type="radio"/> Liver Cancer <input type="radio"/> Lupus <input type="radio"/> Lung Cancer <input type="radio"/> Migraine Headaches (Severe) <input type="radio"/> Merkel Cell Carcinoma <input type="radio"/> Mesothelioma <input type="radio"/> Mouth Cancer <input type="radio"/> Multiple Sclerosis <input type="radio"/> Multiple System Atrophy <input type="radio"/> Muscular Dystrophy <input type="radio"/> Narcolepsy <input type="radio"/> Osteoarthritis <input type="radio"/> Osteomyelitis 	<ul style="list-style-type: none"> <input type="radio"/> Osteoporosis <input type="radio"/> Ovarian Cancer <input type="radio"/> Paget's Disease of Bone <input type="radio"/> Paget's Disease of the Breast <input type="radio"/> Parkinson's Disease <input type="radio"/> Pancreatic Cancer <input type="radio"/> Pharyngeal Cancer <input type="radio"/> Polio <input type="radio"/> Pulmonary Embolism <input type="radio"/> Pulmonary Fibrosis <input type="radio"/> Prostate Cancer <input type="radio"/> Rabies <input type="radio"/> Rectal Cancer <input type="radio"/> Rheumatoid Arthritis <input type="radio"/> Scleroderma <input type="radio"/> Severe Acute Respiratory Syndrome (SARS) <input type="radio"/> Seizures, Recurrent <input type="radio"/> Sickle Cell Anemia <input type="radio"/> Skin Cancer <input type="radio"/> Soft Tissue Sarcoma <input type="radio"/> Spinal Tumor <input type="radio"/> Stomach Cancer <input type="radio"/> Stroke <input type="radio"/> Syphilis <input type="radio"/> Takayasu's Arteritis <input type="radio"/> Testicular Cancer <input type="radio"/> Tetanus <input type="radio"/> Throat Cancer <input type="radio"/> Thyroid Cancer <input type="radio"/> Toxic Shock Syndrome <input type="radio"/> Tuberculosis <input type="radio"/> Ulcerative Colitis <input type="radio"/> Uterine Cancer <input type="radio"/> Vaginal Cancer <input type="radio"/> Ventricular Fibrillation <input type="radio"/> Vulvar Cancer <input type="radio"/> Yellow Fever <input type="radio"/> Other: _____
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The following questions deal with your parent's diagnosis. If both of your parents were diagnosed with a serious illness, please answer the questions that follow with regard to the parent whose illness has affected your day-to-day life the most.

When was your parent first diagnosed with a serious illness?

- My parent was diagnosed before I was born.
- My parent was diagnosed when I was an infant or toddler.
- My parent was diagnosed when I was a small child (age 3 to 6).
- My parent was diagnosed when I was an older child (age 7 to 9).
- My parent was diagnosed when I was a preteen (age 10-12).
- My parent was diagnosed when I was a young teenager (age 13 to 15).
- My parent was diagnosed when I was an older teenager (age 16 to 17).
- I was 18 or older when my parent was diagnosed.

Do you remember the time of your parent's diagnosis?

- Yes, clearly
- Yes, but the memories aren't very clear
- No

What prognosis was given for your parent's illness? (In other words, when your parent was first diagnosed with disease, what did medical professionals say his or her chances of recovering/living a normal life were like?)

- Very good
- Good
- Fairly good
- Fairly poor
- Poor
- Very poor
- I don't know

The next questions deal with your family's experience of your parent's illness. The questions are written in past tense. If your parent is currently ill, consider his or her entire experience, including the present. Again, if both of your parents were diagnosed with a serious illness, please answer the questions that follow with regard to the parent whose illness has affected your day-to-day life the most.

On a scale of 1 to 7, how involved was the health care system in your parent's illness? (If your parent is currently ill, consider your parent's entire experience with his or her illness, including the present. Do the same for the questions that follow.)

- 1 – Barely involved at all. My parent received basic services from his or her usual health care providers.
- 2 – Slightly involved. (My parent relied on his or her usual health care providers more so than in the past, although not to the extent that it interfered with his or her day-to-day life.)
- 3 – Somewhat involved. (My parent relied fairly heavily on his or her usual health care providers. He or she may have sought out specialists and/or been prescribed a non-invasive health regimen that would have to be followed for an extended period.)

- 4 – Involved. (My parent was prescribed a non-invasive health regimen that he or she would have to follow for the rest of his or her life, but it was expected that he or she would live fairly normally.)
- 5 – Quite involved. (My parent had at least one major medical procedure or surgery AND/OR was hospitalized at least one time AND/OR was prescribed an invasive or time-consuming health routine that would have to be followed for an extended period.)
- 6 – Very involved. (My parent had at least two major medical procedures or surgeries AND/OR was hospitalized at least two times AND/OR was prescribed an invasive or time-consuming health routine that would have to be followed for the rest of his or her life.)
- 7 – Extremely involved. (My parent spent a great deal of time in a hospital or care facility. Doctors tried multiple major surgeries, invasive treatments, and/or intrusive medical procedures in an effort to help my parent. He or she may have relied on life support.)

To what extent were doctors and health care professionals involved in your ill parent’s life?

- Not at all
- Very Little
- Somewhat
- Quite a bit
- Very much

How much did the health care system interfere with your ill parent’s day-to-day living?

- Not at all
- Very Little
- Somewhat
- Quite a bit
- Very much

How much did the health care system influence your ill parent’s lifestyle?

- Not at all
- Very Little
- Somewhat
- Quite a bit
- Very much

Were you living with your ill parent during the time of his or her illness?

- Yes.
- No.
- I lived with my ill parent some of the time.
- My parent was hospitalized for most or all of his or her illness.

Was your ill parent married or partnered throughout the course of his or her illness?

- Yes.
- No.
- My ill parent divorced or separated during his or her illness.

What was the duration of your parent's illness, from start to finish?

- My parent is still dealing with his or her illness.
- Less than 3 months.
- More than 3 months but less than a year.
- About 1 year.
- About 2 years.
- About 3 years.
- 4 to 5 years.
- 6 to 10 years.
- More than 10 years.

About how many weeks total did your parent spend in a hospital or care facility (if at all)?

How effective were treatments for your parent's illness?

- Very effective – my parent was cured of his or her illness.
- Somewhat effective – my parent was not cured, but he or she was able to go on to live a normal life.
- Not very effective – my parent's symptoms were lessened, but the disease continued to interfere with his or her life.
- Completely ineffective – my parent's symptoms were not lessened at all, AND/OR he or she passed away despite treatment.
- My parent did not seek treatment for his or her illness.

What is the current status of your parent's illness?

- My parent is deceased due to his or her illness.
- My parent is deceased, but **not** because of his or her illness.
- My parent is still struggling with his or her illness, and it has a large negative impact on his or her day-to-day life.
- My parent is still struggling with his or her illness, but it does **not** have a large negative impact on his or her day-to-day life.
- My parent's illness is in remission.
- My parent has completely recovered from his or her illness.

On a scale of 0 to 10, with 10 representing perfect health, how would you rate your parent's health overall during the time of his or her illness? (If your parent is currently ill, consider the entire course of his or her illness, including the present.)

- 0 – My parent died as a result of his or her illness.
- 1 – My parent's illness was rapidly progressive and/or classified as fatal.
- 2 – My parent was very ill and required urgent hospital admission. He or she required life support.
- 3 – My parent was *severely* disabled as a result of his or her illness. He or she may have had to go to the hospital during the time of his or her illness, but there was no immediate risk of death.
- 4 – My parent was disabled as a result of his or her illness and required special care or help.
- 5 – My parent required frequent help and medical care.

- 6 – My parent required some help, but had the ability to take care of most personal requirements.
- 7 – My parent could care for himself or herself but was not capable of normal activity or work.
- 8 – My parent was able to engage in normal activity with some difficulty. He or she had some signs or symptoms of disease.
- 9 – My parent was capable of normal activity and had few symptoms or signs of disease.
- 10 – My parent’s health was normal. He or she had no complaints and no signs of disease.

During the time of your parent’s illness, which of the following did you and your family experience (if any)? Check all that apply.

- My family changed its routines to accommodate my ill parent’s needs.
- My family had financial difficulty.
- I had to spend more time helping my family.
- My parents had marital difficulties.
- My parents’ relationships with each other seemed more strained than usual.
- It became more difficult for my parents to transport me to my activities.
- My parents did not get along as well as they used to.
- My family had to change the way it did things.
- My family had a harder time making ends meet.
- My family’s routines had to be adjusted.
- My parents weren’t able to drive me places as much as they used to.
- My family had less money.
- I had to take on more responsibilities.
- It was harder for me to get transportation to activities.
- I had to put more effort into helping my family.

Appendix E

Debriefing Form

Thank you for participating in this study! **You will be awarded 1 ½ research credits for your participation.**

If you have any questions about the study, you can contact the investigator, Lindsey Copeland, at lindsey.y.copeland@gmail.com or at 970-315-2798. If you have any questions about your rights as a volunteer in this research, contact Janell Barker, Human Research Administrator, at 970-491-1655.

Sometimes it's difficult to think about topics like parental illness. If you found any of the survey questions in this study upsetting, it might be helpful to visit Counseling Services (now part of the CSU Health Network) for an appointment with a counselor. **To set up an appointment, call 491-7121 or visit the reception desk at 123 Aylesworth Hall. If you have an after-hours mental health emergency, please call 491-7111 to speak with an on call counselor.**

If you're interested in learning more about psychology and physical health, take a look at Module 32, p. 445-456 ("Promoting Health") in your textbook.

My research team and I truly appreciate your involvement!

Sincerely,

Lindsey Copeland
Counseling Psychology Doctoral Program
Colorado State University
lindsey.y.copeland@gmail.com
970-315-2798

Appendix F

Introduction

The psychosocial effects of an adult's serious somatic illness often extend to his or her children. It has been estimated that 4 to 15% of children in Western societies may have a parent or parents with serious illness (Barkmann et al., 2007; Romer et al., 2002; Worsham, Compas, & Sydney, 1997), with a higher prevalence rate among adolescents (14-15%; Pedersen & Revenson, 2005). The children of parents struggling with serious illness are at increased risk for negative emotional, social, and behavioral outcomes, including depression, anxiety, reductions in self-esteem, somatization, sleeping difficulties, and impaired academic performance (Armistead, Klein, & Forehand, 1995; Birenbaum et al., 1999; Grabiak, Bender, & Puskar, 2007; Huizinga, van der Graaf, Hoekstra, & Hoekstra-Weebers, 2003; Korneluk & Lee, 1998; Romer, Barkmann, Schulte-Markwort, Thomalla, & Riedesser, 2002; Vannatta, Ramsey, Noll, & Gerhardt, 2010; Visser, Pedersen & Revenson, 2005). Little is known, however, about the relative persistence of these outcomes. Do they endure into adolescence? Into early adulthood? If the negative impact of serious parental physical illness does indeed persist into adulthood, the manifestation of that impact during one's college years may be particularly crucial, given the importance of college for success in today's world. Successful completion of a college degree is associated with lower rates of unemployment and significantly higher lifetime earnings (Bureau of Labor Statistics, 2011), offering a protective buffer against poverty and the vast array of negative psychosocial and health-related effects to which it has been tied.

We also have an incomplete picture of the manner in which family and peer relationships are related to adjustment. Existing research suggests that the quality of family interactions, which may be taxed by the disruption and uncertainty that so often accompany serious parental physical

illness, plays a role in adjustment among children of ill parents (Faulkner & Davey, 2002; Lewis, Hammond, & Woods, 1993; Miller, 2008; Steele, Forehand, & Armistead, 1997). It has also been suggested that the nature and quality of relationships with peers may contribute to children's adjustment to parental illness (Christ, Siegel, Freund, Langosch, Hendersen, et al., 1993; Vannatta, Grollman, Noll, & Gerhardt, 2010), although the evidence available is not conclusive (Osborn, 2007). A similarly inconclusive body of literature suggests that gender may also play a role in the manner in which children are affected by serious parental physical illness, with some support for the idea that girls (particularly adolescent girls) may be at a higher risk for poor outcomes after a parental cancer diagnosis (Osborne, 2007; Visser, Huizinga, van der Graaf, et al., 2004; Welch, Wadsworth, & Compas, 1996).

The present study aimed to address some of the gaps in our understanding of the manner in which serious parental physical illness affects children's long-term adjustment, and the specific contribution of family and peer relationship factors to the association between subjective impact of illness and college adjustment.

Quantifying Serious Parental Physical Illness

In examining the psychosocial effects of serious parental physical illness, it is necessary to delineate what is meant by "serious illness." The concept is problematic, as "serious" is obviously a highly subjective term. Physical illness differs greatly from person to person, with wide variance across onset, course, outcome, level of incapacitation, level of uncertainty, and other elements (Rolland, 1999), and individuals respond to these elements in unique ways. It is not possible to establish a completely objective "hierarchy of seriousness." Some researchers of parental illness have employed the term "chronic illnesses," defined by the CDC as "noncommunicable illnesses that are prolonged in duration, do not resolve spontaneously, and

are rarely cured completely” (2009, p. 2), to encompass the notion of “serious” illness. However, while this definition does extend to many conditions that most individuals would consider serious (i.e., multiple sclerosis, cancer, chronic kidney disease), it also encompasses relatively non-intrusive conditions (i.e., allergies) that are unlikely to carry major psychosocial implications (Barkmann, Romer, Watson, & Schulte-Markwort, 2007). In light of these difficulties, a definition of serious physical parental illness employed by Barkmann et al. (2007) seems most appropriate for the present study: “physical disease in one or both parents, which can be classified as life-threatening and/or having a severe impact on a patient’s quality of life” (p. 477).

Long-Term Impact of Parental Illness on Adjustment

While most researchers agree that serious parental physical illness does impact children’s immediate functioning, very little is known about how long any effects on adjustment may persist or the shape that these effects may take. Participants in a few studies of long-term adjustment reported some positive experiences as a result of parental illness (Leedham & Meyerowitz, 1999; Wong, Cavanaugh, MacLeamy, Sojourner-Nelson, & Koopman, 2009), although it is important to note that such studies were generally qualitative, relied on small sample sizes, and in the case of Leedham and Meyerowitz’s 1999 study, prompted participants to describe positive growth (Wong et al., 2009). Negative long-term effects have also been observed: Osborne (2007) found that increasing time since cancer diagnosis did not predict improvements in children’s adjustment, suggesting that parental cancer’s impact may extend well beyond initial diagnosis and treatment. A small, 2009 qualitative study of adults who experienced parental cancer during childhood (Wong et al.) found that 59% of participants reported adverse consequences as a result of their parent’s illness (i.e., personal health concerns,

feelings of “void,” worsened outlook on life, and negative impact on interpersonal relationships), while 44% reported positive growth stemming from the experience (i.e., stronger interpersonal relationships, increased appreciation for life, and “possibility of taking new paths in life”). As Wong et al. (2009) remarked, “Of note, there was only minimal overlap between positive and negative effects – four participants reported experiencing both positive and negative outcomes – with the majority of participants focused on just negative or positive outcomes” (p. 60). Thus, despite the fact that what little evidence available tentatively suggests that the long-term effects of parental cancer may vary in direction, many individuals may judge their overall experience in a rather one-sided manner, and the majority may experience negative psychosocial effects.

Parental Illness and Relationships with Family and Peers

Serious parental physical illness has been associated with negative change in the quality of children’s relationships with parents (Christ et al., 1993; Faulkner and Davey, 2002), and in those families in which such change occurs, poorer child adjustment outcomes are frequently observed (Lewis & Darby, 2003; Steele et al., 1997). One theoretical model of child adjustment to parental illness suggested by Armistead et al. (1995) proposes that parental illness negatively impacts child functioning via disrupted parenting, which may be either a direct product of illness (i.e., parental absence due to medical requirements, reduced support from parents as a result of illness demands) or an indirect result of illness (i.e., parental depression, marital discord). The role of disrupted parenting as a mediator between serious parental physical illness and child functioning suggests that the quality of parent-child relationships may be crucial to understanding the psychosocial effects of parental illness. Among other studies, Bogosian et al’s review (2010), which found that parental depression moderated the impact of children’s adjustment to their parent’s multiple sclerosis, offers substantiation for this model. Another

framework proposed by Miller (2008) conceptualizes adolescent adjustment to parental cancer within the context of attachment theory, with security of the parent-child attachment acting as a strong mediator between the experience of parental cancer and emotional adjustment. While Miller did not find predicted differences in adjustment between adolescents who had experienced parental cancer and adolescents in a comparison group, it was observed that attachment style did predict stress response and coping, and that participants in the parental cancer group demonstrated more insecure attachments to their parents than did participants in the comparison group. It is evident that both Miller's and Armistead et al.'s models, though presented in different theoretical contexts, are quite similar in their implications: both point to the parent-child relationship as a vital intermediary between serious parental physical illness and adjustment.

While the models suggested by Armistead et al. and Miller provide a theoretical context within which the interplay between parental relationships and adjustment to parental illness can be understood, the research literature still leaves questions about the amount of variance in adjustment accounted for by changing relationships with either parent, the manner in which other family relationships (i.e., relationships with siblings) are affected by parental illness, and the role that other family relationships play in predicting adjustment. Individual variables also warrant exploration: the role of child gender is a particularly interesting line of inquiry, given the nature of findings in this area. Adolescent daughters experiencing serious parental physical illness have been shown to self-report significantly higher levels of internalizing problems, stress responses, and aggressive behavior than adolescent sons (Osborn, 2007), as well as significantly higher levels of intrusion, avoidance, and overall distress (Huizinga, Visser, van der Graaf, et al., 2005). This gender difference appears to be at its most pronounced in the context of maternal illness, with adolescent girls whose mothers have been diagnosed with cancer exhibiting the most

negative psychological outcomes (Grant & Compas, 1995; Welch, Wadsworth, & Compas, 1996; Worsham, Compas, & Ey, 1997). As many researchers have suggested, shifting burdens of household responsibilities may account for this phenomenon (Welch, Wadsworth, & Compas, 1996; Worsham, Compas, & Ey, 1997), a shift that may be especially potent when a mother is unable to function in her previous role in the household. While this theory is not universally supported by available evidence (Daly, 2008), it may prove valuable to examine gender more closely as a moderating variable in the association between the parent-child relationship and psychosocial adjustment.

The theoretical models proposed by Miller and Armistead also neglect conceptualization of the role that sibling relationships play in the family dynamic during the time of parental illness. Sibling relationship quality has been associated with psychosocial adjustment in general family contexts (e.g., Bank, Patterson, & Reid, 1996; Modry-Mandell, Gamble, & Taylor, 2007), but while a very few studies have attempted to assess the manner in which sibling relationships are impacted by parental illness (e.g., Christ et al., 1993), almost none have examined the way sibling relationships impact adjustment. Nelson and While (2002) found that the presence or absence of siblings was not a predictor of adjustment. Visser et al. (2006), on the other hand, found that primary school children in smaller families dealing with parental cancer (i.e., no or few siblings) fared worse in terms of internalizing problems than children from larger families. In addition to providing an incomplete picture regarding whether or not the presence of siblings impacts adjustment to parental illness, these results tell us nothing about the role relationship quality might play. To the best of our knowledge, there are no existing studies examining the association between sibling relationship quality and adjustment to serious parental physical illness. Peer relationships also seem to be affected by serious parental physical illness (Leedham

& Meyerowitz, 1999; Vannatta et al., 2008) and potentially implicated in adjustment (Conrad & Hammen, 1993; Nelson et al., 1994), but again, research in this area is quite limited.

Current Study

The present study sought to examine the relationship between the retrospectively-reported subjective impact of parental physical illness and current levels of college adjustment. Descriptive information was collected and analyzed to form an exploratory picture of participants' experience of their parent's illness. The internal consistency of the Subjective Impact of Parental Illness Scale (SIPIS), a simple five-item measure of perceived illness impact, was confirmed, and correlation analyses were performed to assess the construct validity of the measure and confirm the valence of the assessed impact. Regression analyses were run between total scores on this measure and both full-scale and subscale scores on the College Adjustment Questionnaire (CAQ), an instrument that measures college-level functioning in academic, emotional, and social domains. Given the body of research suggesting that girls may be more negatively impacted by parental illness than boys, correlation analyses and a subsequent one-way between-groups analysis of variance were performed to determine whether female participants reported stronger perceived impact than male participants. Mediation analyses were planned to determine the role that close relationship domains play in the association between perceived illness impact and college adjustment, should an association exist. Relationship domains of interest included the relationship with the ill parent, the relationship (if existing) with the other parent, sibling relationships (if present), and peer relationships. The level of impact on relationship quality in each of these domains was measured via scores on each subscale of the Parental Illness Relationship Impact Scale (PIRIS). It was predicted that changes in relationship quality as measured by the PIRIS would at least partially mediate the association between

perceived illness impact and college adjustment. We planned to examine the mediation model and conduct additional analyses to determine whether the individual impacts in each relationship domain had additive or interactive effects. As has been made clear, very little is known about the long-term impact of serious parental physical illness, and thus, regression analyses were run to determine whether PIRIS scores were predictive of overall college adjustment or CAQ subscale scores.

Because so little research exists on long-term adjustment to serious physical parental illness, it should be noted that our hypotheses were highly tentative in nature. First, we hypothesized that the Subjective Impact of Parental Illness Scale (SIPIS) developed for the purposes of this study would demonstrate acceptable reliability and construct validity. Items included in this brief assessment were generated in accordance with the suggestions of DeVellis (2003), who recommends clear identification of the construct of interest, development of a broad item pool, determination of format of measurement, and exposure of items to an expert review and revision process. Item wording was guided by the recommendations of DeVellis (2003) and Comrey (1988): long, complex, and double-barreled items were avoided, and all items were designed to represent slight variations of a single unifying idea. We assumed that SIPIS scores would be correlated with scores on the PIRIS and with a variety of items assessing objective qualities of parental illness and the health care system's level of involvement.

Second, we hypothesized that subjective illness impact would predict college adjustment, with changes in relationship quality with family and peers (as measured by the PIRIS) at least partially mediating the relationship between subjective illness impact and college adjustment. While the body of relevant literature available is exceedingly thin, we know that subjective illness impact is far more connected to adjustment outcomes than any "objective" characteristics

of serious physical illness (e.g., Korneluk & Lee, 1998; Romer et al., 2002; Visser et al., 2004), serious parental physical illness is associated with at least short-term negative psychosocial consequences (e.g., Daly, 2008; Grabiak et al., 2007; Visser et al., 2004), increasing time since cancer diagnosis does not predict improvement in children's adjustment (Osborne, 2007), and many adults who experience parental cancer during their childhood years report negative long-term personal effects (e.g., Wong et al., 2009). Family and peer relationships seem susceptible to negative change in the wake of serious parental physical illness (e.g., Christ et al., 1993; Bogosian et al., 2010; Faulkner & Davy, 2002), and negatively impacted family relationships, especially those with parents, seem predictive of poorer outcomes in children experiencing serious parental physical illness (e.g., Armistead et al., 1995; Huizinga et al., 2003; Steele et al., 1997). The theoretical models proposed by Armistead et al. (1995) and Miller (2008) point to the parent-child relationship as an arbitrator between the experience of serious physical parental illness and child adjustment outcomes. In light of these findings, we expected to find an association between SIPIS scores and college adjustment scores, with PIRIS scores acting as a partial or full mediator.

We hypothesized that female participants would endorse higher subjective impact than male participants, and that participant gender would act as a moderator of the relationship between subjective illness impact and college adjustment (with poorly-adjusted female participants demonstrating lower adjustment scores than poorly-adjusted male participants). Girls appear to experience more distress and poorer psychosocial outcomes in response to serious parental physical illness than boys (e.g., Grant & Compas, 1995; Huizinga et al., 2005; Osborne, 2007), possibly as a result of increased family responsibilities (Grant & Compas, 1995; Worsham et al., 1997). If, as Osborne's 2007 review suggests, increasing time since a parent's diagnosis does not

predict improvement in child adjustment, it seems feasible that women might experience higher subjective impact and exhibit poorer adjustment outcomes in adulthood than men.

Methods

Participants

One hundred ninety-five university students participated in data collection during September and October of 2010, and an additional 58 students participated in data collection during May of 2011. There were 253 participants in total. Data collection took place at a large public university in the western United States; participants were recruited from introductory psychology courses. The recruitment notice, which was posted via an online departmental research system, solicited voluntary participation from students who had at some time experienced serious parental physical illness as defined by Barkmann et al. (2007): a “physical disease in one or both parents, which can be classified as life-threatening and/or having a severe impact on a patient’s quality of life” (p. 477). Participants received credit toward introductory psychology course requirements in exchange for their participation. One hundred eighty-four students (72.7%) were female and 69 (27.3%) were male. The high percentage of female participants probably stems from the increasingly female composition of psychology as a field rather than any gender differences in exposure to serious parental physical illness. The U.S. Department of Education estimates that around 75% of students earning a B.A. in psychology are women (Salazar & Frincke, 2005), suggesting that this study’s sample closely represents trends in higher education.

Participants ranged in age from 17 to 47, with an average age of 19.55 ($SD = 3.99$). One hundred forty eight students (58.5%) identified as freshmen, 50 (19.8%) identified as sophomores, 35 (13.8%) identified as juniors, and 20 (7.9%) identified as seniors or beyond. Six

students (2.4%) reported their ethnicity as Asian American/Asian, one (0.4%) as American Indian/Alaska Native, four (1.6%) as African American/Black, ten (4%) as Latino, six (2.4%) as Middle Eastern, two (0.8%) as Pacific Islander, 218 (86.2%) as White Non-Hispanic, and six (2.4%) as Other.

Measures

The Subjective Impact of Parental Illness Scale (SIPIS). The SIPIS is a five-item measure of perceived illness impact developed specifically for the purposes of this study. Respondents are asked to respond to questions about the degree to which their parent's illness affected them. Responses are measured on a 5-point Likert scale with options ranging from not at all to very much. See Appendix A for a copy of the scale.

The Parental Illness Relationship Impact Scale (PIRIS). The PIRIS (Copeland & Rosén, 2011) is a 16-item measure of illness-related change in a respondent's relationships with his or her ill parent, other parent (if a relationship is present), siblings (if any), and peers. The measure includes four subscales corresponding with the relationships of interest: Ill Parent, Other Parent, Sibling, and Peer. Response options are presented as a 7-point (1-7) Likert-type scale with responses ranging from strongly disagree to strongly agree. The PIRIS has a four-factor structure, acceptable fit indices (CFI = .956, RMSEA = .086, TLI = .946), and excellent factor loadings (.826 to .949). In a recent study (Copeland & Rosén, 2011), the PIRIS demonstrated a Chronbach's alpha of .92 and subscale reliabilities between .93 and .95. Its internal consistency in the present study was found to be similar, with a Chronbach's alpha of .93 and subscale reliabilities between .93 and .96. Because some respondents do not have siblings or do not interact with one of their parents, a full-scale PIRIS score would not be meaningful. Total scores for each subscale were utilized in the analyses conducted for the purposes of this study.

College Adjustment Questionnaire (CAQ). The CAQ (Shirley & Rosén, 2011) is a 14-item instrument that asks students to respond to items assessing their current level of academic, social, and emotional functioning in college. Items are measured on a 5-point Likert-type scale with responses ranging from not true to completely true. The Academic Adjustment subscale assesses characteristics of academic functioning, including achievement in classes and overall academic success. The Social Adjustment subscale focuses on social engagement and satisfaction. The Emotional Adjustment subscale examines features of psychological and emotional wellness. The CAQ has a three-factor structure and strong fit indices (TLI = .925, CFI = .939, RMSEA = .070), with factor loadings ranging from .55 to .86. The CAQ demonstrates good reliability ($\alpha = .876$ in Shirley & Rosén, 2011; $\alpha = .836$ in the present study) and strong convergent validity.

Procedure

Participants in the study electronically signed an online informed consent form that described the study, outlined potential risks of participation, and assured confidentiality. Participants completed a series of online questionnaires, including a demographics form, a general information form including items assessing overall impact of parental illness and objective illness characteristics, the PIRIS, and the CAQ, as well as a brief selection of assessments that were used in a previous scale validation study. After completing the questionnaires, participants received web-delivered debriefing forms describing the study's purpose, offering information about available counseling services, and providing contact information for the primary investigator. Participants' names were not connected to their online survey responses, and all completed questionnaires were stored in a protected electronic folder.

All procedures and methods employed in this study were approved by the Colorado State University Human Subjects Committee/Institutional Review Board.

Results

Descriptive Statistics. Demographic form responses were analyzed to examine the nature and course of serious physical parental illness experienced by participants. One hundred twenty-eight respondents (50.8%) indicated that their mother or stepmother was diagnosed with a serious physical illness, while 104 (41.3%) reported that their father or stepfather was diagnosed. Twenty respondents (7.9%) indicated that both of their parents were diagnosed with a serious physical illness. (Participants were asked to respond to subsequent survey items in reference to the parent they considered most ill.) One hundred twenty-six respondents (50%) reported that they were 13 or older when their parent was diagnosed. Most respondents shared that they remembered the time of parental diagnosis, with 122 (48.4%) endorsing that they clearly remembered their parent receiving the diagnosis and 66 (26.2%) endorsing that they vaguely remembered their parent receiving the diagnosis.

Prognosis ranged widely: 24 respondents (9.5%) reported that their parent's prognosis was "very good," 54 (21.4%) endorsed a "good" prognosis, 81 (32.1%) indicated that the prognosis was "fairly good," 28 (11.1%) said that the prognosis was "fairly poor," 17 (6.7%) reported that the prognosis was "poor," 23 (9.1%) endorsed a "very poor" prognosis, and 24 (9.5%) stated that they did not know the prognosis. With regard to the duration of parental illness, 113 respondents (44.8%) indicated that their parent is currently still dealing with his or her illness. Eleven respondents (4.4%) endorsed a duration of less than three months, 29 (11.5%) endorsed a duration of more than three months but less than a year, 16 (6.3%) endorsed a duration of 1 year, 28 (11.1%) endorsed a duration of 2 years, 9 (3.6%) endorsed a duration of 3

years, 9 (3.6%) endorsed a duration of 4-5 years, 13 (5.2%) endorsed a duration of 6-10 years, and 24 (9.5%) endorsed a duration of more than 10 years. Reported effectiveness of treatment was variable, with 61 respondents (24.2%) describing their parent's treatment as "very effective," 103 (40.9%) describing treatment as "somewhat effective," 63 (25%) describing treatment as "not very effective," 17 (6.7%) describing treatment as "completely ineffective," and 8 (3.2%) reporting that their parent did not seek treatment. Twenty-eight participants (11.1%) reported that their parent is now deceased as a result of his or her illness, while 2 participants (.8%) reported that their parent is deceased for reasons unrelated to physical illness. Sixty-one participants (24.2%) indicated that their parent is still struggling with his or her illness and that the illness has a large negative impact on their parent's day-to-day life. Eighty-one participants (32.1%) reported that their parent is still struggling with his or her illness and that the illness does not have a large negative impact on their parent's day-to-day life. Thirty-four respondents (13.5%) indicated that their parent's illness is in remission, and 46 (18.3%) reported that their parent has completely recovered.

Reliability Analyses. The internal consistency of the Subjective Impact of Parental Illness Scale (SIPIS) was assessed by calculating inter-item correlations. While cutoff levels vary, in general a Cronbach's alpha (α) between .70 and .80 can typically be considered "respectable," and values above .80 can be considered "very good" or excellent (DeVellis, 2003). By this criterion, the five-item scale exhibited excellent inter-item consistency, with a Cronbach's alpha (α) of .876. The PIRIS and CAQ also demonstrated excellent internal consistency, with Chronbach's alpha scores of .93 and .84, respectively.

SIPIS scores were normally distributed, with the majority of respondents endorsing scores near the middle of the range (\bar{x} = 15.59). CAQ scores were also normally distributed (\bar{x} =

49.67). PIRIS subscale scores were positively skewed, with subscale means ranging from 8.44 to 10.18, median scores between 7 and 8, and a modal score of 4 across all subscales.

Correlation Analyses. To assess the construct validity of the SIPIS, correlation analyses were run to examine the relationship between SIPIS scores and scores on each subscale of the PIRIS. SIPIS total scores were positively correlated with PIRIS Ill Parent Subscale scores ($r=.246, p=.000$), Other Parent Subscale average scores ($r = .250, p = .000$), Sibling Subscale scores ($r = .225, p = .001$), and Peer Subscale scores ($r = .345, p = .000$), offering evidence of good construct validity and strongly suggesting that respondents who reported high impact on the SIPIS were referring to a highly negative impact.

Correlations were also run between SIPIS scores and items on the demographic form assessing the participant's age and level of recall at the time of the parent's diagnosis (we assumed a basic level of awareness would be needed for the participant to recall high illness impact) and the nature of the parent's experience of illness. Respondent age at the time of parental diagnosis was positively correlated with total SIPIS scores ($r = .205, p = .001$), with older respondent age associated with higher perceived impact. Limited recall of the time of parental diagnosis was negatively correlated with total SIPIS scores ($r = -.276, p = .000$), such that clearer memories of the diagnosis were associated with higher perceived impact. An item assessing level of health care system involvement during the time of serious physical parental illness (where lower scores represent limited involvement and higher scores represent intrusive involvement) was positively correlated with perceived impact ($r = .376, p = .000$). Similarly, SIPIS scores were positively correlated with scores on an item assessing the level to which involvement with the health care system interfered with day to day family life ($r = .319, p = .000$), with higher health care system interference associated with higher perceived impact. SIPIS

scores were also positively correlated with scores on an item assessing the level to which involvement with the health care system influenced the family's lifestyle ($r = .327, p = .000$), such that higher health care system influence was associated with higher perceived impact. There was a negative correlation between SIPIS scores and scores on an item measuring the level to which the parent's illness impacted his or her ability to function ($r = -.393, p = .000$). Lower scores on this item (with a score of 1 representing parental death) were associated with higher perceived impact. The current status of the parent's illness (with the lowest score representing that the parent is deceased, and the highest score representing complete recovery) was negatively correlated with total SIPIS scores ($r = -.197, p = .002$). These results offered further support for the construct validity of the SIPIS.

Preliminary correlations were run between SIPIS scores and CAQ scores. SIPIS scores were not significantly correlated with total CAQ scores ($r = -.033, p = .308$) or with scores on any of the CAQ subscales. Preliminary correlations were also run between PIRIS scores and CAQ scores. Average scores on the PIRIS Sibling Subscale were significantly negatively correlated with total CAQ scores, $r = -.122, p = .038$. The remaining subscale scores were not significantly correlated with total CAQ scores.

Final correlations were run to assess whether SIPIS scores and CAQ scores were associated with gender. Gender was negatively correlated with SIPIS scores ($r = -.212, p = .001$), indicating that being female was associated with higher perceived impact. Gender and CAQ total scores were not significantly correlated, $r = -.049, p = .446$.

Simple Linear Regression Analyses. SIPIS total scores were regressed on CAQ total scores and CAQ subscale scores. Contrary to hypothesis, subjective parental illness impact did not significantly predict overall college adjustment, $B = -.071, t(237) = -.503, p = .615$. Likewise,

SIPIS scores were not significantly predictive of CAQ Emotional Subscale scores, $B = .013$, $t(244) = .206$, $p = .837$, nor did they significantly predict CAQ Social Subscale scores, $B = -.015$, $t(241) = -.231$, $p = .818$. SIPIS scores were also not significantly predictive of CAQ Academic Subscale scores, $B = -.054$, $t(245) = -.854$, $p = .394$.

Multiple Linear Regression Analyses. A multiple regression analysis was performed to determine whether changes in relationship quality as measured by the PIRIS significantly predicted college adjustment. The model was not statistically significant [$R^2 = .020$, $F(4,208) = 1.038$, $p = .389$], indicating that on the whole, negative relationship impact was not predictive of overall college adjustment. Additionally, PIRIS subscales did not individually predict total CAQ scores. Additional regressions were performed to assess whether PIRIS scores were predictive of individual CAQ subscales. The model predicting CAQ Academic Subscale scores from PIRIS scores was not statistically significant, [$R^2 = .095$, $F(4,214)$, $p = .747$], indicating that negative relationship impact was not predictive of academic adjustment. Additionally, PIRIS subscales did not individually predict CAQ Academic Subscale scores. The model predicting CAQ Social Subscale scores from PIRIS scores was similarly insignificant [$R^2 = .022$, $F(4,212) = 1.166$, $p = .327$], as was the model predicting CAQ Emotional Subscale scores from PIRIS scores [$R^2 = .151$, $F(4,214) = 1.245$, $p = .293$]. Likewise, PIRIS subscales did not individually predict CAQ Social Subscale or Emotional Subscale scores.

One-Way Analysis of Variance. A one-way between-groups analysis of variance was conducted to explore the influence of gender on subjective parental illness impact, as measured by the SIPIS. There was a statistically significant difference in SIPIS scores between genders at the $p < .05$ level [$F(1,247) = 11.602$, $p = .001$]. Despite reaching statistical significance, the

actual difference in mean scores between the groups was small. The effect size, calculated using eta squared, was .04.

Post-Hoc Analyses. The overwhelmingly low scores on the PIRIS raised questions about what might account for the high PIRIS scores that were obtained by a minority of participants. Correlations were run to assess the relationship between PIRIS scores and demographic variables that measured the nature of parental illness and characteristics of the respondent. Respondent age at the time of parental diagnosis was positively correlated with PIRIS Other Parent Subscale scores ($r = .183, p = .004$) and with PIRIS Peer Subscale scores ($r = .225, p = .000$), with older respondent age associated with stronger negative impact on relationships with the other parent and peers. Limited recall of the time of parental diagnosis was negatively correlated with PIRIS Other Parent Subscale scores ($r = -.163, p = .01$) and with PIRIS Peer Subscale scores ($r = -.269, p = .000$), such that clear memories of the diagnosis were associated with stronger negative impact on relationships with the other parent and peers. An item assessing level of health care system involvement during the time of serious physical parental illness (where lower scores represent limited involvement and higher scores represent intrusive involvement) was positively correlated with PIRIS Other Parent Subscale scores ($r = .176, p = .006$) and with PIRIS Peer Subscale scores ($r = .221, p = .001$). Scores on an item assessing the level to which involvement with the health care system interfered with day to day family life were positively correlated with PIRIS Other Parent Subscale scores ($r = .228, p = .000$), Sibling Subscale scores ($r = .147, p = .028$), and Peer Subscale scores ($r = .137, p = .034$). Scores on an item assessing the level to which involvement with the health care system influenced the family's lifestyle were positively correlated with PIRIS Other Parent Subscale scores ($r = .209, p = .001$) and Peer Subscale scores ($r = .170, p = .009$).

There was a negative correlation between all PIRIS subscale scores and scores on an item measuring the level to which the parent's illness impacted his or her ability to function. Lower scores on this item (with a score of 1 representing parental death) were associated with higher negative impact on the relationship with the ill parent ($r = -.227, p = .000$), the other parent ($r = -.225, p = .000$), siblings ($r = -.289, p = .000$), and peers ($r = -.231, p = .000$). The current status of the parent's illness (with the lowest score representing that the parent is deceased, and the highest score representing complete recovery) was negatively correlated with scores on the PIRIS Ill Parent Subscale ($r = -.222, p = .000$), Other Parent Subscale ($r = -.213, p = .001$), and Sibling Subscale ($r = -.236, p = .000$), with a negative correlation with the Peer Subscale approaching significance ($r = -.126, p = .051$). Neither participant gender nor gender of the ill parent were significantly correlated with PIRIS subscale scores.

To determine the influence of parental death on PIRIS subscale scores, participants were divided into one of two groups according to whether or not their ill parent had survived. One-way between-groups analyses of variance were conducted to explore the influence of parental death on PIRIS subscale scores. Mean scores on the PIRIS Ill Parent Subscale did not differ by parental outcome [$F(1,247) = 1.359, p = .245$], nor did mean scores on the Peer Subscale [$F(1,238) = 3.513, p = .062$]. Participants who reported that their ill parent was deceased had significantly higher mean scores on the Other Parent Subscale than those who reported that their parent had survived, $F(1,243) = 9.878, p = .002$. Participants who lost their parent also had significantly higher mean scores on the Sibling Subscale [$F(1,221) = 5.600, p = .019$]. The effect of parental death on Other Parent Subscale scores and Sibling Subscale scores was small (effect sizes of .04 and .02 were obtained, respectively).

Discussion

The primary goal of this study was to examine the manner in which overall subjective impact of serious parental physical illness, relationship-specific parental illness impact, and college adjustment intersected with one another. The potential role of gender as a moderating variable was also an area of interest. As hypothesized, the SIPIS was a reliable measure with good construct validity. While SIPIS items queried participants about general impact and were not focused specifically on negative impact, the positive correlations between SIPIS scores and PIRIS scores, as well as the correlations between SIPIS scores and measures of parental illness outcome and health care system involvement, indicate that the valence of SIPIS responses was negative. Thus, while some adults attribute positive outcomes to parental illness experienced during childhood, such as improved relationships or new appreciation for life (e.g., Wong et al., 2009), respondents in our study appeared to respond to SIPIS items in a manner reflective of perceived negative impact.

Contrary to expectations, results indicated that the scores obtained on the SIPIS do not appear to predict long-term adjustment in college students, nor do they seem to have any significant bearing on individual areas of adjustment (e.g., academics, emotional health, and social relationships). The overall distribution of CAQ scores was normal, suggesting that individuals who experience serious parental physical illness adjust to college with varying levels of success in a manner independent of perceived illness impact. Because our study found no significant association between subjective illness impact and college adjustment, we were unable to test the hypothesis that negative changes in relationship quality with family and peers partially mediate said association. Interestingly, changes in the quality of specific relationships (that is, relationships in each separate domain, as measured by subscales of the PIRIS) also did not

predict college adjustment, and PIRIS scores were not predictive of individual facets of college adjustment (emotional, academic, and social domains). SIPIS scores were significantly correlated with scores on all subscales of the PIRIS, suggesting that when participants recalled the level to which they were impacted by parental illness, their recollection process included an evaluation of how they experienced their relationships with family and peers during the time of parental illness.

As hypothesized, scores obtained by female respondents on the SIPIS were significantly higher than scores obtained by male respondents, a finding that mirrors the body of literature suggesting that girls experience higher distress in response to parental physical illness than boys (e.g., Grant & Compas, 1995; Huizinga et al., 2005; Osborne, 2007; Worsham et al., 1997).

While the data collected for the purposes of this study were uninformative regarding the reasons for this discrepancy in perceived impact, we can speculate on the basis of previous conclusions in the field that increased burden of family responsibilities could partially account for this finding (Grant & Compas, 1995; Worsham et al., 1997). Although a review of the literature suggested that girls might be at a higher risk for poor adjustment than boys (e.g., Huizinga, Visser, van der Graaf, et al., 2005; Osborne, 2007), we found no correlation between gender and college adjustment. It appears that while female participants were more heavily impacted by parental illness than male participants, they adjusted equally well in college.

Respondents who clearly remembered the time of parental diagnosis and were older when the diagnosis was given experienced higher perceived illness impact than those who were younger at the time of diagnosis or who did not clearly remember the event. While this finding may simply reflect recency effects and the necessity of awareness for impact to be perceived, it could also speak to a particular vulnerability in adolescence. Perhaps teenagers in the United

States, already negotiating differentiation from parents and establishing increased autonomy (Beyers et al., 2003), experience greater internal conflict as a result of the demands that may be associated serious parental illness, which could translate to perceived impact. This speculation would coincide with the qualitative research of Christ et al. (1994), who found that parental illness was associated with conflict around developmentally normative separation.

Unsurprisingly, intrusive health care system involvement, higher interference with day-to-day routines as a result of the health care system, and more pronounced health care system influence on family life were associated with higher perceived impact, as were current struggles with parental illness and poorer parental functioning as a result of illness.

Our post-hoc analyses also yielded interesting results. Older respondent age at the time of parental diagnosis and clearer memories of the diagnosis were associated with stronger negative impact on relationships with the other parent and peers. Perhaps the demands of serious physical parental illness upon the child (potential increase in family responsibilities, associated reduction in time spent with friends, and reduction in time spent with either parent due to medical needs of the ill parent), which may be more salient for adolescents in the process of individuation, result in teens feel less connected to their peers and resentful of their non-ill parent (who may be perceived as a safer target for resentment than the ill parent). Interestingly, negative impact on the relationship with the other, non-ill parent was associated with all of the negative outcomes examined in post-hoc analyses (intrusive health care system involvement, high interference of health care system with everyday life, high influence of health care system involvement on family lifestyle, poor level of functioning in the ill parent, and poor current illness status), while impact on the relationship with the ill parent was only correlated with the ill parent's level of functioning and current illness status. In general, it appears that the relationship with the other,

non-ill parent is more likely to be negatively impacted in conjunction with other negative outcomes than the relationship with the ill parent.

Participants who reported that their ill parent passed away as a result of his or her illness experienced a significantly stronger negative impact on their relationships with the other parent and siblings than participants who did not lose their parent to illness. Children's adjustment to parental death appears to hinge strongly on interactions with surviving family members; as noted in a 2005 review by Trimblay and Israel, "Being able to talk freely with the surviving parent and other family members about the death appeared to protect against later depressive experiences, as did a high level of care and affection from the surviving parent." Perhaps the negative relational impact seen in our results represents some lack of communication and support from family members in the wake of parental death. For respondents who lost their parent during adolescence, it might also be speculated that these negative relational impacts could represent struggles with individuation from family (e.g., Christ et al., 1994), which could feel especially difficult to navigate during a time in which other family members may be pushing for closeness.

Our results were broadly hopeful. High perceived impact of serious parental physical illness and strongly negative impact on family and peer relationships during the time of parental illness were unrelated to college adjustment, indicating that even individuals who are impacted on a deeply negative level (relational or otherwise) by serious physical parental illness are capable of succeeding academically, emotionally, and socially in college settings. While girls may be more heavily impacted by serious parental physical illness than boys, the effect size obtained for this phenomenon was small, and women appear to be no less likely to adjust well to college than men. Similarly, although death of the ill parent was significantly associated with a stronger negative impact on relationships with the other, non-ill parent and siblings, the rather

small effect size suggests that this finding may have little “real-world” bearing. Over the long-term, individuals who have experienced serious physical parental illness appear to be quite resilient.

Limitations and Directions for Future Research

There are a number of limitations associated with this study. First, the sample was relatively small and consisted primarily of white, young, female participants who were drawn by convenience from the introductory psychology pool of one university. By necessity, participants were self-selected, and it is possible that some individuals may have avoided the study due to negative emotional responses to its subject matter. Likewise, those who did participate could have been very interested in the effects of parental illness, potentially limiting generalizability of the results. In the future, researchers who examine college adjustment in response to serious parental physical illness during childhood or adolescence would do well to recruit a larger, more diverse group of participants, with particular attention to male and minority students and students from a variety of postsecondary institutions.

It must also be noted that most respondents endorsed little or no relationship impact on the PIRIS, indicating a possible restriction of range. Those individuals whose relationships were most negatively impacted by their parent’s illness might not possess the ability to attend college for emotional, financial, or social reasons related to said illness, thus preventing them from participating in our study. Even among heavily impacted individuals who are able to attend college, a certain level of adjustment must be present for a student to successfully participate in any research study for course credit, suggesting that the worst-adjusted of those on campus may not have participated in our research. Our results must be considered with caution, as they may

not be applicable to those with very high levels of negative subjective illness impact or relationship impact.

To a large extent, data collection for this study relied on retrospective self-report, a method thought to have somewhat questionable reliability and accuracy (Stone, Bachrach, Jobe, Kurtzman, & Cain, 1999). Memory is not known for being particularly precise, and it seems that self-report might not be an ideal strategy for assessing the relational impact of serious parental physical illness. However, there are few options that *are* ideal for an examination of this construct: self-report at the time an experience takes place necessitates an awareness of personal state and an understanding of the environment that is not very well-developed in most children (Lyman & Hembree-Kigin, 1994; Pepler & Craig, 1998), and even immediate self-report instruments for adolescents and adults raise concerns about accuracy (Stone et al., 1999). Because the construct of interest is essentially a subjective one, totally objective measurement is not possible.

An anticipated criticism of the current study is that socioeconomic status was not included as a control variable. However, studies of the impact of serious parental physical illness on adjustment have consistently found that adjustment does not seem to vary significantly with socioeconomic status (Lewis, Hammond, & Woods, 1993; Nelson & While, 2002; Osborn, 2007). Overall negative life events were also considered for inclusion as a control variable, but ultimately they were not included due to concerns about the interrelated nature of serious parental physical illness and other negative life events (i.e., a parent's illness might precipitate financial struggles, parental divorce, parental death, or so on).

Our study raised questions about the nature of relational impact of serious parental physical illness within the family, which we speculatively addressed and which would benefit

from quantitative exploration. Why are those who were teenagers at the time of their ill parent's diagnosis more likely to experience negatively impacted relationships with the other, non-ill parent and peers? Does adolescent individuation influence teenagers' perceptions of their family relationships following the death of an ill parent? Our lack of attention to potential positive effects of serious parental physical illness could also be considered a limitation, given qualitative research indicating that some respondents report improvements in family relationships after diagnosis (Leedham and Meyerowitz, 1999; Nelson, Sloper, Charlton, & While, 1994). While the PIRIS only assesses lack of change or negative change in relationship quality, future studies could add something of value to the literature by developing and including a measure of positive relationship impact.

Implications/Conclusion

Existing literature has explored the negative implications of serious parental physical illness for children's adjustment and the manner in which relationships with parents and peers contribute to adjustment outcomes. This study was unique in its focus on long-term adjustment, an outcome variable that has largely been ignored in parental illness literature, and in its inclusion of sibling relationships in its examination of the association between family relationships and adjustment. While we did find evidence that family and peer relationships are likely to be negatively impacted in conjunction with a number of illness-related scenarios (intrusive health care system involvement, poor functioning in the ill parent, death of the ill parent, etc.), our results show that individuals who experience serious parental physical illness adjust to college in a manner independent of perceived illness impact and impact on relationships with family members and peers. Furthermore, college adjustment scores for participants in our study were normally distributed, with the majority endorsing scores near the middle of the range.

This finding suggests that most individuals who experience serious parental physical illness are capable of average or better-than-average adjustment, regardless of the level of subjective impact their parent's illness generated. Our results also offer hopeful implications related to gender. While girls have generally been found to be more susceptible to negative outcomes of parental illness than boys (Huizinga, Visser, van der Graaf, et al., 2005; Osborne, 2007), our findings indicate that over the long-term, boys and girls adjust equally well.

In conclusion, this study sought to clarify the associations between subjective impact of serious parental physical illness, negative change in relationship quality during the time of serious parental physical illness, and college adjustment. Our results showed that our measure of the perceived impact of parental illness did not predict college adjustment outcomes. Negative changes in the quality of specific relationships (e.g., relationships with the ill parent, other parent, siblings, or peers) do not appear to function individually as predictors of long-term outcomes, and changes in relationship quality do not seem to predict specific subtypes of college adjustment (emotional, academic, and social). Our results did support the hypothesis that women are more likely to report high subjective illness impact than men, but no gender differences in college adjustment were found. Future research can extend these results by examining adjustment among a larger, more diverse sample, examining the nature of relationship impact during the time of parental illness in a more nuanced manner, and including measurement of positive relationship impact in analyses.

References, figures, and appendices to be attached upon submission for publication.