CHILDREN WITH JUVENILE RHEUMATIC DISEASE:

THE ROLE OF CAUSAL ATTRIBUTIONS IN THE

PARENT DISTRESS – CHILD DEPRESSIVE

SYMPTOM RELATION

By

RACHELLE REA RAMSEY

Bachelor of Science in Psychology and Life Sciences

Otterbein College

Westerville, Ohio

2007

Submitted to the Faculty of the
Graduate College of the
Oklahoma State University
in partial fulfillment of
the requirements for
the Degree of
MASTER OF SCIENCE
December, 2010

CHILDREN WITH JUVENILE RHEUMATIC DISEASE:

THE ROLE OF CAUSAL ATTRIBUTIONS IN THE

PARENT DISTRESS – CHILD DEPRESSIVE

SYMPTOM RELATION

Thesis Approved:

John M. Chaney, Ph.D.

Thesis Adviser

Larry L. Mullins, Ph.D.

Melanie C. Page, Ph.D.

Mark E. Payton, Ph.D.

Dean of the Graduate College

ACKNOWLEDGMENTS

I would like to express my gratitude to my research mentor, Dr. John M. Chaney, for his expertise and assistance with this project and my graduate school career. His dedication to the success of his students and to cultivating an independent research style has been invaluable throughout the duration of this project. Without his guidance, neither this project nor my skills as a researcher would be where they are today.

I would also to say a special thank you to Drs. Larry L. Mullins and Melanie C. Page for their willingness to be a part of my thesis committee. The knowledge and expertise they brought to this project, enabled me to write a more complete thesis document and manuscript. My appreciation is also extended to Dr. James N. Jarvis for allowing our research lab to utilize his rheumatology clinic at the Oklahoma University Health & Sciences Center. In addition, a big thanks goes out to the past (KAH and JLW) and current members (JLR and DAF) of Dr. Chaney's lab.

Lastly, I will be forever grateful to my husband and my parents for supporting me in this pursuit of my academic dreams. The encouragement and laughter that you provide continually reminds me that life is meant to be enjoyed!

TABLE OF CONTENTS

CHAPTER I

INTRODUCTION

Juvenile Rheumatic Diseases (JRDs) represent a heterogeneous collection of autoimmune disorders consisting of persistent inflammation of the joints, restricted functional ability, and intermittent, chronic pain (Cassidy & Petty, 2005). Juvenile rheumatoid arthritis (JRA), systemic lupus erythematosus (SLE), juvenile spondylarthropathies (JAS), and juvenile dermatomyositis (JDMA) are included within this group. JRA is the most commonly diagnosed JRD and affects as many as 150 per 100,000 children in the United States (Cassidy & Petty, 2005). In addition to sharing the arthritic features of JIA, each JRD possesses additional distinct clinical characteristics (e.g., inflammation of the gastrointestinal tract, muscle weakness). Medical management of JRDs include controlling pain and inflammation, improving range of motion, and preserving muscle strength and function to facilitate typical physical development (Cassidy & Petty, 2005).

The unpredictable, episodic disease course and attendant functional limitations of JRDs present significant psychosocial stressors and increase the likelihood of emotional adjustment difficulties for both children and their families. Children and adolescents with JRDs report significantly lower quality of life than healthy children (Sawyer et al., 2004) and evidence considerable psychological adjustment challenges, particularly internalizing

symptoms (e.g., depressive symptoms) (David et al., 1994; LeBovidge, Lavigne, Donenberg, & Miller, 2003; Mullick, Nahar, & Haq, 2005; Noll et al., 2000).

Longitudinal studies have also found deterioration in social functioning, higher levels of anxiety, and ongoing distress over time in children with JRDs compared to healthy children (e.g., Packham, Hall, & Pimm, 2002; Reiter-Purtill, Gerhardt, Vannatta, Passo, & Noll, 2003; Timko, Baumgartner, Moos, & Miller, 1993; Timko, Stovel, & Moos, 1992). Whereas some studies have documented the resiliency of children with JRD and report levels of psychological distress comparable to their healthy peers (Brace, Smith, McCauley, & Sherry, 2000; Noll et al., 2000; Huygen, Kuis, & Sinnema, 2000), it is important to note that even nonclinical levels of psychological disturbance and daily stress can significantly affect the functioning of these children (Schanberg et al., 2000).

Within the extant pediatric chronic illness literature it is widely accepted that disease outcomes do not occur in isolation, and that children's health status is one of several factors contributing to children's adjustment. Multivariate models of child adjustment to chronic medical conditions conceptualize illness as a stressor requiring adaptation by both the child and his/her family members (Thompson, Gustafson, Gil, Kinney, & Spock, 1999; Thompson, Gil, Burbach, Keith, & Kinney, 1993a; Wallander & Varni, 1992). Although disease (e.g., severity, functional status, duration of illness) and demographic parameters (e.g., child age, socioeconomic status) are key components of contemporary child adjustment models, research has consistently demonstrated the relatively greater contribution of parent and child variables (e.g., parent distress, cognitive appraisals) to the adjustment process (Colletti et al., 2008; Hullmann, Wolfe-

Christensen, Meyer, McNall-Knapp, & Mullins, L.L., in press; Lopez, Mullins, Wolfe-Christensen, & Bourdeau, 2008).

Perhaps one of the most reliable findings in the pediatric chronic illness literature is the robust relation between parent distress and child distress (e.g., Chaney et al., 1997; Gil, Williams, Thompson, & Kinney, 1991; Mullins et al., 1995; Thompson, Gil, Burbach, Keith, & Kenny, 1993a,b; von Weiss et al., 2002; Williamson, Walters & Shaffer, 2002). Within the JRD literature, both cross-sectional and longitudinal studies have demonstrated the important role of parent adjustment in determining children's adjustment to illness (e.g., Daniels, Moos, Billings, & Miller, 1987; Frank et. al., 1998; Timko et al., 1992; Timko, Stovel, Moos, & Miller, 1992; Wagner et al., 2003). Interestingly, despite the multitude of empirical investigations demonstrating the link between parent and child adjustment, considerably less is known about specific mechanisms by which parental distress affects child adjustment in the context of chronic illness, including JRDs.

Child cognitive appraisal variables have begun to receive attention as a potential avenue for the transmission of distress between parents and children. A number of child cognitive appraisal mechanisms (e.g., causal attributions, illness uncertainty) have been shown to influence child adjustment across a variety of pediatric chronic illness populations (e.g., Frank, Blount, & Brown, 1997; Mullins, Chaney, Pace, & Hartman, 1997; Schoenherr, Brown, Baldwin, & Kaslow, 1992), as well as adults and children with arthritis (Chaney et al., 1996; Chaney et al., 2004; Schiaffino & Revenson, 1995; Wagner, Chaney, Hommel, Andrews, & Jarvis, 2007; Wagner et al., 2003; White et al., 2005). Children's pessimistic causal attributions are cognitive vulnerabilities for

depression (e.g., Abela, 2001; Joiner, 2000; Southall & Roberts, 2002; Spence, Sheffield, Donovan, 2002) that appear to have particular relevance to the experience of children with JRDs.

To illustrate, youth with JRDs often confront highly variable and ambiguous situations in which positive health behaviors (e.g., medication compliance) may or may not have positive impacts on disease outcomes (e.g., increased mobility) (Cassidy & Petty, 2005; Lovell, 1996). Consequently, children with JRDs may be more likely to experience significant behavior–outcome noncontingency in their environment, resulting in decreased expectancies for positive outcomes and mood deficits (e.g., Hommel, Chaney, Wagner, & Jarvis, 2006). The manner in which children attribute the causes of these negative events plays a pivotal role in determining emotional adjustment in the presence of this type of environmental noncontingency or ambiguity (Abramson et al., 2002; Alloy et al., 1999; Gladstone & Kaslow, 1995; Joiner & Wagner, 1995; Peterson & Seligman, 1984; Seligman et al., 1984). Indeed, data suggest that repeated exposure to behavior-outcome noncontingency due to arthritis increases the potential for developing pessimistic causal attributions for illness-related events (Affleck, Tennen, & Apter, 2001), as well as pessimistic appraisals of illness-unrelated events and depression (Chaney et al., 1996; Pimm & Weinman, 1998; Wagner et al., 2007).

Further, findings indicate that children of distressed parents are at increased risk for developing a host of cognitive vulnerabilities for depression, including pessimistic causal attributions (Anderson & Hammen, 1993; Garber & Robinson, 1997; Goodman, Adamson, Riniti, & Cole, 1994; Hammen & Brennan, 2001; Jaenicke et al., 1987). Due to the significantly greater levels of emotional distress often observed in the parents of

children with JRDs (e.g., Manuel, 2001), this parent distress-child cognitive vulnerability linkage has important implications for adjustment in children with JRDs. In other words, elevated parent distress in the face of illness may result in an enhanced cognitive vulnerability in children for experiencing emotional adjustment challenges, particularly depression.

No known studies in the pediatric chronic illness literature have examined children's pessimistic causal attributions as potential by-products of parent distress and/or subsequent intervening variables in the link between parent adjustment and child depressive symptoms. Given the integral nature of child appraisal variables to contemporary models of adjustment to illness (e.g., Thompson & Gustafson, 1996), combined with empirical demonstrations of the contributions made by cognitive appraisals to childhood depression, clarifying the role of children's causal attributions in the parent-child transactional adjustment process could provide valuable insights into potential cognitive risk factors for the emotional challenges encountered by children with chronic illnesses (cf. Dahlquist, 2003).

The goal of the present study is to examine the role of children's causal attributions in the parent-child adjustment relation in a sample of children and adolescents with JRDs. Specifically, children's pessimistic causal attributions will be examined as intervening variables in the association between parent distress and child depressive symptoms. First, consistent with previous JRD studies, we hypothesize that increased parent global distress will be significantly associated with greater child depressive symptoms (e.g., Wagner et al., 2003; White et al., 2005). Further, we will test children's pessimistic causal attributions as mediators and/or moderators in the relationship between

parent distress and child depressive symptoms. In other words, we will test whether children's pessimistic attributions will either act as a pathway through which parent distress influences child depressive symptomatology (i.e., mediation) or will specify the circumstances under which the parent distress-child depressive symptom relationship will exist (i.e., moderation).

CHAPTER II

REVIEW OF THE LITERATURE

Juvenile Rheumatic Diseases: An overview

Juvenile Rheumatic Diseases (JRDs) are a heterogeneous group of autoimmune diseases characterized by acute and chronic inflammation of the connective tissues of the musculoskeletal system, blood vessels, and skin (Cassidy & Petty, 2005). Symptoms of JRDs include persistent inflammation of the joints, restricted functional ability, and chronic pain. Children diagnosed with a JRD experience decreased life expectancy, increased costs of medical care, and interference with their quality of life compared to healthy children (Cassidy & Petty, 2005). Sub-types of JRDs include juvenile rheumatoid arthritis (JRA), systemic lupus erthematosus (SLE), juvenile spondylarthropathies (JAS), and juvenile dermatomyositis (JDM).

Juvenile rheumatoid arthritis (JRA), one of the most prevalent pediatric rheumatic diseases, affects approximately 16 to 150 per 100,000 children in the United States (Oen & Cheang, 1996; Peterson, Mason, Nelson, O'Fallon, & Gabriel, 1996). Swelling, fever, effusion, limited range of motion, tenderness on motion, and increased heat in one or more joints are characteristics of JRA (Cassidy et al., 1986; Oen & Cheang, 1996). A diagnosis of JRA requires onset before the age of sixteen, however the typical age of.

onset is early childhood. The highest frequency of diagnosis occurs between one and three years of age and girls are twice as likely to be diagnosed with JRA as boys (Cassidy & Petty, 2005).

The etiology of JRA remains unclear; however, there is evidence suggesting that the disease may be caused by immunoinflammatory pathogenesis, activated by contact with external stimuli in a child with a specific predisposition for the disease. Possible triggers may include aberrant immunological regulation, psychological stress, hormonal abnormalities, and infection (Cassidy & Petty, 2005). The most prevalent subtypes of JRA include pauciarticular, polyarticular, and systemic JRA.

Pauciarticular JRA, or oligoarticular JRA, is characterized by arthritis in less than five joints and accounts for 50% to 60% of children with JRA (Oen & Cheang, 1996; Manners & Bower, 2002). Typically, children with pauciarticular JRA are not systemically ill and in approximately 80% of these children, only one or both knees are affected at onset (Cassidy & Petty, 2005). Uveitis, a swelling and irritation of the middle layer of the eye, may also be present at onset and eventually affects up to 20% of children with pauciarticular JRA; however, typically no symptoms associated with uveitis. Pauciarticular JRA arthritis is diagnosed most frequently in children between two and four years old and is almost always diagnosed before a child is ten years of age (Cassidy & Petty, 2005). Further, pauciarticular JRA has a female to male ratio of three to one, except in children with uveitis, in which the ratio is even more extreme, 5.1-6.1:1 (Sullivan, Cassidy, & Petty 1995).

Polyarticular JRA is diagnosed in children with arthritis in five or more joints and approximately 25% of children with JRA have this sub-type. In severe cases of

polyarticular JRA, more than 20 joints may be affected. Children with polyarticular JRA often have symmetric joint involvement, low-grade fevers, anemia, growth retardation, and/or weight loss. Onset appears to be biphasic with an early peak between the ages of one and four years, and a later peak between the ages of six and twelve years old. Interestingly, disease manifestations of children diagnosed with polyarticular JRA after the age of six seem to be very similar, if not identical, to adult rheumatoid arthritis (RA). Like many subtypes of JRA, polyarticular JRA is more prevalent in females (Cassidy & Petty, 2005).

Systemic JRA is the least common type of arthritis in children. The only known study reports that the annual incidence in Norway is .8/100,000 (Moe & Rygg, 1998). Unlike other types of JRA, children of both sexes are affected with equal frequency (Sullivan et al., 1995). Children with systemic JRA typically present with symptoms that resemble an infectious disease; however, systemic JRA has not been consistently associated with any pathogens (Cassidy & Petty, 2005).

Systemic lupus erythematosus (SLE) is an episodic, multisystem, autoimmune disease characterized by the presence of antinuclear antibodies and widespread inflammation of the blood vessels and connective tissues (Cassidy & Petty, 2005). Presenting symptoms of SLE often include rashes, arthritis, and fever (Cassidy & Petty, 2005). SLE affects between 12 and 50 per 100,000 adults in the United States and accounts for approximately 4.5% of patients with a pediatric rheumatic disease (Cassidy & Petty, 2005). Rarely diagnosed in children less than five years of age, SLE is most frequently diagnosed in adolescents, and girls are affected 4.5 times more frequently than boys (Cassidy, Sullivan, Petty & Ragsdale, 1977). In addition, a high prevalence and

disease severity has been noted in non-white races, such as Native American and African American (Sutcliffe, Clarke, Gordon, Farewell, & Isenberg, 1999).

Juvenile spondylarthropathies affects the joints of the axial skeleton as well as the peripheral joints, and can be broken down into several different subtypes. One major sub-type, juvenile ankylosing spondylitis (JAS**),** is characterized by symptoms such as limited spine motion, pain in the spine, asymmetry in the lower extremities, and peripheral arthritis. JAS is frequently accompanied by enthesitis and antinuclear antibodies, and has a firm genetic basis. Present in one to seven percent of children with a rheumatic disease, JAS occurs most often in boys (seven to one) and the average age of onset is greater than ten years (Ansell, 1980).

The last of the JRDs to be discussed is juvenile dermatomyositis (JDM), a multisystem disease characterized by acute and chronic inflammation of striated muscle, skin, and gastrointestinal tract (Cassidy & Petty, 2005). Although no reliable data on the prevalence rates of JDM is available, incidence rates in the United States are approximately .5 per 100,000 (Medsger, Dawson, & Masi, 1970). Children with JDM typically experience substantial functional disability as the major presenting symptom is muscle weakness and tenderness, specifically in the limb-girdle muscles, anterior neck flexors and abdominal muscles (Cassidy & Petty, 2005). Additional symptoms may include arthritis (65% of children with JDM), discoloration of the eyelids with periorbital edema, and a scaly rash over their knuckles. More common in girls, the onset of JDM most often occurs between ages ten and fourteen (Cassidy & Petty, 2005).

Treatment of JRDs. As previously described, rheumatic diseases are chronic, multisystem diseases characterized by an unpredictable disease course, with periods of

exacerbation and remission (Cassidy & Petty, 2005). In a review of medical treatment for JRA, Singsen (1993) emphasizes, it is imperative for parents, children, and teachers to be educated on the disease process because of the alarming nature of a JRA diagnosis. A cure for JRDs has yet to be discovered; however, spontaneous remissions do occur and pediatric rheumatologists attempt to achieve disease control in the interim. During periods of flare, children often experience increased disease activity and worsening symptoms, such as pain, fatigue, muscle weakness and stiffness, and decreased functional abilities (Schanberg, Anthony, Gil, & Maurin, 2003). The aims of treatment include controlling pain, improving range of motion, preserving muscle strength and function, and facilitating typical nutrition, growth, and physical and psychological development (Cassidy & Petty, 2005). Because it is typically impossible to predict which children will recover and which will go on to have unremitting disease with serious functional impairment, initial treatment in all children is vigorous.

Most children require a combination of pharmacologic, physical, and psychosocial approaches to achieve optimal adjustment (Cassidy & Petty, 2005). Pharmacologic treatments are primarily used to reduce inflammation and decrease pain **(**Ilowite, 2002**).** The more rapidly the inflammation is controlled by nonsteroidal anti-inflammatory drugs (NSAIDs) or methotrexate, the less likely it is that there will be permanent damage (Cassidy & Petty, 2005). NSAIDS are typically taken for approximately one month before a response is clinically evident and the use of these medications should be continued for 12-18 months after the symptoms have disappeared (Lovell, 1997). Although NSAIDS provide symptomatic relief, they do not influence the underlying disease process in any way. In the case that NSAIDS are not effective,

disease-modifying antirheumatic drugs (DMARDs), such as methotrexate, can be prescribed. At times, gluticosteriods (strong anti-inflammatory drugs) are recommended to treat rheumatic diseases; however there are several adverse side effects associated with these drugs including Cushing's syndrome, growth suppression, osteoporosis, and immunosuppressant effects. Although experimental data and clinical observations have demonstrated the efficacy of NSAIDs, gold compounds, methotrexate, glucocorticoids, and etanercept, additional research is needed to determine if there are differences in the efficacy of these medications based on ethnicity or genetic components (Helliwell & Ibrahim, 2003).

For the physical part of the treatment component, children are encouraged to remain as physically active as possible, and to be independent and responsible for adhering to treatment, when age appropriate (Cassidy & Petty, 2005). Continuing to be active is of primary importance for children with JRD to maintain or improve functional mobility (Rhodes, 1991). Physical therapy may be prescribed for some children to encourage or to provide aid in exercise and activity. For children who experience morning stiffness warm baths or use electric blankets to aid in symptom relief may be recommended. In addition, daily massages may also be encouraged to ease the pain and prevent adhesion in the subcutaneous tissues (Lehman, 2004). One study found that children with mild to moderate JRA reported a decrease in pain when they were massaged 15 minutes a day for 30 days (Field et al., 1997). Splints (e.g., knee extension splints, wrist extension splints, ring splints for fingers) are commonly used as well in an effort to keep joints in a correct position and relieve pain.

The third arm of Lovell's comprehensive treatment program includes a multidisciplinary medical team to facilitate all areas of adjustment and school adaptation. Including psychosocial programs to aid in adjustment has been documented as beneficial in helping a child and family cope with the disease and make necessary adjustments (Lovell, 1997). Written materials and training workshops are also available through the American Juvenile Arthritis Organization to help facilitate adjustment to academic, emotional, and physical challenges associated with pediatric rheumatic disease. Lovell (1997) also suggests that promotion of positive self-image and productive family dynamics should be included in therapeutic goals to provide a comprehensive plan for treatment.

Overall, the optimal treatment of JRDs remains somewhat uncertain. Because the inflammation, pain, and stiffness that these children experience are neither predictable nor controllable, it is of the utmost importance for a multidisciplinary medical team to be involved in treatment. Investigations to examine treatment outcomes in children with JRDs should be continued with the goal of finding an optimal treatment plan in the future.

Psychological Comorbidity

Research in general supports that both children and adults who have a chronic illness are at increased risk for depression, anxiety, and lower self-esteem (Ireys, Werthamer-Larsson, Kolodner, & Gross, 1994; Chaney et al., 1996, 1999). In a review of the chronic illness literature, Burke & Elliott (1999) determined that between 5-23% of children with a chronic illness meet criteria for major depression. Additionally, children

with chronic illness including lupus are at risk of experiencing significant social difficulties (Adams, Streisand, Zawacki, & Joseph, 2002).

Given the unpredictable, episodic nature and functional limitations of JRDs, it is evident that having a JRD has the potential to introduce additional stress and increase the likelihood of psychosocial adjustment difficulties for both children and their families. Specifically, Vandvik (1990) found that half of children with rheumatic disease met criteria for a psychiatric diagnosis and 64% demonstrated at least mild maladjustment. Moreover, children with JIA report significantly lower quality of life than previously reported for healthy children in the general community (Sawyer, 2004). A recent meta-analysis of 21 studies also revealed that children and adolescents with chronic arthritis demonstrate psychological adjustment difficulties, particularly internalizing symptoms, and that these problems appear to be amplified in children with various JRDs (LeBovidge et al., 2003). Indeed, children with JRA may be more likely to internalize psychological difficulties than externalize them (Daltroy et al., 1992).

Again, because symptoms of rheumatic illnesses are not predictable, it is not surprising that research has shown psychosocial maladjustment to be both stable over time and show fluctuation. Timko and colleagues found distressed mood to be stable in children with JRD over a one year period (1992) and a four year period (1993). Similarly, David et al. (1994) found that over a ten year period 21% of children with JRA reported clinically depressed symptoms and child depression and anxiety increased with the degree of disability. Another research group demonstrated that social functioning deteriorated over a two year period of time for children with JRA (Reiter-Purtill et al., 2003). Packham, Hall, & Pimm (2002) revealed that in adults with JIA (average disease

duration of 28.3 years) 31.6% were anxious, and 21.1% had suffered from depression. Similarly, adults with JRA are also increased for higher functional loss, more physical disability, limited mobility to engage in exercise and higher unemployment compared to healthy matched controls (Peterson et al., 1997).

In contrast to the previously discussed findings (e.g., Sawyer et al., 2004; Vandvik, 1990), some studies have documented the resiliency of children with JRD and report levels of anxiety and depression within the typical range. For instance, Schanberg and colleagues (2000) found no evidence of clinical depression in children with JRD; however, this study also demonstrated that daily symptoms, including fatigue, stiffness, and restricted activity were predicted by daily mood (Schanberg et al., 2000). This finding suggests that even subclinical depressive symptoms appear to impact daily functioning in children with JRD and emphasizes the importance of depressive symptoms as a focus of assessment and intervention.

In addition to the aforementioned studies, several recent studies have assessed the adjustment of children with JRD by comparing them to control groups. For example, Brace and colleagues (2000) found non-significant differences between children with JRD and comparison children on scales of depression and anxiety. Similarly, Hygen, Kuis, and Sinnema (2000) revealed no significant differences between children with JRD and healthy controls on measures of child-reported depression, self-esteem, or parent reported behavior problems. Moreover, Noll and colleagues (2000) documented that mothers reported children with JRA as less adaptive and having less positive affect than controls. However, no significant differences on child-report of peer relationships and overall adjustment were found. As a follow up to the work of Noll and colleagues (2000),

Reiter-Purtill et al. (2003) demonstrated no differences between children with JRA and healthy controls on measures of social reputation and social acceptance. In contrast, Daniels et al. (1987) noted that mothers of children with JRD reported greater child maladjustment and Mullick and colleagues (2005) documented that children with JRA were more likely to have a depressive disorder (15%) compared to age and sex matched health controls (0%). Lastly, children with JRA have been shown to demonstrate significantly more aggressive, antisocial and uncontrolled behavior compared to health controls (Harris, Newcomb, & Gewanter, 1991).

Transactional Stress and Coping Model. A child's health is only one of several factors that affect how children and families adjust to and cope with illness. Contemporary multivariate models such as Thompson's transactional stress and coping model of adjustment (Thompson, Gil, Burbach, Keith, & Kinny, 1993a; Wallander & Varni, 1992) portray child chronic illnesses as a potential stressor requiring adaptation by both the child and his/her family (Thompson, Gustafson, Gil, Kinney, & Spock, 1999). Although illness (e.g., disease type severity, functional status and duration of illness) and demographic parameters (e.g., child age, sex, and socioeconomic status) are included within adjustment and coping models, research has consistently demonstrated the greater contribution of parental and child adaptational processes over and above the contributions of illness and demographic parameters (Colletti et al., 2008; Lopez, Mullins, Wolfe-Christensen, & Bourdeau, 2008)

Both child and maternal adjustment are included in Thompson's transactional stress and coping model as the main variables that contribute to adjustment to an illness. Adaptational processes within the child and maternal adjustment components of this

model include child and maternal cognitive processes (e.g., cognitive appraisals, daily hassles, illness tasks, efficacy, health locus of control, methods of coping, family functioning), child and maternal methods of coping, and family functioning. Specifically, within this review the current literature examining the effects of parental functioning and child cognitive variables as they affect child adjustment will be presented.

Parental Adjustment in Children with JRDs. Given the emphasis of parents in the aforementioned theoretical models, researchers have begun to elucidate the impact of a child's illness on parent functioning. Notably, parents of children with a chronic illness must also adjust to their child's illness and may encounter adjustment difficulties and increased psychological distress similar to their children. As such, mothers of children with JRA have reported significantly higher levels of emotional distress than a normative sample (Manuel, 2001). Similarly, Gerhardt and colleagues (2003) found that significantly more parents of children with JRA have overall distress scores in the clinical range than comparison parents. Additionally, increased family burden and parental distress have been found in families of children with JIA, and they are significantly more likely to have unmarried parents due to divorce, separation, or death than a comparison sample (Henoch, Batson, & Baum, 1978). Parents of children with JRA have also reported having increased feelings of guilt, anxiety, anger, hopelessness, and isolation (Barlow, Harrison, & Shaw, 1998) as well as reporting significant amount of illness related stress, including fears regarding their child's future, school difficulties, and problems managing the prescribed treatment regimen (Degotardi, Revenson, & Ilowite, 1999). Additionally, White and colleagues (2005) found that in parents of children with JRDs, a lack of perceived control and an inability to care for his/her child can negatively

impact a parents' self-esteem. Although much of the research has been conducted with mothers, McNeill (2004) and Hovey (2005) found that fathers of children with JRA reported higher levels of emotional distress and concerns for their child's illness compared to a control group of fathers.

One area that has received a large amount of research has been the investigation of the effects of maternal depression, both clinical and subclinical levels, on their children's functioning and diagnostic status. Due to the consistency of the findings within the developmental literature, there is no question that children from infancy to adolescence are adversely affected by their mother's depression (see reviews by Beardslee, Versage, & Gladstone, 1998; Downey & Coyne, 1990; Gelfand & Teti, 1990; Goodman & Gotlib, 1999; Goodman & Tully, 2006). Similar relationships have been demonstrated between elevated parental distress and an increase in child maladjustment within the pediatric literature suggesting that parent adjustment is one of the most reliable predictors of a child's adjustment to a chronic illness is parent adjustment. For example, Mullins and Chaney (2001) documented that parent adjustment is one of the single most reliable predictors of a child's adjustment

Indeed, variance in child adjustment can be explained by the influence of parental adjustment and coping within the chronic illness literature (e.g., Chaney et al., 1997; Gil, Williamson, Thompson, & Kinney, 1991; Mullins et al., 1995; von Weiss et al., 2002; Williamson, Walters & Shaffer, 2002), however, less is known about the specific mechanisms by which parental distress affects child depressive symptoms in children with chronic illnesses, specifically JRDs.

Child Cognitive Appraisals

Cognitive variables of both the child and parents play an important part in Thompson's stress and coping model (1992). Recently, research on child cognitive appraisals as a potential mechanism through which the transmission of distress between parent and child takes place has begun to emerge. Ireys et al. (1994) found that perceived illness impact mediated the relationship between disease variables and psychosocial adjustment. In other words, this particular study found that disease variables cause children's perceptions of the impact of their illness on daily events and tasks which in turn cause psychosocial adjustment outcomes. Additionally, when an individual perceives having low control over important events or when they cannot readily determine essential behavior-outcome contingencies in their environment, they are more apt to exhibit depressive symptomatology (Peterson, Maier, & Seligman, 1993). For instance, pessimistic attribution style has been shown to predict depression in children with cancer, (Frank, Blount, & Brown, 1997) diabetes mellitus (Kuttner, Delamater, & Santiago, 1990), and a variety of chronic illnesses (Schoenherr, Brown, Baldwin, & Kaslow, 1992).

Several studies have found that a child's perception of stress, control, and other cognitive factors (e.g., illness uncertainty, illness intrusiveness) can act as a resilience factor, or contribute to the risk of adjustment problems in children and parents (Andrews, Chaney, Mullins, Hommel, Wagner, & Jarvis, 2009; Chaney et al., 1997; Manuel, 2001). Wagner et al., (2003) found that child reported illness intrusiveness moderated the parental distress-child depressive symptom relationship. This finding suggests that child perceptions of illness intrusiveness may create an emotional vulnerability to the effects of parent distress. Children's perceived illness uncertainty has also been shown to moderate

the parental distress-child depressive symptoms relation, such that under high levels of child uncertainty parent distress was associated with child depressive symptoms.

Causal Attributions. Pessimistic causal attribution and learned helplessness have been extensively studied in the adult rheumatic arthritis (RA) literature and findings support further investigation of cognitive appraisals in children with JRD. For example, individuals with RA who endorse more pessimistic causal attributions also report more negative daily mood, pain-related activity, negative daily events, and poorer sleep (Affleck, Tennen, & Apter (2001). In addition, Chaney and colleagues (1996) found that under conditions of decreased illness control individuals with more pessimistic attributions report more depressive symptoms (Chaney et al., 1996). Research has also demonstrated that attributions for negative events are associated with greater depressive symptoms longitudinally, and that causal attributions for disease-unrelated negative events are more reliable predictors of depression than arthritis-specific helplessness (Hommel, Chaney, Mullins, Palmer, Wees, and Klein, 1998; Schiaffino and Revenson, 1995).

Within the developmental literature, many studies have demonstrated the distinct relationship between pessimistic causal attributional style and depression in children. For example, a meta-analytic review of the child causal attribution literature supported the association between attributions and depression, such that children with higher levels of depressive symptoms are also more likely to have a more pessimistic attributional style for negative events (Gladstone & Kaslow, 1995). Seligman et al. (1984) documented that depressive attributional style predicted depressive symptoms longitudinally 8-13 year olds. Schwartz, Kaslow, Seeley, and Lewinsohn (2000) also demonstrated the association

between pessimistic attributions and psychological maladjustment and further specified that the interaction of cognitive style and negative events was even stronger in domains specified as important by the children, and for older children. A meta-analysis conducted by Joiner and Wagner (1995) examining eight studies reported moderate to large effect sizes for negative attributions as they predict depression. From the review of this literature, one can see that a robust relationship between pessimistic cognitive appraisals and emotional distress has been documented. Due in part to the unpredictable nature of the disease course, children with JRDs are left to make sense of ambiguous circumstances surrounding their illness (Smith, Peck & Ward, 1990). Ambiguous circumstances (e.g., sudden flare-ups regardless of level of adherence) create vulnerable situations for children to make negative inferences about illness-related events. Negative inferences about illness related events can in turn provide an environment in which general negative cognitive appraisals and overall maladjustment may flourish. For example, Wagner and colleagues (2007) revealed that in children with JRD, general negative attributions were associated with greater depressive symptoms under conditions of low control. Additionally, Ennett, DeVellis, Earp, Kredich, Warren, & Wilhem (1991) found that children with a more negative disease experience also have diminished perceptions of competence and self worth and feel less well liked by peers and less physically attractive.

In summary, examination of child cognitive appraisal variables has only begun within the pediatric chronic illness literature. However, from the extant literature is it evident when children encounter negative events with an ambiguous cause, they become vulnerable to making pessimistic causal attributions and subsequent mood deficits.

Investigating negative causal attributions in children with JRDs will provide a more complete picture of child adjustment.

Chapter Summary

Each year approximately 300,000 children in the United State are diagnosed with a juvenile rheumatic disease (Lehman, 2008). This heterogeneous group of autoimmune diseases share similar symptoms including persistent inflammation of joints, restricted functional ability, and intermittent, chronic pain. Given the episodic nature of JRDs and the restrictions placed on children to perform daily activities, it is not surprising that some children with JRDs experience increased adjustment difficulties, particularly internalizing problems (e.g., LeBovidge et al., 2003). Although maladjustment is not inevitable, even non-clinical of distress has the potential to disrupt the daily functioning of children with JRDs (Schanberg et al., 2000).

In both the pediatric and developmental literature, the parent distress-child depressive symptom relation has been demonstrated repeatedly. More recently, a variety of child cognitive appraisal variables (e.g., causal attributions, illness uncertainty, illness intrusiveness) have been shown to exert significant influences on children's adjustment due to the potential vulnerability for negative interpretations of an unpredictable disease course (e.g., Andrews et al., 2009; Wagner et al., 2003, White et al., 2005).

It is apparent that at least a subset of children diagnosed with a JRD is at risk for psychosocial difficulties, specifically internalizing issues (LeBovidge et al., 2003). Parents of children with a JRD are often also at risk for adjustment problems such as depression and financial hardship (e.g., Manuel, 2000). Although several studies have investigated the relationship between child cognitive appraisals and child distress, no

known study has investigated child cognitive appraisals as a mechanism through which parental distress affects child distress. Clarifying the nature of the relationship between parent and child distress and child cognitive appraisals would fill a gap in the child adjustment to chronic illness literature.

.

CHAPTER III

PRESENT STUDY

Based on the preceding review of the literature, it is apparent that children diagnosed with a JRD may be at for difficulties with psychosocial adjustment. Past research has also indicated that parents of children with a JRD may experience increased levels of distress and that children of distressed parents are at an increased risk for developing pessimistic causal attributions as well as a variety of cognitive vulnerabilities for depression. The robust relationship between parental distress and child depressive symptoms has been demonstrated numerous times within the pediatric chronic illness literature; however child pessimistic causal attributions have not been investigated as an intervening variable in this relation between parent adjustment and child depressive symptoms. Clarifying the role of children's causal attributions in the patent-child depression relation in families with children with a JRD has the potential to provide health professionals with integral information about cognitive risk factors of maladjustment in these children and families.

The purpose of the present study was to examine the role of child causal attributions in the parent distress-child depressive symptom relationship. In other words, this study used exploratory analyses to examine child cognitive appraisals as both a mediator and a moderator in the parent distress - child depressive symptom relationship.

As previously found in the literature, we hypothesized that greater parent distress would be associated with greater child distress (Wagner et al., 2003; White et al., 2005). Additionally, it was hypothesized that children's causal attributions for negative events would either provide a mechanism by which parent distress affects child depressive symptoms (mediation) and/or would create conditions under which parent distress is related to child depressive symptoms (moderation).

CHAPTER IV

METHODOLOGY

Participants and Procedures

Participants were 52 children and adolescents (33 females, 19 males) ranging in age from 9 to 17 years old (M = 14.16, SD = 2.46), who were diagnosed with juvenile idiopathic arthritis (JIA; n = 30), systemic lupus erythematosus (SLE; n = 12), juvenile dermatomyositis (JDM; n = 7), or juvenile ankylosing spondylitis (JAS; n = 3), and their parents. Illness duration ranged from 1 to 15 years (M = 2.52; SD = 3.29). The majority of participants self-identified as Caucasian (42%), followed by Native American (29%), Hispanic (11%), African American (8%), Biracial (8%), and Asian (2%).

Participants were recruited from a pediatric rheumatology clinic in a large teaching hospital in the southwest United States. Institutional review board approval was obtained, as well as written informed consent from each participating family. Inclusion criteria were: (1) a diagnosis of a JRD; (2) between 9 and 17 years of age; (3) illness duration of at least one year; and (4) no evidence of cognitive deficits or comorbid chronic illness. Eligible participants were recruited either in the pediatric rheumatology clinic (n = 35) or by phone (n = 17) and completed demographic information and questionnaires in the clinic or at home (returned through the mail). No significant differences were observed between participants who completed packets in the clinic

versus at home on basic demographic (e.g., age, sex, ethnicity, parent education level, marital status) or disease parameters (e.g., disease type, severity, functional class; all *p*'s > .05). Participants were compensated with a $10 check upon completion.

Measures

Physican Report. Following a routine physical examination, a rheumatologist completed a questionnaire regarding the diagnosis, date of diagnosis, and child functional disability (See Appendix A). *Physician-rated functional disability* (PRFD) ranged from class I (limited or no disability in vocational and self-care activities) to class IV (severe disability) (e.g., Hochberg et al., 1992). This classification system has been shown to be a valid index of functional disability in children with JRD (Baildam, Holt, Conway, & Morton, 1995). Overall, the level of functional disability among participants in the current sample was relatively low (M = 1.50, SD = .61).

Parent Report. The *Brief Symptom Inventory* (BSI; Derogatis, 1993) is a 53-item, self-report measure designed to assess adult global psychological adjustment (See Appendix B). Respondents rate the degree to which psychological symptoms (e.g., poor appetite, difficulty making decisions, feelings of guilt) have caused distress during the past seven days. Items are rated from 1 (*not at all*) to 4 (*extremely*), and summed scores are divided by the total number of items to obtain a Global Severity Index of overall parental distress. The BSI has demonstrated satisfactory internal consistency, ranging from .71 to .85 (Derogatis, 1993). Cronbach's alpha for the current sample was .96.

Child Report. The *Child Depression Inventory* (CDI; Kovacs, 2003) is a well-validated 27-item, child-report measure of depressive symptoms over the preceding two-week period (See Appendix C). Items range from 0 to 2, with higher scores indicating greater symptom severity. A depressive symptom total score was calculated by summing

the 27 items and was used as the primary outcome variable. The CDI has demonstrated good validity in samples of children with JRDs (e.g., Hagglund, Vieth, Sadler, Johnson, & Hewett, 2000). The CDI has also been shown to be a reliable measure of depression symptom severity, with internal consistency reliabilities ranging from .71 to .89 (Kovacs, 2003). For the current sample, Cronbach's alpha was .91.

The *Children's Attribution Style Questionnaire-Revised* (CASQ-R; Kaslow & Nolen-Hoeksema, 1991; Thompson, Kaslow, Weiss, & Nolen-Hoeksema, 1998) is a 24-item questionnaire that measures the extent to which children explain the causes of positive and negative hypothetical events (e.g., ''You get a bad grade in school'') across three dimensions of attributional style (i.e., internal, stable, global) (See Appendix D). Only responses to the 12 negative events were included in the present study because depressogenic cognitive vulnerability is defined in terms of causal attributions for *negative events* (Hankin, Abramson, & Siler, 2001). Further, research has demonstrated a more reliable relationship between depressive symptoms and attributions for negative events relative to positive events (e.g., Gladstone & Kaslow, 1995). A composite negative score ranging from 0-12 was obtained by summing responses across the three attribution dimensions (i.e., internal, stable, and global) for negative events. Although no reliability estimates have been reported for the composite negative score, the 24-item measure has demonstrated internal consistencies ranging from .45 to .67 (e.g., Joiner, 2000; Schwartz, Kaslow, Seeley, & Lewinsohn, 2000; Spence et al., 2002). For the current study, internal consistency for the composite negative score was .60.

Overview of Statistical Analyses

Using Thompson and Gustafson's (1996) transactional stress and coping model as a guide, theoretical covariates were selected in order to provide a more stringent examination child causal attributions as a mediator/moderator in the parent distress- child depressive symptom relation. Specifically, several theoretically-driven demographic and illness covariates were selected (i.e., sex, diagnosis, disease duration, functional disability) and controlled for in subsequent analyses.

Mediation. To determine whether parental distress was independently related to child depressive symptoms or if child pessimistic attributions mediated this relationship, Baron and Kenny's (1986) criteria for testing mediation was utilized: (1) the predictor must be significantly associated with the hypothesized mediator (BSI → CASQ-R), (2) both the predictor and the proposed mediator must be significantly associated with the outcome variable (BSI → CDI and CASQ-R → CDI, respectively), (3) the mediator must be significantly associated with the outcome variable while controlling for the effect the predictor, and (4) the impact of the predictor on the outcome variable is less when the mediator is included in the model (see also Holmbeck, 1997). An additional assumption of mediation is that no predictor X mediator interaction exists. MacKinnon, Fairchild, and Fritz (2007) point out that this assumption is frequently overlooked and should be tested routinely.

A series of hierarchical multiple regression equations were constructed to examine the conditions for mediation. To test whether the predictor (BSI) was associated with the proposed mediator (CASQ-R), sex, diagnosis, disease duration, and PRFD were entered as covariates on Step 1 of the equation; BSI was entered on Step 2. To assess the

second condition of mediation (BSI → CDI), a regression equation was constructed in which covariates were entered on Step 1 and BSI scores were entered on Step 2. A similar regression equation was constructed in which covariates were again entered on Step 1 and the CASQ-R was entered on Step 2. Lastly, covariates were entered on Step 1 of the final regression equation, and both the predictor and mediator variables (BSI and CASQ-R) were entered simultaneously on Step 2.

If mediation was present, post-hoc probes of the indirect effect of CASQ-R scores on the BSI → CDI association were planned using a bootstrapping approach (Preacher & Hayes, 2004, 2008). Bootstrapping was selected because it allows for testing the indirect effect of a variable (i.e., mediation) when conducting research with small to modest sample sizes, and it accounts for non-normality in the sampling distribution (Lockwood & MacKinnon, 1998; Preacher & Hayes, 2004). Bootstrapping generates a representation of the sampling distribution of the indirect effect by treating the obtained sample of size as a representation of the population. Resampling is conducted with replacement, so that a new sample of the same size created. Once a resample is constructed, the coefficient for the predictor (BSI) in the model predicting the mediator (CASQ-R) from the predictor and the coefficient for predicting the outcome (CDI) from the mediator (CASQ-R) are estimated for this re-sampled data set and the product of the path coefficients recorded. This process is repeated 5000 times (per recommendation by Hayes et al., 2009) to provide 5000 estimates of the indirect effect. The distribution of the estimates of the indirect effect functions as an "empirical approximation of the sampling distribution of the indirect effect when taking a sample of size n from the original population" (Hayes et al., 2009). An inference is made about the size of the indirect effect in the population

sampled by using the estimates to generate a 95% confidence interval. If zero is not included between the lower and upper bound, then it can be said with 95% confidence that the indirect effect is not zero.

Moderation. Moderational analyses will also be conducted. First the CASQ-R and BSI variables were centered by subtracting the mean from each individual score (Aiken & West, 1991). Next, an interaction term (CASQ-R X BSI) was created by multiplying the two variables. Then on Step 1 of the hierarchical regression predicting CDI, the aforementioned theoretically-chosen demographic and illness covariates (i.e., sex, diagnosis, disease duration, and PRFD) were entered. CASQ-R and BSI were then entered on Step 2 of the regression equation, while the interaction term (CASQ-R x BSI) was entered on Step 3 to test children's attributional style as a moderator of the relationship between parent global severity and child depressed mood.

If a significant moderational effect of child attributions for negative events was revealed in the parent distress-child depressive symptom relationship, then post-hoc probing was planned to further understand how the moderator influences this relationship. Specifically, post-hoc probes are planned to examine whether the slopes of the regression lines (i.e., simple slopes) of parent distress were significantly different from zero under high versus low levels of pessimistic cognitive attributions. Simple slopes will be examined by creating conditional moderator variables that function to manipulate the 0 point of the moderator thereby allowing for the conditional effects of the predictor on the dependent variable to be examined (Aiken & West, 1991). High CASQ-R scores will be calculated by subtracting the standard deviation of child attribution (the moderator) for the full sample from each individual score. Next, a new interaction will be

created multiplying High CASQ-R by BSI. Similarly, the product of Low CASQ-R and BSI will create an additional new interaction. Finally, separate post-hoc regressions will be run for high and low conditions of child attributions. On Step 1 of each regression equation, BSI and one of the conditional CASQ-R variables (e.g., HICASQ-R) and the interaction of BSI and the conditional CASQ-R variable (e.g., BSI X HICASQ-R) will be entered to generate a slope for the high CASQ-R condition. Finding a significant BSI X HICASQ-R interaction would indicate that under high levels of pessimistic child attributions parent distress predicts child depressive symptoms. Additionally, if a significant BSI X LOCASQ-R interaction is found then parent distress would predict child depressive symptoms under low levels of negative child attributions. Each of these regression equations will be plotted to demonstrate the conditions of child attributions under which parent distress predicts child depressive symptoms (Holmbeck, 2002).

CHAPTER V

RESULTS

Hierarchical regression analyses revealed: (1) a significant direct relationship between the BSI and CASQ-R, after controlling for covariates, t (51) = 2.00, p = .05. Higher levels of parental distress were positively associated with children's causal attributions for negative events; (2) a significant relationship between the BSI and CDI, t (51) = 2.65, p = .01, such that greater parental distress was associated with greater child depressive symptoms; (3) a significant effect for the CASQ-R on CDI scores, t (51) = 7.01, p < .001, indicating that children's increased causal attributions for negative events were associated with child depressive symptoms; and (4) after controlling for the CASQ-R, the BSI was no longer a significant predictor of CDI scores, t (51) = 1.65, p > .05. Thus, children's causal attributions for negative events met criteria for mediation in the relation between parent distress and child depressive symptoms. Post-hoc bootstrapping results revealed that the CASQ-R indeed mediated the BSI - CDI association (95% CI = .40 to 7.99; see Figure 1).

To examine whether CASQ-R moderated the relation between BSI and CDI (i.e., BSI X CASQ-R interaction), hierarchical regression results indicated that the interaction of BSI and CASQ-R did not contribute significant variance to the prediction of CDI

scores, $p > .05$. Thus, children's causal attributions did not moderate the association between parent distress and child depressive symptoms.

CHAPTER VI

DISCUSSION

The current study examined the role of children's pessimistic attributions in the parent-child adjustment association in a sample of children and adolescents with JRDs. Consistent with previous studies in the JRD (Ryan et al., 2010; Wagner et al., 2003; White et al., 2005) and chronic illness (e.g., Chaney et al., 1997; Gil, Williams, Thompson, & Kinney, 1991; Mullins et al., 1995; Thompson, Gil, Burbach, Keith, & Kenny, 1993a,b; von Weiss et al., 2002; Williamson, Walters & Shaffer, 2002) literature, results revealed a significant association between increased parent distress and children's depressive symptoms. More importantly, results indicated that children's pessimistic causal attributions for disease-unrelated negative events mediated the observed parent distress–child depressive symptom relation, after controlling for demographic and disease variables. Because this study measured children's general attributional style, we have reason to believe that child attributions may play a mediating role in the parent distress-child depressive symptom relationship not only in families of children with JRD, but in all families. Thus, findings of the present study indicated that child causal attributions are one mechanism through which parent distress affects child depressive symptoms. It should be acknowledged that we are not suggesting that negative child cognitive

appraisals are the only pathway through which parent distress affects child depressive symptoms, rather, other pathways (e.g., genetic predisposition for depressive symptoms in the presence of a chronic illness or depressive symptoms due to uncontrollable illness outcomes) may also be possible.

These data are consistent with a growing body of literature indicating the important role of children's cognitive appraisals in the parent-child adjustment process. Previous studies of children with JRDs (e.g., Wagner et al., 2003; White et al., 2005) have demonstrated that children's disease-specific cognitions (e.g., illness uncertainty, illness intrusiveness) enhance the influence of parent distress on children's depressive symptoms. In other words, in the presence of negative child cognitive appraisals specific to the experience of JRD (i.e., being uncertain about their disease or thinking that their illness is very intrusive), parent distress has been shown to have an amplified negative impact on child adjustment. Notably, our findings may be extrapolated to posit that disease-unrelated attributions also function to impact the parent-child distress relationship.

Our finding indicating that higher levels of parental distress predict a pessimistic causal attributional style is consistent with the literature suggesting that children of depressed parents are more likely to have cognitive vulnerabilities for depression, including pessimistic causal attributions (Anderson & Hammen, 1993; Garber & Robinson, 1997; Goodman, Adamson, Riniti, & Cole, 1994; Hammen & Brennan, 2001; Jaenicke et al., 1987). Several factors may influence the relationship between parental maladjustment and child pessimistic attributions. For example, within the larger chronic illness literature research has demonstrated that parents of a child with a chronic illness

are at risk for experiencing a range of stressors including higher caregiver burden, disrupted routines, and financial hardship, each of which is related to an increased risk of maladjustment (Cohen, 1999; Kazak, et al., 2003; Wallander, 1993). Furthermore, the extant literature has specified that these factors can not only cause distress, but can also be a catalyst in producing secondary or downstream child maladjustment. For instance, elevations in parenting stress have been linked to negative self-focused attributions in parents of a child with a chronic illness and to less adaptive disease-specific cognitions in children with a chronic illness (Carpentier, Mullins, Wolfe-Christensen, & Chaney, 2008; Mullins, Wolfe-Christensen, Hoff Pai, Carpentier, Gilaspy, Cheek & Page, 2007). Although the scope of the current study did not allow for the investigation of factors which may contribute to the parent distress- child negative attributions relationship, one explanation is that parenting stress may increase the risk of child negative attributions. Such explanations are speculative and future research would benefit from a more comprehensive examination of the relation between parental distress and child negative attributions.

Our data, unlike previous studies of disease-specific cognitions (Wagner et al., 2003; White et al., 2005), are more consistent with cognitive vulnerability interpretations of depression (e.g., Garber & Robinson, 1997), and suggest that children's pessimistic causal attributions constitute one specific mechanism through which parent distress influences child depressive symptoms. Although it is tempting to conclude that these negative causal attributions arise from the experience of having a JRD, disease-specific attributions were not measured in the current study, rather, general, disease-unrelated attributions were found to mediate the parent- to child-distress relation. Regardless of the

method by which these negative general attributions originated, when present they have the potential to increase depressive symptoms in child of distressed parents. Because we know that parents of children with JRDs are at an increased risk of being distressed (Manuel, 2001), these children appear to be particularly vulnerable to this process. Additionally, general disease-unrelated attributions may in fact have wider implications in that they may become generalizable and pervasive in many settings (e.g., school, family environment, etc.) Indeed, because children's causal attributions for disease-unrelated events were found to mediate the parent-child distress relation in the present study, our findings indicate that children's pessimistic attributions may be a *result* of parent maladjustment and represent an increased risk for depressive symptoms in youths with JRD.

The results of the current study offer a number of clinical and research implications. First, these results argue for early screening of both parental and child distress soon after diagnosis. Indeed, parent and youth may benefit from brief, evidence-based psychosocial interventions that address adaptive coping mechanisms. These interventions may consist of traditional cognitive behavioral therapy or may also include cognitive focused interventions created for family and youth with a chronic illness, such as Behavioral Family Systems Therapy (Wysocki et al., 2007). Furthermore, our findings suggest that child attributions should be a key area to monitor as child development progresses.

The current study should be interpreted in light of several limitations. First, because CASQ-R, BSI, and CDI are self-report measures, the observed relations may have been due to shared method variance. However, our inclusion of multiple informants

allows for the provision of unique and essential information about different aspects of functioning of both children and parents (Holmbeck, 2002). Second, extensive demographic information was not collected from parent participants. Therefore, some demographic data that potentially could have aided in interpretation of the current findings were unavailable. Additionally, although the internal reliability of the CASQ-R is similar to that of other published studies (e.g., Joiner, 2000; Schwartz et al., 2000; Spence et al., 2002; Wagner et al., 2007), it is somewhat low. The low reliability of this measure raises questions regarding the validity of the findings and highlights the necessity for more reliable measures of attributions. Indeed, it may be possible that the demands of the instrument exceed the cognitive abilities of younger children in the present study.

Despite the limitations of the present study, the findings demonstrate the importance of addressing child attributions when assessing distress outcomes in the context of JRDs. Future research should examine attributional styles and the parent-child distress longitudinally in order to investigate the temporal precedence of pessimistic attributional style relative to child depressive symptomatology. Further, this would potentially afford to better explain the long-term effects of different attributional styles on disease outcomes (e.g., treatment adherence, disease severity, and functional ability) and adjustment outcomes. Additionally, future studies need to investigate the correspondence between disease-related and disease-unrelated events as to how they may relate to depressive symptoms.

REFERENCES

Abela, J. R. Z. (2001). The hopelessness theory of depression: A test of the diathesis-stress and causal mediation components in third and seventh grade children. *Journal of Abnormal Child Psychology. 29,* 241-254.

Abramson, L. Y., Alloy, L. B., Hogan, M. E., Whitehouse, W. G., Donovan, P., Rose, D. T., et al. (2002). In R. L. Leahy & E. T. Thomas (Eds.), *Clinical advances in cognitive psychotherapy: Theory and application* (pp.75-92). New York, NY: Springer Publishing Co.

Adams, C. D., Stresand, R. M., Zawacki, T., & Joseph, K. E., (2002). Living with a chronic illness: A measure of social functioning for children and adolescents. Journal *of Pediatric Psychology*, 27, 593-605.

Affleck, G., Tennen, H., & Apter, A. (2001). Optimism, pessimism, and daily life with chronic illness. In E. C. Chang (Ed.), *Optimism & pessimism: Implication for theory, research, and practice* (pp. 147-168). Washington, DC: American Psychological Association.

Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Thousand Oaks, CA: Sage Publications.

Alloy, L. B., Abramson, L. Y., & Francis, E. L. (1999). Do negative cognitive styles confer vulnerability to depression. *Current Directions in Psychological Science, 8,* 128-132.

Anderson, C. A. & Hammen, C. L. (1993). Psychosocial outcomes of children of unipolar depressed, bipolar, medically ill, and normal women: a longitudinal study. *Journal of Consulting and Clinical Psychology, 61,* 448-454.

Andrews, N., Chaney, J., Mullins, L., Hommel, K., Wagner, J., & Jarvis, J. (2009). The differential effect of child age on the illness intrusiveness-parent distress relationship in juvenile rheumatic disease. *Rehabilitation Psychology, 54,* 45-50. doi:10.1037/a0014443

Ansell, B. M. (1980) Juvenile chronic arthritis. In Ansell BM (ed) *Rheumatic Disorders in Childhood,* pp 87-151. London: Butterworths.

Baildam, E. M., Holt, P. J. L., Conway, S. C., & Morton, M. J. S. (1995). The association between physical function and psychological problems in children with juvenile chronic arthritis. *Rheumatology, 34,* 470-477. doi:10.1093/rheumatology/34.5.470

Barlow, J., Harrison, K., & Shaw, K. (1998). The experience of parenting in the context of juvenile chronic arthritis. *Clinical Child Psychology and Psychiatry, 3,* 445-463. doi:10.1177/135910459803308

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.

Beardslee, W. R., Versage, E. M., & Gladstone, T. R. (1998). Children of affectively ill parents: a review of the past 10 years. *Journal of the American Academy of Child and Adolescent Psychiatry, 37,* 1134-1141.

Brace, M. J., Smith, M. S., McCauley, E., & Sherry, D. D. (2000). Family reinforcement of illness behavior: A comparison of adolescents with chronic fatigue syndrome,

juvenile arthritis and healthy controls. *Developmental and Behavioral Pediatrics 21*, 332-339.

Burke, P., & Elliott, M. (1999). Depression in pediatric chronic illness: A diathesis-stress model. *Psychosomatics, 40,* 5-17.

Cassidy, J. T., Levinson, J. E., Bass, J. C., Baum, J., Brewer, E. J., Fink, C. W., … Young, D. (1986). A study of classification criteria for a diagnosis of juvenile rheumatoid arthritis. *Arthritis Rheumatism, 29,* 274-81.

Cassidy, J. T., & Petty, R. E. (2005). *The textbook of pediatric rheumatology* (5th ed.). Philadelphia: W. B. Saunders.

Cassidy, J. T., Sullivan, D. B., Petty, R. E., & Ragsdale, C. (1977) Lupus nephritis and encephalopathy: Prognosis in 58 children. *Arthritis Rheumatism, 20,* 315-321.

Chaney, J. M., Mullins, L. L., Frank, R. G., Peterson, L., Mace, L. D. Kashani, J. H., et al. (1997). Transactional patterns of child, mother, and father adjustment in insulin-dependent diabetes mellitus: A prospective study. *Journal of Pediatric Psychology*, 229-244. doi:10.1093/kpepsy/22.2.229

Chaney, J. M., Mullins, L. L., Urtesky, D. L., Doppler, M. J., Palmer, W. R., Wees, S. J., et al. (1996). Attributional style and depression in rheumatoid arthritis: The moderating role of perceived illness control. *Rehabilitation Psychology, 3,* 205-223. doi:10.1037/0090-5550.41.3.205

Chaney, J. M., Mullins, L. L., Urtesky, D. L., Pace, T. M., Werden, D., & Hartman, V. L. (1999). An experimental examination of learned helplessness in older adolescents and younger adults with long-standing asthma, *Journal of Pediatric Psychology, 24*, 259-270.

Chaney, J. M., Mullins, L. L., Wagner, J. L., Hommel, K. A., Page, M. C., & Doppler, M. J. (2004). A longitudinal examination of causal attributions and depression symptomatology in rheumatoid arthritis. *Rehabilitation Psychology, 49,* 126-133.

Clemmy, P. A., & Nicassio, P. M. (1997). Illness self-schemas in depressed and nondepressed rheumatoid arthritis patients. *Journal of Behavioral Medicine, 20,* 273-290.

Colletti, C. J. M., Wolfe-Christensen, C., Carpentier, M. Y., Page, M. C., McNall-Knapp, R. Y., Meyer, W. H., et al. (2008). The relationship of parental overprotection, perceived vulnerability, and parenting stress to behavioral, emotional, and social adjustment in children with cancer. *Pediatric Blood & Cancer, 51,* 269-274.

Dahlquist, L. M. (2003). Commentary: Are children with JRA and their families at risk or resilient? *Journal of Pediatric Psychology, 28,* 45–46.

Daniels, D., Moos, R. H., Billings, A. G., & Miller, J. J. (1987). Psychosocial risk and resistance factors among children with chronic illness, healthy siblings, and healthy controls. *Journal of Abnormal Child Psychology, 15,* 295-308.

David, J., Cooper, C., Hickey, L., Lloyd, J., Dore, C., McCullough, C., et al. (1994). The functional and psychological outcomes of juvenile chronic arthritis in young adulthood. *British Journal of Rheumatology, 33,* 876-881.

Degotardi, P. J., Revenson, T. A., & Ilowite, N. T. (1999). Family-level coping in juvenile rheumatoid arthritis: Assessing the utility of a quantitative family interview. *Arthritis Care and Research, 12,* 314-324. doi:10.1002/1529-0131(199910)12:5<314;;AID-ART2>3.0.CO:2-V

Derogatis, L. R. (1993). *BSI Brief Symptom Inventory. Administration, scoring, and procedures Manual* (4th ed). Minneapolis, MN: Clinical Psychometric Research.

Downey, G., & Coyne, J. C. (1990). Children of depressed parents: An integrative review. *Psychological Bulletin, 108,* 50-76.

Ennett, S. T., DeVellis, B. M., Earp, J. A., Kredich, D. Warren, R. W., & Wilhem, C. L. (1991). Disease experience and psychosocial adjustment in children with juvenile rheumatoid arthritis: Children's versus mother's reports. *Journal of Pediatric Psychology, 16,* 557-568. doi:10.1093/jpepsy/16.5.557

Field, T., Hernandez-Reif, M., Seligman, S., Krasnegor, J., Sunshine, W., Rivas-Cgacon, R., et al. (1997). Juvenile rheumatoid arthritis: Benefits from massage therapy. *Journal of Pediatric Psychology, 22,* 607-617. doi:10.1093/jpepsy/22.5.607

Frank, N. C., Blount, R. L., & Brown, R. T. (1997). Attributions, coping and adjustment in children with cancer. *Journal of Pediatric Psychology, 22,* 563-576.

Frank, R. G., Hagglund, K.J., Schopp, L. H., Thayer, J. F, Vieth, A. Z., Cassidy, J. T., et al. (1998). Disease and family contributors to adaptation in juvenile rheumatoid arthritis and juvenile diabetes. *Arthritis Care and Research, 11,* 166-176. doi:10.1002/art.1790110304

Garber, J., & Robinson, N. S. (1997). Cognitive Vulnerability in children at risk for depression. *Cognition and Emotion, 11,* 619-635.

Gerhardt, C. A., Vannatta, K., McKellop, M., Zeller, M., Taylor, J. Passo, M. et al. (2003). Comparing parental distress, family functioning, and the role of social support for caregivers with and without a child with juvenile rheumatoid arthritis. *Journal of Pediatric Psychology, 28,* 5-16.

Gelfand, D., & Teti, D. (1990). The effects of maternal depression on children. *Clinical Psychology Review, 10,* 329-353.

Gil, K. M., William, D. A., Thompson, R. J., Jr., & Kinney, T. R. (1991). Sickle cell disease in children and adolescents: The relation of child and parent pain coping strategies to adjustment. *Journal of Pediatric Psychology*, *16,* 643–663.

Gladstone, T. R. G., & Kaslow, N. J. (1995). Depression and attributions in children and adolescents: A meta-analytic review. *Journal of Abnormal Child Psychology, 23*, 597–606.

Goodman, S., Adamson, L.B., Riniti, J., & Cole, S. (1994). Mothers' expressed attitudes: Associations with maternal depression and children's self-esteem and psychopathology. *Journal of the American Academy of Child and Adolescent Psychiatry*, *33*, 1265-1274.

Goodman, S. H., & Gotlib, I. H. (1999). Risk for psychopathology in the children of depressed mothers: a developmental model for understanding mechanisms of transmission. *Psychological Review, 106,* 458-490.

Goodman, S. H. & Tully, E. (2006). Depression in Women who are Mothers: An Integrative Model of Risk for the Development of Psychopathology in their Sons and Daughters. In C.L.M. Keyes & S.H. Goodman (Eds.), *Women and Depression: A Handbook for the Social, Behavioral, and Biomedical Sciences*, Cambridge University Press.

Hammen, C., & Brennan, P. (2001). Depressed adolescents of depressed and nondepressed mothers: Tests of an interpersonal impairment hypothesis. *Journal of Consulting and Clinical Psychology*, *69,* 284-294.

Harris, J. A., Newcomb, A. F., & Gewanter, H. L. (1991). Psychosocial effects of juvenile rheumatic disease. *Arthritis Care and Research, 4*, 242-259.

Helliwell, P. S., & Ibrahim, G. (2003). Ethnic differences in responses to disease modifying drugs. *Rheumatology, 42*, 1197-1201.

Henoch, M. J., Batson, J. W., & Baum, J. (1978). Psychosocial factors in juvenile rheumatoid Arthritis. *Arthritis and Rheumatism, 21,* 229–233.

Hochberg, M. C., Chang, R. W., Dwosh, I., Lindsey, S., Pincus, T., & Wolfe, F. (1992). The American College of Rheumatology 1991 revised criteria for the classification of global functional status in rheumatoid arthritis. *Arthritis and Rheumatism, 35*, 498–502. doi:10.1002/art.1780350502

Holmbeck, G. N. (2002). Post-hoc probing of significant moderational and mediational effects in studies of pediatric populations. *Journal of Pediatric Psychology, 27,* 87-96. doi: 10.1093/jpepsy/27.1.87

Holmbeck, G. N., Li, S. T., Verrill Schurman, J., Friedman, D., Millstein Coakley, R. (2002). *Collecting and Managing Multisource and Multimethod Data in Studies of Pediatric Populati*ons. 27, 5-18. doi:10.1093/jpepsy/27.1.5

Hommel, K. A., Chaney, J. M., Mullins, L. L., Palmer, W., Wees, S., & Klein, H. (1998). Relative contributions of attributional style and arthritis helplessness to depression in rheumatoid arthritis: a longitudinal investigation. *International Journal of Rehabilitation and Health, 4*, 59-67.

Hommel, K. A., Chaney, J. M., Wagner, J. L., & Jarvis, J. N. (2006). Learned helplessness in children and adolescents with juvenile rheumatic disease. *Journal of Psychosomatic Research, 60*, 73-81.

Hovey, J. K. (2005). Father's parenting chronically ill children: Concerns and coping strategies. *Issues in Comprehensive Pediatric Nursing, 28,* 83-95. doi:10.1080/01460860590950863

Hullmann, S. E**.**, Wolfe-Christensen, C., Meyer, W.H., McNall-Knapp, R.Y., & Mullins, L.L. (in press). The relationship between parental overprotection and health-related quality of life in pediatric cancer: The mediating role of perceived child vulnerability. *Quality of Life Research*.

Huygen, A. C. J., Kuis, W., & Sinnema, G. (2000). Psychological, behavioural, and social adjustment in children and adolescents with juvenile chronic arthritis. *Annuals of Rheumatic Disease, 59,* 276-282.

Huygen, A. C. J., Kuis, W., & Sinnema, G. (2000). Psychological behavioural, and social adjustment in children and adolescents with juvenile chronic arthritis. Annuals of Rheumatic Disease, 59, 276-282.

Ilowite, N. T. (2002). Current Treatment of Juvenile Rheumatoid Arthritis. Pediatrics, 109, 109-115.

Ireys, H. T., Werthamer-Larsson, L. A., Kolodner, K. B., & Gross, S. S. (1994). Mental health of young adults with chronic illness: The mediating effect of perceived impact. *Journal of Pediatric Psychology, 19,* 205-222.

Jaenicke, C., Hammen, C., Zupan, B., Hiroto, D., Gordon, D., Adrian, C., et al. (1987). Cognitive vulnerability in children at risk for depression. *Journal of Abnormal Child Psychology, 15,* 559-572.

Joiner, T. E. (2000). A test of the hopelessness theory of depression in youth psychiatric inpatients. *Journal of Clinical child Psychology, 29,* 167-176.

Joiner, T. E., & Wagner, K. D. (1995). Attributional style and depression in children and adolescents: A meta-analytic review. *Clinical Psychology Review, 15*, 777-798.

Kaslow, N. J., & Nolen-Hoeksema, S. (1991). Children's Attributional Questionnaire-Revised. Unpublished manuscript, Emory University, Atlanta, GA.

Kovacs, M. (2003). *Children's Depression Inventory (CDI) technical manual update.* Tonawanda, NY: Multi-Health Systems.

Kuttner, M. J., Delamater, A. M., & Santiago, J. V. (1990). Learned helplessness in diabetic youths. *Journal of Pediatric Psychology, 13,* 583-594.

LeBovidge, J. S., Lavigne, J. V., Donenberg, G. R., & Miller, M. (2003). Psychological adjustment of children and adolescents with chronic arthritis: A meta-analytic review. *Journal of Pediatric Psychology, 28*, 29-40. doi:10.1093/jpepsy/28.1.29

Lockwood, C. M., & MacKinnon, D. P. (1998). Bootstrapping the standard error of the mediated effect. *Proceedings of the Twenty-Third Annual SAS Users Group International Conference*, pp. 997-1002. Cary, NC: SAS Institute.

Lopez, W. L., Mullins, L. L., Wolfe-Christense, C., & Bourdeau, T. (2008). The relation between parental psychological distress and adolescent anxiety in youths with chronic illnesses: The mediating effect of perceived child vulnerability. *Children's Health Care, 37*, 171-182.

Lovell, D. J. (1997). Juvenile rheumatoid arthritis and juvenile spondyloarthropatheis. In J. H. Klippel (Ed.), *Primer on Rheumatic Diseases: Eleventh edition (pp.* 393-398). Atlanta, GA: Arthritis Foundation.

MacKinnon, D. P., Fairchild, A. J., & Fritz, M. S. (2007). Mediation analysis. *Annual Review of Psychology, 58*, 593-614.

Manners P. J., & Bower, C. (2002). Worldwide prevalence of juvenile arthritis— why does it vary so much? *Journal of Rheumatology, 29*, 1520-1530.

Manuel, J. C. (2001). Risk and resistance factors in the adaptation in mothers of children with juvenile rheumatoid arthritis. *Journal of Pediatric Psychology 26,* 237-246. doi:10.1093/jpepsy/26.4.237

McNeill, T. (2004). Fathers' experience of parenting a child with juvenile rheumatoid arthritis. *Qualitative Health Research, 14*, 526-545. doi:10.1177/1049732303262374

Medsger, T. A., Dawson H., & Mast, A. T. (1970). The eptdemiology of polymyositis. American *Journal of Medicine, 48,* 715.

Moe, N., & Rygg, M. (1998). Epidemiology of juvenile chronic arthritis in northern Norway: a ten-year retrospective study. *Clinical and Experimental Rheumatology, 16*. 99-101

Mullick, M. S., Nahar, J. S., & Haq, S. A. (2005). Psychiatric morbidity, stressors, impact, and burden in juvenile idiopathic arthritis. *Journal of Pediatrics, 100*, 378-382. Retrieved from http://icddrb.org/publication.cfm?classificationID=30

Mullins, L. L., & Chaney, J. M. (2001). Pediatric psychology In C. E. Walker & M. C. Roberts (Eds.), Handbook of clinical child psychology (3rd ed., pp 910-927). New York: Wiley and Sons.

Mullins, L. L., Chaney, J. M., Hartman, V. L., Olson, R. A., Youll, L. K., Reyes, S., et al. (1995). Child and maternal adaptation to cystic fibrosis and insulin-dependent diabetes mellitus: diffferential patterns across disease states. *Journal of Pediatric Psychology, 20*, 173-186. doi:10.1093/jpepsy/20.2.173

Mullins, L. L., Chaney, J. M., Pace, T. M., & Hartman, V. L. (1997). Illness uncertainty, attributional style, and psychological adjustment in older adolescents and young adults with asthma. *Journal of Pediatric Psychology, 22*, 871-880.

Noll, R. B., Kozlowski, K., Gerhardt, C. A., Vannatta, K., Talyor, J., & Passo, M. (2000). Social, emotional, and behavioral functioning in children with juvenile rheumatoid arthritis. *Arthritis and Rheumatism, 43,* 1387-1396. doi:10.1002/1529-0131(200006)43:6<1387::AID-ANR24>3.0.CO;2-C

Oen, K. G., & Cheang, M. (1996). Epidemiology of chronic arthritis in childhood. *Seminars in Arthritis and Rheumatism, 26,* 575–591.

Packham, J. C., Hall, M. A., & Pimm, T. J. (2002). Long-term follow-up of 246 adults with juvenile idiopathic arthritis: predictive factors for mood and pain. *Rheumatology, 41,* 1444-1449. doi:10.1093/rheumatology/41.12.1444

Peterson, C., Maier, S. F., & Seligman, M. E. P. (1993). Learned helpessness. Oxford University Press: Oxford.

Peterson, L.S., Mason, T., Nelson, A. M., O'Fallon, W. M., & Gabriel, S. E. (1997). Psychosocial outcomes and health status of adults who have had juvenile rheumatoid arthritis. Arthritis and Rheumatism, 40, 2235-2240. doi:10.1002/art.1780401219

Peterson, C., & Seligman, M. E. P. (1984). Causal explanations as a risk factor for depression: Theory and evidence. *Psychological Review, 91,* 347-274.

Pimm, T. J., & Weinman, J. (1998). Applying Leventhal's self regulation model to adaptation and intervention in rheumatic disease. *Clinical Psychology & Psychotherapy, 5,* 62-75.

Preacher, K. J., & Hayes, A. F. (2008). Aymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40*, 879-891.

Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers, 36*, 717-731.

Reiter-Purtill, Gerhardt, C. A., Vannatta, K., Passo, M., & Noll, R. B. (2003). A controlled longitudinal study of the social functioning of children with juvenile rheumatoid arthritis. *Journal of Pediatric Psychology, 28*, 17-28. doi:10.1093/jpepsy/28.1.17

Rhodes, V. J. (1991). Physical therapy management of patients with juvenile rheumatoid arthritis. *Physical Therapy, 71*, 910-919.

Sawyer, M. G., Whitman, J. N., Roberton, D. M., Taplin, J. E., Varni, J. W., & Baghurst, P. A. (2004). The relationship between health-related quality of life, pain, and coping strategies in juvenile idiopathic arthritis. *Rheumatology, 43*, 325-330.

Schanberg, L. E., Anthony, K. K., Gil, K. M., & Maurin, E. C. (2003). Daily pain and symptoms in children with polyarticular arthritis. *Arthritis & Rheumatism, 48*, 1390-1397.

Schanberg, L. E., Sandstrom, M. J., Starr, K., Gil, K. M., Lefebvre, J. C., Keffe, F. J., et al. (2000). The relationship of daily mood and stressful events to symptoms in juvenile rheumatic disease. *Arthritis Care and Research, 13*, 33–41.

Schiaffino, K. M., & Revenson, T. A., (1995). Why me? The persistence of negative appraisals over the course of illness. *Journal of Applied Social Psychology, 35,* 601-618.

Schoenherr, S. J., Brown, R. T., Baldwin, K., & Kaslow, N. J. (1992). Attributional styles and psychopathology in pediatric chronic illness groups. *Journal of Clinical Child Psychology, 21,* 380-387.

Schwartz, J. A., Kaslow, N. J., Seeley, J., & Lewinsohn, P. (2000). Psychological, cognitive, and interpersonal correlates of attributional change in adolescents. *Journal of Clinical Child Psychology, 29,* 188-198.

Seligman, M. E. P., Peterson, C., Kaslow, N. J., Tanenbaum, R. L., Alloy, L., & Abramson, L. Y. (1984). Attributional style and depressive symptoms among children. *Journal of Abnormal Psychology, 93,* 235–238.

Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: New procedures and recommendations. *Psychological Methods, 7,* 422-445.

Singsen, B. H. (1993). Pediatric rheumatic diseases. In H.R. Schumacher, Jr., J. H. Klippel, & W. J. Koopman (Eds.), *Primer on the rheumatic diseases: Tenth edition* (pp. 171-174). Atlanta, GA: Arthritis Foundation.

Smith, T. W., Peck, J. R., & Ward, J. R. (1990). Helplessness and depression in rheumatoid arthritis. *Health Psychology, 9,* 377-389.

Southall, D., & Roberts, J. E. (2002). Attributional style and self-esteem in vulnerability to adolescent depressive symptoms following life stress: A 14-week prospective study. *Cognitive Therapy and Research, 26,* 563-579.

Spence, S., Sheffield, J., & Donovan, C. (2002). Problem-solving orientation and attributional style: Moderators of the impact of negative life events on the development of depressive symptoms in adolescence? *Journal of Clinical Child & Adolescent Psychology, 31,* 219-229.

Sullivan, D. B., Cassidy, J. T., & Petty, R. E. (1995). Dermatomyositis in the pediatric patient. *Pediatric Clinics of North America, 42,* 1071-1098.

Sutcliffe, N., Clarke, A. E., Gordon, C., Farewell, V., & Isenberg, D. A. (1999). The association of socio-economic status, race, psychosocial factors and outcome in systemic lupus erythematosus. *Rheumatology, 38,* 1130-1137.

Timko, C., Stovel, K. W., & Moos, R. H. (1992). Functioning among mothers and fathers of children with juvenile rheumatic disease: A longitudinal study. *Journal of Pediatric Psychology, 17,* 705-724.

Timko, C., Stovel, K. W., Moos, R. H., & Miller, J. J. (1992). A longitudinal study of risk and resistance factors among children with juvenile rheumatic disease. *Journal of Clinical Child Psychology, 21*, 132–142.

Timko, C., Baumgartner, M., Moos, R. H., & Miller, J. J. (1993). Parental risk and resistance factors among children with juvenile rheumatic disease: A four-year predictive study. *Journal of Behavioral Medicine, 16,* 571-588.

Thompson, R. J., Gil, K. M., Burbach, D. J., Keith, B. R., & Kinney, T. R. (1993a). Psychological adjustment of mothers of children and adolescents with sickle cell disease: The role of stress, coping methods, and family functioning. *Journal of Pediatric Psychology, 18,* 549-559.

Thompson, R. J., Gil, K. M., Burbach, D. J., Keith, B. R., & Kinney, T. R. (1993b). Role of child and maternal processes in the psychological adjustment of children with sickle cell disease. *Journal of Consulting and Clinical Psychology, 61*, 468-474. doi:10.1037/0022-006X.61.3.468

Thompson, R. J., & Gustafson, K. E. (1996). Psychological adjustment of parents and siblings. *Adaptation to Chronic Childhood Illness.* Washington, DC: American Psychological Association.

Thompson, R. J., Gustafson, K. E., Gil, K. M., Kinney, T. R., & Spock, A. (1999). Change in the psychological adjustment of children with cystic fibrosis or sickle cell disease and their mothers. *Journal of Clinical Psychology in Medical Settings, 6*, 373-391. doi:10.1023/a:1026219831205

Thompson, M., Kaslow, N. J., Weiss, B., & Nolen-Hoeksema, S. (1998). Children's Attributional Style Questionnaire-Revised: Psychometric examination. *Psychological Assessment, 10*, 166–170.

Vandvik, I. H. (1990). Mental health and psychosocial functioning in children with recent onset of rheumatic disease. *Journal of Child Psychology and Psychiatry, 31*, 961-971. doi:10.1111/j.1469-7610.1990.tb00837.x

von Weiss, R. T., Rappoff, M. A., Varni, J. W., Lindsley, C. B., Olson, N. Y., Madson, K. L., et al. (2002). Daily hassles and social support as predictors of adjustment in children with pediatric rheumatic disease. *Journal of Pediatric Psychology, 27*, 155-165.

Wagner, J. L., Chaney, J. M., Hommel, K. A., Andrews, N., & Jarvis, J. N. (2007). A cognitive diathesis-stress model of depressive symptoms in children and adolescents with juvenile rheumatic disease. *Children's Healthcare, 36,* 45-62.

Wagner, J. L., Chaney, J. M., Hommel, K. A., Page, M. C., Mullins, L. L., White, M. M., et al. (2003). The Influence of Parental Distress on Child Depressive Symptoms in Juvenile Rheumatic Diseases: The Moderation Effect of Illness Intrusiveness. *Journal of Pediatric Psychology, 28,* 453-462. doi:10.1093/jpepsy/jsg036

Wallander, J. L., & Varni, J. W. (1992). Adjustment in children with chronic physical disorders: Programmatic research on a disability-stress-coping model. In A. M. LaGreca, L. Siegal, J. L. Wallander, & C. E. Walker (Eds.), *Stress and coping in child health* (pp. 279-298). New York: Guilford Press.

White, M. M., Chaney, J. M., Mullins, L. L., Wagner, J. L., Hommel, K. A., Andrews, N. R., et al. (2005). Children's perceived illness uncertainty as a moderator in the parent-child distress relation in juvenile rheumatic diseases. *Rehabilitation Psychology, 50,* 224-231. doi:10.1037/0090-5550.50.3.224

Williamson, G. M., Walters, A. S., & Shaffer, D. R. (2002). Caregiver models of self and others, coping and depression: Predictors of depression in children with chronic pain. *HealthPsychology, 21,* 405-410.

Wysocki, T., Harris, M. A., Buckloh, L. M., Mertlich, D., Lochrie, A. S., Mauras, N., et al. (2007). Randomized trial of behavioral family systems therapy for diabetes. Maintenance of effects on diabetes outcomes in adolescents. *Diabetes Care, 30,* 555-560.

FIGURES & TABLES

Figure 1. Child attributional style as a mediator between parent distress and child depressive symptoms. Note. Values on paths are path coefficients (standardized betas). Path coeffecients outside parentheses are partial correlations ($s_r s$). Path coefficients in parentheses are standardized partial regression coefficients from equations that include the other variable with a direct effect on the criterion.

* $p < .05$. ** $p < .01$. *** $p < .001$.

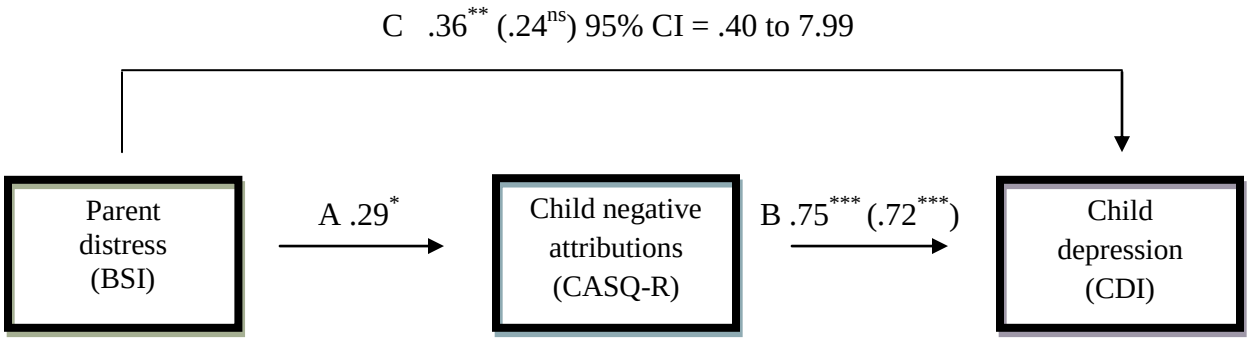

Table 1. *Regression analysis of Children's Depression Inventory*

Step	Variable	*b*	*t* for Within-Step Predictors	R^2 Change for Step	Cumulative R^2	*F* Change for Step
1	Child's sex	.29	.13	.16	.16	2.28
	Diagnosis	4.61	2.05*			
	Disease duration	-.45	-1.32			
	PRFD	-2.70	-1.47			
2	BSI	1.62	1.13	.50	.67	22.08***
	CASQ-R	2.54	6.82***			
	BSI x CASQ-R	1.05	1.32			

Note. Step 1 was the same in all regression equations. PRFD = Physician-Rated Functional Disability. BSI = Brief Symptom Index. CASQ-R = Children's Attributional Style Questionnaire – Revised. * = $p < .05$. ** = $p < .01$. *** = $p < .001$.

APPENDICES

APPENDIX A

PROVIDER QUESTIONAIRE

1. Patient's name:_____

2. Patient's diagnosis (if multiple diagnoses, please list the rheumatic illness first; please indicate if patient is seropositive or ANA-positive)

   _____

   _____

   _____

3. When was the patient diagnosed with the above rheumatic illness?

   Date of diagnosis: _____

4. What is the patient's current medication regimen?

   _____ _____
   _____ _____
   _____ _____

5. Currently, how active is the patient's illness?

1	2	3	4
Clinical Remission (off meds 12 mo)	Clinical Remission (on medication)	Inactive Disease	Active Disease

Based on the patient's physical exam, please classify him/her into one of the following four classes:

Class I	**Class II**	**Class III**	**Class IV**
Completely able to perform usual activities of daily living (self-care, vocational, and avocational)	Able to perform usual self-care and vocational activities, but limited in avocational activities	Able to perform usual self-care activities, but limited in vocational and avocational activities	Limited ability to perform usual self-care, vocational and avocational activities

APPENDIX B

BRIEF SYMPTOM INVENTORY (BSI)

INSTRUCTIONS:

On the next page is a list of problems people sometimes have. Please read each one carefully, and blacken the circle that best describes HOW MUCH THAT PROBLEM HAS DISTRESSED OR BOTHERED YOU DURING THE PAST 7 DAYS INCLUDING TODAY. Blacken the circle for only one number for each problem and do not skip any items. If you change your mind, erase your first mark carefully. Read the example before beginning, and if you have any questions please ask them now.

Not at all	A little bit	Moderately	Quite a bit	Extremely	Example How much were you distressed by:
0	1	2	3	4	Bodyaches

Not at all	A little bit	Moderately	Quite a bit	Extremely	How much were you distressed by:
0	1	2	3	4	Nervousness or shakiness inside
0	1	2	3	4	Faintness or dizziness
0	1	2	3	4	The idea that someone else can control your thoughts
0	1	2	3	4	Feeling others are to blame for most of your troubles
0	1	2	3	4	Trouble remembering things
0	1	2	3	4	Feelings easily annoyed or irritated
0	1	2	3	4	Pains in heart or chest
0	1	2	3	4	Feeling afraid in open spaces or on the streets
0	1	2	3	4	Thoughts of ending your life
0	1	2	3	4	Feeling that most people cannot be trusted
0	1	2	3	4	Poor appetite
0	1	2	3	4	Suddenly scared for no reason
0	1	2	3	4	Temper outbursts that you could not control
0	1	2	3	4	Feeling lonely even when you are with people
0	1	2	3	4	Feeling blocked in getting things done
0	1	2	3	4	Feeling lonely
0	1	2	3	4	Feeling blue
0	1	2	3	4	Feeling no interest in things
0	1	2	3	4	Feeling fearful
0	1	2	3	4	Your feelings being easily hurt
0	1	2	3	4	Feeling that people are unfriendly or dislike you
0	1	2	3	4	Feeling inferior to others
0	1	2	3	4	Nausea or upset stomach
0	1	2	3	4	Feeling that you are watched or talked about by others
0	1	2	3	4	Trouble falling asleep

0	1	2	3	4	Having to check and double-check what you do
0	1	2	3	4	Difficult making decisions
0	1	2	3	4	Feeling afraid to travel on buses, subways, or trains
0	1	2	3	4	Trouble getting your breath
0	1	2	3	4	Hot or cold spells
0	1	2	3	4	Having to avoid certain things, places, or activities because they frighten you
0	1	2	3	4	Your mind going blank
0	1	2	3	4	Numbness or tingling in parts of your body
0	1	2	3	4	The idea that you should be punished for you sins
0	1	2	3	4	Feeling hopeless about the future
0	1	2	3	4	Trouble concentrating
0	1	2	3	4	Feeling weak in parts of your body
0	1	2	3	4	Feeling tense or keyed up
0	1	2	3	4	Thoughts of death or dying
0	1	2	3	4	Having urges to beat, injure, or harm someone
0	1	2	3	4	Having urges to break or smash things
0	1	2	3	4	Feeling very self-conscious with others
0	1	2	3	4	Feeling uneasy in crowds, such as shopping or at a movie
0	1	2	3	4	Never feeling close to another person
0	1	2	3	4	Spells of terror or panic
0	1	2	3	4	Getting into frequent arguments
0	1	2	3	4	Feeling nervous when you are left alone
0	1	2	3	4	Others not giving you proper credit for your achievements
0	1	2	3	4	Feeling so restless you couldn’t sit still
0	1	2	3	4	Feelings of worthlessness
0	1	2	3	4	Feeling that people will take advantage of you if you let them
0	1	2	3	4	Feelings of guilt
0	1	2	3	4	The idea that something is wrong with your mind

APPENDIX C

CHILDREN'S DEPRESSION INVENTORY

This form lists feelings and ideas that kids sometimes have. From each group of feelings and ideas, pick one sentence that describes you best for the past two weeks. After you pick a sentence from one group, go on to the next group.

There is no right or wrong answer. Just pick the sentence that best describes the way you have been recently. Put a mark like this "X" in the box next to the sentence that you pick.

Here is an example of how this form works. Try it. Put a mark next to the sentence that describes you best.

EXAMPLE: _____ I read books all the time
_____ I read books once in a while
_____ I never read books.

---

1. _____ I am sad once in a while
_____ I am sad many times
_____ I am sad all the time

2. _____ Nothing will work out for me
_____ I am not sure if things will work out for me
_____ Things will work out for me O.K.

3. _____ I do most things O.K.
_____ I do many things wrong
_____ I do everything wrong

4. _____ I have fun in many things
_____ I have fun in some things
_____ Nothing is fun at all

5. _____ I am bad all the time
_____ I am bad many times
_____ I am bad once in a while

6. _____ I think about bad things happening to me once in a while
_____ I worry that bad things will happen to me
_____ I am sure that terrible things will happen to me

7. _____ I hate myself
_____ I do not like myself
_____ I like myself

8. _____ All bad things are my fault
_____ Many bad things are my fault
_____ Bad things are not usually my fault

9. _____ I do not think about killing myself
_____ I think about killing myself but I would not do it
_____ I want to kill myself

10. _____ I feel like crying every day
_____ I feel like crying many days
_____ I feel like crying once in a while

11. _____ Things bother me all the time
_____ Things bother me many times
_____ Things bother me once in a while

12. _____ I like being with people
_____ I do not like being with people many times
_____ I do not want to be with people at all

13. _____ I cannot make up my mind about things
_____ It is hard to make up my mind about things
_____ I make up my mind about things easily

14. _____ I look O.K.
_____ There are some bad things about my looks
_____ I look ugly

15. _____ I have to push myself all the time to do my school work
_____ I have to push myself many times to do my school work
_____ Doing school work is not a big problem

16. _____ I have trouble sleeping every night
_____ I have trouble sleeping many nights
_____ I sleep pretty well

17. _____ I am tired once in a while
_____ I am tired many days
_____ I am tired all the time

18. _____ Most days I do not feel like eating
_____ Many days I do not feel like eating
_____ I eat pretty well

19. _____ I do not worry about aches and pains
_____ I worry about aches and pains many times
_____ I worry about aches and pains all the time

20. _____ I do not feel alone
_____ I feel alone many times
_____ I feel alone all the time

21. _____ I never have any fun at school
_____ I have fun at school only once in a while
_____ I have fun at school many times

22. _____ I have plenty of friends
_____ I have some friends but I wish I had more
_____ I do not have any friends

23. _____ My school work is all right
_____ My school work is not as good as before
_____ I do very badly in subject I used to be good in

24. _____ I can never be as good as other kids
_____ I can be as good as other kids if I want to
_____ I am just as good as other kids

25. _____ Nobody really loves me
_____ I am not sure if anybody loves me
_____ I am sure that somebody loves me

26. _____ I usually do what I am told
_____ I do not do what I am told most times
_____ I never do what I am told

27. _____ I get along with people
_____ I get into fights many times
_____ I get into fights all the time

THE END

APPENDIX D

CHILDREN'S ATTRIBUTIONAL STYLE QUESTIONAIRE

1. You get an "A" on a test.
    A. I am smart.
    B. I am good in the subject that the test was in.
2. Some kids that you know say that they do not like you.
    A. Once in a while people are mean to me.
    B. Once in a while I am mean to other people.
3. A good friend tells you that he hates you.
    A. My friend was in a bad mood that day.
    B. I wasn't nice to my friend that day.
4. A person steals money from you.
    A. That person is not honest.
    B. Many people are not honest.
5. Your parents tell you that something that you make is very good.
    A. I am good at making some things.
    B. My parents like some things I make.
6. You break a glass.
    A. I am not careful enough.
    B. Sometimes I am not careful enough.
7. You do a project with a group of kids and it turns out badly.
    A. I don't work well with the people in that particular group.
    B. I never work well with groups.
8. You make a new friend.
    A. I am a nice person.
    B. The people that I meet are nice.
9. You have been getting along well with your family.
    A. I am usually easy to get along with when I am with my family.
    B. Once in a while I am easy to get along with when I am with my family.
10. You get a bad grade in school.
    A. I am not a good student.

B. Teachers give hard tests.

11. You walk into a door and you get a bloody nose.
    A. I wasn't looking where I was going.
    B. I have been careless lately.
12. You have a messy room.
    A. I did not clean my room that day.
    B. I usually do not clean my room.
13. Your mother makes you your favorite dinner.
    A. There are a few things that my mother will do to please me.
    B. My mother usually likes to please me.
14. A team that you are on loses a game.
    A. The team members don't help each other when they play together.
    B. That day the team members didn't help each other.
15. You do not get your chores done at home.
    A. I was lazy that day.
    B. Many days I am lazy.
16. You go to an amusement park and you have a good time.
    A. I usually enjoy myself at amusement parks.
    B. I usually enjoy myself in many activities.
17. You go to a friend's party and you have fun.
    A. Your friend usually gives good parties.
    B. Your friend gave a good party that day.
18. You have a substitute teacher and she likes you.
    A. I was well behaved during class that day.
    B. I am almost always well behaved during class.
19. You make your friends happy.
    A. I am usually a fun person to be with.
    B. Sometimes I am a fun person to be with.
20. You put a hard puzzle together.
    A. I am good at putting puzzles together.
    B. I am good at doing many things.
21. You try out for a sports team and do not make it.
    A. I am not good at sports.
    B. The other kids who tried out are very good at sports.

22. You fail a test.
    A. All tests are hard.
    B. Only some tests are hard.
23. You hit a home run in a ball game.
    A. I swung the bat just right.
    B. The pitcher threw an easy pitch.
24. You do the best in your class on a paper.
    A. The other kids in my class did not work hard on their papers.
    B. I worked hard on the paper.

APPENDIX E

IRB APPROVAL FORM

143

Oklahoma State University
Institutional Review Board

Protocol Expires: 2/10/2005

Date: Thursday, February 12, 2004 IRB Application No AS00104

Proposal Title: PSYCHOLOGICAL COMORBIDITY IN JUVENILE RHEUMATOID DISEASES: A COMPARISON OF AMERICAN INDIANS AND CAUCASIANS.

Principal Investigator(s):

Nicole Andrews
215 North Murray
Stillwater, OK 74078

Janelle Wagner
215 N. Murray
Stillwater, OK 74078

James Jarvis
OUHSC
Oklahoma City, OK 73104

Molly White
407 N. Murray
Stillwater, OK 74078

John M. Chaney
215 N. Murray
Stillwater, OK 74078

Reviewed and Processed as: Expedited (Spec Pop)

Approval Status Recommended by Reviewer(s): Approved

Dear PI :

Your IRB application referenced above has been approved for one calendar year. Please make note of the expiration date indicated above. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval.
2. Submit a request for continuation if the study extends beyond the approval period of one calendar year. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of this research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved projects are subject to monitoring by the IRB. If you have questions about the IRB procedures or need any assistance from the Board, please contact me in 415 Whitehurst (phone: 405-744-5700, colson@okstate.edu).

Sincerely,

Carol Olson

Carol Olson, Chair
Institutional Review Board

VITA

Rachelle Rea Ramsey

Candidate for the Degree of

Master of Science

Thesis: CHILDREN WITH JUVENILE RHEUMATIC DISEASE: THE ROLE OF CAUSAL ATTRIBUTIONS IN THE PARENT DISTRESS – CHILD DEPRESSIVE SYMPTOM RELATION

Major Field: Psychology

Education: Completed the requirements for the Master of Science in Psychology at Oklahoma State University, Stillwater, Oklahoma in December, 2010.

Received Bachelor of Science degree in Psychology and Life Sciences from Otterbein College, Westerville, Ohio in 2007

Professional Memberships:

Psychological Association (APA) Division 54, Society of Pediatric Psychology
Society of Research in Child Development

Experience: Student Research Assistant
Parent and Child Adjustment to Juvenile Rheumatic Disease
Oklahoma University Health and Sciences Center and Oklahoma State

Site Coordinator & Full-time Research Assistant
Center for Biobehavioral Health
Nationwide Children's Hospital, Columbus, Ohio

Research Assistant
Centers for Health Research
Ohio University, Westerville, Ohio

Publications:

Ryan, J. L., **Ramsey, R. R**., Fedele, D. A., Mullins, L. L., Chaney, J. M., & Jarvis, J. N. (2010). A longitudinal examination of the parent-child distress relationship in children with juvenile rheumatic disease. Rehavilitation Psychology. doi: 10.1037/a0020182

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(1), 9-16.

Name: Rachelle Ramsey Date of Degree: December, 2010

Institution: Oklahoma State University Location: Stillwater, Oklahoma

Title of Study: CHILDREN WITH JUVENILE RHEUMATIC DISEASE: THE ROLE OF CAUSAL ATTRIBUTIONS IN THE PARENT DISTRESS – CHILD DEPRESSIVE SYMPTOM RELATION

Pages in Study: 70 Candidate for the Degree of Master of Science

Major Field: Clinical Psychology

Objective: To examine children's attributional style as a mediator in the parent distress–child depressive symptom relation in youth diagnosed with juvenile rheumatic diseases (JRDs) and their parents. **Method:** Fifty-two youth completed the *Children's Attribution Style Questionnaire* and the *Children's Depression Inventory*; parents completed the *Brief Symptom Inventory*. **Results: C**hildren's pessimistic attributions mediated the association between parent distress and child depressive symptoms, when controlling for demographic and disease variables. These findings suggest that parent distress engenders *depressogenic* attributions in children with JRDs, resulting in an increased susceptibility for developing depressive symptoms. **Conclusion:** Results suggest that parents and youth could benefit from psychosocial interventions that focus on the attenuation of parental distress and address cognitive appraisals related to child adjustment. Interventions that focus on educating parents in ways to assist their children in the development of realistic expectations about their illness and promoting age-appropriate levels of mastery are indicated.

ADVISER'S APPROVAL: Dr. John M. Chaney