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Interaction of Parent Pain and Child Empathy on Child Depression: A Pilot Study

Ketlyne Sol
Loma Linda University

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LOMA LINDA UNIVERSITY
School of Behavioral Health
in conjunction with the
Faculty of Graduate Studies

Interaction of Parent Pain and Child Empathy on Child Depression:
A Pilot Study

by

Ketlyne Sol

A Thesis submitted in partial satisfaction of
the requirements for the degree
Doctor of Philosophy in Clinical Psychology

December 2013

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Each person whose signature appears below certifies that this dissertation in his/her opinion is adequate, in scope and quality, as a dissertation for the degree Doctor of Philosophy.

_____, Chairperson
Kendal C. Boyd, Associate Professor of Psychology

Kimberly Freeman, Associate Professor of Social Work and Social Ecology

Jason E. Owen, Associate Professor of Psychology

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ABBREVIATIONS

MPI	Multidimensional Pain Inventory
PT	Perspective Taking
EC	Empathic Concern
PD	Personal Distress
EI	Empathy Index (child empathy variable used for analyses)
YOQ-DA	Child Depression
YOQ	Overall Child Psychological Distress

ABSTRACT OF THE THESIS

Interaction of Parent's Pain and Child's Empathy on Child's Depression:
A Pilot Study

by

Ketlyne Sol

Doctor of Philosophy, Graduate Program in Clinical Psychology
Loma Linda University, December 2013
Dr. Kendal Boyd, Chairperson

Children aged 11-17, in their relationships with their parents, are capable of experiencing a negative mood if their parent is in pain. According to the empathy-altruism hypothesis, people that are high on empathy will want to help someone in distress with the ultimate goal of benefitting the other person. Because of this, the empathy-altruism hypothesis proposes that if an attempt to help is not resolved, the person will report more negative mood. Because children are capable of experiencing empathy for their parents in distress and feel a negative mood as a result, it was hypothesized that an interaction between empathy and parental level of pain will be positively correlated with depressive symptoms in the child. A hierarchical linear regression was done to test this hypothesis. Parent-child dyads were recruited primarily from the internet for this cross-sectional study to complete an internet-based questionnaire. Twenty-seven dyads completed this questionnaire, but analyses proceeded with 25 and 19 dyads following screening. Our hypotheses were not supported in either sample size. Further analyses were tested our hypothesis using overall psychological distress rather than depression alone. Our hypotheses were not supported in the 25 dyad analyses, but they were supported in the 19 dyad sample. This indicated that the

interaction was predictive of child psychological distress, that as parent pain and child empathy increase, so does overall child psychological distress. Limitations are reviewed along with a summary of the importance of further study into the role of empathy in the adjustment of children whose parents have chronic pain.

CHAPTER ONE

INTRODUCTION

As social beings, we interact with others and use a variety of cues to aid us in our interactions with others. At times, those cues can alert us to vital information, such as whether or not another person is in need of assistance. If we are able to read those cues correctly and act upon them, the other person stands to benefit greatly from our intervention. However, why we are motivated to assist another person and the consequences of the decision to act (or not act) is just as important to the person in distress as it is to us. Therefore, studying the role of empathy in the relationships of those facing a stressor such as chronic pain is important.

Usually pain serves as a protective mechanism for our bodies to remove ourselves from the source of that pain to prevent tissue damage (Bennett, 2000; Lipscombe & Raingo, 2006). Unfortunately, some people experience that pain persistently, chronically, without the presence of an external source; the pain is internally derived (Bennett, 2000). Rheumatoid arthritis (RA) is one such chronic pain condition where the pain felt is a result of the patient with RA's own immune system attacking necessary components that aid in the reduction of pain (Zautra, Hamilton, & Burke, 1999). Another chronic pain condition is osteoarthritis (Hastings, Zahn-Waxler, Robinson, Usher, & Bridges) which is due to inflammation and often results in pain in the knees and hips (Leveille, Bean, Ngo, McMullen, & Guralnik, 2007). However, fibromyalgia (FMS), while seemingly symptomatically similar to the other two conditions, differs in that historically, it was classified as a mystery illness with no obvious medical cause and often accompanied by fatigue (Zautra et al., 1999). As such the chronicity, and at times, ambiguity associated

with chronic pain is likely to serve as a stressor itself that likely impacts significant relationships in the patient's life.

Many times, studies on patients with chronic pain investigate their marital status and their spouses' perceptions of the patients' condition. The child's reaction to the parental illness, however, is often ignored. Indeed this observation was also made by Schrag, Morley, Quinn, and Jahanshahi (2004) when studying the effects of a parental diagnosis of Parkinson's disease (PD) on that parent's adult and adolescent children. The aim of their study was to develop a reliable and valid measure to assess the impact of a parent's chronic illness on that parent's children. They used a sample of 12-48 year old children of PD patients to develop their instrument, however less than 34% of their sample was in the 12-18 age range. Steck et al. (2007) studied mental health issues of multiple sclerosis (MS) patients but their sample consisted only of the children of MS patients with an average age of 9.8 years (\pm 4.8 years). Steck et al. found that these children were negatively affected by the severity of their parents' illness; illness severity was significantly negatively correlated with depressive symptoms in the child. Likewise, as reviewed by Evans et al (2008) with parents in pain, pain severity and amount of bodily pain locations is related to increased reports of pain in their children. The authors also reported that there is a lack of more complete studies into the various biological, psychological, and social mechanisms affecting adjustment of children whose parents experience chronic pain. This may be important to understand in helping prevent generational transmission of chronic pain in families.

Child Response to Parental Illness

Solantaus-Simula, Punamäki, and Beardslee (2002) also examined the relationship between a parent's illness and its impact on the child, except they looked at mental illness. In their study, they measured parents' depressive symptoms and children's depressive symptoms in a large community sample. The authors obtained self-reports of the parents' depressive symptoms, parents' reports and self-reports of the children's depressive symptoms and how the children reacted when the parents felt "down," which the authors defined as a feeling of sadness or unhappiness (Solantaus-Simula et al., 2002). The authors then performed cluster analyses to reveal any similarities in the children's response patterns. The analyses revealed four clusters which the authors named indifference, active empathy, emotional overinvolvement, and avoidance. According to the authors, children who fell into the Indifference group (18%) tended to report never noticing if their parents were experiencing a low mood, did not report feeling any empathy for them, and did not report feeling down themselves. Children who fell into the Active Empathy group (44%) reported trying to cheer up their parents if they were experiencing low mood and also felt down at times when their parents felt down; they also tended to report feeling empathy toward their parents. Children who fell into the Emotional Overinvolvement group (9%) scored much higher on negative emotions, such as feeling scared or angry and feeling down if their parents were down. However, they did not differ from children in the Active Empathy group in how much empathy they felt for or how much they tried to cheer up their parents. The last group was the Avoidance group (29%), and children who fell into this group tended to not be able to report how they felt and what they did to cheer up their parents. They also reported not getting

involved, and being unaffected by their parents' emotional state. Interestingly, the two groups that reported the highest amounts of empathy and trying to cheer up their parents differed in that the Emotional Overinvolvement group tended to report more depressive symptoms, guilt, feeling scared, and feeling angry than the Active Empathy group. They also reported much more internalizing symptoms than all of the other groups. These findings indicate that prosocial attitudes, such as bringing their parents coffee and trying to cheer them up, in these two clusters of children may be playing a part in their reactions to their parents' moods. This is because attempts to help may not be viewed as successful if their parents' moods do not change, resulting in increased distress in the child. Because of prosocial behavior's relation to empathy, it is important to understand the role empathy plays in people's interactions with others.

Empathy

According to Eisenberg and Miller (1987), "empathy is defined as an affective state that stems from the apprehension of another's emotional state or condition, and that is congruent with it." They go on to state that *sympathy*, not empathy, is the actual emotional response of an observer to witnessing another's distress. However, this is not the same as the actor's emotional reaction to his situation, but is similar in that the observer's reaction is in the realm of concern for the actor in his or her situation. They also say that altruism is motivated by the observer's sympathy and is the social act of the observer with the *primary goal* of relieving the actor's distress without concern for receiving a reward for his act or concern for reducing any negative feelings he may experience as a result of seeing the actor's distress. Because of this, they say that altruism

falls under the more general umbrella of what is called “prosocial behavior”. According to them, this is because prosocial behavior is any social act that benefits another.

However, not all kinds of prosocial behavior are motivated with an ultimate goal of benefitting the person in need. At times, while the person in need may benefit from the prosocial act, his well-being may not have been the ultimate goal of the person performing the seemingly generous act; hence, the reason for further discrimination between the meanings of prosocial behavior and altruism.

Because Batson had done a considerable amount of work with empathy, his description is included in this review. According to Batson (1990), empathy is “an other-oriented emotional response congruent with the perceived welfare of another,” and is equivalent to Eisenberg and Miller’s use of the word “sympathy.” Like Eisenberg and Miller, empathic arousal in Batson’s observer, resulting from witnessing an actor in distress, will motivate the observer to altruistically aid the observer to reduce the actor’s distress. Thus, such behavior is altruistic because the ultimate goal of the observer’s assistance is to benefit the distressed actor (Batson, Duncan, Ackerman, Buckley, & Birch, 1981). Batson et al. (1981) further draw a distinction between this and what he termed egoistically motivated helping, which is most like the negative motivational behavior described by Eisenberg and Miller (1987) in their description of prosocial behavior. According to Batson et al. (1981), egoistically motivated helping ultimately benefited the observer, whether by reducing distress that the observer felt because of seeing the actor’s distress or by receiving a reward. Although current trends in usage appear to point to using Eisenberg’s “sympathy” instead of Batson’s “empathy” to describe the same concept (of an observer’s other-oriented response due to witnessing an

actor in distress), Batson's "empathy" will be used for the remainder of this review in order to remain consistent with the terminology of the theory guiding this study.

Consequently, whether an act is altruistic depends on how emotionally aroused the observer is in response to the actor's distress, which will motivate the self- or other-orientation of his behavior.

From what seems to be a spectrum of emotional arousal activity within the observer, according to Eisenberg, Valiente, Champion, and Miller (2004) an observer will feel a certain amount of empathic emotional arousal in response to the actor's distress. The amount of empathic emotional arousal will lead either to true empathy for the actor, or to personal distress, where the observer becomes aversively emotionally over-aroused. Therefore, those observers with true empathy, will most likely act with an altruistic motivation, whereas those observers with personal distress will act with an egoistic motivation in an attempt to alleviate their own distress (Batson, Ahmad, Stocks, & Miller, 2004). Furthermore, another factor that seem to influence how much personal distress observers have to actors' distress has a cognitive base and depends on how well observers are able to differentiate between their own emotions and the actors' emotions in the distress situation (Hoffman & Bybee, 1998). As the observers' understanding of their emotions increase, fostered by an increased ability to take the actors' perspectives and see the actors' emotional experience as different from their own, they should experience more empathy and less personal distress. Batson recognized the spectrum of the occurrence of empathic concern versus personal distress and therefore calculated an empathy index of his subjects in his studies to demonstrate which of the two was primarily activated when a subject witnessed an actor in need of help (Bierhoff, 2002). A

relatively high amount of true empathy compared to personal distress would facilitate altruistic helping, whereas a high amount of personal distress compared to true empathy would facilitate egoistic helping.

Based on these descriptions, Batson described the empathy-altruism hypothesis by saying that if an observer sees an actor in distress and is empathically aroused as a result, they will always be moved to help the actor altruistically. He further goes on to say that when feeling a high amount of empathy in a difficult situation, the observers will always help the actor, regardless of whether it is easy or difficult for the observer to escape from the situation.

Batson tested this hypothesis in several experiments (Batson et al., 1989; Batson et al., 1981; Batson et al., 1988; Batson & Weeks, 1996; Fultz, Batson, Fortenbach, McCarthy, & Varney, 1986; Toi & Batson, 1982) and consistently found that when an observer reported feeling a high amount of empathy naturally or through experimental manipulation (i.e. active vs. objective listening, video observation) about another's distress (i.e., electric shocks, needing class notes after a car accident), the high empathy subjects continued to help even when the chance to escape from the situation was high. This link between empathy and altruism was tested in an independent laboratory (Dovidio, 1991) using a procedure similar to Batson's and provided further support of the empathy-altruism hypothesis. Of the different procedures used to support the empathy-altruism hypothesis, two are of particular interest here.

In Study 1 (Batson et al., 1988), the subjects' mood was pretested, manipulated and then post-tested. Pre-test and post-test measures of negative and positive mood were evaluated using lists of words determined by Batson et al. through factor analysis to be

reflective of positive and negative mood. The amount of each endorsed by participant reflected how much positive or negative mood they were experiencing. Batson et al. hypothesized that, according to the empathy-altruism hypothesis, those subjects experiencing a high level of empathy toward the actors would experience a more positive change in mood if they found out that they could not help the actors, but that the actors were still able to escape the distress situation. They said that this was because the primary goal of subjects high in empathy was to relieve the actor of his distress. Therefore, whether that relief came by the aid of the subjects themselves or by some other means did not matter just as long as the actor was relieved of his distress. Batson et al. also hypothesized that high empathy subjects would experience a more positive mood in the previous condition than if they were not allowed to help but found that the subject continued to be in distress. Their hypotheses were supported in both situations. Among high empathy subjects, they found that the negative mood change of those subjects in the no relief/cannot perform situation was statistically significant, which accounted for all of the reliable between-cell variance in the Empathy x Helping x Prior Relief design. Despite this, negative mood change for high sympathy subjects was not statistically significant when compared to all mood change cells. Given that the cell size of participants of this particular scenario was nine, it is presumed that there was a considerable lack of power to detect a statistical significance in the results of that cell if it did exist.

Batson and Weeks (1996) later tested this specific situation (negative mood change in high sympathy subjects due to not being able to help if the actor continued to be distressed) within the context of the empathy-altruism hypothesis in a separate set of

experiments by positing that subjects induced to feel a high amount of empathy would experience a negative mood change if they were prevented from helping actors who remain in the distress situation. According to the authors, this was because their ultimate goal was to relieve the actors of their distress (altruistic helping), not to relieve distress that the subject experienced because of witnessing the actors' distress (egocentric helping). In Experiment 1, Batson and Weeks added the component of justified (subject had no control) and the unjustified (subject had control) failure. They found that high empathy subjects in both the justified and unjustified failure conditions reported a significantly more negative change in mood than those in the low empathy condition. Those in the low empathy had the same response regardless of the failure condition. The authors reasoned that this lack of difference in the low empathy condition could have been due to the low empathy subjects attributing their failure to the difficulty of the helping task. Therefore, they replicated the study with a more simple procedure to decrease the chances of task difficulty being a possible explanation for the smaller decrease in negative mood in the low empathy condition.

In Experiment 2 of the same study, the authors simply placed the subjects in two conditions where they learned that they would be randomly notified that they could no longer help the actor in the task to relieve the actor's distress. Subsequently, the actor would either continue in the distress situation or would have been relieved of the distress situation. The authors found that the high empathy subjects reported significantly more negative changes in mood than the low empathy subjects in the situation where the subjects could not help the actor and found out that the actor remained in the distress situation.

These experiments show that as people empathize with another person, this empathy motivates them to attempt to aid others that they view as being distressed; furthermore, their motivation is simply to help alleviate distress. However, because of this pure motive, if people with high levels of empathy are unable to help a distressed individual, they can experience a negative mood change as a result. On the other hand, all of these studies were conducted with college age students, so age may play a part in people being affected by others' distress, their ability to act prosocially, and the consequences of their efforts. This is because according to Eisenberg et al. (2002), people's prosocial behaviors become more bound to moral reasoning as they get older, which itself increases with age.

Empathy and Children

Nonetheless, Solantaus-Simula et al. (2002) reported that children in their sample, with a mean age of 12.6, were able to respond to the negative moods of their parents, were capable of attempting to make their parents feel better, and were also capable of feeling more negative mood as a result of parental negative mood. The ability of children to respond empathically at this age seems to be supported by a longitudinal study by Eisenberg et al. (1987) which demonstrated that children were better able to use role-taking, empathy, and positive affect in reasoning about consequences beginning at 9-10 years of age. This is supported in that from ages 9-10, children were better able to use different factors in situations to help them in moral reasoning; they used this skill increasingly as they got older. Therefore, according to Eisenberg et al., avoidance of punishment, personal gain, unselfish gain, and focus on the physical or psychological

needs of others influence helping and moral reasoning. These are the same reactions that drive egoistic and altruistic helping as previously described by Eisenberg and Batson. Solantaus-Simula et al. demonstrated that children are capable of using moral reasoning since those with high levels of empathy tried to lift the moods of their parents with the aim of improving their parents' well-being. However, Eisenberg also found that children did increase in using approval-oriented reasoning in making decisions on how to react. Therefore, in line with the empathy-altruism hypothesis, it is possible that the Emotionally Overinvolved used too much of the approval-oriented strategies, so those children may have been more negatively affected by unsuccessful attempts to cheer up their parents. Because of this, the more negative mood experienced by Emotionally Overinvolved may, in part, be because they did not get the approval they desired from their parents in the form of a more positive mood in their parents. Additionally, because the Emotionally Overinvolved children and Active Empathy children were the only two that made more attempts at helping their parents and also did not differ in the amounts of time that they tried to cheer up their parents, it would seem that both were emotionally aroused, but on opposite ends of the arousal spectrum. Therefore, it seems that the Emotionally Overinvolved children may have had an empathy index that included more personal distress, therefore leading to more negative mood compared to the Active Empathy group.

As previously stated, children are capable of responding to their parents' mood. Indeed, Zahn-Waxler (1991) concluded that children initially seek to comfort familiar others in the family, then they comfort unfamiliar others, even before comforting themselves. She also said that the "we-feeling" of taking part in understanding how

others feel begins within the parent-child relationship to help the child identify with others' emotions and empathetically relate his emotions to the other person's emotions.

Gender

When discussing depression, it is important to consider the role that gender plays in prevalence rates. Several authors have reported that there are more incidences of depression in girls than in boys and have reviewed the biological, psychological, and social factors that contribute to the increased prevalence of depression in girls during and after puberty (Hyde, Mezulis, & Abramson, 2008; Rood, Roelofs, Bögels, Nolen-Hoeksema, 2006; Twenge & Nolen-Hoeksema, 2002; Zahn-Waxler, Shirtcliff, & Marceau, 2008). However, this disparity emerges in early adolescence around puberty because before age 13 there is no notable difference in depression symptom levels between boys and girls (Twenge & Nolen-Hoeksema 2002).

Biologically, there are several factors that contribute to this disparity (for review, please see Zahn-Waxler, Shirtcliff, & Marceau, 2008). For example, there are differences in the brain structures of boys and girls that may predispose girls to experiencing more depressive symptoms. During puberty, girls develop larger hippocampi, which leads them to store and recall emotionally-laden events more than boys do. Furthermore, during this time, girls have increased frontal cortex development which is associated with increased inhibition and may predispose girls to more internalization of their symptoms. With respect to hormonal changes during puberty, girls' bodies excrete more estrogen and progesterone. These hormones interfere with the negative feedback action of cortisol in

hypothalamic-pituitary-adrenal axis activity, which may make it more difficult for girls to recuperate after stressful events (Zahn-Waxler, Shirtcliff, and Marceau, 2008).

The hormonal differences between girls and boys play a role in their social experiences, which also contribute to differences in depressive symptoms. For example, at puberty girls excrete significantly more oxytocin than boys excrete. Because of oxytocin's effect in increasing affiliative behavior, girls are more likely to be more negatively affected by changing relationships that occur during this time, like school changes from junior to high school. As this is the period in development that primary attachments move from the parents to peers and romantic partners, girls are also more likely to experience negative effects from disruptions in these new attachments (Cyranowski, Frank, Young, & Shear, 2000). Furthermore, girls and boys are often socialized differently to fit gender norms. As puberty approaches girls are increasingly reinforced for exhibiting more dependence in relationships, being emotional, helpless, passive, and self-giving while boys are increasingly encouraged to be more independent (Zahn-Waxler, Shirtcliff, & Marceau, 2008).

Consequently, when these relationship disruptions occur, differences between girls and boys in coping with these have been found to affect their psychological health. Rood et al. (2009) described stress-reactive rumination as being persistent negative thinking related to stressful events in one's life and reported that it has been associated with depressive symptoms which persist as girls transition into puberty. A meta-analytic study that the authors conducted on studies about rumination found that adolescent girls ruminate significantly more than do adolescent boys.

In conclusion, children can identify with others' emotions as young as toddlerhood, with the capability to empathize with others' distress as they develop an understanding of their own identity, with a relatively competent understanding of how to gauge if others are distressed and are in need of help by age 9. Therefore, the primary aim of this study will be to assess how empathy affects the child's mood, specifically in the context of the parent-child relationship of a parent who has a chronic pain condition. It is hypothesized that:

1. Gender will be significantly correlated to depression with the children in the study, so it will be controlled to remove the effects it has on depression.
2. Parent's pain severity will be positively correlated with child's depressive symptoms.
3. Child's level of empathy will be positively correlated with child's depressive symptoms. Level of empathy will be measured by a composite of the personal distress and true empathy variable, the empathy index. The newly created empathy index will be reliable enough to accurately measure empathy in children.
4. Child's level of empathy will moderate the relationship between parent's pain severity and child's depressive symptoms.

CHAPTER TWO

METHOD

Participants

Participants were adults diagnosed with a chronic pain illness and their oldest children in the age range of 11-17 years old. Oldest children within that age group were requested when parents had more than one child within that age range to maximize our chances of sampling from among those children with increased cognitive development. Power analyses were conducted using the Batson studies and consistently found high effect sizes (~.90) which indicated a high effect size for his studies. For four total variables in the model (discussed below), in order to have a large effect size significant at the .05 level, 48 subjects are needed to participate in the study.

Materials

Gender

As previously reported, gender differences in depression have been consistently reported in adolescence. Furthermore, both the Solantaus-Simula et al. (2002) and the Eisenberg et al. meta-analysis (1987) found significant differences in their samples on gender with girls reporting more empathy than boys do. Therefore, gender will be used as a covariate in our study.

Parent Pain

The parent's pain level will be measured using the Interference (e.g., *In general, how much does your pain interfere with your day-to-day activities?*) and Pain Severity

(e.g., *Rate the level of your pain at the present moment*) scales of a modified version (Deisinger, Cassisi, Lofland, Cole, & Bruehl, 2001) of the 61-item Multidimensional Pain Inventory (MPI; (Rudy, 1989), which was based off of the original West-Haven MPI (WHYMPI; (Kerns, Turk, & Rudy, 1985)). In this 15-item measure, participants were asked to rate their responses on a six point scale (0 = *low/no/not* to 6 = *high/extreme/a lot*), where the anchors vary between questions. Ultimately, with the total scores, higher scores imply higher the pain severity and disability in the parent.

In the Deisinger et al. measure, the items that comprised the WHYMPI Interference scale were the same items that comprised the Interference scale. Additionally, all of the items that comprised the WHYMPI Pain Severity scale were included in the present pain severity scale, with the addition of one more item from the Deisinger et al. Pain Severity scale. Therefore, the psychometric information of the WHYMPI scales were used to estimate convergent and divergent validity information for Deisinger et al. scales. For the WHYMPI, both scales also had good convergent validity with the factors that they were believed to fall into along with other measures that were believed to be related to those factors, e.g., the McGill Pain Questionnaire's Total Pain Rating Index and Present Pain Intensity scales ($r_s = .44 - .81$). However, there did not seem to be much divergence between the two scales with correlation coefficients of .54.

The WHYMPI was found to have twelve subscales, which had acceptable internal consistencies with coefficient alpha values of .70 - .90. The scales were also found to have test-retest reliabilities of .62 - .91 over two weeks. However, the study did not list reliability information for the three different factors under which those subscales fell. The revised Deisinger et al. scale also did not provide specific internal reliability information

for each of the three factors nor for their scales, however it was reported that the internal reliabilities for the nine new scales ranged from .74 to .90, which is acceptable. For our study, this combination of items was found to have good internal reliability, with a Cronbach's alpha of .79.

Empathy Measure

Child empathy was measured using the Davis (1980) Interpersonal Reactivity Index (IRI) which is a self-report measure. It is comprised of four scales, of seven items each, that asks subjects to rate their responses on a five-point scale (0 = *does not describe me well* and 4 = *describes me very well*; total score for each scale ranging from 0 to 28). Specifically, the Empathic Concern (EC; coefficient alpha = .70-.72; e.g., When I see someone being taken advantage of, I feel kind of protective toward them), Personal Distress (PD; coefficient alpha = .78; e.g., Being in a tense emotional situation scares me), and Perspective Taking (PT; coefficient alpha = .75-.78; e.g., Before criticizing somebody, I try to imagine how I would feel if I were in their place) scales were used. The EC and PD scales had significant discriminant validity ($r = .11$) and were reported in Davis (1983) to have significant convergent validity with the Mehrabian and Epstein Emotional Empathy Scale (EC, $r = .56-.63$; PD, $r = .12-.36$). Davis (1983) also reported that the PT scale had significant convergent validity ($r = .37-.42$) with the Hogan Empathy Scale, which is a measure of cognitive empathy.

An Empathy Index was created using the EC and PD scores ($EI = EC - PD$; range of scores: -28 to 28), which will be the variable used in the final analyses. This process of creating an Empathy Index is similar to that followed by Batson to measure empathy in

his studies. The PT score will serve as a validity check of the EI because EC was found to be positively correlated with PT ($r = .30$ to $.32$; Davis, 1980) and PD was found to be negatively correlated with PT ($r = -.16$ to $-.29$; Davis, 1980). This is consistent with what seems to be happening cognitively and affectively with empathy because it is believed that the more self-other differentiation (which is necessary to take another's perspective) that people have, the more likely they are to respond with more empathic concern instead of personal distress, as previously discussed. For our study, all three scale had adequate internal reliability with Cronbach's alphas for PT = $.83$ - $.84$, EC = $.73$ - $.75$, PD = $.87$ - $.89$, and the combination of items to make EI = $.78$ - $.81$.

Finally, although the IRI was developed with a college-aged sample, it has been used with children as young eleven years old to measure empathy with significant correlations being found between empathy and perspective taking, internal motivations for prosocial behavior, other focused reasons, and prosocial behavior (Wentzel, Filisetti, & Looney, 2007).

Child's Depressive Symptoms

The children's depressive symptoms will be measured using the six-item Depression/Anxiety subscale (DA) from the thirty-item short form of the Youth Outcome Questionnaire (Y-OQ 30.1; (Burlingame et al., 2003). This instrument uses a five-point scale for all items ($0 = \textit{never or almost never}$ to $4 = \textit{almost always or always}$). The total score for the DA scale ranges from 0-24, while the total score of the entire YOQ has a range of 0-120. The Y-OQ 30.1 can be used as a parent report or as a self-report for use by the youth, however for this study, only the youth will be asked to complete the

measure for a self report. The DA scale was reported in Dunn, Burlingame, Walbridge, Smith, and Crum (2005) as having a self-report coefficient alpha of .82 for the whole scale in a community sample and a test-retest reliability coefficient of .81 over three weeks. Dunn et al. also reported that the Y-OQ 30.1 had good discriminant validity in that overall scores for the community sample were significantly lower than the scores for the outpatient sample, $F(1,9857) = 379.41, p < .001$. Finally, they reported that the Y-OQ had a concurrent validity coefficient with the Achenbach Child Behavior Checklist of $r = .76$. While the DA scale is titled to reflect its measurement of depressive and anxiety symptoms, only one of the items in this scale seems to measure anxiety, (“I worry and can’t get thoughts out of my mind”). Furthermore, the authors asserted that due to the historically strong correlation between depression and anxiety, they did not attempt to separate the two for this scale. Therefore, we felt that it would be appropriate to use this scale as a measure of depression for our study. In our study, the DA scale and the total scale had adequate internal reliability with Cronbach's alphas, YOQ-DA = .78 and YOQ = .94.

Procedure

The Loma Linda University Institutional Review Board gave approval for this study (OSR # 5100056). Participants were recruited from the Loma Linda University Medical Center Department of Rheumatology, Center for Pain Management, and Department of Family Medicine via fliers posted in the waiting rooms and/or examination rooms of these departments. Participants were also recruited on the internet using Facebook and Yahoo! Groups, through groups for people in chronic pain. Groups

were searched by using the terms “pain”, “chronic pain” and when those had been exhausted, by searching specific pain conditions such as “fibromyalgia”, “back pain”, and “Crohn’s disease”.

If listed, group administrators were initially messaged privately or emailed asking them to send mass messages/emails to group members requesting their participation in the study. For Facebook, if no group administrator was listed, or if there was no way to privately message the listed administrator due to their privacy settings not allowing messages from individuals who were not their “friends” on Facebook, the recruitment message was posted to the Wall of the Facebook group.

The message on the fliers and in the internet recruitment messages targeted adult chronic pain patients with children aged 11-17 years old. Fliers informed potential participants that the requirements were that parents have a chronic pain condition, have a child aged 11-17 years old, and have internet access. The potential of winning a \$20 gift card to Amazon.com through a raffle was listed as an incentive for participation as part of the recruitment efforts. The survey website (Survey Monkey) and the contact information of the investigators were listed on the flyer and in the Internet recruitment messages.

Parents who felt that they met the study criteria, were interested in participating, and who had informed their children of the study who themselves were willing to participate, went to the survey website and were informed that the purpose of the study was to examine the relationships between the parental physical pain, child depression, and child empathy. They were informed of their voluntary participation in the study, and their right to withdraw and cancel their survey at any time. Parents were also informed of their children’s right to participate and withdraw from the study as well as potential risks

to their children in participation. Parents consented for their participation as well as their children's participation in the study by clicking on a "Yes" button to proceed.

Alternatively, if parents did not wish to consent for their and/or their children's participation they could click on the "No" button (which would terminate the session) or simply leave the website.

Because of the anonymity of the internet, our ability to verify whether participants met exclusion criteria was decreased. Thus, this increased the potential for abuse of the survey by opportunistic individuals who may have tried to take advantage of the participation incentive through multiple survey submissions and/or multiple email address submissions. Several safeguards were put in place to minimize the occurrence of such behavior and to maximize the chance that the surveys that were completed were completed honestly. First, the electronic survey was designed such that on the first page after the parent consent page were screening questions which required responses from all consenting parents. These questions asked parents if they had a chronic pain condition and if they had a child in the 11-17 age range that was willing to participate in the study. Furthermore, the website was designed such that we did not collect the IP addresses of visitors, but the website prevented repeated access to the questionnaire by the same computer after it had opened the survey once. This meant that parents and children had to complete their respective portions of the survey in one session. Although it severely restricted our sample size, because the survey was initiated by 54 computers with only 27 completing the survey, it also likely improved the accuracy of the results that we did obtain.

After positively answering the screening questions, parents were taken to pages asking demographic questions and questions about their pain. After parents had completed this section, they were thanked for their time and informed that the following sections were for the child to complete. Children were then provided information about the study on the following page and if they clicked on the “Yes” button to provide their assent, they were allowed to proceed with the rest of the survey.

After children completed their section of the survey, the following screen was addressed to the parents, which informed them of how they may access the other Survey Monkey website to enter their email address to enter the survey.

CHAPTER THREE

RESULTS

In addition to the flyers placed in the three previously mentioned hospital clinics, 203 Facebook groups with a group membership mean of 142.19 ($SD = 12.93$) were contacted. Thirty-five emails were sent to the administrators of Yahoo! groups (group membership $M = 562.26$, $SD = 461.44$). Please see Figure 1 for summary of contact details.

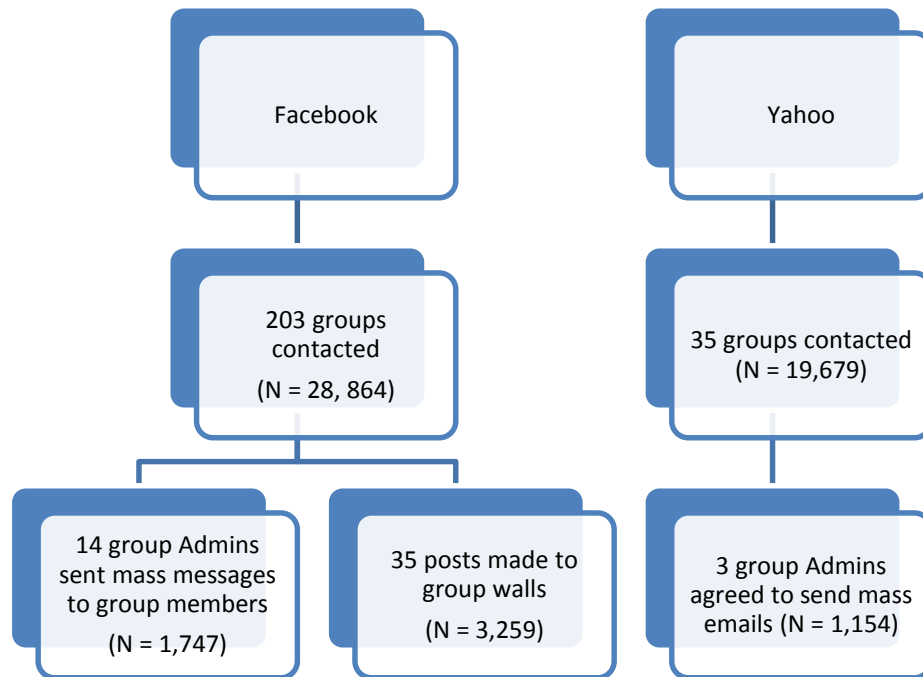


Figure 1. Summary of contacts made in online recruitment efforts.

Ultimately, 54 surveys were initiated, with 27 being completed by both the parent and the child to allow for analysis. Because of an early error in designing a rule for the online questionnaire, the first six child participants who completed the survey were not taken to

the demographic page for their part of the survey, therefore demographic information is unknown for six of them. The error did not interfere with children completing the rest of the questionnaire. The error was corrected and the remainder of child participants were taken to this page to provide demographic information. Of the 27 completed surveys, most of the children were white males with an average age of 13.89 ($SD = 2.29$). A summary of the demographic information can be seen on Table 1. Most of the parents were white, unemployed, married women who had completed some college and had household income of less than \$30,000. As only one parent provided demographic information per dyad, this information is for that one parent who completed the questionnaire, with the exception of household income information which is the self-reported combined income information for the home. A summary of the parents demographic information can also be seen on Table 1.

Table 1

Demographic Information for Parent and Child (27 total dyads)

	Parent		Child	
	<i>N</i>	%	<i>n</i>	%
Gender				
Male	3	11.1	13	48.1
Female	24	88.9	8	29.6
Unknown	0	0	6	22.2
Race				
White or Caucasian	24	88.9	18	66.7
Hispanic or Latino	1	3.7	1	3.7
Asian	0	0	0	0
Pacific Islander	0	0	1	3.7
Multiracial	1	3.7	1	3.7
Unknown	1	3.7	6	22.2
Marital Status				
Married	16	59.3	-	-
Divorced	4	14.8	-	-
Separated	3	11.1	-	-
Single, never married	3	11.1	-	-
Unknown	1	3.7	-	-
Employment Status				
Unemployed	19	70.4	-	-

Employed	7	25.9	-	-
Unknown	1	3.7	-	-
Education			-	-
Some high school	2	7.4	-	-
High school diploma	3	11.1	-	-
Some college	10	37.0	-	-
Associate's degree	3	11.1	-	-
Bachelor's degree	5	18.5	-	-
Some graduate or professional School	2	7.4	-	-
Graduate or professional degree	2	7.4	-	-
Annual Household Income			-	-
Less than \$20,000	0	0	-	-
\$20,001-30,000	13	48.1	-	-
\$30,001-40,000	1	3.7	-	-
\$40,001-50,000	3	11.1	-	-
\$50,001-60,000	0	0	-	-
\$60,001-70,000	5	18.5	-	-
\$70,001-80,000	2	7.4	-	-
\$80,001-90,000	1	3.7	-	-
\$90,001-100,000	0	0	-	-
More than \$100,000	2	7.4	-	-

The data were screened and 9 missing values were found; 5 on the items for Parent Pain (MPI), 1 item on the Perspective Taking Scale (PT) of the empathy measure (IRI), and 3 for the items for Child Overall Psychological Distress (YOQ; with one of them being for the Depression/Anxiety scale [YOQ-DA]). The mean of each of these items, across all values for that item within its specific scale for that specific case, was used to replace these values.

Two cases were found to be outliers on MPI. These two cases were likely not representative of the chronic pain patient population, due to their scores being too low. Furthermore, comparing the internal reliability estimates (Cronbach's α) with these two cases included ($N=27$, $\alpha = .93$) and with them deleted ($N=25$, $\alpha = .79$) indicated that the outliers led to a large inflation in the internal reliability estimates of MPI in this sample. Nonetheless, the reliability estimate for MPI with the cases deleted was still within acceptable limits. Analyses proceeded with the two outlier cases deleted because the inflation in MPI with them included would lead to inaccurate estimates for the main analyses (Liu & Zumbo, 2007). Additionally, because of the relatively large number of missing child gender information, the hypotheses were tested two separate ways: with the cases that had missing child demographic information ($N = 25$) and without the cases with missing child demographic information ($N = 19$).

Analysis Including Cases with Missing Child Demographic

Information (N=25)

Screening indicated that that the skew and kurtosis previously found on the parent pain variable (MPI) were no longer present, therefore, no transformation was needed.

Furthermore, no other variables were significantly skewed. Slight significant kurtosis was found on the Personal Distress (PD) variable and the Overall Child Distress (YOQ) variable with kurtosis values of -1.04 ($SE = .90$) and -1.14 ($SE = .90$), respectively. However, visual inspection of their normal curves did not indicate significant kurtosis, therefore they were not transformed. Of these remaining variables, there was no statistically significant main effect of age for child gender, $F(1, 17) = .15, p = .71$; mean and standard deviations are presented on Table 2. Furthermore, as can be seen on Table 3, there was no significant relationship between child age and any of the predictor variables.

To accurately determine the effect of child gender on the predictor and criterion variables for the regression, one-way ANOVAs were conducted to see if any significant differences existed between the three gender categories. Results of the one-way ANOVAs indicated that there was no significant main effect found for child gender for any of the pertinent variables: PT (Perspective Taking), $F(2, 22) = .36, p = .70$; EC (Empathic Concern), $F(2, 22) = 1.83, p = .18$; PD (Personal Distress), $F(2, 22) = .17, p = .85$; EI (Child Empathy, Index = EC – PD), $F(2, 22) = .87, p = .44$; YOQ-DA (Child Depression), $F(2, 22) = .24, p = .79$; and YOQ (Child Overall Psychological Distress), $F(2, 22) = .45, p = .64$; MPI (Parent Pain), $F(2, 22) = 1.96, p = .17$. Means and standard deviations of these, stratified by child gender, can be found on Table 2. Post-hoc comparisons using a Bonferonni correction found no significant differences between the child gender groups on all variables, with mean differences between gender groups on all of these variables being $p \geq .19$. So overall, there was no trending towards significance on these variables. Ultimately, this did not confirm the hypothesis that gender would be significantly related to child depression. Furthermore, child gender was not significantly

related to child overall child psychological distress. Because there were no significant differences between the child gender groups, Child Gender was not included in the main analyses.

Exploration of differences of parent gender groups indicated no significant difference between parent gender groups on age, $t(23) = .49, p = .63$ nor on MPI, $t(23) = -.44, p = .68$. Parent age was not significantly related to MPI, $r(23) = .01, p = .95$. There were also no significant differences between parent gender groups on any of the other relevant variables in the model: YOQ-DA, $t(23) = .47, p = .64$; YOQ, $t(23) = -.28, p = .28$; PT, $t(23) = .22, p = .83$; EC, $t(23) = .007, p = .995$; PD: $t(23) = .53, p = .60$. Mean and standard deviations for these variables by parent gender are also found on Table 2.

Table 2

Mean and Standard Deviation (in parentheses) by Gender, N = 25

	By Child Gender		
	Male, <i>n</i> = 11	Female, <i>n</i> = 8	Gender Unknown, <i>n</i> = 6
MPI	75.91 (8.54)	79.14 (5.36)	82.83 (5.19)
Child Age (yrs)	13.82 (2.44)	14.25 (2.36)	Unknown
PT	15.04 (5.45)	12.50 (7.43)	14.33 (7.12)
EC	20.73 (3.93)	20.38 (5.13)	24.33 (3.20)
PD	14.00 (7.39)	15.75 (6.80)	14.17 (5.53)
EI	6.73 (7.07)	4.63 (9.32)	10.17 (6.88)
YOQ-DA	8.62 (4.31)	9.00 (5.53)	7.17 (5.84)
YOQ	40.68 (19.39)	45.75 (23.72)	34.17 (26.71)
	By Parent Gender		
	Male, <i>n</i> = 2	Female, <i>n</i> = 23	
MPI	76.50 (4.95)	78.79 (7.45)	
Parent Age (yrs)	42.00 (11.31)	39.65 (6.22)	
PT	15.00 (4.24)	13.98 (6.56)	
EC	21.50 (.71)	21.48 (4.54)	
PD	17.00 (7.07)	14.39 (6.66)	
EI	4.50 (7.78)	7.09 (7.91)	
YOQ-DA	10.00 (4.24)	8.25 (5.04)	
YOQ	36.50 (21.92)	41.11 (22.57)	

Note. MPI = Multidimensional Pain Inventory; PT = Perspective Taking; EC = Empathic Concern; PD = Personal Distress; EI = Empathy Index (child empathy variable); YOD-DA = Child Depression; YOQ = Overall Psychological Distress

As detailed in Table 3, a significant negative correlation was found between PT and PD, and a significant positive correlation was found between PT and EC. This indicated that the combination of variables to create EI was valid, because the correlations were in their expected directions. This consistent with information presented in the review that increasing self-other differentiation as measured by Perspective Taking (PT) would positively correlate with true empathy as measured by Empathic Concern. This is also consistent with information in the review that decreasing self-other differentiation (PT) would negatively correlate with Personal Distress. The low correlations between EC and PD indicate that these are different constructs and measure different things, as expected. There was a significant relationship between EI and the variables PT, EC, and PD, as expected since those scales were already related. A significant positive correlation was also found between YOQ-DA and YOQ, as expected. All other correlations were in the expected directions and level of significance. These correlations confirmed the hypotheses that the combination of EC and PD would create a valid empathy index variable. Internal reliability estimates (Cronbach's alpha) for all of these variables can be seen on Table 3.

Table 3

*Summary of Means, Standard Deviations, Correlations, and Internal Reliability Estimates
(N = 25)*

	MPI	PT	EC	PD	EI	YOQ-DA	YOQ	<i>M</i>	<i>SD</i>
Child Age	-.06	-.04	-.16	-.18	.07	.02	.02	14.00	2.36
MPI	<u>.79</u>	-.01	.34 [†]	-.13	.30	.23	.18	78.61	7.23
PT		<u>.84</u>	.50*	-.50*	.70***	.09	-.25	14.06	6.35
EC			<u>.76</u>	.03	.53**	.22	.12	21.48	4.35
PD				<u>.87</u>	-.83***	.13	.41*	14.60	6.58
EI					<u>.78</u>	.01	-.30	6.88	7.77
YOQ-DA						<u>.78</u>	.86***	8.39	4.92
YOQ							<u>.94</u>	40.74	22.10

Note. Internal reliability estimates (Cronbach's alpha) for each variable are underlined. MPI = Multidimensional Pain Inventory (parent pain); PT = Perspective Taking; EC = Empathic Concern; PD = Personal Distress; EI = Empathy Index (child empathy variable); YOD-DA = Youth Outcome Questionnaire, Depression/Anxiety Scale (child depression); YOQ = Youth Outcome Questionnaire Full Scale (child overall psychological distress); * $p < .05$, ** $p < .01$, *** $p < .001$, [†] $p = .10$

Furthermore, as can be seen on Table 3, there was no significant correlation between any of the predictor variables and the parent pain variable, although the relationship between parent pain and one of the measures used to create the child empathy variable (EI) trended towards significance. Additionally, there was no significant relationship between the parent pain variable and child depression. With both child depression and overall child distress in relation to parent pain, the directions of the correlations indicated that

that as parent pain increases, both child depression and overall psychological distress increase.

A hierarchical linear regression was done to test the hypothesis that empathy would moderate the relationship between parent's pain and depression in the child. Parent pain and child empathy were entered into the first block, which accounted for 5.4% of the variance in the model; the model was not significant $F(2, 22) = .63, p = .54$. The interaction variable was entered into the second and final block along with Parent Pain and Child Empathy, and accounted for 5.6% of the variance in the model; this model was also not significant, $F(3, 21) = .42, p = .74$. Furthermore, the additional variance added by the interaction variable in the second model (0.2%), was not significant; $\Delta F(1, 21) = .06, p = .82$. As summarized in Table 4, none of the predictor variables was significant within the model, which can be expected with a model that was as non-significant as this. The Parent Pain variable added the most unique variance to the main model, out of all three variables ($sr^2 = 5.4\%$). Ultimately, the hypothesis that that child empathy moderates the relationship between parent's pain and child depression was not supported.

Figure 2 illustrates that despite non-significant findings the directions of the interaction were in the expected directions. It indicates that for children with a net (EI) of more negative empathy (indicating more personal distress), as parent pain increases their depressive symptoms decrease. For children with a net of more positive empathy (true empathy), as parent pain increased, so did their depressive symptoms. So, this may indicate that children with more personal distress may be more sensitive and reactive to parent pain at lower levels, but as parent pain increases, they may find other ways to cope that decreases depression they experience to not being able to help alleviate the pain of

the parent. Conversely, the self-other differentiation that is implicit in those with more true empathy, children with a net of more true empathy may not be as reactive to parent pain at lower levels of pain. However, as parent pain increases, and attempts to help are not successful, children with more true empathy may experience more depressive symptoms as a result. Children whose empathy index netted to approximately zero showed little change in depressive symptoms as parent pain increased. They may be representative of the Avoidant and Indifferent empathy types found in the Solantaus-Simula et al. (2002) study.

Table 4

Hierarchical Regression Analysis of Child Depression Symptoms on Parent Pain, Child Empathy, and their Interaction (N = 25)

	R^2	ΔR^2	β	T	p	sr^2
<i>Step 1</i>	.05	-	-	-	-	-
(constant)	-	-	0	8.38	<.001	-
Parent Pain	-	-	.24	1.11	.28	.05
Child Empathy	-	-	-.06	-.27	.79	.003
<i>Step 2</i>	.06	.002	-	-	-	-
(constant)	-	-	0	7.87	<.001	-
Parent Pain	-	-	.24	1.09	.29	.05
Child Empathy	-	-	-.05	-.24	.81	.003
Parent Pain x Child Empathy	-	-	.05	.23	.82	.003

Note. Parent Pain (MPI; Multidimensional Pain Inventory); Child Empathy (EI; Empathy Index)

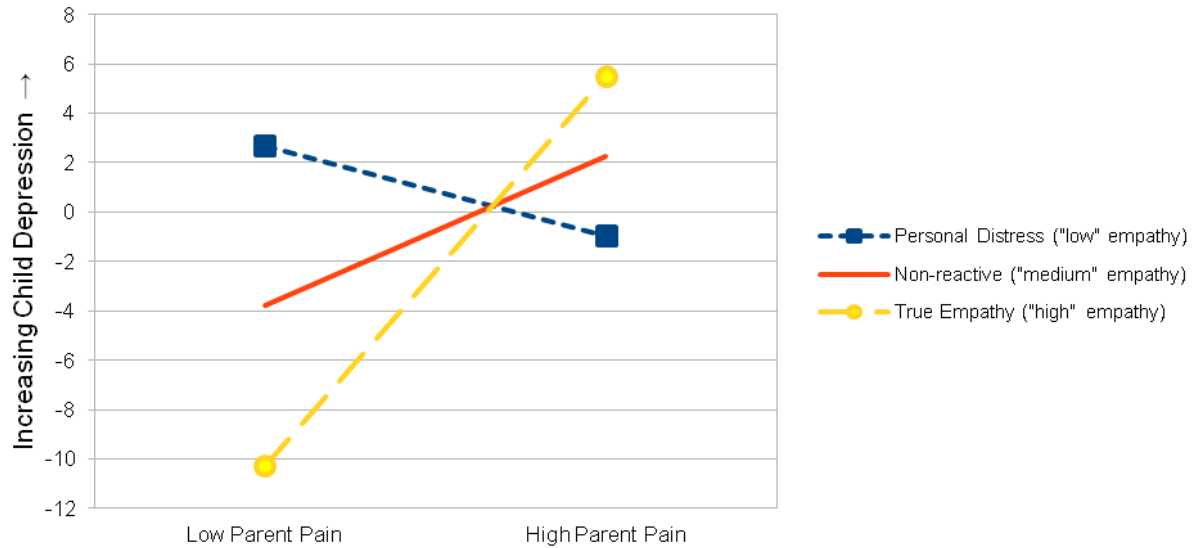


Figure 2. Interaction between parent pain and child empathy on child depression.

The same analyses were conducted with the whole scale from which the Child Depression variable (YOQ-DA) was taken (YOQ) because it had more items, which could improve the power of the test to detect any significant effects. Again, a hierarchical linear regression tested whether child empathy would moderate the relationship between parent's pain and overall psychological distress in the child. Parent pain and child empathy were entered into the first block, which accounted for 15.4% of the variance in the model; the model was not significant $F(2, 22) = 2.01, p = .16$. The interaction variable was entered into the second and final block along with the Parent Pain and Child Empathy variables, and all accounted for 17.7% of the variance in the model; this model was also not significant, $F(3, 21) = 1.51, p = .24$. Furthermore, the additional variance added by the interaction variable in the second model (2.3%), was not significant, $\Delta F(1, 21) = .58, p = .46$. As summarized in Table 5, the Child Empathy variable approached significance in predicting overall child psychological distress in the first model, and this

trend came closer to significance in the second model (Model 1 $\beta = -.37, p = .09$; Model 2 $\beta = -.36, p = .10$). None of the other predictor variables was significant within either of the models. The Child Empathy variable accounted for most of the unique variance in the main model ($sr^2 = 7.7\%$). The increase in power to detect significance of the model could be due to using a scale with more items by using the entire YOQ, but it could also mean that the predictors are better related to child overall psychological distress rather than depression specifically. Ultimately, the model could not confirm that child empathy moderated the relationship between parent's pain and overall psychological distress.

As seen in Figure 3, the direction of the interaction was also in the expected directions, and consistent with the direction found in Figure 2 when predicting child depression. This consistency is likely due to depression being one type of measure of psychological distress. Furthermore, the two variables (child depression and overall child psychological health) were highly positively correlated in this sample, indicating that as child depression increased, so did overall psychological distress. Therefore, it is plausible that they would produce interaction graphs with similar directions.

Table 5

Hierarchical Regression Analysis of Overall Child Psychological Distress Symptoms on Parent Pain, Child Empathy, and their Interaction (N = 25)

	R^2	ΔR^2	β	T	p	sr^2
<i>Step 1</i>	.15	-	-	-	-	-
(constant)	-	-	0	9.60	<.001	0
Parent Pain	-	-	.29	1.41	.17	.08
Child Empathy	-	-	-.37	-1.78	.09	.12
<i>Step 2</i>	.18	.02	-	-	-	-
(constant)	-	-	0	8.99	<.001	0
Parent Pain	-	-	.29	1.40	.18	.08
Child Empathy	-	-	-.36	-1.71	.10	.11
Parent Pain x Child Empathy	-	-	.15	.76	.46	.02

Note. Parent Pain (MPI; Multidimensional Pain Inventory); Child Empathy (EI; Empathy Index).

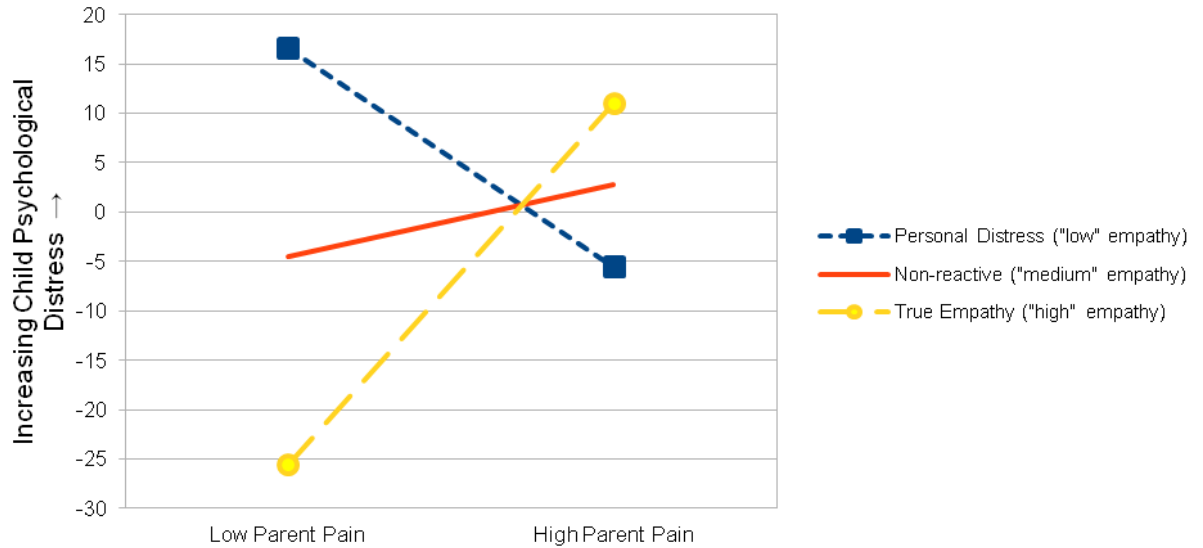


Figure 3. Interaction between parent pain and child empathy on child overall psychological distress.

Analysis with Missing Child Demographic Information

Deleted (N = 19)

Screening indicated that that the significant skew and significant kurtosis previously found on the parent pain variable (MPI) in the full sample was also not present in this sample, therefore no transformation was needed. As for the other predictor variables, kurtosis values for overall child psychological distress (YOQ) and personal distress (PD) continued to be slightly statistically significant with kurtosis values of -1.05 ($SE = 1.01$) and -1.19 ($SE = 1.01$), respectively. Visual inspection of their normal curves did not indicate significant kurtosis; therefore nothing else was done to those variables. As for the other predictor variables, their skew and kurtosis values were within normal limits. In this sample, there was also no statistically significant difference between child gender groups on child age, $t(17) = -.39, p = .71$, means and standard deviations can be

found in Table 6. Additionally, as can be seen on Table 7, there was no significant relationship between child age and any of the predictor variables.

Again, exploration of differences of parent gender groups indicated no significant difference between parent gender groups on age, $t(17) = .60, p = .56$ nor on MPI, $t(17) = -.15, p = .88$. Parent age was not significantly related to MPI, $r(19) = .01, p = .96$. There were also no significant differences between parent gender groups on any of the relevant variables in the model: YOQ-DA, $t(17) = .38, p = .71$; YOQ, $t(17) = -.44, p = .66$; PT, $t(17) = .24, p = .82$; EC, $t(17) = .309, p = .76$; PD: $t(17) = .47, p = .64$. Mean and standard deviations for these variables by parent gender are also found on Table 6.

Mean comparisons of child gender groups on the predictor variables using an independent samples t-test indicated that there were no significant differences between groups on all variables: PT (Perspective Taking), $t(17) = .86, p = .40$; EC (Empathic Concern), $t(17) = .17, p = .87$; PD (Personal Distress), $t(17) = -.53, p = .61$; EI (Child Empathy, Index = EC – PD), $t(17) = .56, p = .58$; YOQ-DA (Child Depression), $t(17) = -.17, p = .87$; and YOQ (Child Overall Psychological Distress), $t(17) = -.51, p = .61$; MPI (Parent Pain), $t(17) = -.94, p = .36$. Overall, there was no significant (nor trending towards significance) effect of child gender on any of these variables, therefore child gender was not included in the test regression. Means and standard deviations of these variables, stratified by child gender groups, can be found on Table 6.

Table 6

Mean and Standard Deviation (in parentheses) by Gender, N = 25

	By Child Gender	
	Male, <i>n</i> = 11	Female, <i>n</i> = 8
MPI	75.91 (8.54)	79.14 (5.36)
Child Age (yrs)	13.82 (2.44)	14.25 (2.36)
PT	15.04 (5.45)	12.50 (7.43)
EC	20.73 (3.93)	20.38 (5.13)
PD	14.00 (7.39)	15.75 (6.80)
EI	6.73 (7.07)	4.63 (9.32)
YOQ-DA	8.62 (4.31)	9.00 (5.53)
YOQ	40.68 (19.39)	45.75 (23.72)
	By Parent Gender	
	Male, <i>n</i> = 2	Female, <i>n</i> = 17
MPI	76.50 (4.95)	77.36 (7.72)
Parent Age (yrs)	42.00 (11.31)	39.00 (6.33)
PT	15.00 (4.24)	13.85 (6.58)
EC	21.50 (.71)	20.47 (4.58)
PD	17.00 (7.07)	14.47 (7.17)
EI	4.50 (7.78)	6.00 (8.15)
YOQ-DA	10.00 (4.24)	10.00 (4.24)
YOQ	36.50 (21.92)	43.56 (21.29)

Note. MPI = Multidimensional Pain Inventory; PT = Perspective Taking; EC = Empathic Concern; PD = Personal Distress; EI = Empathy Index (child empathy variable); YOD-DA = Child Depression; YOQ = Overall Psychological Distress

Similar to what was found in the $N = 25$ analyses and as detailed in Table 7, a significant negative correlation was found between PT and PD, and a significant positive correlation was found between PT and EC. Low non-significant correlations were found between EC and PD. There was also a significant relationship between EI and the variables PT, EC, and PD. A significant positive correlation was also found between YOQ-DA and YOQ, as expected. A significant positive correlation was also found between YOQ-DA and YOQ, as expected. Furthermore, the correlation between MPI and YOQ-DA as well as the correlation between EI and YOQ each neared significance. No other significant or unexpected correlations were found between the relevant variables.

Table 7

Summary of Means, Standard Deviations, Correlations, and Internal Reliability Estimates (N=19)

	MPI	PT	EC	PD	EI	YOQ-DA	YOQ	<i>M</i>	<i>SD</i>
Child Age	-.06	-.04	-.16	-.18	.07	.02	.02	14.00	2.36
MPI	<u>.79</u>	-.05	.21	-.08	.18	.40 [†]	.37	77.27	7.37
PT		<u>.83</u>	.53*	-.56*	.78***	.25	-.12	13.97	6.29
EC			<u>.73</u>	.09	.47*	.52*	.40 [†]	20.58	4.34
PD				<u>.89</u>	-.84***	.10	.38	14.74	7.01
EI					<u>.81</u>	.19	-.12	5.84	7.92
YOQ-DA						<u>.78</u>	.87***	8.78	4.71
YOQ							<u>.94</u>	42.82	20.84

Note. Internal reliability estimates (Cronbach's alpha) for each variable are underlined. MPI = Multidimensional Pain Inventory; PT = Perspective Taking; EC = Empathic Concern; PD = Personal Distress; EI = Empathy Index; YOD-DA = Child Depression; YOQ = Overall Psychological Distress; * $p < .05$, *** $p < .001$, [†] $p = .09$

A hierarchical linear regression tested whether empathy would moderate the relationship between parent's pain and depression in the child. Parent pain and child empathy were entered into the first block, which accounted for 17.4% of the variance in the model; the model was not significant, $F(2, 16) = 1.68, p = .22$ in this sample. The interaction variable was entered into the second and final block along with Parent Pain and Child Empathy, and accounted for 29% of the variance in the model; this model, likewise, was not significant, $F(3, 15) = 2.04, p = .15$. Furthermore, the additional variance added by the interaction variable in the second model (11.6%), was not significant; $\Delta F(1, 15) = 2.46, p = .14$. As summarized in Table 8, none of the predictors was significant in either the first or the second models. The Parent Pain variable contributed the most unique variance. The interaction graph was consistent with the directions previously illustrated by the other analyses, as shown in Figure 4. In short, as net empathy becomes more negative indicating more personal distress, child depression decreases, and as net empathy becomes more positive indicating true empathy, child depression increases. There was little change in child depression ratings for those children whose empathy index indicated a net value of approximately zero.

Table 8

Hierarchical Regression of Child Depression on Parent Pain, Child Empathy, and their Interaction (N = 19)

	R^2	ΔR^2	β	T	p	sr^2
<i>Step 1</i>	.17	-	-	-	-	-
(constant)	-	-	0	8.42	<.001	0
Parent Pain	-	-	.38	1.63	.12	.14
Child Empathy	-	-	.12	.54	.60	.01
<i>Step 2</i>	.29	.12	-	-	-	-
(constant)	-	-	0	8.43	<.001	0
Parent Pain	-	-	.38	1.71	.11	.14
Child Empathy	-	-	.16	.71	.49	.02
Parent Pain x Child Empathy	-	-	.34	1.57	.14	.12

Note. Parent Pain (MPI; Multidimensional Pain Inventory); Child Empathy (EI; Empathy Index)

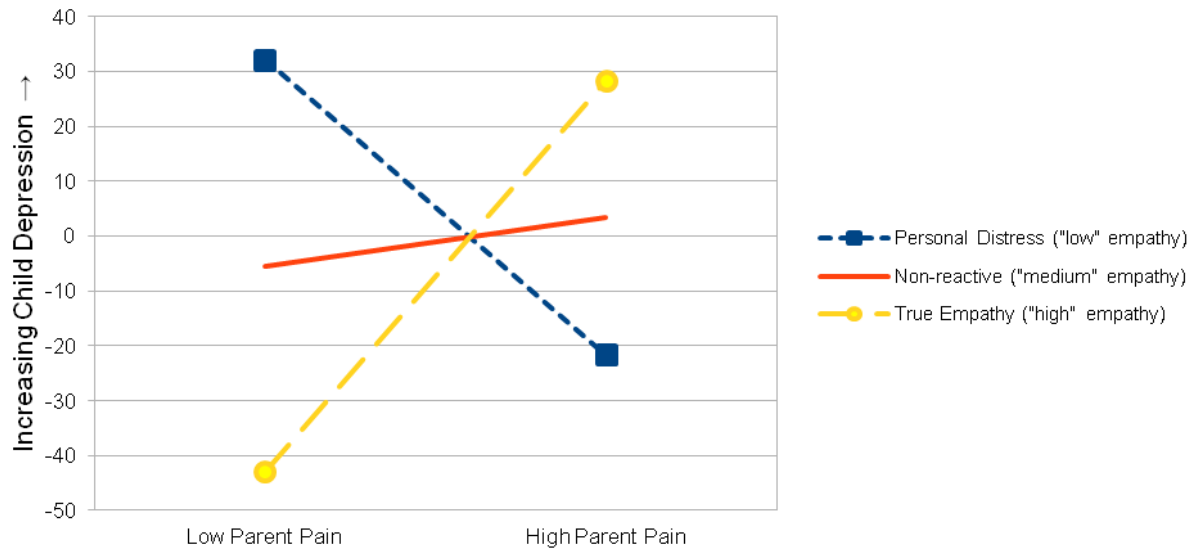


Figure 4. Interaction between parent pain and child empathy on child depression.

As before, the same analyses were conducted with the whole scale from which the Child Depression variable (YOQ-DA) was taken (YOQ) because it had more items, which could improve the power of the analysis to detect significant differences. A hierarchical linear regression tested whether empathy would moderate the relationship between parent's pain and overall psychological distress in the child. Parent pain and child empathy were entered into the first block, which accounted for 17.6% of the variance in the model; the model was not significant $F(2, 16) = 1.71, p = .21$. The interaction variable was entered into the second and final block along with Parent Pain and Child Empathy, which increased the total variance explained by the model to 39%; this model neared significance, $F(3, 115) = 3.18, p = .055$. However, the additional variance added by the interaction variable in the second model (21.3%), was significant, $\Delta F(1, 15) = 5.22, p = .04$. As summarized in Table 9, the Parent Pain variable approached significance in predicting overall child psychological distress in the first

model, and this trended into statistical significance in the second model. Conversely, the Child Empathy variable was not significantly predictive of overall child distress in either model. Most importantly, the interaction variable was statistically significant in predicting overall child distress ($\beta = .46, t(17) = 2.29, p = .04$), accounting for most of the unique variance in the model ($sr^2 = 21.3\%$). The direction of the interaction as indicated in Figure 5 was consistent with what has been reported throughout the previous analyses that when child empathy is more negative indicating more personal distress, child psychological distress decreases. However, when child empathy is more positive, as parent pain increases then child distress increases.

Analyzing with a related scale, with more items, continues to suggest that a larger effect may have been found in the main analysis with child depression if the scale had more items.

Table 9

Hierarchical Regression Analysis of Overall Child Psychological Distress Symptoms on Parent Pain, Child Empathy, and their Interaction (N = 19)

	R^2	ΔR^2	β	T	p	sr^2
<i>Step 1</i>	.18	-	-	-	-	-
(constant)	-	-	0	9.30	<.001	-
Parent Pain	-	-	.41	1.77	.10	.16
Child Empathy	-	-	-.20	-.86	.40	.04
<i>Step 2</i>	.39 [†]	.21*	-	-	-	-
(constant)	-	-	0	9.96	<.001	-
Parent Pain	-	-	.41	2.00	.06	.16
Child Empathy	-	-	-.15	-.75	.467	.02
Parent Pain x Child Empathy	-	-	.46	2.29	.04	.21

Note. Parent Pain (MPI; Multidimensional Pain Inventory); Child Empathy (EI; Empathy Index); * $p < .05$, [†] $p = .055$

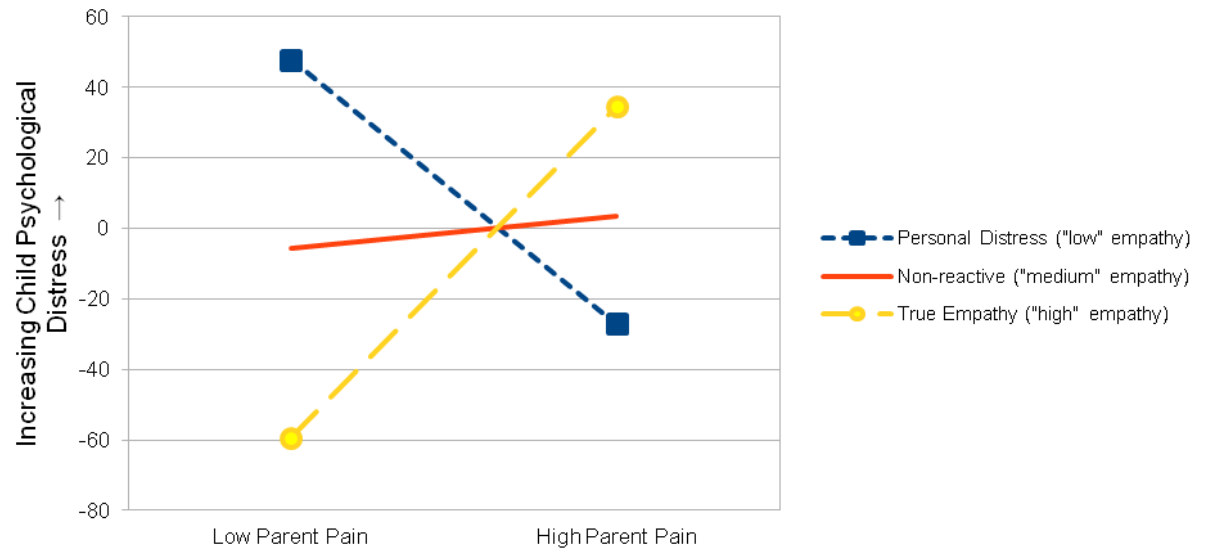


Figure 5. Interaction between parent pain and child empathy on child psychological health ($N=19$).

CHAPTER FOUR

DISCUSSION

The hypothesis for the main analysis were not supported, indicating that the interaction of parent pain and child empathy were not significantly predictive of depression in children of chronic pain patients. However, when predicting overall psychological distress, the interaction was significantly predictive, indicating that as parent pain increases and child empathy becomes more positive (true empathy), child distress increases. One possible reason for this is that depression is only one measure of psychological distress, so it is likely that the data in this sample were better related to the combination of different types of psychological distress rather than only the subset measuring depression. Furthermore, the total scale measuring overall psychological distress had many more items than the scale measuring depression, which improved the reliability of the overall distress scale. This combination of factors likely contributed to the significant findings found in the additional analysis predicting overall psychological distress.

Nonetheless, these results are consistent with the previously reviewed findings of Batson's studies where individuals high in true empathy reported more negative mood change if they were unable to help a person in distress. Individuals with more personal distress were able to decrease their distress if they were unable to help a person who remained in distress by escaping the situation or finding other ways to rationalize their inability to help the individual. It is possible that this is one mechanism at work in the children of this sample that were high in personal distress that permits them to report lower levels of depression and overall psychological distress as parent pain increases.

As will be further discussed later in this section, data for several important variables were not collected, with the primary reason being that a low sample size was expected due to very specific inclusion criteria for participants. This was necessary in order to sample from among those children who were legally dependent on their parents, but had also achieved enough cognitive development for us to better measure their empathy. This would also allow us to study from among those children who frequently see their parents in pain, and likely not have regular sources of respite from this. Thus, this low sample size would not allow for including these additional important variables due attempting to preserve maximal degrees of freedom to increase the power to detect significant findings. It is interesting, however, that the analysis with the lower sample size where cases with unknown child gender were deleted ($N = 19$) is the one where the interaction significantly predicted overall child distress. Conversely, the analysis with the larger sample size where cases with unknown child gender were included ($N = 25$) was not significant. The same pattern was found when predicting child depression, whereby larger effect sizes were found in the models for the $N = 19$ sample compared to the effects sizes for $N = 25$ sample. Mean comparisons between gender groups on all relevant predictor variables did not indicate any significant differences between gender groups that could provide an explanation for this outcome. However, an examination of the internal reliability estimates for the variables in the model indicated that Cronbach's alpha was higher in the $N = 19$ sample ($\alpha = .81$) sample than in the $N = 25$ sample ($\alpha = .78$) for the combination of the 14 items making up the empathy index. The internal reliability estimate for parent pain items remained the same in the both samples ($\alpha = .79$). Similarly, the Cronbach's alpha for psychological distress also remained the same ($\alpha =$

.94) in both samples. This may indicate that this slight improvement in reliability helped increase the power of the analyses of the $N = 19$ sample.

Furthermore, there were no significant differences found between gender groups as was expected, and part of this may be due the small sample size of the study and complications in data collection that further affected analyses pertaining to gender in the sample. Because of the small sample sizes, these results should be viewed with some caution, however because this difference in internal reliability helps to support the results of the theory guiding this study—the empathy altruism hypothesis—the interpretability of these results are better substantiated.

Overall, because this is a cross sectional study and because of additional constraints on interpretability with a small sample size (and any complications resulting in decreased sample size), it is more difficult to draw stronger conclusions about results of the data in this sample.

In addition to the previously mentioned limitations of small sample size, small item count for the depression variable, and missing child gender information, there were other limitations of this study. One such limitation of this study is that most of the subjects were recruited from the Internet, so they may represent a group of highly motivated individuals that may not necessarily be representative of chronic pain patients in general. For example, a study by Berman, Iris, Bode, and Drengenberg (2009) examining the use of an online intervention for chronic pain in older adults, found that a high percentage of those consenting for the study had a higher baseline self-efficacy score than those who did not enroll in the group. This suggests that chronic pain patients with internet access may be more motivated to use online resources to help them cope

with their pain, and as it relates to our study, perhaps also be more motivated to participate in internet-based studies. Furthermore, similar to the results of this study, chronic pain patients participating in internet-based studies have tended to report higher levels of education—at least some college education (Berman et al., 2004; Johannes, Le, Zhou, Johnston, & Dworkin, 2010; Leveille, Huang, Tsai, Weingart, & Iezzoni, 2008)—which do not correlate with predominantly lower education levels obtained from non-internet based population studies (Portenoy, Ugarte, Fuller, & Haas, 2004).

Individuals with the least income have been found to be more likely than those with higher incomes to have chronic pain (Johannes et al, 2010; Portenoy et al, 2004), and this was supported in this study whereby 48% of the sample reported a household income of \$20,00-\$30,000, which was the least in our sample. As such, the global economic crisis may have added to financial stresses that chronic pain patients have experienced, which may likely increase their stress levels and thus their pain experiences. Since our results may indicate that more empathic children may be more negatively affected by their parents' pain, the economic crisis may have distorted the higher levels of distress reported by these children.

As previously mentioned, due to the expected small sample of the study, it was designed such that very few variables would be examined, to minimize the negative effects of increased variables to the power of the study. Therefore, important factors such as family health, depression in parent, and gender of parent were not included. These variables have been found to affect the psychological health of children (Beardslee, Versage, & Gladstone, 1998; Meadows, McLanahan, & Brooks-Gunn, 2007; Sander & McCarty, 2005). For example, a review by Beardslee, Versage, and Gladstone (1998)

reported that the number, severity, and duration of a parent's depressive episodes affect the occurrence and severity of their child's own psychological illness. Because of this, the child may be more likely to identify the parent as being ill and be chronically distressed by this or use the information in such a way that s/he becomes resilient. Because both this study and the various studies by Batson were cross sectional, it is unclear if those individuals high in empathy would eventually become more resilient or more distressed over time, in response to chronically seeing another in distress. Longitudinal studies can better examine the course of psychological distress in such children over time.

Similarly, duration of the parent's pain is another variable that is important to examine but was mistakenly left out of the online questionnaire for this study. The importance of this variable was demonstrated in a study by Demmelmaier, Lindberg, Åsenlöf, and Denison (2008) where they examined differences in pain intensity, disability, and cognitive, psychological, social, and behavioral factors based on pain duration for individuals with nonspecific spinal pain. The results indicated decreased functioning in all domains, with longer duration of pain (three months to more than twelve months) experiencing more dysfunction. Longer duration and its corresponding increases in distress may also indicate increased visibility of the parent's pain and illness to the child over time, potentially resulting in concurrent distress of the child or resilience as mentioned by the Beardslee et al. review.

As it relates to chronic pain patients, gender of the parent has also been found to affect psychological health of children who have parents with chronic pain. In a study by Evans and Keenan (2007) examining parent gender differences of parents with chronic

pain in child psychological health, mothers' chronic pain was significantly associated with child anxiety compared to fathers with chronic pain and healthy controls. However, this was a small sample study ($n \sim 12$ in each group), so results should be interpreted with caution. In another study by Evans, Keenan, and Shipton (2007) on mothers with chronic pain with a slightly higher sample ($n \sim 50$ for each group), children of these mothers were found to have significantly more anxiety and depressive symptoms than did the children of healthy controls. Clinically significant depression has consistently been found to co-occur in individuals with chronic pain (Williams, Jacka, Pasco, Dodd, & Berk, 2006). Therefore, it can be reasonably concluded that the psychological health of a parent in chronic pain can also affect the psychological health of their child.

The Evans, Keenan, and Shipton (2007) study also found that the children of chronic pain patients also demonstrated more illness behaviors as compared to the children of healthy parents. This risk is present in families with a parent who has chronic pain because illness behavior, specifically pain behavior, is frequently modeled by the patient. As reviewed by Bruehl, France, France, Harju, and al' Absi (2007), several other studies have made that assertion as well. Several studies have found that the adult children of chronic pain patients are more likely to report having chronic pain, as compared to the children of healthy parents (Bruehl et al., 2007; Bergman, Herrstrom, Jacobson, & Petersson, 2002; Koutanji, Pearce, & Oakley, 1998). However, as demonstrated by the study conducted by Bruehl et al. (2007), children's *perceptions* of parent pain severity significantly predicted their own reports of chronic pain, while parent reports of their actual pain severity did not significantly predict this. This may indicate that the children of parents with chronic pain may be hypersensitive to or overestimate

the pain severity of their parents based on their parents' pain behaviors. This may support our finding of empathy being predictive of increased overall psychological distress in the children of our sample because empathy is a reaction to someone in distress, based on one's *perception* of another in distress.

Modeling behavior has been associated with mirror neuron activity (Iacoboni 2009; Iacoboni, 2007), which are activated when people see others doing activities that are familiar to them. As reviewed by Iacoboni (2009), these neurons show increased activity when imitating the behavior of others. They have also been found to play a role in the empathy responses of people (Iacobini, 2009). Surprisingly, no studies have yet examined the role played by mirror neurons in illness behavior. This could help to further understand the mechanisms underlying poorer psychological health in children. Furthermore, as the children of chronic pain patients have been found to develop chronic pain as adults, understanding the role of mirror neurons in illness behavior may also help in preventing the development of chronic pain in the children of chronic pain patients.

These factors further support the need for more study into the role of empathy in child internalizing symptoms, and their overall psychological health, when a parent experiences chronic pain. In studying the role of children's empathy, clinicians can help families with a parent in chronic pain better cope with their own illness to help improve the psychological health of their children in the short term, and in the long term help to prevent the future occurrence of chronic pain in these parents' children.

Conclusion

Although not significant for the initial analysis with depression alone, the results

of this study are promising in that a more inclusive measure of overall psychological distress was significantly related to the interaction of parental pain and child empathy. With a larger sample, future studies may find stronger associations between child empathy, parent pain, and psychological health in children of chronic pain patients. Such a sample would allow for the inclusion of more variables that have known effects on child psychological health to be more accurately assessed as to their role in a child's mental health when a parent has chronic pain, without compromising the power of the study. A larger sample may also minimize the potentially sample-decreasing effects of missing data and outliers. Furthermore, as briefly reviewed here, empathy works through several biological, psychological, and social factors. Therefore, a study with a larger sample, could also allow for more detailed analysis of the relative effect of each variable, to better assess the path(s) by which empathy has its effect on child psychological health when their parent chronically experiences pain.

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APPENDIX A

INTERPERSONAL REACTIVITY INDEX (IRI)

The following statements ask about someone would feel in different situations. For each statement, please rate how well it describes you by choosing the appropriate number on the scale below: 0, 1, 2, 3, or 4. Please rate your response as honestly and correctly as you can. When you have decided on your answer, please fill in the number in the blank next to the item. **PLEASE READ EACH ITEM CAREFULLY BEFORE RESPONDING.** Thank you.

0	1	2	3	4
DOES NOT				DESCRIBES
DESCRIBE ME WELL				ME VERY WELL

Perspective-Taking Scale

3. I sometimes find it difficult to see things from the "other guy's" point of view. (-)
8. I try to look at everybody's side of a disagreement before I make a decision.
11. I sometimes try to understand my friends better by imagining how things look from their perspective.
15. If I'm sure I'm right about something, I don't waste much time listening to other people's arguments. (-)
21. I believe that there are two sides to every question and try to look at them both.
25. When I'm upset at someone, I usually try to "put myself in his shoes" for a while.

28. Before criticizing somebody, I try to imagine how I would feel if I were in their place.

Empathic Concern Scale

2. I often have tender, concerned feelings for people less fortunate than me.
4. Sometimes I don't feel sorry for other people when they are having problems. (-)
9. When I see someone being taken advantage of, I feel kind of protective toward them.
14. Other people's misfortunes do not usually disturb me a great deal. (-)
18. When I see someone being treated unfairly, I sometimes don't feel very much pity for them. (-)
20. I am often quite touched by things that I see happen.
22. I would describe myself as a pretty soft-hearted person.

Personal Distress Scale

6. In emergency situations, I feel apprehensive and ill-at-ease.
10. I sometimes feel helpless when I am in the middle of a very emotional situation.
13. When I see someone get hurt, I tend to remain calm. (-)
17. Being in a tense emotional situation scares me.
19. I am usually pretty effective in dealing with emergencies. (-)
24. I tend to lose control during emergencies.

27. When I see someone who badly needs help in an emergency, I go to pieces.

APPENDIX B

INTERFERENCE AND PAIN SEVERITY SCALES OF MODIFIED MPI

(DEISINGER ET AL.)

Please read each question carefully and then circle a number on the scale under that question to indicate how that specific question applies to you. An example may help you to better understand how you should answer these questions.

Example

How nervous are you when you ride in a car when the traffic is heavy?

0 1 2 3 4 5 6

Not at all

Extremely

nervous

nervous

If you are not at all nervous when riding in a car in heavy traffic, you would want to circle the number 0. If you are very nervous when riding in a car in heavy traffic, you would then circle the number 6. Lower numbers would be used for less nervousness, and higher numbers for more nervousness.

Interference

2. In general, how much does your pain interfere with your day-to day activities?

0 1 2 3 4 5 6

No interference

Extreme interference

3. Since the time your pain began, how much has your pain changed your ability to work?

(___ Check here, if you have retired for reasons other than your pain.)

0 1 2 3 4 5 6

No change

Extreme change

4. How much has your pain changed the amount of satisfaction or enjoyment you get from taking part in social and recreational activities?

0 1 2 3 4 5 6

No change

Extreme change

10. How much has your pain changed your ability to take part in recreational and other social activities?

0 1 2 3 4 5 6

No change

Extreme change

11. How much do you limit your activities in order to keep your pain from getting worse?

0 1 2 3 4 5 6

Not at all

Very much

12. How much has your pain changed the amount of satisfaction or enjoyment you get from family-related activities?

0 1 2 3 4 5 6

No change

Extreme change

18. How much has your pain changed your relationship with your spouse, family, or significant other?

0 1 2 3 4 5 6

No change

Extreme change

19. How much has your pain changed the amount of satisfaction or enjoyment you get from work?

(___ Check here, if you are not presently working.)

0 1 2 3 4 5 6

No change

Extreme change

23. How much has your pain changed your ability to do household chores?

0 1 2 3 4 5 6

No change

Extreme change

25. How much has your pain interfered with your ability to plan activities?

0 1 2 3 4 5 6

No change

Extreme change

27. How much has your pain changed or interfered with your friendships with people other than your family?

0 1 2 3 4 5 6

No change

Extreme change

Pain Severity

1. Rate the level of your pain at the present moment.

0 1 2 3 4 5 6

No pain

Very intense pain

7. How much has your pain interfered with your ability to get enough sleep?

0 1 2 3 4 5 6

No interference

Extreme interference

8. On the average, how severe has your pain been during the last week?

0 1 2 3 4 5 6

Not at all severe

Extremely severe

16. How much suffering do you experience because of your pain?

0 1 2 3 4 5 6

No suffering

Extreme suffering

APPENDIX C

PARENT INFORMATION AND CONSENT (FOR SELF AND CHILD)

Loma Linda University

Dept. of Psychology

11130 Anderson Street, Suite 106

Loma Linda, California 92350

The following information will tell you about a research study which you may want to join. Please take your time to make your decision. Discuss it with your friends and family.

WHY IS THIS STUDY BEING DONE?

Research on chronic pain patients is needed to help improve the care available to them and their families. This study is being conducted as part of a student project and will try to add to the information available on parents' pain and the effects of the pain on their child.

WHAT IS INVOLVED IN THE STUDY?

This is a study of a parent's pain and the effects that pain has on their oldest child aged 11-17 years. Therefore, we need both you and your oldest child to agree to participate. If both of you do not agree then we thank you for your time and you may leave the website.

This is a one-time study. If you take part in this study, you will be directed to a secure

website where you can anonymously enter all of your responses at your convenience. The same procedure will be open to your oldest child if you consent for him or her to be in the study. If your oldest child agrees to be part of the study, he or she will answer questions about their reactions to your pain in one section of the survey. We request that both you and your child complete your parts of the survey by yourselves.

You and your child's participation are completely voluntary. You and your child can stop participating at any time after starting the survey and discard any of the information you may have already entered up to that point.

WHAT ARE THE RISKS OF THE STUDY?

Because some of the questions will be asking you and your child about negative feelings, this may cause both of you to reflect on your emotions. If you feel you or your child may have problems coping with emotions you may want to ask your doctor for a referral to a professional to help you with these issues. Participation in this study exposes you and your child to minimal risk, no more than daily life.

ARE THERE BENEFITS TO TAKING PART IN THE STUDY?

You may not benefit directly but your participation may help us find out more information about parents' pain and the effects on children.

ARE THERE ANY CHARGES FOR TAKING PART IN THE STUDY?

There is no cost to you to participate in this study. If both you and your child complete

the surveys, at the end you can go to another website within SurveyMonkey where you can provide us with your email address if you wish to be entered into a drawing. The drawing will be for a \$20 Amazon.com gift card for you and your child to share. About 25% or 1 in 4 participants will receive a gift card.

WHAT ABOUT CONFIDENTIALITY?

Your survey responses will be anonymous. At no time will your name be connected to your survey responses in any way. In addition, your physicians at LLU will not know what you say on this survey or whether you participate or not. If you provide us with your email address for the gift card drawing, we will not connect your email address to your survey answers at any time. We will ensure that your survey answers and email address are not connected by directing you to another website within SurveyMonkey for you to enter your email address.

STUDY INVESTIGATORS

If you have any questions you can contact Ketlyne Sol, B.A. at (909) 558-4000 x86356, (786) 488-2001, ksol@llu.edu, or her research supervisor, Kendal Boyd, Ph.D., at (909) 558-8574 or kboyd@llu.edu.

IMPARTIAL THIRD PARTY CONTACT

If you are concerned or have a complaint, you may talk to someone who is not a part of the study. The patient relations office can be reached at Loma Linda University Medical Center at (909) 558-4647 or patientrelations@llu.edu.

INFORMED CONSENT

If you complete this survey and submit the answers, you and your child will be consenting to have this information included in our research study.

I have read the information about the study and

- Yes, I consent for myself and my child's participation in the study. I want to continue.
- No, I do not consent for myself and my child's participation in the study. I do not want to continue.

APPENDIX D

CHILD INFORMATION AND ASSENT (11-17YEARS OLD)

Loma Linda University

Department of Psychology

11130 Anderson Street, Suite 106

Loma Linda, California 92350

This information will tell you about a research project that you may want to join. Please take your time to make your decision and talk to your parents before making your decision.

WHY IS THIS PROJECT BEING DONE?

This is a student's project; the project will add to information about a parent's pain and the effects of the pain on the child.

WHAT DO I NEED TO DO FOR THIS PROJECT?

This is a project about a parent's pain and how that pain affects the oldest child (you) that the parent has that's 11-17 years old. We need both you and your parent to agree to participate. If you both don't agree to participate you can leave the website and we thank you for your time.

This is a one-time project. If you participate, you will be asked to go to a safe website. If your parent gives permission, you can anonymously enter all of your answers during a

time that is good for you and your parent. You will answer questions about your feelings in one part of the survey. We ask that both you and your parent answer your questions on the survey by yourselves.

Your participation is completely your choice. You can stop participating at any time after you've started the survey. You can also delete any of the information you may have already entered up to that point, it's okay.

WHAT ARE THE RISKS OF THE PROJECT?

Because some of the questions will be asking about negative feelings this may cause you to think about your feelings. If you have problems dealing with your feelings you can ask your doctor to send you to get help dealing with these feelings.

WILL I GET ANYTHING BY PARTICIPATING IN THE PROJECT?

You will probably not get anything directly but your participation may help us find out more information about parents' pain and how it affects their children.

ARE THERE ANY CHARGES FOR PARTICIPATING IN THE PROJECT?

It won't cost you anything to participate in this project. If both you and your parent finish all of the questions, at the end your parent can give us an email address if they want to be part of a drawing. The drawing will be for a \$20 Amazon.com gift card for the two of you share. About 1 in 4 participants (25%) will receive a gift card.

WHAT ABOUT PRIVACY?

Your answers on the survey will be anonymous. Your name will not be connected to your answers in any way. If your parent gives us an email address for the gift card drawing, we will not connect the email address to your answers at any time. Your parent will be sent to another website to put in the email address to make sure that this doesn't happen.

STUDY INVESTIGATORS

If you have any questions you can contact Ketlyne Sol, B.A. at (909) 558-4000 x86356, (786) 488-2001, or ksol@llu.edu, or her research supervisor, Kendal Boyd, Ph.D., at (909) 558-8574 or kboyd@llu.edu.

IMPARTIAL THIRD PARTY CONTACT

If you are uncomfortable about the project or have a complaint, you may talk to someone who is not a part of the project. The patient relations office can be reached at Loma Linda University Medical Center at 909-558-4647 or patientrelations@llu.edu.

INFORMED ASSENT

If you finish the survey and answer all of the questions, you will be giving us permission to have your answers be a part of this project.

I have read the information about the project and

- Yes, I want to participate.
- No, I do not want to participate.