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THE RELATIONSHIP BETWEEN LEVEL OF EMPATHY  
AND STRESS CONTAGION

By

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Salve Regina University, Newport, RI, 2002

Professional Paper

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## The Relationship Between Level of Empathy and Stress Contagion

Chairperson: Dr. Kimberly Wallace

Although potential benefits associated with social support are well documented, it is also the case that social networks expose an individual to the stressful life events of others. Studies have shown that the stressful life events of others are positively related to negative affect. It has been theorized by several researchers that relationships between, for example, stressful life events of others and negative affect are evidence of a stress contagion process that may occur through empathy. The current study addressed this idea by testing whether the positive relationship that exists between network stress and depressive symptoms varied dependent upon (ie. was moderated by) an individual's level of empathy. A sample of 160 Native American individuals, ages fifty and older, who completed the "Coping in Later Life" survey was utilized. A series of hierarchical multiple regression analyses revealed that when network stress is measured by number of life events that occurred to others, empathy does moderate the relationship between network stress and depressive symptoms. This significant interaction occurs both when using a global level of empathy and when the Personal Distress dimension of the measure is removed. Personal Distress alone does not moderate the relationship between overall network stress and depressive symptoms. These data fill several gaps in the social network, stress, and empathy research literature. It also advances the understanding of the stress contagion process.

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## CHAPTER 1

### The Relationship Between level of Empathy and Stress Contagion

For many years the benefits of social support have been disseminated through the research literature. The importance of social support as a buffer against stress has been well documented (Cohen & Syme, 1985), and there is a great deal of evidence to suggest that supportive social ties are related positively to psychological well-being (House, Umberson, & Landis, 1988; Leavy, 1983). Yet, recently researchers are beginning to investigate the costs associated with social support and social networks (Aneshensel, Pearlin, & Schuler, 1993; Gore, Aseltine, & Colten, 1993; Riley & Eckenrode, 1986; Rook, 1992). Much of this relates to the areas of negative social exchange and caretaker burden. Research indicates that both individual characteristics and specific social conditions moderate the process by which social bonds actually become supportive (Riley & Eckenrode, 1986). This challenge to long held assumptions has serious implications for psychologists and social workers who often advocate the expansion of an individual's social network to combat a lack of economic or psychological resources. It is crucial to identify under what conditions extended social support and social networks are truly beneficial and when they are aversive. It is also important to consider that the rewards and costs of social networks may vary over time for the same individual (Kessler & McLeod, 1984).

The present study examined the emotional costs of a social network for those individuals with a high level of empathy. This conditional individual characteristic was selected based on information from an ongoing qualitative study of Native American Resilience (Wallace & Swaney, 2007). In this research older adults expressed the

benefits as well as the costs of being a member of a large social network during personal interviews. In the preliminary and on-going qualitative analysis, stressful events in the lives of others emerged as a theme under personal life stressors. Qualitative analysis suggested that the stress of others could be passed through the tight knit social network in a “ripple effect”. Examination of the available literature revealed that empathy could be an avenue through which such a stress-contagion process occurs (Kessler & McLeod, 1984; Riley & Eckenrode, 1986; Rook, Dooley, & Catalano, 1991).

In the present study, the first hypothesis was that the relationship between network stress and depressive symptoms would vary dependent on the individual’s level of empathy. In other words, it was expected that empathy would moderate the relationship between network stress and depressive symptoms. The second hypothesis was that personal distress, a single dimension of empathy, was not solely responsible for the “ripple effect” within social networks. It was predicted that when the dimension measuring personal distress was not included in the global measure of empathy, the relationship between network stress and depressive symptoms would still vary dependent on the individual’s level of empathy. The third hypothesis further examined the single dimension of personal distress, predicting that the relationship between network stress and depressive symptoms would vary dependent on the individual’s level of personal distress. Yet, this moderating relationship was expected to be significantly weaker than the moderating relationship described in the first hypothesis.

#### *Stress Contagion/ Ripple Effect*

Originally, researchers believed that social networks may cause further distress in an individual primarily due to the fact that expectations for support may go unmet, and

there may be an imbalance in reciprocity of support (Fiore, Becker, & Coppel, 1983; Rook, 1984). It was soon evident that this explanation did not fit all situations, and that many people were experiencing distress in their lives because an unfortunate event had occurred in the life of someone in their social network. For example, Kessler and McLeod (1984) examined the impact network crises have on the well-being of those who may potentially provide support. They found that women were more emotionally affected than men by life events that occurred to others in their social network. In fact, the difference in vulnerability between the sexes accounts for a large amount of the overall relationship between sex and distress that is found in the overall population (Kessler & McLeod, 1984).

One reason Kessler and McLeod (1984) believe this vulnerability may exist is that women have been shown to have a stronger orientation than men to decipher the needs and desires of those around them, especially loved ones. This level of emotional involvement or the deep personal concern for the well-being of others could be categorized as empathy (Kessler, McLeod, & Wethington, 1985). Most interestingly, based on their findings Kessler and McLeod (1984) believe that support and concern may be an intervening link between stressful life events of those in the social network and high levels of distress among women. In further studies they found that emotional involvement, characterized by deep concern for the well-being of a loved one, can result in personal distress even when an individual is not providing support (Kessler, McLeod, & Wethington, 1985).

Along similar lines, Gore, Aseltine, and Colten (1993) investigated whether this vulnerability to stress in females could be found in an adolescent population. These

researchers felt that involvement in the problems of significant others and higher levels of an interpersonal caring orientation would account for the gender difference in distress levels. In their hypothesis it was the concept of caregiving burden, operationalized by the above mentioned features, and not empathy that moderated the positive relationship between the life events of significant others and depressive symptoms. Their results revealed that twenty-five percent of the differences between male and female distress levels was accounted for by caregiving burden. Gore, Aseltine, and Colten (1993) suggested that future research should utilize psychometrically sound measures to examine caring in relation to the greater vulnerability of females to the stress of significant others.

Riley and Eckenrode (1986) have also investigated the costs of social support for women. In their study they were primarily interested in whether undesirable life events happening to significant others would have a more stressful effect in certain subgroups. Riley and Eckenrode (1986) emphasized that although larger support networks help to lessen the distress experienced from one's own difficulties, they also expose that individual to distress from other's problems. For those who invested emotional caring in these wider networks, a contagion of stress may occur from the network to the individual. They labeled this phenomena "stress contagion," borrowing the term from Wilkins (1974). This was similar to what the Native American Resilience team (Wallace & Swaney, 2007) had observed as an emerging theme in their qualitative interviews and labeled the "ripple effect".

Riley and Eckenrode (1986) speculated that the stress-contagion process may occur when the distress associated with stressful life events of a loved one is experienced

through empathy by the individual. In other words, people will feel the pain of a loved one as their own. This was similar to Kessler and McLeod's (1984) explanation of why women were more vulnerable to the stressful life events of others. Yet, neither study measured the level of empathy, and Riley and Eckenrode (1986) did not test their theory of the stress-contagion process.

What Riley and Eckenrode (1986) did find was that the number of social ties alone did not explain the relationship between network support and stress. This lent support for their stress-contagion process theory that stated a larger exposure to negative life events is necessary but not sufficient for stress contagion to occur (Riley & Eckenrode, 1986). Experiencing the large number of others' negative life events through empathy may be the connecting element. A related study researched the effects of husbands' job stressors on the psychological well-being of their wives (Rook, Dooley, & Catalano, 1991). These researchers found that women in untroubled marriages experienced greater depressive symptoms in response to their husbands' job difficulty than women in troubled marriages. After ruling out several explanations for this occurrence it was concluded that empathy, although not directly assessed, may explain the stress transmission (Rook, Dooley, & Catalano, 1993). The current study directly tested this stress-contagion idea by obtaining measures of network stress, empathy, and depressive symptoms.

#### *Network stress*

The amount of perceived stress individuals experience as a result of the life events of others in their social network can be measured and labeled as network stress. Riley and Eckenrode (1986) provided respondents with a list of thirty undesirable life events

and they were to indicate if this event had occurred in the life of a significant other in the previous twelve months. They were also instructed to rate how worried or upset they were when that event occurred. These perceived stressfulness ratings were then summed to reflect the overall load placed on the individual due to events happening to others, and this construct was labeled overall network stress. They found that overall network stress was positively related to negative affect, which was measured by both an anxiety and depression scale (Riley & Eckenrode, 1986). For the purposes of this study, network stress will be measured similarly and conceptualized as the overall load placed on the individual due to events happening to others in their social network.

An extensive literature search did not present evidence that this operationalization of perceived stressfulness has been replicated in further studies. Other researchers do employ a similar perceived stressfulness rating procedure, attaching a perceived stressfulness scale to a life events inventory. However, these researchers focus on the mean perceived stressfulness for each life event and do not calculate an overall score (Gore, Aseltine, & Colten, 1993; Muldoon, 2003; Sarason et al., 1978; Yamamoto & Davis, 1982). Therefore, two additional measures of an individual's distress to the life events of others (i.e., network stress) were utilized in the present study in order to most accurately capture the stress contagion idea. The first is the general reactivity of subjects to the negative life events of others (see Riley & Eckenrode, 1986). This dimension was conceptualized as the average of each individual's perceived stressfulness rating, and in the literature was positively related to the number of negative life events that occurred to significant others (Riley & Eckenrode, 1986). The second defines network stress as a sum of the total number of life events of others that occurred in the prior twelve months,

which is a common approach to examining network stress in the existing literature (Eckenrode & Gore, 1981).

### *Empathy*

Empathy has been defined and measured in the literature in numerous ways. Many describe it as the ability to understand the mental and emotional states of others, as well as a concern for their feelings, desires, and needs (Davis, 1980; Eisenberg & Fabes, 1998; Schieman & Van Gundy, 2000). There is also a consensus that empathy includes both a cognitive and an affective dimension. The affective component involves emotional responses to the distressed target (Davis, 1996), which may include sympathy, sensitivity, and sharing in the suffering of other people (Schieman & Van Gundy, 2000). The cognitive feature involves the awareness of others' problems and emotions along with the capacity for role taking (Davis, 1996). Social scientists feel that empathy could be a dispositional trait or a learned behavior (Siu & Shek, 2005).

Earlier attempts to measure empathy either isolated the emotional component or focused on the accurate perceptions of others (Cliffordson, 2002). In contrast, Davis (1980) approached empathy as a multidimensional construct, where each dimension was a crucial building block comprising the more general concept. The instrument he developed to test empathy given this definition was the Interpersonal Reactivity Index (IRI; Davis, 1980), and it has since become the most widely used instrument in assessing empathy (Pulos, Elison, & Lennon, 2004).

The first of the four dimensions the IRI measures is *Empathic Concern*, which assesses the individual's reported tendency to experience feelings of warmth, compassion, and concern for others. Empathic concern can be thought of as other-

oriented in nature. The second dimension is *Personal Distress* and refers to unpleasant, anxious feelings in response to a distressed target (Davis, 1983). Personal distress, in comparison to empathic concern, is clearly self-oriented. Interestingly, some researchers hypothesize that personal distress is separate from empathy and define it instead as an empathetic response (Eisenberg & Fabes, 1998; Scheiman & Turner, 2001). These researchers further reason that a personal distress response could lead to an increase in vulnerability to depression as it may indicate that hardships and sorrows of others are also serving as a source of stress for the empathizer (Scheiman & Turner, 2001). In contrast, another group of researchers (Commons & Wolfson, 2002; Davis, 1983) postulate that personal distress is a developmentally lower level aspect of empathy that should lessen over time and give way to higher levels of empathic concern. In response to these competing views of personal distress, the present study separated out this specific dimension of empathy to focus on its role in moderating the relationship between network stress and depressive symptoms. By separating out personal distress it can be determined if it alone increases an individual's vulnerability to network stress or if personal distress in combination with the other three dimensions of empathy produces the most vulnerable circumstance.

These first two dimensions, empathic concern and personal distress, together represent the affective component of empathy. The third dimension is *Perspective Taking* which measures an individual's cognitive attempt to role take or understand another person's point of view (Davis, 1993). Lastly, the fourth dimension is *Fantasy*, defined as using imagination to experience the feelings and actions of characters in creative works, such as movies and novels (Davis, 1980). These last two dimensions

reflect the cognitive aspect of empathy in Davis's scale. According to Davis (1980), all four elements must be examined in order to get a full understanding of an individual's level of empathy. Taking into consideration that all four dimension comprise an individual's level of empathy, an overall score was also utilized in the present study to examine the extent to which the four dimensions operate in combination with each other.

The relationships between empathy and several positive outcomes, including conformity to norms, moral conduct, and altruistic behavior, have been documented (Davis, 1996; Eisenberg & Miller, 1987). However, research that highlights how a high level of empathy may also entail costs under certain circumstances is extremely important. Schieman and Turner (2001) hypothesized that high levels of empathy increase sources of stress for the empathizer because exposure to the problems of others may be intensified. They further contended that resource deficient people, those with low self-esteem, low mastery, and few supportive social ties, would have a more difficult time separating their own feelings from those of others around them. They found that empathy is positively associated with depressive symptoms, and that this relationship is stronger only at lower levels of self-esteem. Empathy may increase an individual's risk for depression because those who become deeply involved in crises have a higher potential for emotional transference. The cost of empathy was not found to differ based on gender (Schieman & Turner, 2001).

Schieman and Turner (2001) also reported that the relationship between empathy and depressive symptoms does not vary across levels of social support. They speculate that social support may increase the exposure to the hardships of others and the opportunity to become distressed by such problems of others. Therefore, the stress-

buffering effects of support could be counteracted by increased exposure to network stress, given the context of empathy. Although not tested in their study, they hypothesized that empathy may cause stress through the process of an empathetic person being exposed at a higher level to the sorrows and stress of others (Schieman & Turner, 2001).

A comparable finding has also been documented in studies that looked at the professional experiences of nurses and paramedics. In fact, a significant amount of the burnout experienced by all health care workers was found to be accounted for by empathy variables (Miller, Stiff, & Ellis, 1998). It is thought that paramedics who experience the traumatic events of others may internalize and relive that trauma themselves, evident through generalized fears, sleep disturbances, and affective arousal, as a result of empathic engagement between the paramedic and the client (Regeher, Goldberg, & Hughes, 2002). Omdahl and O'Donnell hypothesized that the role of empathy in nurse burnout was more complex and found that empathic concern was negatively associated with burnout, while the relationship between emotional contagion, as measured with items adapted from the personal distress dimension of the IRI, and burnout was positive (Omdahl & O'Donnell, 1999). The abovementioned research again supports the need to measure empathy directly in the present study, as well as highlighting the importance of separating personal distress from the other dimensions of the IRI.

#### *Older Adults and Collectivism*

Few studies that specifically measure empathy have been conducted in older adult populations. Studying how certain levels of empathy may be detrimental is of particular

importance in the aging population, as nursing homes often promote programs that train older adults to be more empathetic (May & Alligood, 2000). They believe that this will aid with successful aging, but there has been little documentation of this. As a population often deprived of many resources (Whitbourne, Jacobo, & Munoz, 1996), increasing older adults' level of empathy may put them at risk for becoming overly distressed by the negative life events of significant others. The negative life events of significant others could be substantial as in general older adults experience more death and loss, reduced income, and physical illness (Volcek, 1994).

Cartensen's Socioemotional Selectivity Theory (1993) describes another way in which older adults may be more vulnerable to the negative life events of others in their social network. Socioemotional Selectivity Theory states that older adults' social interactions are motivated in part by the need to regulate their emotions, and to accomplish this they narrow their social networks to devote more emotional resources to fewer relationships with close friends and family (Carstensen, 1993). Therefore, although not exposed to a large number of negative life events by having a large social network, older adults who are highly emotionally involved with a smaller number of close friends and family may be more deeply affected by the negative life events of others in their remaining social network. In other words, older adults may be more vulnerable to the stress contagion process. Older adults may also perceive the negative life events happening to others in their social network as more personally distressing, which could increase the overall load of network stress. The present study therefore stresses the importance of conducting such research with a sample of older adults.

Similar to older adults, Native Americans may be more vulnerable to the stress

contagion process, however this may be associated more with the collectivist nature of their culture. Empathy has not been extensively studied from a cross-cultural perspective, and an extensive literature search did not reveal any studies that looked at empathy in a Native American population. There has been research, however, concerning the connection between collectivism and empathy, as empathy is among personality and value tendencies that are often associated with collectivism (Realo & Luik, 2002). Native American culture is broadly defined as falling more toward the side of collectivism on an individualistic/collectivistic continuum (Hobfoll, 1998). The emotions of a collectivist are other-focused and socially engaged. The focus is on maintaining group harmony, which requires that individuals can easily understand the emotions of those in their in-group. The self is in a way intertwined with those around them (Realo & Luik, 2002). Such close emotional connections with others within one's social network could make an individual more vulnerable to experiencing the stress of others through the stress contagion process. Researching empathy in a Native American population fills an existing gap in the literature.

### *Hypotheses*

The three primary hypotheses are stated below. Each was tested using the different concepts of network stress discussed previously (i.e., overall load, general reactivity, and number of life events of others).

1. It is predicted that empathy<sup>1</sup> will moderate the relationship between network stress and depressive symptoms. More specifically, while each individual's level of network stress is positively related to his or her level of depressive symptoms,

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<sup>1</sup> The use of the term "empathy" when discussing the findings will refer to overall empathy calculated with all four sub-dimensions of the IRI.

this relationship is expected to be stronger for individuals with high levels of empathy. For individuals with low levels of empathy it is predicted that there will be a weak relationship, if any at all, between network stress and depressive symptoms.

2. The relationship between network stress and depressive symptoms will vary dependent on level of empathy even when the single dimension of personal distress is removed from the calculation of the overall empathy measure. That is, level of empathy, calculated with empathic concern, perspective taking, and fantasy will moderate the relationship between networks stress and depressive symptoms.
3. The relationship between network stress and depressive symptoms will vary dependent on (i.e., will be moderated by) Personal distress, a single dimension of the overall empathy measure. More specifically, while each individual's level of network stress is positively related to his or her level of depressive symptoms, this relationship strengthens as the level of personal distress in the individual increases. For individuals with very low levels of personal distress, it is predicted that there will be a weak relationship, if any at all, between network stress and depressive symptoms. It is also predicted that this moderating relationship will be significantly weaker than the moderating relationship predicted in the first hypothesis.

## CHAPTER 2

### Method

#### *Participants*

Participants included 160 Native American individuals, ages fifty and older, who completed the “Coping in Later Life” survey (Wallace & Swaney, 2007). This sample includes both males and females living on a reservation in the Western geographic region. All individuals were monetarily compensated thirty dollars for their participation in the survey. The participants were selected from a mailing list of 624 Native Americans enrolled in a local Elderly Program. A modified systematic random sampling procedure was followed resulting in 501 individuals being mailed surveys, with a 32% response rate.

Of the 160 participants, 42.5% were male and 57.5 % were female. The mean age of the sample was 68 (6.42). In terms of marital status, 47.5% were married; 20% widowed; 20% divorced; 9.4 % single; and 1.3 % separated. 30% of the participants reported living alone; 47.5% with a spouse; 16.9% with child(ren); 10.6% with grandchild(ren); 1.9% with siblings; and 1.9% with friends. In addition, 58% of the participants had continued their education beyond high school. The specific breakdown for education is as follows: 2.5 % completed education thru grade school; 8.1% thru middle school; 21.3% thru high school; 10% earned a GED; 15.6% thru vocational school; 25% thru some college; 12.5% thru college; 5% thru a post college professional, graduate, medical, or law school. With regard to reported average annual income: 15% earned less than \$7,500; 24.4% earned between \$7,500 and \$14,999; 16.9% reported \$15,000 to \$24,999; 20% reported \$25,000 to \$40,000; and 18.8% earned over \$40,000. Overall, 56% reported an average annual household income below \$25,000. The average number of years living on a reservation was 51.45 years.

### *Measures*

*Overall Network Stress:* Perceived network stress was measured in three separate ways with a modified Life Events Checklist. This includes a total of 63 life events, both positive and negative, that were adapted from the original Geriatric Life Events Inventory (Kahana, Fairchild, & Kahana, 1982). Additional events were added based on preliminary qualitative data analysis from Study 1 of the Native American Resilience Project (e.g., More traditional activities; less traditional activities) (Wallace & Swaney, 2007). Respondents were asked to indicate/check those events that occurred in the lives of family members and close friends during the past year. In addition, the participants were asked to rate how worried or upset they were personally on a scale of 1-5, ranging from *not at all upset* to *extremely upset*, for any of the events that had occurred in the lives of significant others (See appendix A).

For the purposes of the present study, network stress was first conceptualized as the sum of perceived stressfulness ratings across all life events endorsed as happening to others within one's social network. This variable captures the total perceived stress (i.e., overall load) that the events of others within the social network places on an individual (Riley & Eckenrode, 1986). In the present study, the reliability (Cronbach's Alpha) calculated for this overall network stress component was .87. The average of each individual's perceived stressfulness rating, representing the general reactivity of subjects to the life events of others, was also computed. Lastly, network stress was measured as the sum of the number of life events of others. In all three measures of network stress higher scores reflect higher levels of network stress (Riley & Eckenrode, 1986).

*Empathy:* Empathy was measured using Davis's Interpersonal Reactivity Index (1980). This scale is a 28-item questionnaire that incorporates both cognitive and

affective dimensions. The four subscales include: *Empathic Concern* (e.g., “I often have tender, concerned feelings for people less fortunate than me”); *Personal Distress* (e.g., “Being in a tense emotional situation scares me”); *Perspective Taking* (e.g., “I sometimes try to understand my friends better by imagining how things look from their perspective”); *Fantasy* (e.g., “I really get involved with the feelings of the characters in a novel”). Participants respond to items using a five-point Likert scale ranging from 1 (*does not describe me well*) to 5 (*describes me very well*) (See Appendix B). Overall level of empathy was constructed by adding all four dimensions. Higher scores reflect higher levels of empathy. Davis’ IRI (1980) has good internal consistency with alpha ranging between .71 and .77 and a test-retest reliability ranging from .62 to .71 (over a two month retest period). In terms of validity, the IRI subscales are correlated in the predicted directions and strength to established measures of self-esteem, emotionality, social functioning, and sensitivity to others (Davis, 1983). In the present study, reliability (Cronbach’s Alpha) for overall empathy was .67. The alpha for overall empathy minus the dimension of Personal Distress was .70, and the alpha for Personal Distress alone was .64<sup>2</sup>.

*Depressive symptoms:* Depressive symptoms were measured with the Center for Epidemiologic Studies- Depression Scale (CES-D; Radloff, 1977). In this scale, respondents are asked how often in the past seven days they experienced each of the twenty symptoms on the list using a four-point Likert scale, ranging from *rarely/none of the time* to *most/all of the time* (see Appendix C). The items are summed so that higher scores reflect higher levels of depressive symptomology. The validity and reliability of

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<sup>2</sup> Alphas for each dimension of empathy are as follows: empathic concern  $\alpha = .66$ , perspective taking  $\alpha = .55$ , personal distress  $\alpha = .64$ , fantasy  $\alpha = .65$ .

the CES-D have been documented (Radloff, 1977). In the present study the internal consistency was calculated using Cronbach's Alpha and found to be .89.

## CHAPTER 3

### Results

#### *Descriptives*

Descriptive statistics including means, standard deviations, and correlation to age were calculated for depressive symptoms, network stress, and empathy (see Table 1). Several relationships between the variables were explored, and interestingly depressive symptoms were found not to be significantly associated with empathy,  $r = -.04$ . Yet, depressive symptoms were negatively related to empathy without personal distress,  $r = -.22$ , and positively related to personal distress,  $r = .33$ . Similar to past research (Riley & Eckenrode, 1986), all three conceptualizations of network stress were significantly associated to depressive symptoms in a positive direction (see Table 2 for all intercorrelations). The present study was able to produce new information with regard to the relationships between the three conceptualizations of network stress and the different interpretations of empathy. In particular, the variables of overall network stress and number of life events of others were found to be positively related to both empathy and empathy without personal distress. Personal distress alone was only found to be positively related to network stress conceptualized as general reactivity,  $r = .18$ .

In the present study it was also important to consider which demographics were related to the outcome variable of depressive symptoms. Past research, as presented in the introduction, provided support to specifically test for relationships with age, gender,

income, education level, and marital status<sup>3</sup>. The only variable found not to be significantly related to depressive symptoms was the continuous variable of age,  $r = .10$ . Females reported significantly higher levels of depressive affect than males [ $t(153.4) = -2.62, p < .01$ ]. Those individuals who reported an average annual household income less than \$25,000 had a significantly higher level of depressive affect than those who reported an average annual household income above \$25,000 [ $t(144.8) = -3.53, p < .05$ ]. Further, participants who reported an education level beyond that of high school had significantly lower levels of depressive affect than those who had not been educated beyond high school [ $t(124.3) = -3.25, p < .01$ ]. Lastly, those who reported being married had significantly lower levels of depressive affect than those who reported being unmarried [ $t(146.9) = 3.25, p < .01$ ]. As these four variables were found to be significantly related to the dependent variable of depressive symptoms, they were statistically controlled for in the hierarchical multiple regression analysis.

### *Multiple Regressions*

Findings will be presented for each hypothesis using the three different conceptualizations of networks stress (overall network stress; general reactivity; number of life events of others).

*Overall Network Stress:* In order to test whether empathy moderates the relationship between network stress and depressive symptoms, a hierarchical multiple regression analysis was utilized, as suggested by Cohen (1968) and Aiken and West (1991)<sup>4</sup>. The criterion was depressive symptoms and the two predictor variables of

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<sup>3</sup> These demographic categorical variables were theoretically dichotomized for statistical calculations.

<sup>4</sup> The distributions for all scale measures, except total IRI score and IRI with three dimensions, failed to meet the required assumptions for multiple regression analysis. The distributions were not normal, therefore, those sets of data were transformed with a square root function, a procedure described in Tabachnick and Fidell (2001). All analyses

interest (in addition to the control variables) were overall network stress and empathy. The two predictor variables were centered for computational reasons<sup>5</sup>. When conducted in SPSS, block one consisted of the dichotomized demographic variables: gender, average income, education level, and marital status. The second block contained the two centered predictors entered simultaneously, and the third block of the model was the interaction between the two predictors. Displayed in Table 3 are the unstandardized regression coefficients, the standard errors, the standardized regression coefficients ( $\beta$ ),  $R^2$ , and  $R^2\Delta$ . The entire model accounted for a significant amount of variance in depressive symptoms, [ $R^2 = .30$ ,  $F(7,131) = 8.11$ ,  $p < .01$ ]. In Block 1, the control variables accounted for a significant amount of variance in depressive symptoms, [ $R^2 = .16$ ,  $F_{change}(4,134) = 6.36$ ,  $p < .01$ ]<sup>6</sup>, and in Block 2 there was a significant increase in the variation accounted for by the predictors, [ $R^2 = .29$ ,  $R^2\Delta = .13$ ,  $F_{change}(2,132) = 12.51$ ,  $p < .01$ ]. In Block 3, the interaction term was not significant, [ $R^2 = .31$ ,  $R^2\Delta = .01$ ,  $F_{change}(1,131) = 1.67$ ,  $p = .20$ ], thus the hypothesis that the relationship between depressive symptoms and network stress varies as a function of empathy level was not supported.

The second hypothesis was also tested with a hierarchical multiple regression analysis, using the same steps as described previously. For hypothesis two, the criterion was again depressive symptoms and the predictors were networks stress and empathy

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were conducted using both the original and the transformed data sets, with no observable differences in the resulting statistical patterns. Due to this fact, only the findings for the data in the original metric will be reported and utilized.

<sup>5</sup> Centering involves transforming the variables into their deviation score form which makes their means equivalent to zero. When the predictor variables are left uncentered high levels of multicollinearity may be introduced into the higher order regression equations. Multicollinearity causes difficulty in properly estimating regression coefficients (Aiken & West, 1991). Aiken and West (1991) have found that there is no computational need to center the criterion variable, which in this model is the depression score.

<sup>6</sup> As Block 1 statistics remain constant in each multiple regression model they will not be reported in

(calculated with empathic concern, perspective taking, and fantasy). The entire model accounted for a significant amount of variance in depressive symptoms, [ $R^2 = .35$ ,  $F(7,131) = 9.97$ ,  $p < .01$ ]. In Block 2 there was a significant increase in the variation accounted for by the predictors, [ $R^2\Delta = .19$ ,  $F_{change}(2,132) = 18.60$ ,  $p < .01$ ]. Again, in Block 3 the interaction term was not significant, [ $R^2\Delta = .00$ ,  $F_{change}(1,131) = .64$ ,  $p = .43$ ], offering no support for the second hypothesis, which states that Personal distress is not the only dimension of empathy responsible for moderating the relationship between network stress and depressive symptoms. (Refer to Table 4 for further multiple regression findings)

The third hypothesis refers to an interaction of network stress and personal distress in predicting depressive symptoms. This third relationship was also tested using hierarchical multiple regression and represented by the same model, with the criterion being depressive symptoms and the predictors being network stress and personal distress. As before, the entire model accounted for a significant amount of variance in depressive symptoms, [ $R^2 = .32$ ,  $F(7,132) = 9.06$ ,  $p < .01$ ]. Again there was a significant increase in the variation accounted for by the predictors in Block 2, [ $R^2\Delta = .16$ ,  $F_{change}(2,133) = 15.01$ ,  $p < .01$ ], and another non-significant interaction term in Block 3, [ $R^2\Delta = .01$ ,  $F_{change}(1,132) = 1.98$ ,  $p = .16$ ]. Therefore, the third hypothesis was not supported and no comparisons with regard to a stronger moderator can be made. (Refer to Table 5 for the complete multiple regression findings)

*Average Network Stress:* As discussed previously, this study also considered the average of each individual's perceived stressfulness rating, representing the general reactivity of subjects to the life events of others. Using this different operationalization

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subsequent models.

of network stress, a second series of hierarchical multiple regression analyses were computed. Similar to the previous findings with overall network stress, there were no significant interactions in the multiple regressions, thus there was no support for the three hypotheses using average network stress. (Refer to Tables 6-8 for the statistics that accompany these models)

*Number of Network life events:* The final operationalization of network stress as the total number of life events of others was used in the same series of hierarchical multiple regressions. For hypothesis one, the entire model accounted for a significant amount of variance in depressive symptoms, [ $R^2 = .28$ ,  $F(7,132) = 7.25$ ,  $p < .01$ ]. A significant increase in the variation accounted for by the predictors was found in Block 2, [ $R^2\Delta = .10$ ,  $F_{change}(2,133) = 8.43$ ,  $p < .01$ ]. Also a significant interaction in Block 3 [ $R^2\Delta = .02$ ,  $F_{change}(1,132) = 4.33$ ,  $p < .05$ ] was revealed in support of the first hypothesis. The relationship between network stress (i.e., number of network events) and depressive symptoms varied dependent on level of empathy. (Refer to Tables 9 for the statistics that accompany this model)

The nature of this moderational relationship was further examined through simple slope analysis, which included plotting and post hoc statistical testing. As suggested by Aiken and West (1991), in order to construct simple regression lines, specific values for empathy level were chosen at one standard deviation above the mean and one standard deviation below the mean. First the simple slopes were computed by hand and with SPSS. Next, the standard errors of the simple slopes were calculated for both simple regression equations; t-tests revealed that for a high level of empathy (+1SD), the regression of depressive symptoms on network stress is significantly different from zero,

[ $B = .61$ ,  $SE = .15$ ,  $t(147) = 4.18$ ,  $p < .01$ ]. For the low level of empathy ( $-1SD$ ), the regression of depressive symptoms on network stress does not differ significantly from zero, [ $B = .13$ ,  $SE = .20$ ,  $t(147) = .63$ ,  $p = .53$ ]. For a graphical depiction of the simple slopes and the nature of the interaction, see Figure 1. For high level of empathy ( $+1SD$ ),  $\hat{Y} = .61X + 26.72$ , and for low level of empathy ( $-1SD$ ),  $\hat{Y} = .13X + 36.27$ .

For hypothesis two, the entire model accounted for a significant amount of variance in depressive symptoms, [ $R^2 = .33$ ,  $F(7,132) = 9.47$ ,  $p < .01$ ]. There is a significant increase in the variation accounted for by the predictors in Block 2 [ $R^2\Delta = .15$ ,  $F_{change}(1,133) = 14.51$ ,  $p < .01$ ], and the interaction of network stress, when measured as total number of life events of others, and empathy, without personal distress, in predicting depressive symptoms is significant [ $R^2\Delta = .02$ ,  $F_{change}(1,132) = 4.78$ ,  $p < .05$ ]. See Table 10 for complete multiple regression statistics in this model. Simple slope analysis was again used to probe the significant interaction. For a high level of empathy (calculated with EC, PT, and F) ( $+1SD$ ), the regression of depressive symptoms on network stress is significantly different from zero, [ $B = .67$ ,  $SE = .14$ ,  $t(147) = 4.82$ ,  $p < .01$ ]. For the low level of empathy (calculated with EC, PT, and F) ( $-1SD$ ), the regression of depressive symptoms on network stress does not differ significantly from zero, [ $B = .21$ ,  $SE = .20$ ,  $t(147) = 1.07$ ,  $p = .29$ ]. Again, to further examine the strength and direction of the relationship, the interaction was plotted by restructuring the overall regression equation and then substituting in the appropriate data. For high level of empathy ( $+1SD$ ),  $\hat{Y} = .67X + 23.40$ , and for low level of empathy ( $-1SD$ ),  $\hat{Y} = .21X + 39.55$  (See figure 2).

The third hypothesis stated that the relationship between network stress and

depressive symptoms should also vary dependent on personal distress, a single dimension within the overall empathy measure. Again the entire model, with all three Blocks, accounted for a significant amount of variance in depressive symptoms, [ $R^2 = .29$ ,  $F(7,133) = 7.86$ ,  $p < .01$ ]. In Block 2, a significant increase in the variation accounted for by the predictors was found, [ $R^2\Delta = .13$ ,  $F_{change}(2,134) = 12.51$ ,  $p < .01$ ]. A non-significant interaction between network stress and personal distress in predicting depressive symptoms was found [ $R^2\Delta = .00$ ,  $F_{change}(1,133) = .17$ ,  $p = .67$ ], lending no support to this hypothesis. See Table 11 for the complete multiple regression findings of this model. In addition, the third hypothesis stated that the first predicted moderating relationship, where overall empathy is the moderator, would be significantly stronger than this predicted moderating relationship, in which personal distress alone is the moderator. As support was found for the hypothesis that overall empathy does moderate the relationship between network stress and depressive symptoms, that relationship does appear stronger.

## CHAPTER 4

### Discussion

The first hypothesis was that the relationship between network stress and depressive symptoms will vary dependent on level of empathy. When network stress is measured by summing the number of life events that occurred to others, empathy moderates the relationship between network stress and depressive symptoms. Simple slope analysis reveals that for individuals with very low levels of empathy, there is not a relationship between network stress and depressive symptoms. For individuals with high levels of empathy, there is a strong, positive relationship between network stress and

depressive symptoms. As the number of life events occurring to significant others increases, individuals with high levels of empathy report an increase in depressive symptoms. Finding support for the first hypothesis represents a crucial step toward understanding the stress contagion process.

Indeed, the present findings support the idea that empathy *is* related to the transmission of stress through the social network to the individual. It may be the case that empathic individuals are feeling the pain of others (Schieman & Turner, 2001) and therefore reporting higher levels of depressive symptoms. As Riley and Eckenrode (1986) had speculated, the distress associated with the stressful life events of a loved one could be experienced through empathy by the individual. It may also be the case that empathic individuals who are experiencing higher levels of depressive symptoms take more notice of the life events occurring to significant others. Although stress contagion research spans over twenty years (Fiore, Becker, & Coppel, 1983; Gore, Aseltine and Colton, 1993; Kessler & McLeod, 1984; Riley & Eckenrode; 1986; Rook, Dooley, & Catalano, 1991; Wilkins, 1974), it is not until the present study that these relationships have been tested empirically. In the past, alternative explanations for the stress contagion process were demonstrated to be unsupported, leaving empathy as a viable mechanism. Finding that empathy moderates the relationship between network stress and depressive symptoms, while not testing if level of empathy controls the transmission of stress, does provide preliminary empirical support to the previously untested theory that empathy is somehow involved.

At the same time, however, it is important to consider that overall empathy only moderated the relationship between network stress and depressive symptoms when

network stress was operationalized as the number of life events occurring to others. When network stress was operationalized as overall perceived stressfulness and general reactivity, this moderating relationship was not found. This provides insight into the nature of the stress contagion process as the mere accumulation of stressful events in the lives of significant others and an individual's perception of the stressfulness of those events interact with empathy in different ways. The difference appears to lie in the interaction as all network stress conceptualizations are significantly correlated in the same direction with both depressive symptoms and empathy (with the exception of average network stress which did not reach a significant level of correlation with empathy).

The finding that overall empathy only moderated the relationship between network stress and depressive symptoms when network stress was operationalized as the number of life events occurring to others was not expected as Riely and Eckenrode (1986) had found that the average stressfulness rating of other's life events increased as the number of negative life events of significant others increased. This relationship was not found in the present study, and perhaps this is due to the fact that Riley and Eckenrode (1986) only used negative life events in their checklist. Still, their results seem to support the idea that stress accumulates, meaning that the more stressful events that are encountered, the greater the psychological toll. This is a theory supported by researchers who study personal life events with regard to physical, psychological, and emotional well-being (Broadhead, Abas, Khumalo, Chigwanda, & Garura, 2001; Mccubbin & Patterson, 1983). The idea that stressful life events have an additive psychological effect may be a strength of using number of life events of others as an

indicator of network stress, and why researchers (Glickman, Tanaka, & Chan, 1991; Myers, Lindenthal, & Pepper, 1975) find a positive relationship between the number of personal life events and the degree of psychological symptomatology and distress.

In addition, Mendez and colleagues (1980) conducted a study that revealed experience with an event is significantly related to the perception of that event. Once an event was experienced, the individual found that event to be less stressful, as they had gained confidence in their future coping abilities. Therefore, the measure of perceived stressfulness of life events of others in the present study may be biased, providing much lower estimates of the stress that had truly accumulated.

The second hypothesis stated that the relationship between network stress and depressive symptoms would vary dependent on level of empathy even when the single dimension of personal distress is removed from the calculation of the overall empathy measure. Level of empathy, calculated with empathic concern, perspective taking, and fantasy, did in fact moderate the relationship between networks stress and depressive symptoms when network stress was measured with the number of life events that occurred to others. Simple slope analysis reveals that for individuals with low levels of empathy, there is no relationship between network stress and depressive symptoms. For individuals with high levels of empathy, there is a strong positive relationship between network stress and depressive symptoms. This demonstrates that personal distress is not solely responsible for the moderating relationship between empathy and network stress in the prediction of depressive symptoms, which has been implied by some researchers (Eisenberg & Fabes, 1998; Scheiman & Turner, 2001). Personal distress may best be operationalized as part of the larger empathy trait and not as a separate empathetic

response, especially when considering the outcomes generated by the third hypothesis. Even when personal distress is considered as a dimension of empathy, stress is not entirely transmitted from the network to the individual due to a person's inability to distinguish the distress of others from personal distress. This point is further supported by results of testing the third hypothesis.

The third hypothesis stated that personal distress alone would moderate the relationship between networks stress and depressive symptoms, but that this moderating relationship would not be as strong as that which exists when overall empathy is the moderator. When operationalizing network stress in any of the three separate approaches the interaction terms were not significant and this hypothesis was not supported. Of particular interest is that when network stress was defined as the number of life events that occurred to others, the first two hypotheses were supported however the third hypothesis involving personal distress as a separate response was not. This contrasts with the research of some (Eisenberg, 1998; Eisenberg & Fabes, 1998; Scheiman & Turner, 2001) who believe that personal distress is the trait responsible for stress contagion. The current study demonstrates that for these participants it is a combination of the empathic concern, perspective taking, and fantasy dimensions of empathy that makes an individual most vulnerable to network stress. Future researchers should continue to focus on the role of overall empathy in the stress contagion process, and not simply focus on the dimension of personal distress. Exactly how different combinations of all four dimensions of empathy contribute to the most vulnerable circumstances for the stress contagion process is also an interesting avenue for future studies.

Findings from the present study regarding empathy in a Native American older

adult population also contribute to the existing literature as empathy and stress contagion have not been thoroughly explored in Native Americans or older adults. The mean scores for each empathy dimension and for overall empathy [empathy  $M= 87.78$  ( $SD=11.03$ ); Empathic Concern  $M= 27.65$  ( $SD=4.70$ ); Perspective Taking  $M= 23.91$  ( $SD=4.27$ ); Personal Distress  $M= 17.14$  ( $SD=4.95$ ); Fantasy  $M= 19.18$  ( $SD=5.40$ )], will be useful for future studies to use as a comparison. Of the past published research utilizing the IRI (Davis, 1980), the only one to report means for empathic concern and perspective taking was a study of a collectivist Estonian population by Realo and Luik (2002). These researchers report for their sample of 121 men and women with a mean age of 25.9 years ( $SD= 11.8$ ), the mean for empathic concern was 40.7 ( $SD =9.2$ ) and the mean for perspective taking was 39.9 ( $SD=8.6$ ). Comparatively, the means from the present study are lower, which may be a result of a negative association between age and empathy that was found in the research of Schieman and Gundy (2000). In general, it is important to note that the data collected on all four dimensions revealed sufficient variability and were distributed in a relatively normal pattern.

Overall, the findings shed light once again on the fact that social networks entail costs as well as benefits, and that the supportiveness of social networks is highly dependent on context. The practice of psychologists and social workers to encourage those with deficient resources to expand their social network as a coping strategy should be taken under advisement. Not all individuals in all cases, namely those with higher levels of empathy, may benefit from such an exercise. Research has to consider the costs associated with having a higher level of empathy, a concern that to date has not been addressed. Empathy has usually been handled as a trait important to foster whenever

possible (Davis, 1996; Eisenberg & Miller, 1987).

The present study does not address the issue of causation, however findings from this study begin to inform psychologists and counselors of correlates and potential causes of stress and depression in Native American older adult populations. As mentioned before, this specific population may be more vulnerable to the stress contagion process due to collectivist characteristics and the tendency of older adults to reduce the size of their social network to include only close emotional ties. Empathy enhancing programs even exist in nursing home facilities (May & Alligood, 2000), where the trait could prove maladaptive in excess. These programs may need to be reevaluated and it may be important to teach people strategies to cope with stress that results specifically from the life events of those in their social networks.

#### *Limitations and Future Directions*

A limitation of this study is that the four subdimensions of empathy were summed in order to create a global empathy score. Davis (1980) developed the four constructs as building blocks to define the general concept of empathy, and he warned of the dangers of simply summing all four constructs to achieve a global measure. He explained that Personal distress is considered to be a developmentally lower level aspect of empathy and that if summed with the others would lower a total empathy score (Davis, 1980). In the present study the mean personal distress score was not significantly lower than the mean scores of the other three dimensions. This does not mean personal distress is not the earliest developmental dimension of empathy, but does lessen the first concern of creating a global measure. The question of whether or not personal distress is a dimension within empathy or a separate construct has been touched upon by this study,

but requires further research.

Davis' largest concern was that by simply summing the constructs one cannot assess if a particular aspect of empathy is more responsible for a given relationship to other variables. The current study did take this into consideration, and available literature suggested that personal distress, whether viewed as a dimension of empathy or an empathic response, can increase a persons' vulnerability to the stress of others (Eisenberg, 1998; Scheiman & Turner, 2001). It is for this reason that personal distress was summed along with the other three dimensions of empathy and addressed separately as a possible moderator for the relationship between network stress and depressive symptoms.

The reliability of scores generated by the IRI measure (Davis, 1980) may be considered a limitation as the reliability estimates for these data were not as high as those reported by previous researchers. As a result of this limitation and potential cultural differences in the interpretation of questions, a cultural consultant linguistically reexamined all individual items in a post hoc examination. Out of the 28-item questionnaire, four questions were targeted as potentially problematic, including the item, "If I'm sure I'm right about something, I don't waste much time listening to other people's arguments". Interestingly, statistical analyses revealed that the removal of this question would slightly raise the calculated alphas. Therefore, in a separate analysis this item was removed. The resulting alpha values and multiple regression analyses are not discussed further as the resulting patterns were similar to the original analysis; a more in depth description of the post hoc analysis is included in the appendix (see Appendix D).

Another limitation of this study is that it utilizes a survey, which creates specific

weaknesses that must be acknowledged. First, all measures were taken at one point in time limiting the conclusions that can be drawn. The possible relationships are correlational and no cause or effect can be established among the variables. In the future, researchers could approach this from a longitudinal or more experimental approach. Secondly, the survey data were collected through self-report which includes the risk of participants not answering the questions honestly or being unable to accurately recall their behaviors and emotions. The survey is also relatively long, with the IRI located at the end, and the order of the measures was not randomly varied. Older adults could have become fatigued by the time they reached the IRI and not answered the questions to the best of their ability. Future research could easily correct this last limitation by randomly varying the measures in the survey.

Older Native American adults are a very heterogeneous population. As outlined by Norton and Manson (1996), there are over 250 federally recognized tribes and 209 Alaska Native villages. With such diversity in tribal cultures, findings within this specific sample from one reservation may be limited. The significance of starting this research in such a community has been discussed, but it is research that stresses the impact of different contexts. It is implied that similar studies need to be conducted in different populations, and that broad generalizations should be made with caution. The applicability to other minority groups or individual cultures must be tested by further research. A similar study could examine an individualistic population and compare the results to the current study. This would be interesting to consider as perhaps empathy moderates the relationship between network stress and depressive symptoms only in cultures where an individual has an interdependent concept of the self (Markus &

Kitayama, 1991; Triandis, Chen, & Chan, 1998).

Lastly, it would be crucial to explore the practical implications of the results for empathy interventions and the practice of mental health care professionals. Given the moderating relationship found between empathy and network stress (as measured by number of life events of others) in predicting depressive symptoms, it would be interesting for future research to examine the mechanisms behind this interaction. To answer this question, a qualitative study that explores the lived experience of individual's with high levels of empathy may be clinically informative. Despite the acknowledged limitations, this study is a solid first step in understanding the stress contagion process and it paves the way for a myriad of pertinent future studies.

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## Appendix A

**Life Events of Family Members and Close Friends**

Here is a list of events that may have occurred in the lives of your family members and close friends. If an event happened to any of your family members and friends **during the past year** (past 12 months), please check the box (☑) to the left of the event. If an event was experienced by a family member or friend, please rate how worried or upset **you** were when it happened. Only rate those events that did occur.

☑	Please rate how <b>worried</b> or <b>upset you</b> were when the event occurred. <b>Only</b> rate events that <b>did occur</b> in the lives of family members and friends within the past year.	Not At All Upset				Extremely Upset
-	Minor Illness	-	-	-	-	-
-	Loss of Hearing or Vision	-	-	-	-	-
-	Difficulty Waking	-	-	-	-	-
-	Divorce	-	-	-	-	-
-	Sexual Difficulty	-	-	-	-	-
-	Separation	-	-	-	-	-
-	Family Member Ill or Injured	-	-	-	-	-
-	Gain New Family Member	-	-	-	-	-
-	Death of a Close Friend	-	-	-	-	-
-	Change in the Number of Family Get-togethers	-	-	-	-	-
-	Personal Achievement of Family Member	-	-	-	-	-
-	Relinquish Financial Responsibility	-	-	-	-	-
-	Financial Difficulty	-	-	-	-	-

-	Change Work Hours/Conditions	-	-	-	-	-
-	Change in Residence	-	-	-	-	-
-	Sell Major Possessions	-	-	-	-	-
-	Personal Achievement	-	-	-	-	-
-	Spouse Unfaithful	-	-	-	-	-
-	Fired from Job	-	-	-	-	-
-	Loss of Valuable Object	-	-	-	-	-
-	Child Got Married	-	-	-	-	-
-	Taking Large Loan	-	-	-	-	-
-	Legal or Custody Troubles	-	-	-	-	-
-	Trouble with government, insurance or social service agencies	-	-	-	-	-
-	Age Discrimination	-	-	-	-	-
-	Racial Discrimination	-	-	-	-	-
-	Major Illness or Injury	-	-	-	-	-
-	Change in Sleep Habits	-	-	-	-	-
-	Change in Eating Habits	-	-	-	-	-
-	Menopause	-	-	-	-	-
-	Death of Spouse	-	-	-	-	-
-	Marriage	-	-	-	-	-
-	Marital Reconciliation	-	-	-	-	-
-	More Arguments with Spouse	-	-	-	-	-
-	Fewer Arguments with Spouse	-	-	-	-	-
-	Death of Family Member	-	-	-	-	-
-	Improvement in Family Member's Health	-	-	-	-	-
-	Trouble with Children or other family member(s)	-	-	-	-	-
-	Victim of Crime	-	-	-	-	-
-	Improvement in Financial State	-	-	-	-	-
-	Retirement	-	-	-	-	-

-	Illness or Injury of a Close Friend	-	-	-	-	-
-	Lose a pet	-	-	-	-	-
-	Gain a pet	-	-	-	-	-
-	Less Church Activity	-	-	-	-	-
-	More Church Activity	-	-	-	-	-
-	More Recreation or Social Activity	-	-	-	-	-
-	Less Recreation or Social Activity	-	-	-	-	-
-	Travel (Taking Vacation)	-	-	-	-	-
-	Stop Driving	-	-	-	-	-
-	Go to Jail	-	-	-	-	-
-	Parole	-	-	-	-	-
-	More traditional activities	-	-	-	-	-
-	Less traditional activities	-	-	-	-	-
-	Unemployed at Least One Month	-	-	-	-	-
-	Demotion	-	-	-	-	-
-	Promotion	-	-	-	-	-
-	Grandchild Got Married	-	-	-	-	-
-	Arguments with Boss/Coworker	-	-	-	-	-
-	Friends and/or Family Turn Away	-	-	-	-	-
-	Caregiving Responsibilities	-	-	-	-	-
-	Other _____	-	-	-	-	-

## Appendix B

**Interpersonal Reactivity Index (Davis, 1980)**

The following statements inquire about your thoughts and feelings in a variety of situations. For each item, indicate how well it describes you by choosing the box (☑). Read each item carefully before responding. Answer as honestly as you can.

	<b>Does Not Describe Me Well</b>				<b>Describes Me Very Well</b>
I daydream and fantasize, with some regularity, about things that might happen to me.	-	-	-	-	-
I often have tender, concerned feelings for people less fortunate than me.	-	-	-	-	-
I sometimes find it difficult to see things from the "other person's" point of view.	-	-	-	-	-
Sometimes I don't feel very sorry for other people when they are having problems.	-	-	-	-	-
I really get involved with the feelings of the characters in a novel.	-	-	-	-	-
In emergency situations, I feel apprehensive and ill-at-ease.	-	-	-	-	-
I am usually objective when I watch a movie or play, and I don't often get completely caught up in it.	-	-	-	-	-
I try to look at everybody's side of a disagreement before I make a decision.	-	-	-	-	-
When I see someone being taken advantage of, I feel kind of protective towards them.	-	-	-	-	-
I sometimes feel helpless when I am in the middle of a very emotional situation.	-	-	-	-	-
I sometimes try to understand my friends better by imagining how things look from their perspective.	-	-	-	-	-
Becoming extremely involved in a good book or movie is somewhat rare for me.	-	-	-	-	-
When I see someone get hurt, I tend to remain calm.	-	-	-	-	-

Other people's misfortunes do not usually disturb me a great deal.	-	-	-	-	-
If I'm sure I'm right about something, I don't waste much time listening to other people's arguments.	-	-	-	-	-
After seeing a play or movie, I have felt as though I were one of the characters.	-	-	-	-	-
Being in a tense emotional situation scares me.	-	-	-	-	-
When I see someone being treated unfairly, I sometimes don't feel very much pity for them.	-	-	-	-	-
I am usually pretty effective in dealing with emergencies.	-	-	-	-	-
I am often quite touched by things that I see happen.	-	-	-	-	-
I believe that there are two sides to every question and try to look at them both.	-	-	-	-	-
I would describe myself as a pretty softhearted person.	-	-	-	-	-
When I watch a good movie, I can very easily put myself in the place of a leading character.	-	-	-	-	-
I tend to lose control during emergencies.	-	-	-	-	-
When I'm upset at someone, I usually try to "put myself in his shoes" for a while.	-	-	-	-	-
When I am reading an interesting story or novel, I imagine how I would feel if the events in the story were happening to me.	-	-	-	-	-
When I see someone who badly needs help in an emergency, I go to pieces.	-	-	-	-	-
Before criticizing somebody, I try to imagine how I would feel if I were in their place.	-	-	-	-	-

## Appendix C

**CES-D (Radloff, 1977)**  
**Thoughts, Attitudes and Feelings**

Check the box () for each statement that best describes how often you felt or behaved this way during the past week.

	Rarely or None of the Time (Less than 1 day)	Some or a Little of the Time (1-2 days)	Moderate Amount of Time (3-4 days)	Most or All of the Time (5-7 days)
I was bothered by things that usually do not bother me.				
I did not feel like eating; my appetite was poor.				
I felt that I could not shake off the blues even with help from my family and friends.				
I felt that I was just as good as other people.				
I had trouble keeping my mind on what I was doing.				
I felt depressed.				
I felt that everything I did was an effort.				
I felt hopeful about the future.				
I thought my life had been a failure.				
I felt fearful.				
My sleep was restless.				
I was happy.				
I talked less than usual.				
I felt lonely.				
People were unfriendly.				
I enjoyed life.				
I had crying spells.				
I felt sad.				
I felt that people disliked me.				
I could not get "going."				

## Appendix D

### Post Hoc Examination of Individual Items of the IRI

1. Low reliability of scores on the dimension of Perspective Taking (PT) raised concerns, and statistics demonstrated that one particular question, number 15, would sufficiently raise the Cronbach's alpha for PT. The item reads, "If I'm sure I'm right about something, I don't waste much time listening to other people's arguments".
2. The Native American Resilience lab group was asked by the researchers to re-examine the IRI survey and note any concerns. Lab members commented that some of the negatively worded statements might have been confusing to participants (this would include question 15).
3. On behalf of the NAR lab group, Dr. Gyda Swaney contacted and consulted a linguistic specialist from the reservation sampled in this study. The specialist was asked to review the IRI to ascertain whether the scale contained any possible language challenges or barriers for the participants. Four questions were particularly highlighted as troublesome (including question 15).
4. At no time were any of the consultants made aware of the statistical focus on question number 15, yet both sources listed this question among their concerns.
5. For these theoretical and statistical reasons, question 15 was removed from the IRI measure and all analyses were repeated.
6. There were only slight increases in the reliability estimates for Perspective Taking scores, overall empathy scores, and empathy without personal distress scores. The same series of analyses used for Hypotheses 1-3 were conducted without item 15. The pattern of findings did not differ from that found with all items.

Table 1

*Descriptives by Gender and Age Correlations*

	Females		Males		$r_{age}$
	M	(SD)	M	(SD)	
Depression	33.48 <sup>a</sup>	(10.79)	29.62	(7.59)	.10
Network stress overall	27.70 <sup>b</sup>	(21.69)	21.49	(16.16)	-.02
Network stress general reactivity	3.05 <sup>c</sup>	(1.02)	2.46	(.77)	.00
Network stress # life events of others	9.39	(7.01)	8.75	(6.02)	.02
Empathy total	91.33 <sup>d</sup>	(10.53)	83.11	(9.93)	.01
Empathy-PD	72.91 <sup>e</sup>	(9.66)	67.65	(9.01)	-.05
Personal Distress	18.42 <sup>f</sup>	(5.43)	15.48	(3.70)	.03

Note. <sup>a</sup> $t(153.37) = -2.62, p < .01$ ; <sup>b</sup> $t(147.87) = -2.10, p < .05$ ; <sup>c</sup> $t(148.62) = -4.04, p < .01$ ; <sup>d</sup> $t(146.14) = -4.97, p < .01$ ; <sup>e</sup> $t(146.80) = -3.49, p < .01$ ; <sup>f</sup> $t(151.82) = -4.01, p < .01$

Table 2

*Intercorrelations Between Variables*

Variables	1	2	3	4	5	6	7
1. Depression	-						
2. Empathy	-.04	-					
3. Empathy w/o PD	-.22**	.89**	-				
4. Personal Distress	.33**	.47**	.03	-			
5. Network stress	.36**	.26**	.23**	.12	-		
6. Ave. Network stress	.26**	.15	.08	.18*	.35*	-	

7. Network events	.29**	.23**	.25**	.02	.91**	.04	-
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Note. \* $p < .05$  \*\* $p < .01$

Table 3

*Multiple Regression: Empathy X Network Stress*

Variables	B	SE B	$\beta$
<b>Block 1</b>			
Level of Ed.	-4.48	1.63	-.23**
Marital Status	3.26	1.78	.17
Ave. Income	-2.26	1.83	-.12
Gender	2.63	1.61	.13
<b>Block 2</b>			
Level of Ed.	-4.50	1.53	-.23**
Marital Status	2.83	1.65	.15
Ave. Income	-1.86	1.70	-.09
Gender	2.82	1.60	.14
Empathy	-.14	.07	-.16*
Network stress	.18	.04	.37**
<b>Block 3</b>			
Level of Ed.	-4.10	1.56	-.21**
Marital Status	3.08	1.66	.16
Ave. Income	-2.25	1.72	-.11
Gender	2.71	1.60	.14
Empathy	-.15	.07	-.17*
Network stress	.16	.04	.33**
Interaction	.00	.00	.11

Note.  $R^2 = .16$  for Block 1; as Block 1 statistics are identical in each model they will not be repeated in subsequent tables;  $R^2\Delta = .13$ \*\* for Block 2;  $R^2\Delta = .01$  for Block 3. \* $p < .05$  \*\* $p < .01$

Table 4

*Multiple Regression: Empathy-PD X Network Stress*

Variables	B	SE B	$\beta$
<b>Block 2</b>			
Level of Ed.	-3.72	1.50	-.19**
Marital Status	2.55	1.60	.13
Ave. Income	-1.50	1.64	-.08
Gender	3.28	1.50	.17*
Empathy-PD	-.30	.08	-.30**
Network stress	.20	.04	.40**

## Block 3

Level of Ed.	-3.50	1.52	-.18*
Marital Status	2.72	1.61	.14
Ave. Income	-1.71	1.66	-.09
Gender	3.19	1.51	.16*
Empathy-PD	-.30	.08	-.30*
Network stress	.18	.04	.37**
Interaction	.00	.00	.06

Note. Empathy-PD in this and subsequent tables refers to overall empathy measure without the dimension of personal distress.  $R^2\Delta = .19^{**}$  for Block 2;  $R^2\Delta = .00$  for Block 3. \* $p < .05$  \*\* $p < .01$

Table 5

*Multiple Regression: PD X Network Stress*

Variables	B	SE B	$\beta$
Block 2			
Level of Ed.	-4.76	1.48	-.24**
Marital Status	2.93	1.62	.15
Ave. Income	-1.26	1.70	-.06
Gender	.61	1.52	.03
Personal Distress	.43	.15	.22**
Network stress	.16	.04	.33**
Block 3			
Level of Ed.	-4.56	1.48	-.23**
Marital Status	2.93	1.61	.15
Ave. Income	-1.46	1.70	-.07
Gender	.62	1.51	.03
Personal Distress	.42	.15	.21**
Network stress	.15	.04	.30**
Interaction	.01	.01	.11

Note.  $R^2\Delta = .16^{**}$  for Block 2;  $R^2\Delta = .01$  for Block 3. \* $p < .05$  \*\* $p < .01$

Table 6

*Multiple Regression: Empathy X Average Network Stress*

Variables	B	SE B	$\beta$
Block 2			
Level of Ed.	-3.83	1.64	-.20*
Marital Status	2.51	1.78	.13
Ave. Income	-2.75	1.82	-.14
Gender	2.29	1.75	.11
Empathy	-.08	.08	-.10
Ave. Network stress	1.99	.83	.20*

## Block 3

Level of Ed.	-3.72	1.64	-.19*
Marital Status	2.79	1.80	.14
Ave. Income	-2.73	1.82	-.14
Gender	2.21	1.76	.11
Empathy	-.08	.08	-.09
Ave. Network stress	1.98	.83	.20*
Interaction	.06	.07	.07

Note.  $R^2\Delta = .04^*$  for Block 2;  $R^2\Delta = .01$  for Block 3. \* $p < .05$  \*\* $p < .01$

Table 7

*Multiple Regression: Empathy-PD X Average Network Stress*

Variables	B	SE B	$\beta$
Block 2			
Level of Ed.	-3.13	1.62	-.16
Marital Status	2.29	1.74	.12
Ave. Income	-2.52	1.78	-.13
Gender	2.83	1.68	.15
Empathy-PD	-.22	.08	-.22**
Ave. Network stress	1.97	.81	.20*
Block 3			
Level of Ed.	-3.10	1.64	-.16
Marital Status	2.34	1.77	.12
Ave. Income	-2.52	1.78	-.13
Gender	2.83	1.68	.14
Empathy- PD	-.22	.08	-.22**
Ave. Network stress	1.98	.82	.20*
Interaction	.02	.08	.02

Note.  $R^2\Delta = .07^{**}$  for Block 2;  $R^2\Delta = .00$  for Block 3. \* $p < .05$  \*\* $p < .01$

Table 8

*Multiple Regression: PD X Average Network Stress*

Variables	B	SE B	$\beta$
Block 2			
Level of Ed.	-3.94	1.56	-.20**
Marital Status	2.58	1.73	.13
Ave. Income	-2.04	1.78	-.10
Gender	.54	1.64	.03
Personal Distress	.44	.16	.23**
Ave. Network stress	1.70	.81	.17*

## Block 3

Level of Ed.	-4.07	1.56	-.21**
Marital Status	2.67	1.72	.14
Ave. Income	-2.01	1.77	-.10
Gender	.63	1.63	.03
Personal Distress	.41	.16	.21**
Ave. Network stress	1.63	.81	.16*
Interaction	.23	.15	.11

Note.  $R^2\Delta = .08^{**}$  for Block 2;  $R^2\Delta = .01$  for Block 3. \* $p < .05$  \*\* $p < .01$

Table 9

*Multiple Regression: Empathy X Number of Network Events*

Variables	B	SE B	$\beta$
Block 2			
Level of Ed.	-4.38	1.57	-.22**
Marital Status	3.43	1.69	.18*
Ave. Income	-1.62	1.74	-.08
Gender	3.43	1.64	.18*
Empathy	-.13	.07	-.15
Network Events	.45	.11	.31**
Block 3			
Level of Ed.	-3.82	1.57	-.20*
Marital Status	3.37	1.67	.17*
Ave. Income	-2.26	1.75	-.12
Gender	3.20	1.63	.16*
Empathy	-.34	.12	-.38**
Network Events	.37	.12	.25**
Interaction	.02	.01	.30*

Note.  $R^2\Delta = .10^{**}$  for Block 2;  $R^2\Delta = .02^*$  for Block 3. \* $p < .05$  \*\* $p < .01$

Table 10

*Multiple Regression: Empathy-PD X Number of Network Events*

Variables	B	SE B	$\beta$
Block 2			
Level of Ed.	-3.54	1.53	-.18*
Marital Status	3.17	1.63	.16*
Ave. Income	-1.20	1.68	-.06
Gender	4.07	1.53	.21**
Empathy-PD	-.30	.08	-.30**
Network Events	.51	.11	.35**

## Block 3

Level of Ed.	-3.00	1.52	-.15*
Marital Status	3.12	1.60	.16*
Ave. Income	-1.78	1.68	-.09
Gender	3.83	1.52	.20**
Empathy-PD	-.53	.13	-.53**
Network Events	.42	.12	.29**
Interaction	.03	.01	.30*

Note.  $R^2\Delta = .15^{**}$  for Block 2;  $R^2\Delta = .02^*$  for Block 3. \* $p < .05$  \*\* $p < .01$

Table 11

*Multiple Regression: PD X Number of Network Events*

Variables	B	SE B	$\beta$
Block 2			
Level of Ed.	-4.59	1.50	-.23**
Marital Status	3.43	1.64	.18*
Ave. Income	-.94	1.71	-.05
Gender	1.07	1.53	.06
Personal Distress	.49	.15	.25**
Network Events	.42	.11	.28**
Block 3			
Level of Ed.	-4.55	1.51	-.23**
Marital Status	3.42	1.64	.18*
Ave. Income	-1.01	1.72	-.05
Gender	1.04	1.54	.05
Personal Distress	.39	.28	.20
Network Events	.42	.11	.28**
Interaction	.01	.03	.06

Note.  $R^2\Delta = .13^{**}$  for Block 2;  $R^2\Delta = .00$  for Block 3. \* $p < .05$  \*\* $p < .01$

Figure 1. Interaction Plotted from centered equation

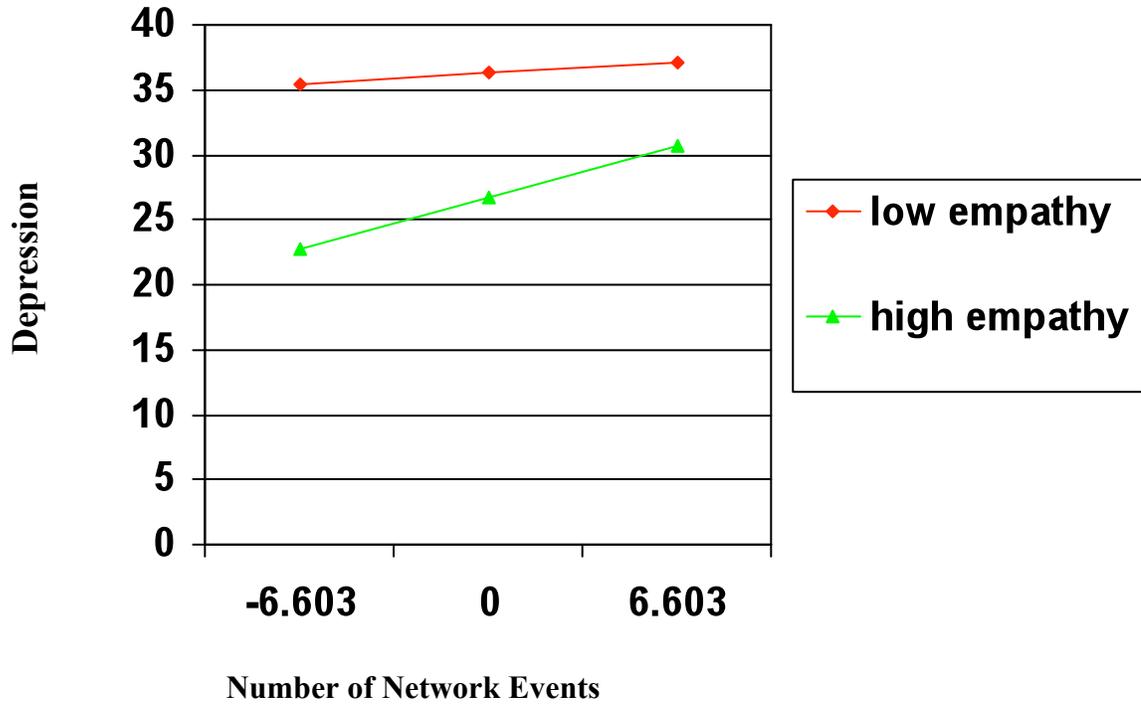


Figure 1. For high level of empathy (+1SD),  $\hat{Y} = .61X + 26.72$ , and for low level of empathy (-1SD),  $\hat{Y} = .13X + 36.27$ . For a high level of empathy(+1SD), the regression of depression on network stress is significantly different from zero, and for a low level of empathy (-1SD), the regression of depression on network stress does not differ significantly from zero

Figure 2. Interaction Plotted from centered equation

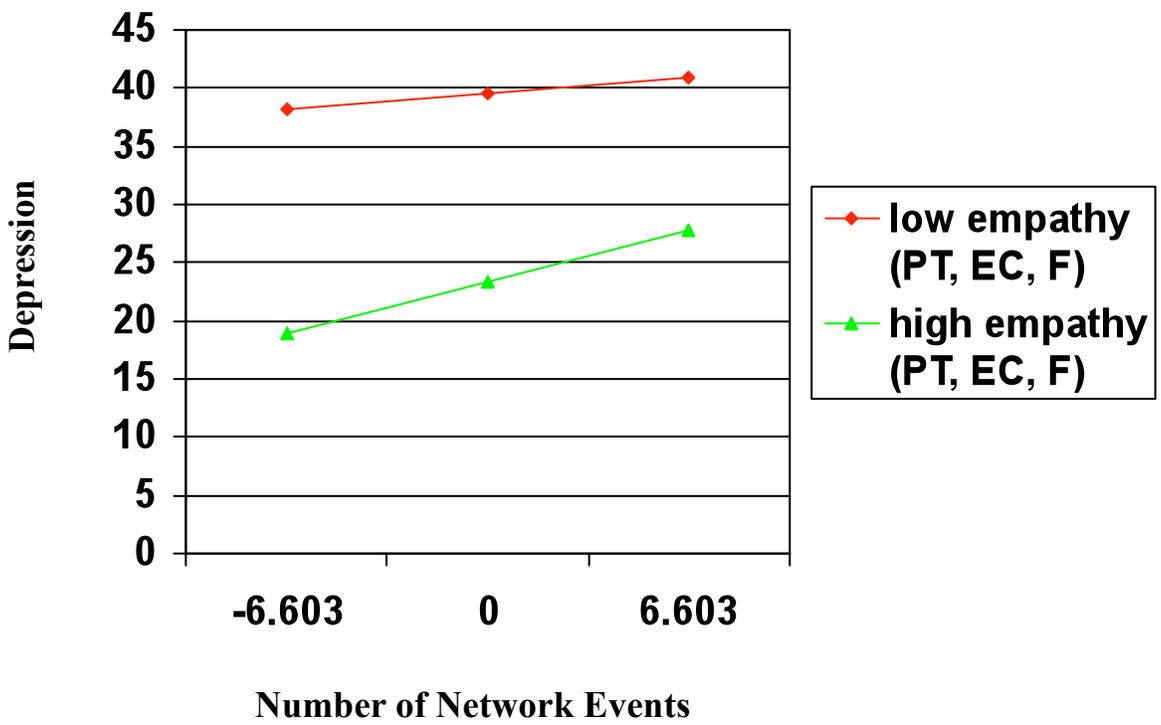


Figure 2. For high level of empathy (+1SD),  $\hat{Y} = .67X + 23.40$ , and for low level of empathy (-1SD),  $\hat{Y} = .21X + 39.55$ . For a high level of empathy (calculated with EC, PT, and F) (+1SD), the regression of depression on network stress is significantly different from zero. For the low level of empathy (calculated with EC, PT, and F) (-1SD), the regression of depression on network stress does not differ significantly from zero.