

Daily Financial Worry and Physical Health Symptoms among Individuals
with Chronic Pain: The Moderating Effect of Income

by

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ABSTRACT

Socioeconomic status (SES) is linked with poorer health outcomes across the range of SES. The Reserve Capacity Model (RCM) proposes that low SES fuels repeated and/or chronic exposure to elevated levels of stress, producing deleterious emotional, psychological, social, and physiological changes that result in development of disease over time. The RCM further asserts that a relative lack of social and psychological resources, including efficacy and social support, among low SES individuals accounts for their greater vulnerability to the effects of stress. Although the links between stress, reserve capacity, and health outcomes are framed in the RCM as an ongoing process that produces disease, the majority of investigations testing the model have not examined its utility in explaining 1) coping with daily stressors or 2) symptom flares among individuals managing a chronic illness. This study investigated the effects of SES, reflected in income level, on the: 1) levels of daily financial events and financial worry; 2) relations between daily financial worry and symptoms of pain and fatigue; and 3) extent to which daily coping efficacy and social support mediated the daily financial worry→symptom relation across 21 daily diary reports collected from 220 individuals with fibromyalgia (FM). Simple correlations showed that income was inversely related to frequency of financial events and level of financial worry across 21 days. Results from multilevel models indicated that daily increases in financial worry were unrelated to pain regardless of income level, but were related to increased fatigue among individuals with lower relative to higher income. Daily efficacy and support mediated the relations between financial worry and pain and fatigue, but the extent of mediation did not differ based on high versus low income level. Taken together, the findings suggest that

individuals of low versus high income encounter more frequent financial stress and experience greater daily fatigue exacerbation related to that stress, in line with the RCM. Over time, the greater exposure and reactivity to financial strain may account for the inverse relation between income and disability among those with chronic pain.

TABLE OF CONTENTS

	Page
LIST OF TABLES.....	v
LIST OF FIGURES.....	vi
INTRODUCTION.....	1
Socioeconomic Status and Health.....	4
Pathways Linking Socioeconomic Status and Health.....	5
Chronic Pain and Financial Stress.....	13
Proposed Model & Hypotheses.....	17
METHODS.....	19
Participants.....	19
Procedure.....	20
Measures.....	21
Data Analytic Plan.....	23
RESULTS.....	29
Sample Characteristics.....	29
Variable Descriptive Properties and Intercorrelations.....	29
Tests of Between-person Relations Between Income and Financial Stress.....	30
Tests of Within-person Relations of Daily Financial Strain with Symptoms and the Moderating Effect of Income.....	31
Tests of the Within-person Mediation Effects of Reserve Capacity Variables.....	34
DISCUSSION.....	37
REFERENCES.....	66

APPENDIX

Page

A MEASURES.....77

LIST OF TABLES

Table	Page
1. Participant Demographics.....	49
2. Means, Standard Deviations, and Intercorrelations of Study Variables.....	50
3. Regression Model Predicting Daily Financial Worry from Centered Income, Centered Age, and Gender (N = 207).....	51
4. Regression Model Predicting Daily Financial Stressors from Centered Income, Age, and Gender (N = 207).....	52
5. Multilevel Regression Models Predicting Daily Pain Levels from Person-centered Daily Financial Worry, Income, and Daily Financial Worry X Income Interaction (N = 211).....	53
6. Multilevel Regression Models Predicting Daily Fatigue Levels from Person-centered Daily Financial Worry, Income, and Daily Financial Worry X Income Interaction (N = 204).....	54
7. Simple Regression Analysis of Daily Fatigue on Daily Financial Worry [†] at 1 Standard Deviation (SD) Above, Below, and at the Mean of Income (N = 204).....	55
8. Mixed models Testing Indirect Paths from Daily Financial Worry to Coping Efficacy to Pain in Participants with Income below the Sample Median (N=104).....	56
9. Mixed models Testing Indirect Paths from Daily Financial Worry to Daily Pain in Participants with Income above the Sample Median (N=99).....	57
10. Mixed models Testing Indirect Paths from Daily Financial Worry to Coping Efficacy to Fatigue in Participants with Income below the Sample Median (N=107).....	58
11. Mixed models Testing Indirect Paths from Daily Financial Worry to Daily Fatigue in Participants with Income above the Sample Median (N=104).....	59

LIST OF FIGURES

Figure	Page
1. Reserve Capacity Model (Matthews, et al., 2010).....	60
2. Proposed Model for Hypotheses 2 and 3. Note: Solid lines represent paths being tested.....	61
3. Proposed Models for Hypothesis 4.....	62
4. Relation between Daily Financial Worry and Daily Fatigue at 1 Standard Deviation Below, Above, and at the Mean for Income.....	63
5. Mediation Model Depicting the Indirect Effect of Daily Coping Efficacy in the Relation between Daily Financial Worry and Daily Pain among Income Groups.....	64
6. Mediation Model Depicting the Indirect Effect of Daily Coping Efficacy in the Relation between Daily Financial Worry and Daily Fatigue among Income Groups.....	65

Daily Financial Worry and Physical Health Symptoms among Individuals with Chronic Pain: The Moderating Effect of Income

Chronic pain in the United States is pervasive and costly. Over 25 million Americans report daily pain (Nahin, 2015), and \$560 billion dollars are accrued annually in pain-related health care and lost worker productivity (Gaskin & Richard, 2012). One risk factor associated with an increased risk of chronic pain, as well as nearly every other chronic health condition, is low socioeconomic status (SES) (Adler & Ostrove, 1999; Andersson, Ejlertsson, Leden, & Rosenberg, 1993; Blyth et al., 2001; Riskowski, 2014; Wolfe, Michaud, Geffeller, & Choi, 2003). Among individuals with chronic pain, those with lower SES experience greater pain severity, pain-related disability, and lower quality of life compared to their higher SES counterparts (Andersson et al., 1993; Blyth et al., 2001; Fuentes, Hart-Johnson, & Green, 2007; Gerstle, 2001; Portenoy, Ugarte, Fuller, & Haas, 2004; Riskowski, 2014; VonKorff, Ormel, Keefe, & Dworkin, 1992). With an eye toward the development of interventions, an important first step is to explore the pathways that link lower SES with poorer health outcomes among individuals with chronic pain.

Although the mechanisms remain unclear, Gallo and Matthews (2003) have proposed a comprehensive model, the Reserve Capacity Model (RCM) that incorporates stress processes and psychosocial factors to illustrate potential pathways between SES and health. According to the RCM, SES is inversely associated with exposure to stressors and positively associated with tangible, interpersonal, and intrapersonal resources necessary to deal with stressors. Deficits in these resources, known as ‘reserve capacity,’ are thought to impair effective responses to stress among those with low SES, resulting in

downstream emotional, behavioral, and physiological processes that ultimately lead to disparities in health (Figure 1). This model depicts a process that occurs over years, with negative effects accruing over decades to impinge on the health of individuals of lower SES.

The literature provides support for the roles of stress and reserve capacity depicted in the RCM. With regard to stress, there is evidence to suggest that individuals with lower SES are exposed to and are more vulnerable to experience distress associated with stressful life events than those with higher SES (Brown & Harris, 1978; Dohrenwend, 1973; Kessler & Cleary, 1980; Lazarus, 1966; Pearlin 1989; McLeod & Kessler, 1990; Turner & Noh, 1983). In addition to facing greater levels of chronic economic stress (Lantz, House, Mero, & Williams, 2005), lower SES vs. higher SES individuals may also experience a greater number of daily negative financial events (Sturgeon, Zautra, & Okun, 2014), which has been positively related to physical health complaints in adults with chronic pain (Skinner, Zautra, & Reich, 2004). Research also suggests that daily worry related to finances has been linked with increased pain symptoms in adults with chronic pain, particularly for those with higher versus lower levels of economic hardship (Rios & Zautra, 2011).

With regard to the reserve capacity, research indicates that SES is positively related with resources, including social support (Campbell, Marsden, & Hurlbert, 1986; Gallo, de los Monteros, Ferent, Urbina, & Talavera, 2007; Gallo, Matthews, Kuller, Sutton-Tyrrell & Edmundowicz, 2001; Huang & Tausig, 1990; Marmot, Ryff, Bumpass, Shipley, & Marks, 1997; Matthews, Kelsey, Meilahn, Muller, & Wing, 1989; Ranchor, Bouma, & Sanderman, 1996) and self-efficacy (Boardman & Robert, 2000; Gallo et al.,

2007; Lachman & Weaver, 1998; Staples, Schwalbe, & Gecas., 1984). These resources are thought to directly assist individuals in coping with daily stress (Matthews, Gallo, & Taylor 2010; Matthews, Raikkonen, Gallo, & Kuller, 2008) and may buffer the impact of stress on physical health problems over an extended period of time (DeLongis, Coyne, Dakof, Foldman, & Lazarus, 1982; Holahan, Holahan, & Belk, 1984). Still, only two studies have examined whether aspects of the RCM are evident in studies of daily life among individuals with chronic pain (Rios & Zautra, 2011; Skinner, Zautra, & Reich, 2004) and neither examined the role of *daily* reserve capacity resources in the process linking daily worry related to financial stress to daily symptoms. To the best of my knowledge, this is the first study to conceptualize the reserve capacity as a within-day process with the potential to fluctuate daily in response to acute stress. This may be due to the limited number of studies that use daily diary reports to represent within-day processes in samples with chronic health conditions.

The present study used daily diary data collected from individuals with chronic pain to examine the following questions: (1) are participant income levels negatively associated with daily financial stressors and worries; (2) are days of above-average daily financial worries associated with greater levels of same-day pain and fatigue; (3), are daily financial worry-symptom relations stronger among individuals with lower versus higher income levels; (4) do daily changes in coping efficacy and satisfaction with support (i.e., reserve capacity) mediate the relation between daily financial worry and symptom outcomes among individuals with lower versus higher income levels.

Socioeconomic Status and Health

The literature linking SES with health includes a variety of metrics to indicate social standing of an individual or group within a society. It is often measured by examining education, income, and occupation, either individually or in combination (APA Task Force on Socioeconomic Status, 2007). Educational attainment is a common measurement of SES that reflects either total years of schooling or degrees conferred, and typically remains relatively stable throughout the lifespan. Conversely, income is a status marker that has a greater tendency to fluctuate, as it reflects an individual's level of monetary compensation for employment at the present moment. One's level of income is therefore indicative of his or her ability to buy necessities and to receive access to mental and physical health care. The third commonly measured factor of SES is occupation, which can be categorized by participation in the workforce, or can be classified among the employed according to employment rank or prestige.

Consistently across all three measures, lower SES is associated with an increased risk for poor health across a variety of outcomes. Low SES is associated with lower life expectancy (Guralnik, Land, Fillenbaum, & Branch, 1993), higher rates of mortality (Elo & Preston, 1996; Marmot, Shipley, & Rose, 1984), and increased risk for chronic health conditions, including chronic pain (Adler et al, 1994). Of note, these relations extend through the entire gradient of SES, affecting those at the middle and top as well; in a gradual and near-linear fashion, each unit decrease in SES is associated with higher prevalence rates of chronic diseases and mortality (Adler et al., 1994; Marmot et al., 1984). Regarding the directionality of these relations, longitudinal studies suggest that SES is related to subsequent health, even when accounting for early illness (Fox, Jones,

Moser, & Goldblatt, 1985; Power & Hertzman, 1997). These findings warrant investigation to identify the underlying pathways linking SES with health.

Pathways Linking Socioeconomic Status and Health

The RCM provides an integrated framework for understanding disparities in health as a function of SES (Gallo & Matthews, 2003; Matthews et al., 2010). According to the RCM, individuals of lower SES experience more negative and fewer positive events than their higher SES counterparts due to their position in society and their relative lack of resources (Figure 1). Exposure to stressful experiences is related to higher levels of negative affect and lower levels of positive affect and associated cognitions. These mental states are thought to ultimately impact health outcomes through behavioral and physiological mechanisms. Lower SES is also associated with reduced levels of ‘reserve capacity,’ thought of as an individual’s bank of tangible and psychosocial resources necessary to cope with life stressors. The RCM suggests that the lower reserve capacity among lower SES individuals may in part be due to increased demand and decreased replenishment of resources in low SES environments. In the model, the reserve capacity is hypothesized to act in two ways: (1) the reserve capacity mediates the relation between SES and downstream processes related to physical health, and (2) the reserve capacity moderates the relation between stressful experiences and emotional and cognitive reactions, such that a depleted reserve capacity exacerbates the impact of stressors on emotional dysregulation and ultimately on health.

The vast literature on stress—health relations provides evidence for many ways in which stress impacts individuals’ health following exposure to a stressor. Stress is defined as “an emotional experience accompanied by predictable biochemical,

physiological, and behavioral changes” (Baum, 1990). According to Lazarus and Folkman (1984), individuals cognitively appraise a difficult situation as either a threat or challenge, in part due to individuals’ assessment of their available resources to deal with the stressor. Appraising the situation as threatening versus challenging is associated with more pronounced activation of the physiological stress response, and a potentially more deleterious pattern of physiological responses (Tomaka, Blascovich, Kelsey, & Leitten, 1993). When facing an acute, or brief stressor, individuals may experience an activation of the sympathetic-adrenal-medullary (SAM) system, also known as the “fight or flight” response. This physiological response allows for the release of adrenaline into the bloodstream, and is characterized by increased heart rate, blood pressure, and respiration rate. In response to acute and chronic stress, individuals also may experience activation of the hypothalamic-pituitary-adrenal (HPA) axis, which prompts the release of the stress hormone cortisol. Repeated (acute) or sustained (chronic) exposure to stress over time is linked with the development of a heightened allostatic load, a physiological response of the body that reflects wear and tear (McEwen, 1998). Research suggests that prolonged stress can increase risk for a wide range of physical health outcomes, including chronic pain (Chrousos & Gold, 1992; Melzack, 1999; Sapolsky, 1992), cardiovascular disease (Kaplan & Keil, 1993), cancer (Andersen, Kiecolt-Glaser & Glaser, 1994; Baum, 1990), infectious diseases (Cohen & Williamson, 1991; McKinnon, Weisse, Reynolds, Bowles, & Baum, 1989), and slower healing and immune suppression (Kiecolt-Glaser, Page, Marucha, MacCallum & Glaser, 1998; Marucha, Kiecolt-Glaser & Flavageh, 1998; O’Leary, 1990).

One mechanism by which stressors are associated with physiological arousal is through worry behavior (Brosschot, Van Dijk, & Thayer, 2007). Worry is a cognitive phenomenon related to the focus on potential negative outcomes of a future event in which the outcome is unknown (MacLeod, Williams, and Bekerian, 1991). After appraising a tangible or perceived situation as threatening, individuals may engage in worry as an attempt at problem-solving. However, finding a solution is thwarted by the focus on the potential negative outcomes related to the uncertain event (Davey, 1994). Worry, then, is associated with anxiety and accompanying physiological arousal (Brosschot, Gerin, & Thayer, 2006).

Daily stressors, or minor hassles occurring in everyday life (Almeida, Neupert, Banks, & Serido, 2005), represent a source of stress and worry that can have consequences for physical and mental health. In fact, daily stressors are more predictive of psychological and somatic health symptoms than a more frequently used measure of stress, major life events (DeLongis et al., 1982; Kahn & Pearlin, 2006; Pearlin, Menaghan, Lieberman, & Mullan, 1981; Sturgeon et al., 2016). Daily stressors can elicit physiological processes akin to those elicited by acute stressors, characterized by short spikes in arousal. However, research suggests that daily stressors also may be associated with sustained physiological arousal through prolonged worry (Brosschot, Van Dijk, & Thayer, 2007), which in turn is associated with poorer sleep quality and ultimately higher rates of mortality (Dew et al., 2003).

Whereas the empirical evidence linking stress with poor health outcomes is very consistent in the literature, the evidence linking SES with stress is less clear. Some of the variability in findings across studies may be due to use of different indicators of SES. As

the RCM proposes that stress is a factor ultimately linking SES with health, levels of stress should be inversely related with SES. The literature does suggest that lower SES vs. higher SES individuals experience greater exposure to stressful life experiences (Dohrenwend 1973; Lazarus, 1966; Pearlin, 1989; MacLeod et al. 1991; Murrell & Norris, 1991; Myers, Lindenthal, & Pepper, 1974; Stansfeld, Head, & Marmot, 2000; Turner & Lloyd 1999; Turner, Wheaton, and Lloyd 1995). Of the three measures of SES, income is most strongly and consistently related with exposure to difficult life events (e.g. job loss, illness) (MacLeod et al., 1990), whereas the evidence is more mixed when SES is measured by education or occupation. For example, a study by Grzywacz, Almeida, Neupert, & Ettner (2004) found a *positive* relation between education and exposure to daily stressors. One possibility for this unexpected finding is that individuals with greater educational attainment may face increased daily pressures and demands if they hold prestigious occupational positions (Kristensen, Borg, & Hannerz, 2002; Marmot, Bosma, Hemingway, Brunner, & Stansfeld, 1997). Another possibility is that lower SES individuals may become desensitized to daily stressors in the face of cumulative adversity (Grzywacz et al, 2004). The varied methods used to assess stress and SES makes generalizing findings difficult, but studies that have used income as a measure of SES have provided the most consistent evidence in support of the RCM, linking SES inversely with stress.

The literature also provides evidence that lower SES individuals are more vulnerable to experience the negative effects of stress, such that lower-SES individuals experience more emotional distress than higher SES individuals in response to the same levels of stress (Almeida et al., 2005; Brown & Harris, 1978; Brown, Bhrolchain, &

Harris, 1975; Gallo & Matthews, 2003; Grzywacz et al., 2004; Kessler, 1979; Kessler & Cleary, 1980; McLeod & Kessler, 1990; Pearlin, 1989; Turner & Noh, 1983). However, the findings in the literature are mixed depending on the methods used to assess both SES and stress. With regard to the measurement of SES, in a daily diary study that measured stress-related processes, SES as measured by education was found to be inversely related with individuals' perceptions that their stressors were 'severe' and with subsequent reports of mental and physical health symptoms (Almeida et al., 2005; Grzywacz et al., 2004). By contrast, some studies have found positive relations between SES and emotional distress when SES was measured according to occupational rank or prestige, possibly due to increased workplace pressures and demands (Gallo, Bogart, Vranceanu, & Matthews, 2005; Matthews et al., 2000; Gallo & Matthews, 2003; Kristensen, Borg, & Hannerz, 2002; Marmot, Bosma, Hemingway, Brunner, & Stansfeld, 1997). In a similar vein, when stress is measured by exposure to major life events, vulnerability to emotional distress is inversely related with SES. However, when stress is measured according to daily stressors, the findings are mixed. Two daily diary studies found evidence of increased vulnerability to experiencing distress in response to daily stressors among lower SES vs. higher SES individuals (Gallo & Matthews, 2003; Almeida et al., 2005), whereas two others found no association (Gallo et al., 2005; Sturgeon et al., 2016).

According to the RCM, one reason that lower versus higher SES individuals may be more likely to experience distress in response to stressors is due to deficits in reserve capacity. Indeed, SES is inversely related with the quantity and quality of tangible (e.g. monetary resources; Thoits, 1995), interpersonal (e.g. social support; Cohen et al., 1998; Gracia, Garcia, & Musitu, 1995; Lachman & Weaver, 1998; Marmot et al., 1997;

Matthews et al., 1989; Mirowsky, Ross, & Willigen, 1996; Ranchor et al., 1996), and intrapersonal resources (e.g. self-efficacy; Boardman & Robert, 2000; Cohen et al., 1999; Gallo & Matthews, 2003; Lachman & Weaver, 1998; Marmot, et al., 1997; Matthews et al., 1989; Mirowsky et al., 1996; Ranchor et al., 1996, Staples et al., 1984; Tigges, Browne & Green, 1998). However, the exact role of the reserve capacity is unclear. As previously stated, the RCM hypothesizes two ways in which reserve capacity levels are involved in the model linking SES with health outcomes, as a moderator and as a mediator.

One hypothesis is that the reserve capacity moderates the relation between stressful experiences and emotional and cognitive reactions, which then impact pathways linked with health outcomes. Indeed, some research has found that interpersonal and intrapersonal resources, including social support and self-efficacy, are protective against the impact of daily stress on physical and mental health problems (DeLongis, 1988; Holahan et al., 1984). There is also some support for the second hypothesis, that reserve capacity mediates the relation between SES and downstream processes related to physical health (Avendano et al., 2006; Bailis, Segall, Mahon, Chipperfield & Dunn, 2001; Bosma, Schrijvers, & Mackenbach, 1999; Liu, Hermalin, & Chuang, 1998; Matthews et al., 2008). For example, one study using daily diaries indicated that individuals' reserve capacity (composite of global measures of mastery, self-esteem, dispositional optimism, and perceived social support) partially mediated the relation between SES and daily affect (Gallo, Bogart, Vranceanu, & Matthews, 2005). By contrast, the study found no evidence that the individuals' reserve capacity moderated or buffered the relation between daily interpersonal stress and affect. These findings suggest that one's global

reserve capacity may impact daily affect more directly, rather than by protecting individuals against the effects of daily stressors.

It is unclear, however, how these relations would vary if the reserve capacity was conceptualized and measured as a bank of resources that fluctuate daily in response to daily stressors. Thus far, there have been no studies to the best of my knowledge that have conceptualized reserve capacity as fluid from day to day. This may be because, consistent with prior research, the reserve capacity is thought to represent a generalized underlying bank of stable resources that varies between individuals based on SES (Gallo, Bogart, Vranceanu, & Matthews, 2005; Hobfoll, 2001). However, the broader literature does suggest that resources included in the reserve capacity, including self-efficacy and perceived social support, do fluctuate within-day, after controlling for baseline levels of resources (Shiffman et al., 2000; Song, Graham-Engeland, Mogle, & Martire, 2015; Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2009).

What might be the source of fluctuations in daily levels of perceived reserve capacity? Although the literature is limited, changes in daily stress may represent a predictor of daily levels of perceived reserve capacity. Bandura (1982) asserts that experience or “enactive mastery” represents the primary source by which we perceive our level of self-efficacy. Succeeding or failing to navigate a challenging situation provides individuals with information about their competency to face stressors moving forward. Indeed, Bandura demonstrated the ability to induce varying levels of self-efficacy by exposing individuals to tasks with varying levels of difficulty. In the study (Bandura, 1982), level of self-efficacy was positively related to the percentage of successful performance on tasks, at the between and within-individual level. Furthermore, a study

investigating processes in adjustment with aging found that the frequency of daily hassles was negatively correlated with participants' self-efficacy (Holahan, Holahan & Belk, 1984). Therefore, it is possible that facing a financial stressor, such as worrying about the ability to pay rent, may influence one's daily concept of self-efficacy for individuals who have experienced financial failures in the past.

A similar pattern emerges regarding fluctuations in individuals' perception of stress and social support. One study found that social support seeking and subsequent perception of support mediated the relation between daily stressors and depressed mood, such that participants who perceived inadequate levels of social support reported increased depressed mood, whereas participants who perceived adequate levels of social support reported decreased mood (Frison & Eggermont, 2015). Of note, the cross-sectional nature of these studies prohibits the ability to assert causation in these processes, and directionality of these factors should be interpreted with caution. Put together, these findings suggest that daily reductions in perceived reserve capacity may only occur among individuals with existing deficits in reserve capacity.

Although there is evidence that stress and psychosocial resources play a role in the process through which SES is linked to health outcomes, more research needs to be done to understand the nuances within the framework of the reserve capacity model. One way this may be accomplished is by looking at daily processes of stress and worry, reserve capacity resources, and physical health symptoms to understand the ways in which these processes play out in everyday life. Furthermore, much of the research on the RCM has used healthy participants, making it difficult to generalize findings to chronically ill populations. The most prevalent chronic health problem facing the adult

population is chronic pain (Institute of Medicine, 2011). Despite the enormous personal and societal costs exacted by chronic pain, there is very little research that explores the underlying processes that account for socioeconomic differences in mental and physical health outcomes for individuals with chronic pain.

Chronic Pain and Financial Stress

Chronic pain is a condition marked by unpleasant sensory and affective experiences, lasting longer than three months (Merskey & Bogduk, 1994). Chronic pain may be a symptom of a physical condition or may be absent of a detectible organic cause, labeled “idiopathic” or “benign” pain. Individuals with chronic pain conditions face poorer outcomes than the healthy population in multiple domains. The literature consistently demonstrates that chronic pain is associated with increased rates of depression and anxiety (Burke, Mathias, & Denson, 2015; Demyttenaere et al., 2006; McWilliams et al., 2004; Tsang et al., 2008); for example, primary care patients with chronic pain are four times more likely to have co-morbid anxiety and depression than pain-free patients (Lepine & Briley, 2004). Research also suggests that chronic pain is associated with interpersonal problems (Haythornthwaite & Benrud-Larson, 2000), poor productivity and work attendance (Smith et al., 2001; Stewart et al., 2010), and interference with physical functioning (Douglas & Bope, 2004).

Identifying pathways associated with poor outcomes among chronic pain patients is important because chronic pain is pervasive and costly. A recent survey of a nationally representative sample found that nearly 56% of American adults report experiencing pain within the last three months, and 11.2% or 25.3 million adults reported experiencing chronic daily pain (Nahin, 2015). The pervasiveness of chronic pain among U.S. adults

leads to an economic burden of \$560-\$635 billion in annual costs resulting from additional health care costs and lost worker productivity (Gaskin & Richard, 2012). This annual cost is larger than the annual costs for other prominent chronic conditions, including heart disease, cancer, and diabetes (Gaskin & Richard, 2012). These figures provide evidence of a growing need to identify ways in which chronic pain patients can maintain their functioning and quality of life.

Like other medical conditions, individuals with chronic pain versus those without pain are disproportionately less educated (Smith et al., 2001), have lower incomes (Verhaak et al., 1998), and are more likely to work in less prestigious jobs (Andersson et al., 1993), or to be unemployed (Smith et al., 2001). In addition, chronic pain combined with low SES has additive detrimental effects. Among individuals with chronic pain, SES is inversely related to pain severity and pain-related disability, and is positively related to quality of life (Andersson, 1993; Blyth et al., 2001; Fuentes et al., 2007; Gerstle et al., 2001; Portenoy et al., 2004; Riskowski, 2014; VonKorff et al, 1990). These findings are consistent with the RCM, but they need to be interpreted with caution due to the cross-sectional nature of the data.

In terms of pathways linking SES with symptoms of chronic pain, the RCM would suggest that lower SES is related to worse physical health symptoms among those with chronic pain due to heightened exposure to stress and heightened vulnerability to the adverse effects of stress relative to their higher SES counterparts. According to the literature, lower SES individuals with chronic pain are more likely to experience one type of stressor relative to their higher SES counterparts: financial stressors (Blank & Burstrom, 2002). Financial stressors are particularly of interest, as they are reported to be

one of the most frequently experienced stressors among middle-aged adults, especially among individuals with low income (Almeida et al., 2005; Kanner, Coyne, Schaefer, & Lazarus, 1981; Lepore, Evans, & Schneider, 1991). Focusing on the impact of *daily* financial stressors (e.g., inability to afford a bill) as opposed to major financial events is also of particular importance, because existing evidence suggests that individuals with chronic pain conditions are more susceptible to poorer health outcomes when encountering smaller rather than larger stressors (McEwen, 1998; Wheaton, 1994; Zautra, Burleson, Matt, Roth, & Burrows, 1994; Zautra, Hamilton, & Burke, 1999). Daily stressors, however, are not independent from other types of stressors. Research suggests that chronic strains exacerbate the effects of daily stressors on health outcomes, and that daily financial stressors are most predictive of poor health when they are experienced chronically (Lepore, Evans & Palsane, 1991; Serido, Almeida, & Wethington, 2004). These findings are consistent with the RCM's assertion that stressors have a greater impact on subsequent health when experienced under chronically stressful conditions associated with low SES.

Although the literature is limited, there has been some research examining the links between financial stress and symptom outcomes relevant to chronic pain populations. One hypothesis in the literature is that stressors and worry related to economic instability may play a role in worsening pain symptoms. A recent study by Chou, Parmar, & Galinsky (2016) indicated that experimentally induced economic worry predicted subsequent increases in physical pain and reduced pain tolerance in healthy individuals. When examining these factors among individuals with chronic pain conditions, however, the results are mixed. A daily diary study among individuals with

chronic pain revealed that participants rated their pain as more severe following daily financial worries, particularly if they also reported significant chronic economic hardship (Rios & Zautra, 2011). By contrast, a weekly interview study of individuals with arthritis found that weeks of increased levels of financial stressors were associated with more general health complaints and higher levels of negative affect, but not more pain; these relations did not vary according to participant income (Skinner et al., 2004). These limited findings suggest that (1) subjective reports of financial worry may be more strongly related to levels of pain than are reports of negative financial events, and (2) the evidence is mixed with regard to whether global financial strain, or low SES, exacerbates the relation between daily financial worries and pain symptoms among individuals with chronic pain.

One mechanism by which daily financial worry may be related to worse physical health symptoms for individuals with chronic pain is through reserve capacity levels. As previously stated, there has been some evidence for the role of the reserve capacity as a mediator linking SES with processes related to health (Avendano et al., 2006; Bailis, Segall, Mahon, Chipperfield & Dunn, 2001; Bosma, Schrijvers, & Mackenbach, 1999; Gallo et al., 2005; Liu, Hermalin, & Chuang, 1998; Matthews et al., 2008), but the evidence is limited with regard to whether the model applies to short term, daily processes, and whether this model applies to individuals with chronic health conditions, like chronic pain. More simply, there is no clear indication that individuals' reserve capacity mediates the links between daily financial worry and physical health symptoms among individuals with chronic pain. However, the literature does provide some indication for piecemeal associations related in this model. For example, the literature

suggests a positive association between daily financial stressors and negative interpersonal events among middle-aged adults (Sturgeon et al., 2014); although not a component of individuals' reserve capacity, negative interpersonal events may overlap with the absence of positive interpersonal support in terms of their consequences on emotional well-being (Zautra, Johnson, & Davis, 2005). Furthermore, daily measures of social support among those with chronic pain have been found to predict next-day levels of pain (Feldman, Downey, & Schaffer-Neitz, 1999). Therefore, it is plausible that individuals' reserve capacity serves as a mechanism by which daily financial worry translates into worsening pain symptoms.

The current study seeks to address several gaps in the literature. First, it seeks to test whether the RCM applies to daily processes, including the conceptualization of reserve capacity variables as fluctuating entities within-day, and whether these daily processes vary according to individuals' broader socioeconomic standing. Second, it examines the RCM among individuals with chronic pain, and in particular, its ability to predict exacerbations of the physical health symptoms of pain and fatigue. Third, it targets daily financial worry as potent perceived stressor in the model that is linked with downstream markers of physical health.

Proposed Model & Hypotheses

The present study explored the relations between daily financial worry and symptom outcomes in a sample of adults with fibromyalgia (FM). FM is a pain condition of unknown etiology that is characterized by widespread musculoskeletal pain, fatigue, and nonrestorative sleep (Fietta & Manganelli, 2007). Among the general population, it is estimated 0.5-5% of adults experience the symptoms of FM, and the vast majority of

them are women (Fietta et al, 2007). Individuals with FM share many characteristics with the general chronic pain population, except that they are more likely to experience psychological distress and co-morbid anxiety and depression than those without FM (Fietta et al., 2007).

Because individuals with FM are an even more vulnerable subset of the adult population with chronic pain, they are an important sample in which to explore issues related to SES, daily financial worry, and physical well-being. To best capture SES, the present study will use income as a marker. Although all three measures (i.e., income, education, job status) capture aspects of social status, they are only moderately correlated with one another (Braveman, Cubbin, Marchi, Egerter, & Chavez, 2001). For example, higher education is generally related to better economic outcomes, but it is only moderately correlated with income (APA Task Force on Socioeconomic Status, 2007). Using occupational status or prestige is another way to assess economic standing, but may be problematic in investigations involving aging or physically limited populations, as unemployment status may simply reflect retirement or disability. Income then, as opposed to educational attainment and occupational status, may best capture lack of monetary resources in an aging and disabled sample.

Using the theoretical guidance provided by Reserve Capacity Model (RCM), as well as findings in the existing literature, the hypotheses of the current study were that:

- (1) Participants' income levels will be negatively associated with the proportion of days with financial stressors and mean ratings of financial worry over the course of 21 days.

- (2) On days when participants report above-average levels of financial worry, they will also report greater levels of pain and fatigue.
- (3) The relation between daily financial worry and daily levels of pain and fatigue will be stronger for participants with lower versus higher income levels (Figure 2).
- (4) Daily levels of coping efficacy and satisfaction with social support will mediate the relations between daily financial worry and daily levels of pain and fatigue, but only for participants with income levels less than or equal to the group median relative to participants with income levels greater than the group median (Figure 3).

Methods

Participants

Participants were recruited through physician referrals, fibromyalgia support groups, and print and online advertisements for participation in an intervention study for individuals with fibromyalgia based in the Phoenix metropolitan area. Interested participants were screened for the following inclusionary criteria: 1) aged 18 to 72 years old; 2) self-reported pain lasting at least three months in at least three of the four quadrants of the body, or within two quadrants of the body with additional and significant fatigue and sleep disturbance; and 3) pain in at least 11 of 18 tender points, verified by a research nurse using the American college of Rheumatology criteria. Exclusion criteria included: 1) diagnosis of an autoimmune or neuropathic disorder; 2) involvement in litigation related to pain; and 3) participation in another clinical trial, research study, or counseling program for pain or depression.

Procedure

Participants were initially screened by phone, and those who met initial eligibility criteria completed an in-home evaluation that included a tender point exam conducted by a registered nurse to confirm diagnosis of FM. Interested participants who met all eligibility criteria were consented and given an initial questionnaire packet to gather information on participants' physical health, emotional health, and pain. Participants were then contacted by telephone to complete an interview about psychological health and life events, followed by a laboratory assessment to assess physiological and emotional reactions to stimuli. Following the completion of these measures, participants completed daily diary reports for 21 days to assess functional, affective, cognitive, and social factors related to managing FM. Upon the completion of the daily diaries, participants were randomly assigned to a treatment condition that lasted 7-weeks. Finally, participants completed a post-intervention assessment, as well as follow-up questionnaires at six and twelve-months.

Seven hundred and sixteen individuals were screened by phone, and of those, 444 did not meet inclusion criteria, primarily due to lack of interest and/or time to complete the requirements of the study. Two hundred and seventy two participants were enrolled into the study, but 52 individuals dropped from the study after the enrollment mainly due to their time constraints. Thus, a total of 220 individuals will be included in the proposed study sample.

The daily diary reports consisted of questions relating to participants' daily emotions, pain cognitions, coping strategies, functional health, physical symptoms, and interpersonal relations. Prior to the start of the daily diaries, study members provided

participants with a cell phone and trained them how to complete the diaries. Four times a day for 21 days, an automated phone system called each participant to facilitate the diary. Calls were timed to occur 30 minutes after awakening, and at 11 am, 4 pm, and 7 pm. If calls were missed, the participants had the opportunity to call the system back within two and a half hours to complete the diary. Failure to do so resulted in a missed diary record for that time period for that day. Calls and diary records were closely monitored by the research team to ensure proper functioning of the call system, as well as adherence to completing the diaries. Participants were paid \$2 for each day that they completed the diaries, with an additional \$1 for daily rates of completion exceeding 50%.

The current study used income data from the initial questionnaires and financial worry, coping efficacy, support satisfaction, and symptoms data from the end-of-day reports from the pre-intervention daily diaries. Analyses of the daily diary data allowed for the examination of within-person processes, including the examination of daily financial worry. This method allowed for the following question to be asked: “*When* individuals are experiencing financial worry, do they exhibit higher levels of pain and fatigue than when they are not worrying about finances?”

Measures

Appendix A includes all measures contained in the current study.

Income. Income was measured during the initial interview with participants prior to the administration of the daily dairies. Participants checked one of nineteen boxes containing an income range from box 1, indicating “under \$3,000” to box 19, indicating “\$150,000 and over”. Participants’ incomes were coded from 1 to 19 based on their reported income.

Daily financial worry. Daily financial worry was assessed using one item with the question, “Overall, how much did you worry about finances today?” Participants answered on a scale of 1 to 5, with 1 being “not at all” and 5 being “completely.” The intraclass correlation (ICC) for this variable is .55, indicating that 55% of the variance in financial worry is between-person variance (level 2), and 45% is within-person variance (level 1).

Daily financial stressors. Daily financial stressors were assessed using a single diary item with the question, “Did you have any financial stressors today?” Participants answered either yes or no. The ICC for this variable is .31.

Daily pain severity. Daily pain was assessed using one item in the daily diary with the question, “What was your overall level of pain today?” Participants answered on a scale between 0, indicating “no pain” and 100, indicating “pain as bad as it can be”. The ICC for this variable is .54.

Daily fatigue. Daily fatigue was assessed using one item in the daily diary with the question, “What was your overall level of fatigue today?” Participants answered on a scale between 0, indicating “no fatigue” and 100, indicating “fatigue as bad as it can be”. The ICC for this variable is .57.

Reserve capacity: Coping efficacy. Coping efficacy was assessed with a diary item related to coping with stressful life events. Participants were first asked to identify and rate the difficulty in coping with the most stressful event of that day. They were then asked, “If you had a similar experience again, how certain are you that you would be able to cope well with its negative aspects?” Participants answered on a scale of 1, indicating “not at all” to 5, indicating “completely”. The ICC for this variable is .46.

Reserve capacity: Daily satisfaction with social support. Satisfaction with social support was assessed using a mean composite of two items measuring the degree to which participants felt satisfied with the support they received from their spouse/partner, and from family, friends, and co-workers in coping with their most stressful event of the day. Participants rated each question on a scale from 1, “not at all”, to 5, “completely” satisfied. Satisfaction with support from spouse and with others for most stressful daily event were correlated at .38. The ICC for this composite is .47.

Data Analytic Plan

The data are multilevel: repeated measures across days (level 1) are nested within individuals (level 2). Therefore, multilevel modeling was employed to test study hypotheses. Multilevel modeling is a useful approach for diary data because it makes use of all available data; thus, even individuals with missing data are included in analyses.

Level 1 variables for the study include: daily financial worry, daily financial stressors, daily pain severity, daily fatigue, daily coping efficacy, and daily satisfaction with social support. The predictor variable, daily financial worry, was person-centered (i.e., each individual’s mean over the course of the diary assessment was subtracted from each daily score). This allowed for the disaggregation of the between-person variation from the within-person variation, thus creating a variable that represents “when” a person is experiencing more or less financial worry than his or her average level. Centering this variable was also useful because it allowed for the intercept in the regression model to represent the value of the outcome when an individual’s daily financial strain was at its mean level. Daily coping efficacy and satisfaction with social support were also person-centered when modeled as predictors during the mediational analyses. Income was a

Level 2 variable in the present study, and each participant's income score was grand mean centered, meaning the grand mean income of the sample was subtracted from each participant's income score. Analyses were conducted in IBM SPSS Software, Version 24.

Correlational analyses were used to test whether income levels were related to each participant's proportion of days with financial stressors and mean ratings of financial worry over the course of 21 days. These relations were also tested with regression analysis to account for the variance in daily financial worry and daily stressors attributed to participant age and gender. The following equations reflect this hypothesis.

Hypothesis 1:

$$\text{Mean Daily Financial Worry}_i = \beta_0 + \beta_1 \text{Income}_i + \beta_2 \text{Age}_i + \beta_3 \text{Gender}_i + r_i$$

$$\text{Proportion of Days with Financial Stressor(s)}_i = \beta_0 + \beta_1 \text{Income}_i + \beta_2 \text{Age}_i + \beta_3 \text{Gender}_i + r_i$$

In the first equation, β_0 represents the level of daily financial worry for participants whose income level and age are equal to the group averages, and for participants who are female (gender was dummy coded: 0 = female, 1 = male). β_1 represents the slope of the relation between income and daily financial worry, β_2 represents the slope of the relation between age and daily financial worry, and β_3 represents the slope of the relation between gender and daily financial worry. Finally, r_i represents the residuals, or the difference between the observed and predicted mean daily financial worry score for each individual.

In the second equation, β_0 represents the proportion of days with financial stressors for participants whose income level and age equal the group averages, and for participants who are female (gender was dummy coded: 0 = female, 1 = male). β_1

represents the slope of the relation between income and proportion of days with financial stressors, β_2 represents the slope of the relation between age and proportion of days with financial stressors, and β_3 represents the slope of the relation between gender and proportion of days with financial stressors. Finally, r_i represents the residuals, or the difference between the observed and predicted proportion of days with financial stressors for each individual.

The remaining hypotheses used multi-level regression analysis. The models specified a first-order autoregressive covariance structure to represent decreasing strength in covariance of observations across time. The second hypothesis predicted that change in daily financial worry would be negatively associated with same-day pain severity and level of fatigue. The third hypothesis predicted that each relation would be stronger among individuals with lower income levels relative to individuals with higher income levels. The following equations reflect these hypotheses, using daily fatigue as the outcome variable.

Hypotheses 2 and 3:

Model 1:

$$\text{Level 1. } \text{Daily fatigue}_{ij} = \beta_{0j} + \beta_{1j} \text{Change in daily financial worry}_{ij} + r_{ij}$$

$$\text{Level 2. } \beta_{0j} = \gamma_{00} + u_{0j}$$

$$\beta_{1j} = \gamma_{10}$$

Model 2:

$$\text{Level 1. } \text{Daily fatigue}_{ij} = \beta_{0j} + \beta_{1j} \text{Change in daily financial worry}_{ij} + r_{ij}$$

$$\text{Level 2. } \beta_{0j} = \gamma_{00} + \gamma_{01} \text{Income}_j + u_{0j}$$

$$\beta_{1j} = \gamma_{10} + \gamma_{11} \text{Income}_j$$

In the level 1 equations, β_{0j} represents the level of daily fatigue when there is no change in daily financial worry for each individual (i.e., person-level intercepts), β_{1j} represents the average change in daily level of fatigue for every one unit increase in daily financial worry for each individual (i.e., person-level slopes), and r_{ij} represents the difference between the observed and predicted fatigue scores within individual (i.e. person-level residuals). In the level 2 equations for Model 1, γ_{00} represents the average level of fatigue for participants whose average level of daily financial worry equals that of the group mean (i.e., grand mean intercept), γ_{10} represents the average change in daily level of fatigue for every one unit increase in daily financial worry across participants (i.e., grand mean slope), and u_{0j} represents the proportion of each participant's intercept that cannot be predicted by his/her average level of daily financial worry (i.e., person-level residuals).

In the level 2 equations for Model 2, γ_{00} represents the average level of fatigue for participants whose income level equals the average income level across participants (i.e., grand mean intercept), γ_{01} represents how much the intercept (β_{0j}) changes as the income increases by one unit, γ_{10} represents the average change in daily level of fatigue for every one unit increase in daily financial worry for participants whose income level equals the average group income level, γ_{11} represents the relation between income and the slope linking change in financial worry and fatigue, and u_{0j} represents the proportion of each participant's intercept that cannot be predicted by his/her level of income (i.e., person-level residuals).

The fourth aim of the study was to examine whether daily variations in coping efficacy and satisfaction with social support could account for the relations between daily

financial worry and daily levels of pain and fatigue among low versus high income participants in the sample. To test whether the indirect effect varied as a function of individuals' income, participants were split at the median into low and high-income groups and analyses were conducted separately for each. Mediation analyses were conducted using the product-of-coefficients method (Krull & MacKinnon, 2001) and RMediation (Tofighi & MacKinnon, 2011). The first analysis examined whether daily financial worry was associated with the proposed mediators in separate models (i.e. coefficient *a*). The second analysis examined whether each mediator was associated with daily levels of pain or fatigue, accounting for daily financial worry in the model (i.e. coefficient *b*). If both paths were significant, RMediation was used to estimate the indirect effects and confidence intervals of each mediated effect.

Hypothesis 4 (Product-of-coefficients method; Krull & MacKinnon, 2001):

Testing the *a* path:

$$\text{Level 1. } \textit{Coping efficacy}_{ij} = \beta_{0j} + \beta_{1j} \textit{Change in daily financial worry}_{ij} + r_{ij}$$

$$\text{Level 2. } \beta_{0j} = \gamma_{00} + u_{0j}$$

$$\beta_a = \gamma_{10}$$

Testing the *b* and *c* ' paths:

$$\text{Level 1. } \textit{Daily fatigue}_{ij} = \beta_{0j} + \beta_{1j} \textit{Change in daily financial worry}_{ij} + \beta_{2j} \textit{Coping Efficacy}_{ij} + r_{ij}$$

$$\text{Level 2. } \beta_{0j} = \gamma_{00} + u_{0j}$$

$$\beta_{1j} = \gamma_{101}$$

$$\beta_{2j} = \gamma_{102}$$

In the equations testing the *a* path, β_{0j} represents the level of daily coping efficacy when there is no change in daily financial worry for each individual (i.e., person-level intercepts), β_{1j} represents the average change in daily level of coping efficacy for every

one unit increase in daily financial worry for each individual (i.e., person-level slopes), and r_{ij} represents the difference between the observed and predicted average daily coping efficacy scores within individual (i.e. person-level residuals). In the level 2 equations, γ_{00} represents the average level of coping efficacy for participants whose average level of daily financial worry equals that of the group mean (i.e., grand mean intercept), γ_{10} represents the average change in daily level of coping efficacy for every one unit increase in daily financial worry across participants (i.e., grand mean slope), and u_{0j} represents the proportion of each participant's intercept that cannot be predicted by his/her average level of daily financial worry (i.e., person-level residuals).

In the equations testing the b and c' paths, β_{0j} represents the level of daily fatigue when there is no change in daily financial worry or daily coping efficacy for each individual (i.e., person-level intercepts), β_{1j} represents the average change in daily level of fatigue for every one unit increase in daily financial worry for each individual (i.e., person-level slopes), β_{2j} represents the average change in daily level of fatigue for every one unit increase in daily coping efficacy for each individual (i.e., person-level slopes), and r_{ij} represents the difference between the observed and predicted fatigue scores within individual (i.e. person-level residuals). In the level 2 equations, γ_{00} represents the average level of fatigue for participants whose average level of daily financial worry and daily coping efficacy equals those of the group means (i.e., grand mean intercept), γ_{101} represents the average change in daily level of fatigue for every one unit increase in daily financial worry across participants (i.e., grand mean slope), γ_{102} represents the average change in daily level of fatigue for every one unit increase in daily coping efficacy across participants (i.e., grand mean slope) and u_{0j} represents the proportion of each participant's

intercept that cannot be predicted by his/her average level of daily financial worry and daily coping efficacy (i.e., person-level residuals).

To evaluate model fit, main effects models predicting physical health symptoms from centered daily financial worry were modeled separately, first with random intercepts only and then with random intercepts and slopes. In separate models predicting level of pain and fatigue by change in daily financial worry, the estimates of the variance of intercepts were significant in both the random intercept-only models (pain: Wald $Z = 9.87, p < .001$; fatigue: Wald $Z = 9.92, p < .001$) and in the random-intercepts-and-slopes models (pain: Wald $Z = 9.88, p < .001$; fatigue: Wald $Z = 9.93, p < .001$), whereas the estimates of the variance of the slopes were not significant (pain: Wald $Z = -.81, p = .42$; fatigue: Wald $Z = -.51, p = .61$). Regarding the fit indices, the data best fit random intercepts-only models (pain: BIC: 32,457; fatigue: BIC: 32,395) versus random-intercepts-and-slopes models (pain: BIC: 32,466; fatigue: BIC: 34,885) when using the magnitude of the difference of the Bayesian information criterion (BIC) as a guide. Based on these results, all models testing hypotheses 2-4 used random intercepts-only models.

Results

Sample Characteristics

Table 1 summarizes the demographic characteristics of the sample. Participants in the study were mostly female (87.4%), Caucasian (78.0%), married or living with a romantic partner (55.1%), and were employed at least part time (51.6%). The mean age of the sample was 51.3 years ($SD = 11.0$), and the median annual income and level of education were \$30,000-\$39,999 and 1-3 years of college, respectively.

Variable Descriptive Properties and Intercorrelations

Table 2 depicts the descriptive properties and intercorrelations of key variables at the between-person (lower triangle) and within-person (upper triangle) levels. At the between-person level, income was significantly correlated in expected directions with financial strain, pain, fatigue, efficacy, and support. Of note, mean daily financial worry across days was strongly related to proportion of days with financial stressors ($r = .77, p < 0.01$), suggesting a global relation between negative financial events and financial worry. Also, pain and fatigue symptoms were highly correlated ($r = .76, p < 0.01$), which is consistent with previous findings in samples of individuals with FM (Wolfe et al., 2010).

At the within-person level, daily financial worry and daily financial stressors were not significantly correlated with daily levels of pain or fatigue. Days of above-average levels of daily financial worry and financial stressors were moderately related to below average daily coping efficacy ($r = -.12, p < 0.01$; $r = -.07, p < 0.01$, respectively), but only days of increased financial stressors (not worry) were negatively related to daily satisfaction with social support ($r = -.04, p < .05$). In contrast to the strong association at the between-person level, at the within-person level, daily financial worry and daily financial stressors were only moderately correlated ($r = .40, p < 0.01$), suggesting that a day of increased financial worry need not be associated with the occurrence of a financial stressor, and vice versa. The two proposed reserve capacity variables, daily satisfaction with social support and daily coping efficacy, were moderately positively correlated ($r = .29, p < 0.01$), indicating that these resources are distinct and can operate independently within-day. Finally, daily pain and fatigue symptoms were moderately correlated within-day ($r = .50, p < 0.01$).

Tests of Between-person Relations Between Income and Financial Stress

Hypothesis 1 predicted that higher income would be related to fewer daily financial stressors and lower levels of financial worry over the course of the 21 days of diaries. Consistent with this hypothesis, participants' income level was negatively associated with mean number of days with financial stressors ($r = -.25, p < .01$) and with mean rating of financial worry ($r = -.29, p < .001$) over the course of the 21-days (see Table 2). These effects were maintained when tested in regression models that controlled for age and gender (see Tables 3 and 4).

Tests of Within-person Relations of Daily Financial Strain with Symptoms and the Moderating Effect of Income

Multilevel modeling was used to test whether centered daily financial worry was associated with daily levels of pain and fatigue as predicted in Hypothesis 2, and whether these relations were moderated by income level as predicted in Hypothesis 3. Tables 5 (pain) and 6 (fatigue) present findings generated from these models.

Prediction of pain. Contrary to the second hypothesis, days of greater than average daily financial worry were not associated with daily levels of pain ($B = .25, SE = .33, p = .46$) as by the nonsignificant main effect in the model (Table 5, Model 1). Next, the interaction effect between centered daily financial worry and income predicting pain was examined (Table 5, Model 2). Income had a significant main effect on the intercept of pain, indicating that participants with higher versus lower income levels tended to report less pain ($B = -.72, SE = .26, p < .01$). Regarding the interaction effect in the model, income had no significant effect on the financial worry—pain slope, indicating

that the relation between daily pain and daily financial worry did not vary based on level of income.

Prediction of fatigue. Contrary to the second hypothesis, days of greater than average daily financial worry were not associated with daily levels of fatigue ($B = .18$, $SE = .33$, $p = .59$; see Table 6, Model 1). In the interaction model predicting fatigue (Table 6, Model 2), income had a significant effect on the intercept of fatigue, indicating that higher income was associated with less fatigue ($B = -.83$, $SE = .27$, $p < .01$).

Regarding the interaction effect of financial worry with income in the model, income had a significant effect on the slope of the relation between centered daily financial worry and daily levels of fatigue ($B = -.16$, $SE = .06$, $p < .05$). Furthermore, when analyses were repeated controlling for centered daily pain, the interaction effect remained significant ($B = -.11$, $SE = .06$, $p < .05$).

The interaction was probed according to the recommendations of Aiken and West (1991). Two separate multilevel regression analyses were conducted to examine the relation between daily financial worry on daily fatigue at specific levels of income. Income levels at one standard deviation above the group mean and one standard deviation below the group mean ($M = 12.28$, $SD = 4.80$) were used to generate simple slopes for the models (1 *SD* Below= $0.817 * \text{Financial Worry} + 60.0011444$; 1 *SD* Above= $-0.688426 * \text{Financial Worry} + 51.995821$). The simple slopes were used to plot the interaction effect (Figure 4). To test the significance of the simple slopes, *t*-scores were obtained for each simple regression equation, calculated by dividing the unstandardized regression coefficient of the predictor by its standard error. As depicted in Table 7, at one standard deviation above the group mean for income, fluctuations in daily financial

worry were not significantly related to levels of daily fatigue ($t(1, 3358) = -1.42, p = .156$). At one standard deviation below the group mean for income however, above-average daily financial worry was marginally related to greater fatigue ($t(1, 3358) = 1.92, p = .054$). These findings suggest a null relation between daily financial worry and fatigue for participants with higher income levels and a marginally significant positive relation between daily financial worry and fatigue for participants with lower income levels.

In summary, higher income was related to lower levels of pain and fatigue across the 21 daily diary reports, as predicted. However, daily fluctuations in financial worry were unrelated to fluctuations in pain and fatigue, and income level did not interact with financial worry to predict pain, contrary to predictions. Income level did interact with financial worry to predict fatigue, such that at lower but not higher levels of income, increases in financial worry tended to predict greater levels of fatigue.

Examination of relationship status as a covariate. To rule out the possibility that relationship status accounts for the relations between income, financial worry, and fatigue, the model was re-run controlling for relationship status (dummy coded: lives with partner = 1, does not live with partner = 0). Thus, the model predicting fatigue was repeated, this time including income, centered financial worry, relationship status, and the interaction terms centered financial worry X income, and centered financial worry X marital status. Findings showed that partner status had no significant impact on the intercept of daily fatigue or on the slope of the relation between daily financial worry and daily fatigue (Main effect: $B = 3.57, SE = 3.01, p = .24$; Interaction: $B = .32, SE = .80, p = .69$). Moreover, the main effect of financial worry and the financial worry X income

interaction described previously remained significant (Main effect: $B = -1.02$, $SE = .31$, $p < .01$; Interaction: $B = -.17$, $SE = .08$, $p < .05$). These findings indicate that the interaction between daily financial worry and income on daily fatigue is not accounted for by partner status.

Tests of the Within-person Mediation Effects of Reserve Capacity Variables

Mediational analyses were conducted using the product-of-coefficients method (Krull & MacKinnon, 2001) and RMediation (Tofighi & MacKinnon, 2011) to test Hypothesis 4, that the reserve capacity variables of satisfaction with social support and coping efficacy account for the relation between centered daily financial worry and daily pain and fatigue. Tables 8 through 11 present findings generated from these models for low (below the sample median) and high (above the sample median) income groups.

Satisfaction with social support as a mediator. First, relations between centered daily financial worry and satisfaction with social support were probed in separate models based on income group (a paths). Daily satisfaction with social support was not associated with centered daily financial worry for either income group (high income group: $B = -.04$, $SE = .03$, $p = .19$; low income group: $B = -.02$, $SE = .03$, $p = .53$). The nonsignificant a paths preclude the possibility of mediation by social support satisfaction in the daily financial worry→daily symptoms relations for either high or low income groups.

Daily coping efficacy as a mediator. Daily coping efficacy was the second mediator variable tested in this study. Relations between centered daily financial worry and coping efficacy were probed in separate models based on income group (a paths).

For both high and low income groups, centered daily financial worry was associated with daily levels of coping efficacy (high income group: $B = -.11$, $SE = .03$, $p < .001$; low income group: $B = -.12$, $SE = .02$, $p < .001$). The direction of effects suggests that both income groups tend to report lower levels of coping efficacy on days when they are experiencing above-average levels of financial worry.

Next, the b paths were tested to examine whether centered daily coping efficacy was related to daily pain and daily fatigue in separate models for each income group, accounting for centered daily financial worry. For the models predicting daily pain, daily coping efficacy was negatively related to daily levels of pain in each income group, controlling for daily financial worry (high-income group: $B = -2.07$, $SE = .49$, $p < .01$; low-income group: $B = -2.13$, $SE = .52$, $p < .01$). The direction of effects suggests that below-average levels of coping-efficacy are related to greater levels of pain among participants in the sample. The effect of daily financial worry was non-significant in both models (c' paths), indicating the possibility of full mediation (high-income group: $B = -.97$, $SE = .51$, $p = .057$; low-income group: $B = .62$, $SE = .46$, $p = .177$).

RMediation was used to estimate the indirect effects and confidence intervals of each mediated effect with daily pain as the outcome. For both income groups, the indirect effects were significant, indicating that daily coping efficacy fully mediated the relation between daily financial worry and daily levels of pain (see Figure 5). For the high-income group, the estimate of the indirect effect was $B = 0.23$, $SE = 0.08$, $p < 0.01$, 99% CI [0.05 - 0.48]. For the low-income group, the estimate of the indirect effect was $B = 0.26$, $SE = 0.08$, $p < 0.01$, 99% CI [0.10 - 0.50].

Interestingly, the direct effect (c' path) in the high-income group is opposite in sign from the indirect or mediated effect (direct effect: $B = -.97, SE = .51, p = .057$; indirect effect: $B = 0.23, SE = 0.08, p < 0.01$), indicating the presence of inconsistent mediation (MacKinnon, Fairchild, & Fritz, 2007). Furthermore, the null result of the total effect (c path) for the high-income group ($B = -.76, SE = 0.51, p = .14$) indicates that the mediator acts like a suppressor variable. These results suggest that daily financial worry is related to less pain in the high income group, but is also related to less coping-efficacy which in turn is related to elevated levels of pain, indicating that the direct and indirect effects may cancel each other out.

For the models predicting daily fatigue, daily coping efficacy was negatively related to daily levels of fatigue for both income groups, controlling for daily financial worry (high-income group: $B = -1.66, SE = .51, p < .001$; low-income group: $B = -2.26, SE = .50, p < .001$). The effect of daily financial worry remained significant in both models (c' paths), indicating no possibility of full mediation (high-income group: $B = -1.62, SE = .52, p < .01$; low-income group: $B = 1.19, SE = .44, p < .01$).

RMediation was then used to estimate the indirect effects and confidence intervals of each mediated effect for the financial worry \rightarrow fatigue relation for each income group. For the model representing the low-income group, the estimate of the indirect effect was significant ($B = 0.27, SE = 0.08, p < 0.01, 99\% \text{ CI } [0.10 - 0.50]$). For the model representing the high-income group, the estimate of the indirect effect was also significant ($B = 0.18, SE = 0.08, p < 0.01, 99\% \text{ CI } [0.03 - 0.42]$). (See Figure 6).

Similar to the findings for pain, the direct effect (c') and the indirect effect (ab) predicting fatigue were opposite in sign for the high-income group (direct effect: $B = -$

1.62, $SE = .52$, $p < .01$; indirect effect: $B = 0.18$, $SE = 0.08$, $p < 0.01$), indicating the presence of inconsistent mediation (MacKinnon, Fairchild, & Fritz, 2007). However, the indirect effect did not appear to act as a suppressor variable in this model because the total effect of the relation between daily financial worry and daily fatigue in the high income group ($B = -1.44$, $SE = .52$, $p < .01$) was significant. The failure of daily coping efficacy to attenuate the direct effect of daily financial worry to daily fatigue suggests that there are likely to be additional mediators that are not accounted for in the model.

Discussion

The present study used the Reserve Capacity Model (RCM) as a framework to examine the relations between both chronic and acute elevations of financial stress and daily pain and fatigue in individuals with FM. The overall pattern of the current findings suggests that the RCM holds some utility for understanding how daily processes link stress and physical symptoms in chronic pain based on SES. The RCM asserts that one pathway by which low SES is linked with poorer health over time is through exposure to stressors. Consistent with the RCM (and Hypothesis 1), the current findings indicated that individuals with lower income levels reported both more frequent daily financial stressors and more chronic worry about finances than those with higher income levels. A second assertion of the RCM is that SES moderates the relations between stressors and health outcomes. In the present study, when daily pain was modeled as the outcome, findings were not consistent with the RCM (or Hypotheses 2-3), in that higher than usual daily financial worry was not significantly related to fluctuations in daily pain, nor was that relation moderated by SES. However, the findings for the financial worry and daily fatigue relation were consistent with the RCM. That is, lower SES participants reported

greater increases in fatigue on days of more than usual financial worry, whereas higher SES participants in the study did not.

In addition to specifying the moderating effect of SES on the relation between stress and health outcomes, the RCM also theorizes that an individual's level of personal resources, known as reserve capacity, influences the way in which he or she reacts to stressful situations. Thus, individuals with global deficits in reserve capacity, due in part to SES, may be more likely to perceive lower than average immediate levels of coping-efficacy and social support in response to daily financial worry, which may ultimately impact physical health symptoms. When examining the mechanisms by which financial worry may lead to daily fluctuations in pain and fatigue, the RCM would predict that daily reductions in perceived reserve capacity may serve to link daily financial worry with worse physical health symptoms only among individuals with existing deficits in reserve capacity (Hypothesis 4). The findings from this study are partially consistent with this hypothesis. One reserve capacity resource, daily satisfaction with social support, was not found to mediate the link between daily financial worry and physical health symptoms. The second resource examined, coping-efficacy, did mediate the link between daily financial worry and both pain and fatigue, regardless of income level. Put another way, on days when participants reported worrying more than average about their finances, they also reported feeling less efficacious in coping with the stressful events of the day, which in turn, predicted higher levels of pain and fatigue. The fact that these relations held regardless of income level is not consistent with the RCM (or Hypothesis 4). Of note, coping-efficacy fully mediated the relation between daily financial worry and daily pain, suggesting that it may be the loss of a sense of efficacy that accounts for the

increased pain in the face of acute financial stress. By contrast, coping-efficacy partially mediated the relation between daily financial worry and daily fatigue, suggesting the presence of other mediators in the daily worry and fatigue relation. However, the lack of temporal precedence in the current design constrains the interpretation of these relations as reflecting true mediation versus statistical mediation.

The RCM is a framework that was developed to address the long term processes whereby SES impacts health. Indeed, the current findings at the between-person level are consistent with several of the major tenets of the RCM in this chronic pain sample. Income was negatively related to not only exposure to financial stress but also to pain and fatigue. The findings with regard to the income-symptoms relations are in line with the literature that demonstrates that low SES individuals with chronic pain experience more severe physical health symptoms compared to their higher SES counterparts (Andersson, 1993; Blyth et al., 2001; Fuentes et al., 2007; Gerstle et al., 2001; Portenoy et al., 2004; Riskowski, 2014; VonKorff et al., 1992). In addition, current findings indicated that income was positively related to the reserve capacity indices of social support satisfaction and coping efficacy, consistent with existing evidence highlighting the relative lack of psychosocial resources among individuals of lower SES (Baum et al., 1999; McLeod & Kessler, 1990; Sturgeon et al., 2014).

The extent to which the RCM applies to more acute, daily processes among those in chronic pain, however, is less clear. One pattern of findings in the present study points to the relation between above-average daily financial worry and increased fatigue among low, but not high, SES individuals, aligned with predictions based on the RCM. This is the first study to examine daily fatigue as an outcome when examining the importance of

economic factors in the management of chronic pain. Although much focus of FM research has been placed on pain rather than fatigue, fatigue is one of the prominent and disabling symptoms in FM. Epidemiological studies have reported that between 78% and 94% of individuals with FM complain about fatigue (Wolfe, Hawley, & Wilson, 1996). Thus, elaborating the nature of the daily relations among chronic and acute economic strain and fatigue within an RCM framework can help increase understanding of how economic strain may fuel disability over the long term.

Interestingly, fluctuations in financial worry did not predict daily level of pain in the current study, either in the sample as a whole or conditioned on level of income. These findings are partially in accordance with a weekly interview study that found that increased levels of financial stressors were related to more physical health complaints (including fatigue) but were unrelated to levels of pain in arthritis patients (Skinner et al., 2004). However, this study of arthritis patients did not find participant income to moderate the financial stressor-symptom relations (including fatigue). One possible explanation for the discrepant findings between the current study and Skinner et al., (2004) is that including fatigue in a composite count of somatic symptoms may have masked the moderating effects of income on the stress—fatigue relation. A second diary study examined the moderating effect of chronic financial hardship on the relation between daily financial worry and pain in individuals with chronic pain (Rios & Zautra, 2011). They found that financial worry was positively related to levels of pain, particularly among those individuals who experienced chronic economic hardship. These findings suggest that measures of SES that focus on chronic financial hardship may be especially useful for capturing aspects of SES that are central to the RCM model.

Another consideration when examining relations between stress and health is the way in which stress is measured. The RCM asserts that stressors are linked with cognitions and affect about the stressor that are ultimately linked with poorer health. The current study used a subjective measure of stress, daily financial worry, rather than an objective report of daily financial stressors as a predictor of physical symptoms because it may be a more robust predictor of health. According to the literature, worry is one mechanism by which stressors are associated with prolonged physiological arousal (Brosschot, Van Dijk, & Thayer, 2007), a bodily stress response linked with health outcomes. The existing literature has used both stressors and perceived stress as predictors of physical health symptoms, with mixed results. Skinner and colleagues (2004) failed to find income as a moderator linking financial stressors with physical health symptoms. By contrast, Rios and Zautra (2011) found that greater economic hardship strengthened the financial worry—pain relation. When taken with the current findings, the evidence is mixed, but is consistent with the theory that lower versus higher SES individuals are more reactive to stressors (Brown & Harris, 1978; Dohrenwend, 1973), and that subjective appraisals of stress may help us understand socioeconomic disparities in health.

Mediational processes included in the RCM were also examined in the present study to identify whether individuals' reserve capacity levels could account for the relations between stress and physical health symptoms on a within-day basis for individuals with chronic pain. For both high and low income groups, daily reductions in coping efficacy fully accounted for the relation between increased daily financial worry and pain, and partially accounted for the relation between increased daily financial worry

and fatigue. These findings suggest that at least some reserve capacity resources fluctuate across days (Bakker et al., 2009; Shiffman et al., 2000; Song et al., 2015) and that facing daily financial stress may reduce individuals' sense of efficacy due to the perception of failure with regard to navigating financial situations (Bandura, 1982). This explanation is informed by the RCM's theory that stressors impact downstream health processes through the evaluation of one's reserve capacity, but the directionality of these relations in the current data cannot be evaluated. In the present study, financial worry was conceptualized as a stressor, but it may also represent a consequence of one's appraisal of reserve capacity resources. If this were the case, an alternative explanation for the findings under the RCM is that that fluctuation in perception of one's reserve capacity may cause individuals to engage in financial worry, and to subsequently experience greater pain and fatigue. Regardless, the findings from the mediational analyses are not consistent with the RCM, as they suggest that daily relations between stress and health are similar across income groups. The magnitude of the indirect effects in the low income group appeared comparable to those in the high income group, but further tests are needed to confirm that the groups were not significantly different.

An unexpected finding in the current study was that the relations between financial worry and fatigue were positive for low SES individuals, as expected, but negative for high SES individuals. Specifically, participants in the study with income levels below the group median reported more fatigue on days of elevated financial worry, whereas participants with income levels above the group median reported *less* fatigue on days with elevated financial worry, even when accounting for daily coping efficacy (i.e. direct effect). As previously stated, however, the indirect or mediational effect for the

high income group indicated that reductions in coping efficacy partially mediated the positive relation between daily financial worry and daily fatigue. The reason for this discrepancy is unknown, but such findings are referred to in the literature as inconsistent mediation (MacKinnon et al., 2007). Given that daily changes in coping efficacy did not attenuate the relation between above-average daily financial worry and reduced same-day fatigue, it is likely that an alternative mediator is at play. One possibility is that participants with higher income levels felt less fatigue following daily financial stress because they felt mobilized to solve the financial problem, as the literature suggests an inverse association between motivation and fatigue (Boksem, Meijman, & Lorist, 2006). Higher versus lower income individuals may have more motivation to face financial problems due to previous success in handling financial challenges and therefore may have higher global levels of coping efficacy (Stajkovic & Luthans, 2003). In the present sample, income was positively associated with overall coping efficacy across days, allowing for the possibility that global coping efficacy and motivation may stand as mediators linking elevations in daily financial stress with lower levels of fatigue among high SES individuals.

Similar socioeconomic differences are also evident in the relations between daily financial worry and pain between the high and low income groups. For both groups, there was no significant relation found between daily financial worry and pain as indicated by the direct effects, but the indirect or mediational effect was positive and significant. This suggests that reductions in coping efficacy fully mediated the positive relation between daily coping efficacy and pain for both groups. For the high income group, however, the direction of the direct effect was opposite from the direction of the indirect effect. The

direct effect was negative, suggesting that elevations in daily financial worry are related to reduced pain, whereas the indirect effect was positive, suggesting that elevations in daily financial worry are related to elevated levels of pain through daily reductions in coping-efficacy. This is consistent with the null findings for the total effect of daily financial worry on pain for the high income group. Put more simply, when high SES individuals experience financial worry, they also feel less efficacious, and in turn, report more pain; simultaneously, when high SES individuals experience financial worry, they tend to report less pain due to an unknown mediator. As previously suggested, it is possible that global levels of coping efficacy may link financial stress with reduced pain among high SES individuals due to enhanced motivation and attention toward solving the problem. Motivational and attentional theories related to the perception of pain would suggest that strong motivation to solve an external problem may drive attention away from the pain (Van Damme, Legrain, Vogt, & Crombez, 2010). Nevertheless, given that that this effect was not predicted, and not consistent with findings in the broader literature, these findings should be viewed with caution.

The other reserve capacity resource investigated as a mediator linking financial stress with health was daily satisfaction with social support. It was hypothesized that reductions in satisfaction with social support would indirectly link daily financial worry with physical health symptoms among low SES individuals. However, daily satisfaction with social support did not serve as a mediator. Fluctuations in daily financial worry were not associated with fluctuations in participants' satisfaction with their level of social support. One explanation for the null findings is that the way in which satisfaction with social support was measured in the current study did not capture the specific aspects of

social support that are relevant for dealing with financial strain, for at least two reasons. First, participants' scores on satisfaction with support from others and from spouse/partner were averaged, even though roughly half of the participants reported not living with a partner. The result is that one's satisfaction with support following a stressor from one's partner may have been skewed by a lower score on satisfaction from support from others possibly less involved in the matter at hand. An alternative way to represent satisfaction with support would be to take participants' maximum score across parties as their satisfaction score. Taking such an approach may have more accurately distinguished those who felt supported from those who did not. Second, the satisfaction with support measure was not specific to financial strain. It is plausible that assessing the kinds of support that are well-matched with the demands of acute financial need (e.g., material, instrumental) is more apt to capture this mediating process (Cutrona & Russell, 1990).

This study had some strengths worth noting. First, the large number of participants in the study allowed for participants to be grouped by median income split to examine the ways in which SES related to daily processes involved in physical health. Next, the study was conducted with participants with FM, a type of chronic pain condition that is widespread in impact but is disproportionately less represented in the literature. This study allows for a greater understanding of processes involved with pain and fatigue that may be unique to individuals with this type of pain condition. Finally, this study utilized daily diary data to examine daily level processes occurring within individuals in addition to person-level phenomena. This nuanced approach to investigating health is limited in the chronic pain literature.

This study also had important limitations. First, the lack of temporal precedence in the measured variables precludes the interpretation of causality or directionality of the variables. For example, it is possible that daily financial worry causes individuals to feel more pain or fatigue, that more pain and fatigue cause increases in financial worry, or that a third variable is responsible for both. It is also possible that the variables examined in the study have reciprocal influences on one another. The justification with modeling daily financial worry as a predictor lies simply within the theory of the RCM that stressors precede changes in physical health symptoms. Finally, participants in the study were largely female and Caucasian, which limits the generalizability of the data to other populations. For example, research indicates that women may be more reactive to stress than men, and have poorer self-esteem and self-concept (Nolen-Hoeksema, 2001). These differences could mean that lower SES men tend to feel more efficacious and/or less likely to experience fatigue on days of financial stress. The current findings also may not generalize to ethnic minorities. According to research, Hispanic and African-Americans ascribe more importance to social relationships than do Caucasians, allowing for the possibility that social support may be involved with processes related to stress and physical health symptoms, unlike in the current, mostly Caucasian sample (Vaux, 1985). More research is needed to understand the ways in which processes related to stress, income, and health differ across groups.

The findings in this study are partially consistent with using the RCM as a framework for daily processes involved in physical health disparities by SES among individuals with chronic pain. In line with the RCM, low SES individuals in the study encountered more frequent daily financial stressors and reported worrying about finances

more than individuals with higher income levels. Also consistent with the RCM, low SES individuals reported higher levels of fatigue on days of elevated financial worries. Regardless of income level, however, daily financial worry was not significantly related to daily pain. A particularly noteworthy finding was that reductions in daily coping efficacy mediated relations between above average daily financial worry and pain and fatigue, potentially representing an important mechanism by which economic stress impacts physical health. These relations were significant in both high and low income groups, but relations between financial worry and physical health symptoms trended in a negative direction for the high income group but positive in the low income group, a discrepancy that warrants further investigation.

To better understand whether the RCM is suitable for daily processes linking SES with health, more research needs to be done using daily diaries with multiple time points to confirm whether daily stress precedes physical health symptoms within or across days for individuals differentially according to SES. Future research should also aim to uncover which of the reserve capacity resources are relatively stable over time, and which fluctuate within-day or across days, and to subsequently study the ways in which these resources moderate or mediate the impact of stress on indicators of health on a day-to-day basis. Understanding daily processes under the RCM framework could have significant implications for the treatment of chronic pain. For example, policy makers may be better able to target low SES individuals most highly at risk for worse health outcomes, and healthcare providers may be better able to create targeted interventions aimed at reducing specific stressors or aimed at bolstering malleable resources within patients' reserve capacity.

Chronic pain is a common, often disabling condition. The twin burdens of low SES and chronic pain may be especially costly to health and well-being over the long term. Although bolstering individuals' SES would be an ideal strategy to alleviate a root cause of disability in chronic pain, such a strategy is best implemented at a societal rather than an individual level. What then do the current findings and the existing evidence highlight as potential areas of focus for health psychologists going forward? Increasing individuals' reserve capacity resources, particularly efficacy, may hold the most promise for improving adaptation in chronic pain.

Table 1

Participant Demographics

Measure	<i>n</i>	%*
Sex		
Male	25	11.2
Female	195	87.4
Race		
Caucasian	174	78.0
Not Caucasian	46	20.6
Marital Status		
Married	104	46.6
Living with a partner	19	8.5
Widowed	13	5.8
Divorced / separated	64	28.7
Never married	18	8.1
Occupational Status		
Full-time	52	23.3
Part-time	61	27.4
Not working	105	47.1
Education		
High school incomplete	5	2.2
High school	29	13.0
Business/Trade school	19	8.5
1-3 years college	74	33.2
4 years college	39	17.5
Post-graduate college	38	17.0
Income (Annual Household)		
< \$3,000 - \$6,999	15	6.7
\$7,000 - \$12,999	17	7.6
\$13,000 - \$18,999	21	9.4
\$19,000 - \$29,999	23	10.3
\$30,000 - \$59,999	70	31.5
\$60,000 - \$99,999	44	19.8
> \$100,000	18	8.1

*Percentages for categories may not equal 100% due to missing data

Table 2

Means, Standard Deviations, and Intercorrelations of Study Variables

	<i>Range</i>	<i>M(SD)</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>
1. Financial Worry	0-5	2.29(.95)	-	.40**	.01	.01	-.12**	-.03
2. Financial Stressors	0-1	.38(.29)	.77**	-	.02	-.01	-.07**	-.04*
3. Pain	0-100	54.06(18.23)	.13	.05	-	.50**	-.10**	-.07**
4. Fatigue	0-100	56.16(19.20)	.23**	.12	.76**	-	-.10**	-.05**
5. Coping Efficacy	1-5	3.52(.77)	-.38**	-.26**	-.39**	-.49**	-	.29**
6. Social Support	1-5	3.53(.77)	-.20**	-.19**	-.23**	-.35**	.53**	-
7. Income	1-19	12.28(4.80)	-.29**	-.25**	-.19**	-.21**	.24**	.27**

* $p < 0.05$, ** $p < 0.01$ (two-tailed)

Notes: Correlations in lower triangle represent relations between level 2 variables (at the between-person level); daily diary variables 1-6 were averaged across days for each individual. Correlations in the upper triangle represent relations between level 1 variables (within-person centered).

Table 3

Regression Model Predicting Daily Financial Worry from Centered Income, Centered Age, and Gender (N = 207)

Predictor	<i>b</i> (SE)	β	<i>t</i>
Intercept	2.29 (.07)		
Income	-0.06 (.01)**	-.29	-4.40
Age	-.01 (.01)	-.06	-.86
Gender [†]	.03 (.20)	.01	.15

[†] Gender dummy coded as 0 = female, 1 = male

** $p < 0.01$ (two-tailed)

Table 4

Regression Model Predicting Daily Financial Stressors from Centered Income, Age, and Gender
(*N* = 207)

Predictor	<i>b</i> (SE)	β	<i>t</i>
Intercept	0.38 (.02)		
Income	-0.02 (.01)**	-.25	-3.66
Age	.001 (.002)	.046	.67
Gender [†]	-.02 (.06)	-.02	-.34

[†] Gender dummy coded as 0 = female, 1 = male

***p* < 0.01 (two-tailed)

Table 5

Multilevel Regression Models Predicting Daily Pain Levels from Person-centered Daily Financial Worry, Income, and Daily Financial Worry X Income Interaction (N = 211)

Predictor	<i>b</i> (SE)	<i>t</i> - <i>value</i>	95% CI	
			Lower	Upper
Model 1: Model Testing Main Effects				
Intercept (γ_{00})	54.01 (1.23)	43.75	51.58	56.44
Daily Financial Worry [†] (γ_{10})	.25 (0.33)	.74	-.41	.90
Intercept Variance (σ_{u0}^2)	315.84			
Model 2: Model Testing Interaction Effects				
Intercept (γ_{00})	53.92 (1.25)	43.23	51.47	56.38
Daily Financial Worry [†] (γ_{10})	.09 (.34)	.26	-.58	.76
Income (γ_{01})	-.72 (.26)**	-2.79	-1.24	-.21
Income x Fin. Worry (γ_{11})	-.09 (0.06)	-1.40	-.22	.04
Intercept Variance (σ_{u0}^2)	302.90			

[†] Centered around individual means; * $p < 0.05$, ** $p < 0.01$ (two-tailed)

Table 6

Multilevel Regression Models Predicting Daily Fatigue Levels from Person-centered Daily Financial Worry, Income, and Daily Financial Worry X Income Interaction (N = 204)

Predictor	<i>b</i> (SE)	<i>t</i> - <i>value</i>	95% CI Lower Upper	
Model 1: Model Testing Main Effects				
Intercept (γ_{00})	56.09 (1.29)	43.43	53.54	58.63
Daily Financial Worry [†] (γ_{10})	.18 (0.33)	.543	-.47	.82
Intercept Variance (σ_{u0}^2)	347.76			
Model 2: Model Testing Interaction Effects				
Intercept (γ_{00})	56.00 (1.30)	43.16	53.45	58.56
Daily Financial Worry [†] (γ_{10})	.06 (0.34)	.191	-.60	.73
Income (γ_{01})	-.83 (0.27)**	-3.09	-1.37	-.30
Income x Fin. Worry (γ_{11})	-.16 (0.06)*	-2.46	-.28	-.03
Intercept Variance (σ_{u0}^2)	329.69			

[†] Centered around individual means; * $p < 0.05$, ** $p < 0.01$ (two-tailed)

Table 7

Simple Regression Analysis of Daily Fatigue on Daily Financial Worry[†] at 1 Standard Deviation (SD) Above, Below, and at the Mean of Income (N = 204)

Level of Income	Simple Slope	<i>t</i> -value (3358)	<i>Sig.</i>
1 SD below group mean for income	0.817	1.92	.054
At the group mean for income	0.064	0.19	.849
1SD above group mean for income	-0.688	-1.42	.156

[†] Centered around individual means

Table 8

Mixed models Testing Indirect Paths from Daily Financial Worry to Coping Efficacy to Pain in Participants with Income below the Sample Median (N=104)

	Potential Mediator (M): Daily Coping Efficacy				
	Intercept Variance (σ_{u0}^2)	Interce pt (γ_{00})	<i>b</i> (SE) (γ_{10})	95% CI Lower Upper	
Total Effect (<i>c</i> path: Fin worry → Pain)	299.72	56.94	.87 (.45)	-.02	1.76
IV to <i>M</i> (<i>a</i> path: Fin worry → Efficacy)	.62	3.42	-.12 (.02)**	-.17	-.08
<i>M</i> to DV (<i>b</i> path: Efficacy → Pain)	302.06	56.92	-2.13 (.52)**	-3.15	-1.11
Direct Effect (<i>c'</i> path: IV to DV with M)	302.06	56.92	.62 (.46)	-.28	1.51
Indirect Effect (<i>ab</i> path) [†]			.26 (.08)**	.10	.48

* $p < 0.05$, ** $p < 0.01$ (two-tailed); IV = Independent Variable, M = Mediator, DV = Daily Pain

[†] = Correlation between *a* and *b* paths (ρ) designated 0. Total number of observations ranged from 1,679 to 1,692 due to missing data.

Table 9

Mixed models Testing Indirect Paths from Daily Financial Worry to Daily Pain in Participants with Income above the Sample Median (N=99)

	Potential Mediator (M): Daily Coping Efficacy				
	Intercept Variance (σ_{u0}^2)	Intercept (γ_{00})	b (SE) (γ_{10})	95% CI	
				Lower	Upper
Total Effect (c path: Fin worry \rightarrow Pain)	310.93	50.78	-.76 (.51)	-1.75	.24
IV to M (a path: Fin worry \rightarrow Efficacy)	.44	3.64	-.11 (.03)**	-.16	-.06
M to DV (b path: Efficacy \rightarrow Pain)	311.22	50.77	-2.07 (.49)**	-3.04	-1.10
Direct Effect (c' path: IV to DV with M)	311.22	50.77	-.97 (.51)	-1.97	.03
Indirect Effect (ab path) [†]			.23 (.08)**	.05	.48

* $p < 0.05$, ** $p < 0.01$ (two-tailed); IV = Independent Variable, M = Mediator, DV = Daily Pain

[†] = Correlation between a and b paths (ρ) designated 0. Total number of observations ranged from 1,659 to 1,665 due to missing data.

Table 10

Mixed models Testing Indirect Paths from Daily Financial Worry to Coping Efficacy to Fatigue in Participants with Income below the Sample Median (N=107)

	Potential Mediator (M): Daily Coping Efficacy				
	Intercept Variance (σ_{u0}^2)	Intercept (γ_{00})	b (SE) (γ_{10})	95% CI Lower Upper	
Total Effect (c path: Fin worry \rightarrow Fatigue)	348.89	60.01	1.46 (.43)**	.61	2.31
IV to M (a path: Fin worry \rightarrow Efficacy)	.62	3.42	-.12 (.02)**	-.17	-.08
M to DV (b path: Efficacy \rightarrow Fatigue)	352.16	60.07	-2.26 (.50)**	-3.24	-1.28
Direct Effect (c' path: IV to DV with M)	352.16	60.07	1.19 (.44)**	.33	2.05
Indirect Effect (ab path) [†]			.27 (.08)**	.10	.49

* $p < 0.05$, ** $p < 0.01$ (two-tailed); IV = Independent Variable, M = Mediator, DV = Daily Fatigue

[†] = Correlation between a and b paths (ρ) designated 0. Total number of observations ranged from 1,781 to 1,802 due to missing data.

Table 11

Mixed models Testing Indirect Paths from Daily Financial Worry to Daily Fatigue in Participants with Income above the Sample Median (N=104)

	Potential Mediator (M): Daily Coping Efficacy				
	Intercept Variance (σ_{u0}^2)	Intercept (γ_{00})	b (SE) (γ_{10})	95% CI	
				Lower	Upper
Total Effect (c path: Fin worry \rightarrow Fatigue)	308.53	51.83	-1.44 (.52)**	-2.46	-.43
IV to M (a path: Fin worry \rightarrow Efficacy)	.44	3.64	-.11 (.03)**	-.16	-.06
M to DV (b path: Efficacy \rightarrow Fatigue)	308.31	51.84	-1.66 (.51)**	-2.66	-.67
Direct Effect (c' path: IV to DV with M)	308.31	51.84	-1.62 (.52)**	-2.64	-.60
Indirect Effect (ab path) [†]			.18 (.08)**	.03	.42

* $p < 0.05$, ** $p < 0.01$ (two-tailed); IV = Independent Variable, M = Mediator, DV = Daily Fatigue

[†] = Correlation between a and b (ρ) designated 0. Total number of observations ranged from 1,765 to 1,771 due to missing data.

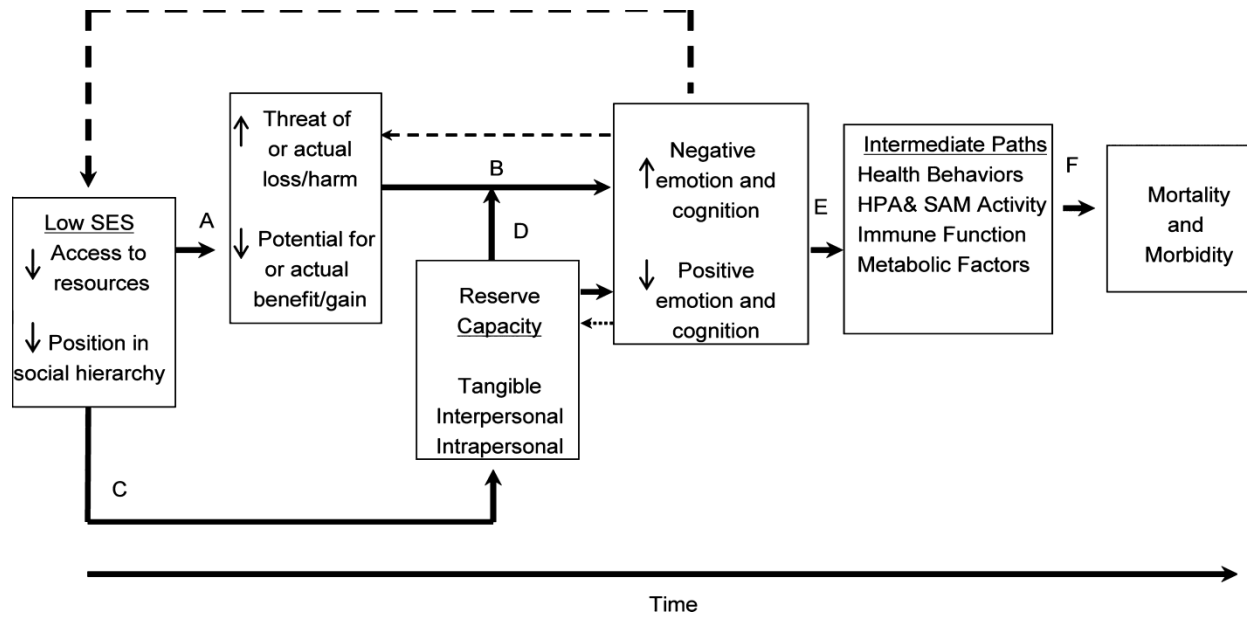


Figure 1. Reserve Capacity Model (Matthews, et al., 2010)

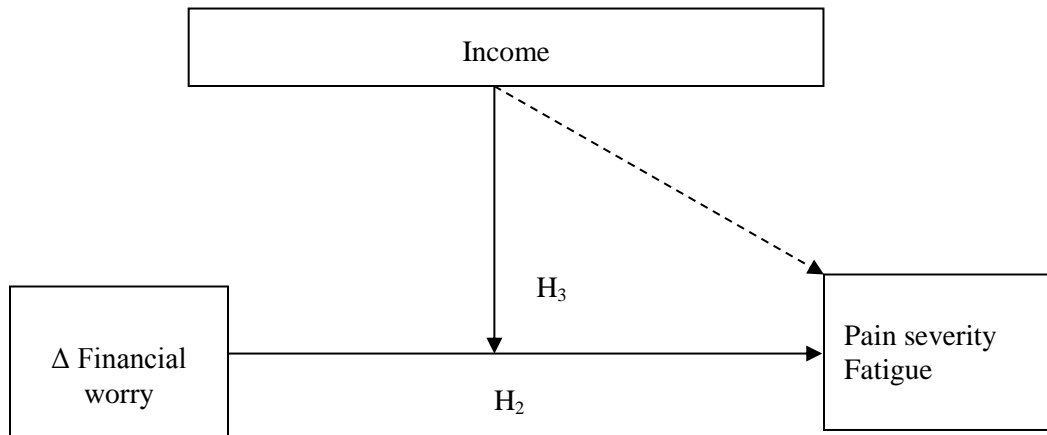


Figure 2. Proposed Model for Hypotheses 2 and 3. Note: Solid lines represent paths being tested.

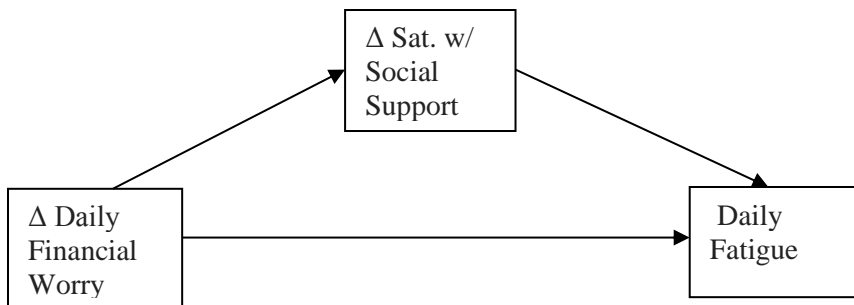
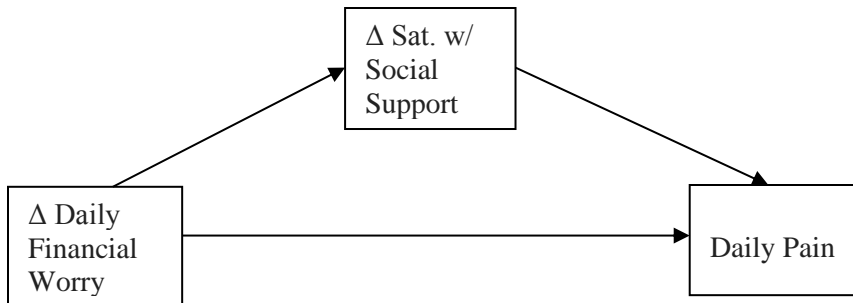
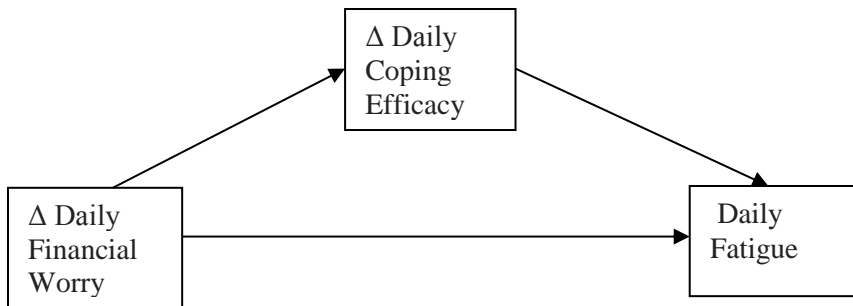
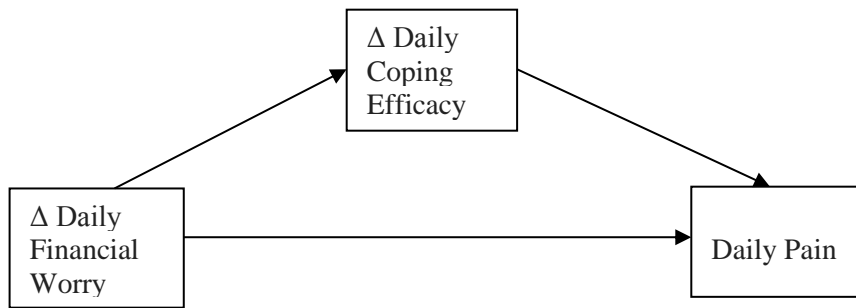


Figure 3. Proposed Models for Hypothesis 4

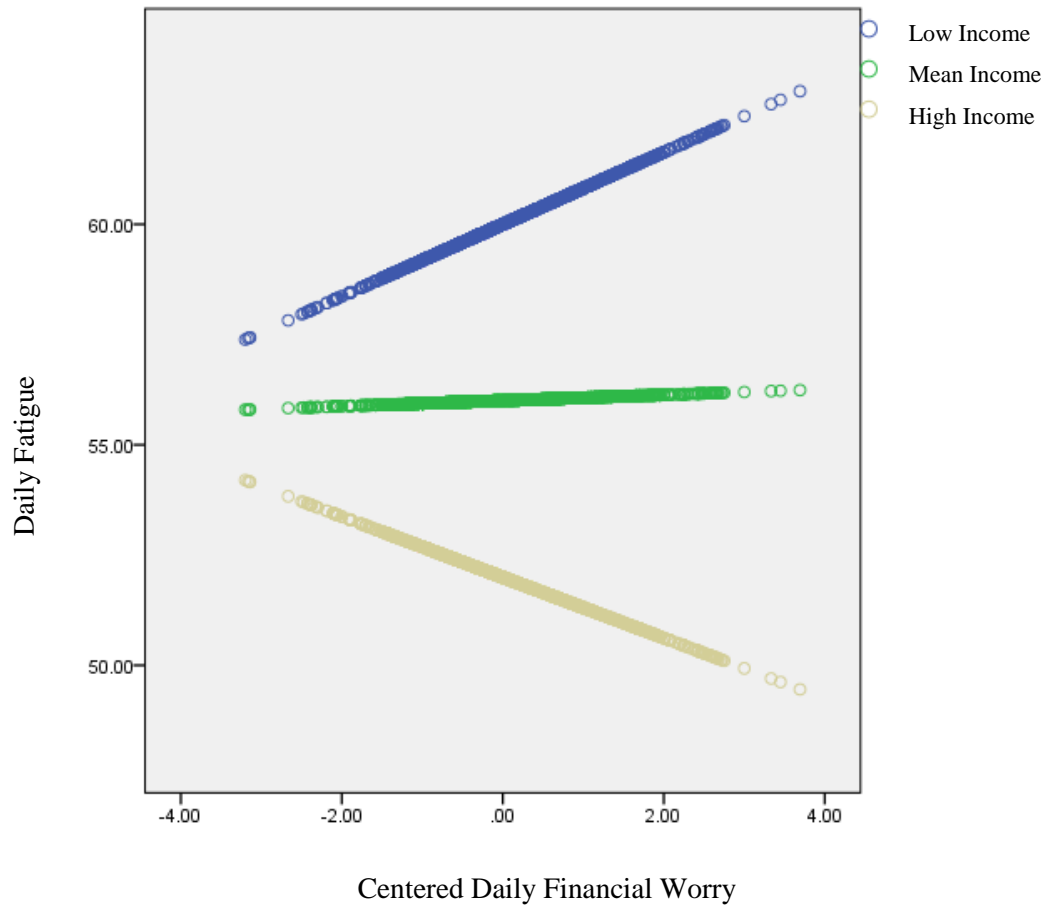
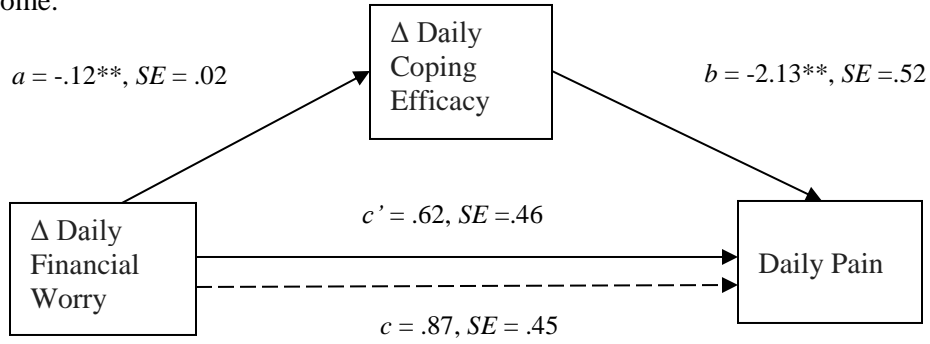


Figure 4. Relation between Daily Financial Worry and Daily Fatigue at 1 Standard Deviation Below, Above, and at the Mean for Income

Low Income:



High Income:

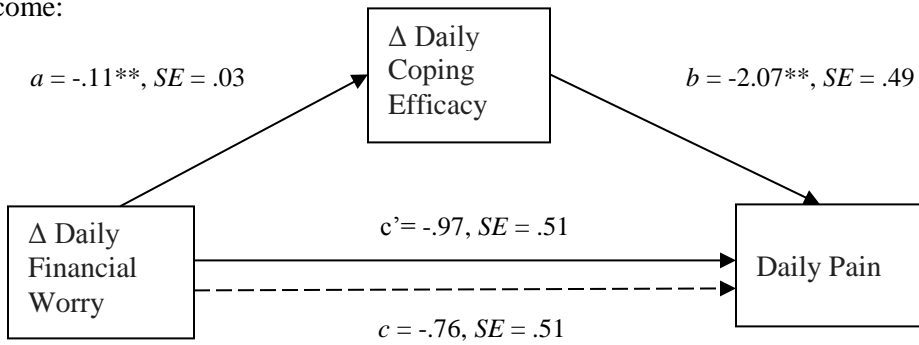
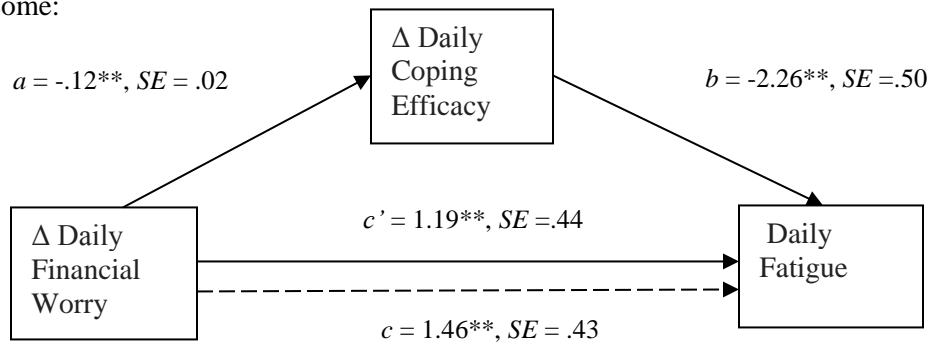


Figure 5. Mediation Model Depicting the Indirect Effect of Daily Coping Efficacy in the Relation between Daily Financial Worry and Daily Pain among Income Groups (* $p < 0.05$, ** $p < 0.01$ (two-tailed))

Low Income:



High Income:

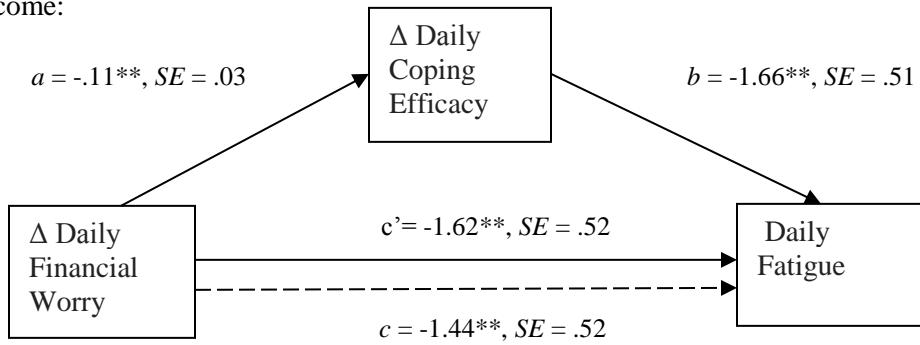


Figure 6. Mediation Model Depicting the Indirect Effect of Daily Coping Efficacy in the Relation between Daily Financial Worry and Daily Fatigue among Income Groups (* $p < 0.05$, ** $p < 0.01$ (two-tailed))

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APPENDIX A
MEASURES

Income: “Below you will find a standard income table widely used in survey research. Yearly family income is grouped into categories. Family income includes, for example, income from work plus other sources such as interest, social security, and so forth. Please check the box to the left of the answer choice that comes closest to your family income, last year.”

SCALE

1	Under \$3,000
2	\$3,000 - \$4,999
3	\$5,000 - \$6,999
4	\$7,000 - \$8,999
5	\$9,000 - \$10,999
6	\$11,000 - \$12,999
7	\$13,000 - \$14,999
8	\$15,000 - \$16,999
9	\$17,000 - \$18,999
10	\$19,000 - \$20,999
11	\$21,000 - \$24,999
12	\$25,000 - \$29,999
13	\$30,000 - \$39,999
14	\$40,000 - \$49,999
15	\$50,000 - \$59,999
16	\$60,000 - \$69,999
17	\$70,000 - \$99,999
18	\$100,000 - \$149,999
19	\$150,000 and over

Daily Financial Worry: “Overall, how much did you worry about finances today?”

SCALE

1	Not at all
2	A little
3	Some
4	Quite a bit
5	Completely

Daily Financial Stressors: “Did you have any financial stressors today?”

SCALE

0	Not at all
1	A little

Daily Pain Severity: “What was your overall level of pain today?”

SCALE

0	No pain
>0 -	Varying levels of pain
100	Pain as bad as it can be

Daily Fatigue: “What was your overall level of fatigue today?”

SCALE

0	No fatigue
>0 -	Varying levels of fatigue
100	Fatigue as bad as it can

Reserve Capacity - Coping Efficacy: Coping efficacy was assessed with a diary item related to coping with stressful life events. Participants were first asked to identify and rate the difficulty in coping with the most stressful event of that day. They were then asked, “If you had a similar experience again, how certain are you that you would be able to cope well with its negative aspects?”

SCALE

1	Not at all
2	A little
3	Some
4	Quite a bit
5	Completely

Reserve Capacity - Daily Satisfaction with Social Support: Satisfaction with social support was assessed using a mean composite of two items measuring the degree to which participants felt satisfied with the support they received from their spouse/partner, and from family, friends, and co-workers in coping with their most stressful event of the day: “How satisfied were you with the support you received from your spouse or partner in coping with your most stressful event, on a scale of 1 to 5?” and “On a scale of 1 to 5, how satisfied were you with the support you received from your family, friends, and co-workers in coping with your most stressful event?”

SCALE

1	Not at all
2	A little
3	Some
4	Quite a bit
5	Completely