How Painful is a Recession? An Assessment of Two Future-Oriented Buffering Mechanisms

Abstract

Guided by stress process theory, this study investigates the influence of the economic downturn on chronic pain, as well as the role of two future-oriented buffering mechanisms (anticipated stressor duration and pre-recession financial optimism) in this relationship. We consider both an objective measure of the recession based on personal experience, as well as a subjective event-based appraisal of the recession. Drawing on three waves of data from the National Survey of Midlife Development in the United States (N = 1,062), we used linear lagged dependent variable models to examine the consequences of the Great Recession for chronic pain. The findings reveal that both an accumulation of adverse experiences and global appraisals of the economic recession have harmful, longitudinal implications for chronic pain; however, the consequences for each varied according to future-oriented moderating factors. Overall, our study demonstrates that positive future orientations can be protective for health during an economic crisis.

1. Introduction

Chronic pain is a significant health issue for many Americans. An estimated 126.1 million adults in the United States reported some pain in the previous three months in 2012, with 25.3 million (11.2%) of these adults experiencing chronic pain daily (Nahin, 2015). Persistent and bothersome pain limits the functional status and productivity of those affected, and adversely impacts their quality of life. Chronic pain is also estimated to cost the U.S. economy an estimated $560 to $635 billion annually in health care costs due to pain and lower worker productivity (Gaskin & Richard, 2012). Estimates of the costs of persistent pain exceed the combined economic costs of heart disease, cancer, and diabetes.

Though chronic pain often stems from an underlying disease, injury, inflammation or from a recent medical treatment (e.g., surgery), emerging research also points to the potential triggering role of psychosocial stress (Brown et al., 2018; Burgess et al., 2009; Burns et al., 2018; Edwards, 2008; Goodin et al., 2013). In particular, several empirical studies suggest an association between financial worry, strain, or insecurity and increased frequency or severity of chronic pain (Chou, Parmar, & Galinsky, 2016; Jablonska et al., 2006; Rios & Zautra, 2011), even as the biological mechanisms linking stress and pain are a matter of continued investigation (Gatchel et al., 2007; McEwen, 2006).

The present study seeks to offer three main contributions to the study of financial stress and chronic pain. First, we consider pain in the aftermath of the Great Recession. To our knowledge, no research using representative national data has examined the impact of a major financial crisis on chronic pain. The "Great Recession" of 2007-2009 was reportedly the worst economic downturn in the United States since the Great Depression of the 1930s. This period had substantial effects on the financial well-being of U.S. residents, which in turn posed threats

to the mental and physical health of those adversely affected by the recession (see Burgard & Kalousova, 2015). For example, two studies found that experiencing housing instability during the recession increased the odds of reporting fair or poor health by a factor of 3.1 - 7.5 relative to those with more stable housing experiences (Burgard, Ailshire, & Kalousova, 2013; Burgard, Seefeldt, & Zelner, 2012). Relatedly, physical discomfort is likely to be among the important health outcomes shaped by recessionary experiences, and so we examine pre- and post-recession levels of chronic pain.

Second, we integrate two ways of understanding the potential painfulness of the Great Recession: (1) the influence of actual, objective adverse events experienced during the downturn, but also (2) the role of subjective summary appraisals of how the recession impacted people's own lives. Most studies examining the health impacts of the Great Recession utilize objective measures of financial hardship during the downturn such as wealth declines (Boen & Yang, 2016; McInerney, Mellor, & Nicholas, 2013), housing difficulties (Burgard et al., 2012; Yilmazer, Babiarz, & Liu, 2015), and job loss (Catalano et al., 2011; Tekin, McClellan, & Minyard, 2013), or—as we pursue in this article—a combination of these interrelated events (Burgard et al., 2013; Kirsch & Ryff, 2016; Vijayasiri, Richman, & Rospenda, 2012). Few studies have investigated the potential health effects of subjective assessments during the recession, despite the relative importance of subjective financial strain in comparison to more objective indicators (Wilkinson, 2016). Further, no prior studies have included measures of *both* stressful recession-related experiences and explicit event-based appraisals of the recession. Including objective and subjective indicators provides an opportunity to consider factors that may intervene on each distinctive link between recession-based stress and pain.

Consequently, our third contribution is to extend current formulations of stress process theory by distinguishing two future-orienting moderating mechanisms. Positive expectations about the future have been identified as health-protective resources during times of stress, in large part because they foster coping strategies that help people eliminate or manage stressors rather than avoid or withdraw from them. Yet this issue has been studied almost exclusively in the form of dispositional optimism (Nes & Segerstrom, 2006). The present study introduces the concept of *anticipated stressor duration* as a complementary moderating mechanism. Duration perception is an especially relevant factor in contexts such as the Great Recession because macro-economic crises are times of pronounced economic uncertainty. This uncertainty makes it difficult for people to plan for the future and affects diverse dimensions of their professional, financial, and personal lives (Ananat, Gasman-Pines, & Gibson-Davis, 2013; Cherlin, Cumberworth, Morgan, & Wimer, 2013; Goda, Shoven, & Slavov, 2011; Morgan, Cumberland, & Wimer, 2011). Interpreting such events as both damaging *and* likely to extend into the future, we argue, is likely to maximize their painfulness because the stress has no perceptible reprieve.

2. Conceptual framework and study hypotheses

The stress process model marks an interdisciplinary effort to explain how adverse events and conditions harm health. In this framework, acute or chronic stressors first challenge people's adaptive capacity. Individuals appraise the nature of the threat and their ability to adjust—their ensuing emotional and behavioral responses altering physiological systems (e.g., neuroendocrine, immune) and ultimately their health. Sociological versions of the social stress framework tend to emphasize the upstream structural conditions that induce exposure to stressors (Aneshensel, 1992; Pearlin, 1989; Pearlin & Bierman, 2013), while health psychologists have generally been most attuned to people's modes of appraisal and the coping process (Folkman,

2013; Folkman, Lazarus, Gruen, & DeLongis, 1986; Taylor & Aspinwall, 1996). Both fields underscore that resources—social (e.g., support availability) or individual (e.g., optimism)—can mitigate the impact of consequences of stressors on physical health (Cohen & Wills, 1985; Pearlin & Bierman, 2013; Thoits, 1995).

The present study begins from a stress process premise by acknowledging that macro-economic events such as recessions have varied health consequences in the population. More disadvantaged subgroups, on average, confronted the broadest constellation of stressors stemming from the recent downturn, including job loss (Engemann & Wall, 2009; Hoynes, Miller, & Schaller, 2012), eviction or home foreclosure (Rugh & Massey, 2010), and consumer debt problems (Kim, Wilmarth, & Henager, 2017; Rix, 2011). Yet many in the middle-class, too, weathered multiple interrelated stressors. Not surprisingly, cross-sectional research suggests that those people accumulating the highest number of adverse experiences during the period of the Great Recession also have tended to report an elevated number of health problems (Kirsch & Ryff, 2016). Building from this existing evidence, we hypothesize that higher stressor exposure during the recession era is similarly linked to an increase in pain (*Hypothesis 1*).

Importantly, the stress process framework also summons us to sites of contingency between adverse event and outcome. Appraisal is a juncture that could account for important variation in the recession's painfulness. In brief, stress appraisal encompasses whether people see an event as threatening, harmful, or challenging and whether or how people think they can respond to the event (Folkman, 2013). Though both aspects of appraisal orient one to expectations about the future—namely, how much harm the event is likely to cause or how well one expects to cope—little research has considered how people assess the permanence of the

stressor itself in time. We refer to this as *anticipated stressor duration*: how much longer will this bad thing go on?

Duration estimates are a potentially overlooked aspect of the appraisal process that likely dictate the extent to which stressors impact health. On the one hand, the sense that a stressful event has passed or is near its end can renew hope and promote resilience. Though conceptualizations of resilience vary in the literature, one perspective is that overcoming adversities—especially those understood to be 'transitory'—fortifies people for future challenges (Davydov, Stewart, Ritchie, & Chaudieu, 2010). The immunization brought on by a sense of stressor closure could offset threats to health. On the flip side, believing that a stressful event is far from over may reinforce fear of the future and trigger anxiety. It may sustain worries that current personal troubles will persist and produce unease about the proliferation of yet more difficulties.

In the context of the Great Recession, estimates of stressor duration imply an attribution process emerging from the event. That is, for something as broad as the Great Recession to endure in any stressful sense, it must be to people first an identifiable thing; second, people must ascribe diverse negative experiences to it. Individuals will undeniably vary in the extent to which they assign a bundle of personal troubles as fallout to the Great Recession. Yet to the extent that they appraise the Great Recession as having been harmful or threatening, people's evaluations of its continued duration should have negative health implications. Specifically, we hypothesize that viewing the Great Recession—in its totality—as an adverse event prompts pain (*Hypothesis 2*), but painfulness is exacerbated to the extent that the recession is expected to endure past the short term (*Hypothesis 3*). To be clear, not all of the negative effects of actual recession-era stressors must be transmitted through the above-mentioned attribution process; but the joint

assessment of the recession's sting *and* the anticipated duration of that recession likely represents an important mechanism of the overall stress process and an explanation of variance in pain.

Introducing the concept of anticipated stressor duration raises a question as to whether such aspects of appraisal are distinct from personal resources that people bring into the stress process. Optimism, whether as a general or as a domain-specific disposition (e.g., optimism towards finances), has been identified as a powerful resource for coping positively with adversity and minimizing the health consequences of stressors (Friedman et al., 1992; Scheier et al., 1989; Thomas, Britt, Odle-Dusseau, & Bliese, 2011). We therefore hypothesize that pre-recession optimism buffers the increase in pain associated with experiencing adverse events during the Great Recession (*Hypothesis 4*). Still, the question remains whether a buffering effect of pre-recession optimism effectively washes out the role of future-oriented appraisals described in Hypothesis 3. Optimistic people likely take a rosier outlook in the midst of difficulty—does optimism ultimately override the variation explained by estimates of stressor duration?

Figure 1 is a conceptual model which summarizes our main research questions and hypotheses. Actual stressful experiences and global negative appraisals of the recession are each expected to increase levels of pain from before to after the recession. Anticipated duration of the recession is expected to moderate the effect of recession appraisals, while optimism, as a personal resource, is expected to buffer the painful consequences of experiencing more stressors. We leave as an open question whether optimism also buffers the impact of global recession appraisals and potentially overrides the hypothesized moderation pattern implied by H3 (denoted by the question mark). Finally, dashed lines designate anticipated associations—not central to our focus on explaining pain variation—that will be investigated in supplementary analyses.

[Figure 1 about here]

3. Design and Methods

3.1 Sample

This study uses three waves of data from the National Survey of Midlife Development in the United States (MIDUS). Baseline data for the MIDUS were collected in 1995-1996 by the MacArthur Midlife Research Network. The data investigators used random-digit-dialing to obtain a national sample of non-institutionalized, English-speaking adults age 25 to 74 living in the contiguous United States, with oversamples of older adults and of men. Respondents were first administered a telephone interview (70% response rate); for those who completed the telephone interview, a self-administered questionnaire was mailed to respondents (87% response rate), which resulted in an overall response rate of 61 percent (0.70 x 0.87 = 0.61) or 3,034 respondents. Of the 3,034 respondents who were surveyed at the first wave, 2,103 respondents completed the telephone interview when they were re-contacted in 2004-2006 for the second wave of data collection. In 2013-2014, the data investigators conducted a follow-up survey with the longitudinal respondents, which included detailed information on the economic recession. Of the 2,103 longitudinal respondents, 1,145 respondents completed both the telephone interview and the self-administered questionnaire at the third and most recent wave of data collection.

The sample for this analysis was limited to respondents who had a valid score on both the dependent variable and the sample weight. Close to 11 percent of respondents had missing data on only one variable, while another 8 percent had missing data on more than one variable; therefore, we used multiple imputation to account for item-missing data. Our sample size is equal to 1,062 respondents.

3.2 Measures

Chronic pain. Beginning at Wave 2, respondents were asked a series of questions about their pain. Initially, respondents were asked, "Do you have chronic pain, that is do you have pain that persists beyond the time of normal healing and has lasted from anywhere from a few months to many years?" If respondents answered affirmatively, they were asked the extent to which their pain, during the past week, interfered with each of the following activities or feelings: general activity, mood, relations with other people, sleep, and enjoyment of life. Each item measure ranges from 0 (did not interfere) to 10 (completely interfered). We created a scale from these five items using the row mean and coded those who reported no chronic pain as 0. Pain is measured at Waves 2 and 3; the alpha reliability coefficient is 0.92 at both waves. We tested alternative coding strategies, including coding pain as an ordinal variable, but the conclusions were unchanged.

Recession measures. We use two measures collected at Wave 3 to assess recession-related experiences. The first is a measure of the actual, objective events that individuals experienced since the recession began in 2008. Specifically, respondents were asked to think about the recession and whether they had experienced any of 18 negative recession-related events across three domains: employment (four items; e.g., lost a job or had to take an additional job), home/living arrangement (seven items; e.g., missed a mortgage or rent payment), and financial (seven items; e.g., missed a credit card payment). We coded respondents 1 for an affirmative response and 0, otherwise. Following Kirsch and Ryff (2016), we summed these 18 item measures together to create a count of *negative recession experiences*. See Appendix 1 for a complete list of the 18 items.

Second, *way affected by the recession* is a subjective, event-based appraisal of the recession that is derived from the question, "Thinking about the recession that began in 2008, which best describes the way you and your household have been affected by it?" Response categories include 1 "the recession has been a hardship and caused major changes" 2 "the recession has been difficult but not caused any major changes" 3 "the recession has not had much effect one way or the other" and 4 "overall, the recession has been good for me; I am better off now." Due to the small number of responses in the highest category, we combined the top two categories and reverse-coded the measure so that higher scores correspond to greater hardship.

Future-oriented buffering mechanisms. We use two items collected at Wave 3 to measure *anticipated stressor duration*. Respondents were first asked whether they think the recession is over (yes/no). If respondents answered that the recession is not over, they were asked how much longer they think it will last, with response categories ranging from 1 (less than a year) to 4 (more than 5 years). Due to the small number of respondents who reported that the recession will last less than a year, we combined the bottom two categories—less than a year and 1-2 years. We utilized information from both items to create a measure of anticipated stressor duration that includes the following response categories: 1 "recession is over" 2 "recession is not over and will last less than 2 years" 3 "recession is not over and will last 3-5 years" and 4 "recession is not over and will last more than 5 years."

We assess pre-recession *financial optimism* at Wave 2 using the question, "Looking ahead ten years into the future, what do you expect your financial situation will be like at that time?" This single-item measure ranges from 0 (worst) to 10 (best).

Demographics and additional covariates. We also include age, sex, and race in the analysis. Chronological *age* in measured in years. *Female* is coded 1 for female and 0, otherwise. *Nonwhite* is a binary variable coded 1 for nonwhite and 0 for white respondents.

In addition to demographics, we account for characteristics at Wave 2 that relate to both the recession-related measures and chronic pain. *Marital status* is measured using a series of binary variables for married, divorced, widowed, and never married (reference group). *Education* measures the highest level of education completed and is coded into three categories: less than high school (reference group), high school, college, and postgraduate. Current or most recent *occupation* distinguishes between upper-white collar (e.g., professional and managerial), lower-white collar (e.g., sales, clerical, and service), and blue-collar (e.g., craft, operatives, and laborers) occupations, as other studies have done (Carr & Friedman, 2005). We also use a binary variable to indicate if the respondent was *not employed* (1 = not employed). *Work stability* is a continuous measure that captures the proportion of time over the past 10 years in which respondents were employed. *Household income* is a continuous measure top-coded at $300,000 by the data investigators. We recoded the variable so that it is measured in thousands and ranges from 0 to 300. *Financial strain* is a single-item measure derived from the question, "In general, would you say you (and your family living with you) have more money than you need, just enough for your needs, or not enough for your needs?" Response categories range from 1 (more money) to 3 (not enough money). *Current financial situation* asks respondents to rate their financial situation on a scale of 0 to 10, with 0 being the worst and 10 being the best.

Morbidity is a count of the number of chronic conditions (e.g., hypertension, diabetes, stroke) that respondents reported experiencing during the past year; the variable has a possible range of 0 to 30. *Psychological distress* is based on the 6-item Kessler Psychological Distress

Scale (K-6), which asks respondents how often, during the past 30 days, they felt nervous, hopeless, worthless, etc. Each item measure ranges from 1 (none of the time) to 5 (all of the time). We reverse-coded the items so that higher scores indicate greater psychological distress and created a scale using the row mean; the alpha reliability coefficient is 0.85.

4. Analytic plan

To examine the influence of the economic recession on chronic pain, including the role of two future-oriented buffering mechanisms, Table 2 presents unstandardized coefficients from six ordinary least squares (OLS) regression models predicting chronic pain. We estimate lagged dependent variable models, which adjust for pre-recession pain in all models. Coefficients in lagged dependent variable models can be interpreted as the effect of the covariate on the change in the dependent variable across the two time points. In sensitivity analyses, we employed change score models and the conclusions were unchanged. We introduce our key independent variables in blocks, adjusting for demographics and additional covariates (including marital status, education, occupation, employment, household income, financial strain, current financial situation, morbidity, and psychological distress) at each stage of the analysis, as we sequentially evaluate our four hypotheses. Model 1 includes the objective measure of negative recession experiences. Model 2 adds the subjective summary appraisal of the recession, along with our measure of anticipated stressor duration; i.e., expectations about how long the recession will last. These models address Hypotheses 1 and 2, respectively. To evaluate Hypothesis 3, Model 3 adds an interaction term between the event-based appraisal of the recession and anticipated stressor duration. Model 4 incorporates pre-recession financial optimism, while Model 5 adds an interaction term between financial optimism and the objective measure of recession-related

experiences to address Hypothesis 4. Model 6 further incorporates an interaction term between financial optimism and the subjective summary appraisal of the recession.

5. Results

Descriptive statistics for the study covariates are displayed in Table 1. Overall, respondents reported low levels of chronic pain: on a scale of 0 to 10, the mean was 1.340 at Wave 3, a slight increase from a mean of 1.090 at Wave 2. On average, respondents reported few recession-related stressors; the variable ranged from 0 to 13, with the mean score equal to 1.880 (standard deviation = 2.163). Close to one-half of respondents reported that the recession has not had much effect on them or has even been good. More than one-third of respondents indicated that the recession has been difficult for them, while another 15 percent of respondents considered the recession to be a hardship that has caused major changes in their lives. Those who viewed the recession as a hardship were more likely to have experienced each of the negative recession-related events (see Appendix 1). In addition, about three-quarters of respondents believed that the recession was *not* over—most respondents anticipated that the recession would last another 3-5 years (32%), with a smaller proportion believing that it would last more than 5 years (16%). However, prior to the recession, respondents reported being relatively optimistic about their future financial situation, with the mean equal to 7.265 on a scale of 0 to 10. Respondents in the sample were, on average, 47 years of age at baseline. The majority of respondents were female (53%) and white (93%).

Table 2 presents the results from six OLS regression models to examine the role of future-oriented moderating mechanisms in the recession-pain relationship. Model 1 evaluates the effect of the count of negative recession experiences on pain, adjusting for pre-recession pain

and all control variables. We find that the count of negative recession-related experiences was non-significant in predicting change in pain in the period surrounding the recession (*Hypothesis 1* is not supported). Model 2 examines the effect of the event-based appraisal of the recession and shows that, compared to respondents who reported that the recession had little to no effect on their lives or was even beneficial, those who considered the recession to be a hardship experienced an increase in pain (*Hypothesis 2* is supported). We also include anticipated stressor duration in this model, which had a significant and positive effect: compared to respondents who believed that the recession is over, those who anticipated that the recession will last at least another five years experienced an increase in pain in the period surrounding the recession. Model 3 evaluates Hypothesis 3, which specifies that anticipated stressor duration will moderate the effect of the subjective summary appraisal on pain. We find that anticipated stressor duration exerts a moderating effect. Specifically, reporting that the recession has been a hardship is associated with increased pain; however, feeling that it would be longer-lasting was associated with greater increases in pain. As shown in Figure 1, individuals who rated the recession as a hardship and anticipated that it would last five or more years experienced the largest increases in pain in the aftermath of the recession (*Hypothesis 3* is supported).

[Figure 1 about here]

Models 4 and 5 assess the role of pre-recession financial optimism and the potential buffering effect of financial optimism on the count of negative recession-related experiences, respectively. While financial optimism did not have a significant main effect, it did lessen the effect of experiencing adverse recession-related events on pain (*Hypothesis 4* is supported). Figure 2 provides an illustration of this effect. In addition, the count of objective recession-

related experiences becomes significant in Model 5. In supplementary analyses, we tested a global measure of optimism and found that it did not produce the same protective effect.

[Figure 2 about here]

Model 6 is our fully-adjusted model that adds an interaction term between financial optimism and the subjective summary appraisal. We find that the results are unchanged from Model 5 with one exception: the main effect of the subjective summary appraisal becomes non-significant. Notably, however, the moderating effect of anticipated stressor duration remains significant even after accounting for the potential moderating influence of financial optimism.

[Table 2 about here]

6. Discussion

This study continues investigation on the health consequences of the Great Recession. The bulk of earlier work has considered mental health outcomes and has tended to consider particular, isolated stressors such as job loss or asset loss (Houle, 2014; Wilkinson, 2016; Yilmazer et al., 2015). The present study complements and extends an earlier cross-sectional analysis on physical health (Kirsch & Ryff, 2016), finding that both an accumulation of adverse experiences and global appraisals of the economic event had longitudinal implications for chronic pain. To our knowledge, no prior study has distinguished personal experiences *during* the recession from *evaluations of the historical event itself* and considered the health impact of both. Further, the consequences of each varied according to future-oriented moderating factors. Specifically, people with high levels of financial optimism fared far better amidst stressor burden than did people entering the recession with low levels of optimism. Likewise, people who

appraised the recession as having a bad effect on their lives suffered more pain only if they believed the recession would continue on for the foreseeable future.

In general, findings support the perspective that positive future expectations lead to optimized health outcomes by buffering stressful events (Rasmussen, Scheier, & Greenhouse, 2009). Some authors contend that such expectations provide resilience in the face of adversity and enable adaptive coping (Aspinwall, 2005; Nes & Segerstrom, 2006). At the same time, other research has suggested that adolescents exhibiting high hopefulness pre-adversity actually suffer the most distress following trauma, perhaps because they are ill-suited to the stressfulness of their environment (Fletcher, 2018). To our knowledge, however, this is the first study to examine future-oriented moderation mechanisms with respect to chronic pain in a national sample of adults. Future research should further specify whether positive views of the future have outcome-specific influences and/or whether their buffering effects differ by stage of the life course. Because older adults can now expect greater longevity, it is important to understand how hopefulness or other proactive adaptations to age-related challenges help limit chronic pain and promote successful aging.

Though anticipated stressor duration and financial optimism both appeared to mitigate effects of the recession on pain, it is important to distinguish their roles in the theorized stress process. Optimism stands as a pre-existing personal resource that equips people to deal with stressful events and conditions, helping them actively cope in adaptive ways (Nes & Segerstrom, 2006). Appraisals of stress duration, on the other hand, *emerge from* one's experience in the aftermath of stressor exposure. Greater optimism was only weakly associated with favorable prognoses about the future course of the recession, and our findings indicated that the latter is not reducible to a baseline personal resource. Emergent perceptions of the situation are a largely

overlooked feature of the stress process, but such appraisals deserve close attention because they have the power to redirect people's future life trajectories and to explain health variance between people who otherwise experience similar objective conditions (Ferraro, Shippee, & Schafer, 2009).

Contributions of this study must be weighed against its limitations. Unfortunately, there is only one wave of MIDUS data available post-recession. All recession-related information, and our outcome variable, were measured several years after the onset of the downturn. This meant that we were unable to assess potential indirect effects of recession experiences on pain through subjective appraisals, or to examine whether increased pain during the downturn shaped estimates of stressor duration. We did, however, use a measure of pre-recession pain to account for possible selection processes (i.e., those suffering from chronic pain were hit disproportionately hard by the recession). Still, without random assignment into recessionary experiences, we cannot make definitive causal assertions and rule out unmeasured confounders in the association between stressor and pain. We also acknowledge that the measurement validity of anticipated recession duration may vary across levels of socioeconomic status. In particular, the most educated MIDUS respondents likely had the strongest technical understanding of the Great Recession. On the basis of economic indicators, the event ended in June 2009, and some participants undoubtedly used this macro-economic interpretive frame rather than their own personal or community circumstances when answering the survey question about recession duration. Still, regardless of whether people evaluated the recession's staying power in light of their local experiences or whether they were merely misinformed about economic technicalities (or perhaps some of each), sensing that the downturn will go on seems to sharpen the recession's pain. We urge caution, however, when interpreting descriptive patterns of the variable across

levels of education, as it is unclear whether the most advantaged respondents have better resources for providing optimistic outlooks or whether they are interpreting the question differently from their less-educated counterparts.

In conclusion, findings from this study point to the distinctive effects of adverse events experienced during this economic crisis and subjective global appraisals of the recession on physical well-being and implicate protective mechanisms within these associations. Pain is a pressing outcome because it is intertwined with other social problems associated with economic downturns and that pose additional threats to population health. These include long-term unemployment and worker disability and prescription drug addiction and abuse. Although examining these issues is beyond the scope of the current study, our findings suggest that positive future orientations could be protective mechanisms for additional health outcomes in the aftermath of an economic crisis.

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Table 1. Descriptive statistics of study variables from the MIDUS (N = 1,062)

	Range	Mean	SD
Chronic Pain, W3	0 to 10	1.340	2.376
Chronic Pain, W2	0 to 10	1.090	2.067
Key Independent Variables			
Recession Experiences, W3	0 to 13	1.880	2.163
Way Affected by Recession, W3			
No Effect/Good	0,1	0.472	
Difficult	0,1	0.375	
Hardship	0,1	0.153	
Anticipated Recession Duration, W3			
Recession is Over	0,1	0.270	
2 Years or Less	0,1	0.249	
3-5 Years	0,1	0.318	
More than 5 Years	0,1	0.163	
Financial Optimism	0 to 10	7.265	2.097
Demographics			
Age, W1	20 to 74	46.542	11.349
Female, W1	0,1	0.533	
Nonwhite, W1	0,1	0.073	
Covariates			
Marital Status			
Married	0,1	0.700	
Divorced	0,1	0.157	
Widowed	0,1	0.066	
Never Married	0,1	0.077	
Education			
Less than High School	0,1	0.054	
High School	0,1	0.523	
College	0,1	0.250	
Postgraduate	0,1	0.173	
Occupation			
Upper-white Collar	0,1	0.442	
Lower-white Collar	0,1	0.382	
Blue Collar	0,1	0.176	
Not Employed	0,1	0.317	
Work Stability	0 to 1	0.803	
Household Income (in thousands)	0 to 300	74.829	62.542
Financial Strain	1 to 3	1.883	0.677
Current Financial Situation	0 to 10	6.616	2.081
Morbidity	0 to 16	2.330	2.271
Psychological Distress	1 to 4.833	1.493	0.538

Note: Descriptive statistics are from Wave 2 unless otherwise noted.

Table 2. OLS regression of chronic pain at W3 on recessionary measures: Testing future-oriented buffering mechanisms (N = 1,062)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
W2 Chronic Pain	0.353***	0.342***	0.351***	0.355***	0.352***	0.356***
	(0.056)	(0.055)	(0.054)	(0.054)	(0.053)	(0.052)
Negative Recession Experiences	0.096	0.036	0.031	0.039	0.672***	0.695**
	(0.064)	(0.073)	(0.071)	(0.072)	(0.196)	(0.211)
Way Affected by Recession						
Recession Difficult		0.325	0.374	0.379	0.422	-0.322
		(0.216)	(0.342)	(0.341)	(0.334)	(0.920)
Recession Hardship		0.804*	-1.163*	-1.180*	-1.206*	-1.289
		(0.370)	(0.548)	(0.557)	(0.575)	(1.117)
Anticipated Recession Duration						
2 Years of Less		0.035	-0.214	-0.224	-0.219	-0.212
		(0.225)	(0.271)	(0.270)	(0.267)	(0.264)
3-5 Years		0.351	0.444	0.442	0.387	0.396
		(0.224)	(0.328)	(0.327)	(0.309)	(0.305)
More than 5 Years		0.655*	0.172	0.173	0.145	0.144
		(0.319)	(0.394)	(0.397)	(0.399)	(0.398)
Recession Difficult x 2 Years or Less			0.407	0.404	0.248	0.236
			(0.468)	(0.468)	(0.466)	(0.467)
Recession Difficult x 3-5 Years			-0.524	-0.525	-0.474	-0.510
			(0.464)	(0.463)	(0.445)	(0.445)
Recession Difficult x More than 5 Years			0.163	0.140	0.134	0.135
			(0.742)	(0.746)	(0.720)	(0.715)
Recession Hardship x 2 Years or Less			1.620*	1.598*	1.791*	1.756*
			(0.763)	(0.760)	(0.733)	(0.737)
Recession Hardship x 3-5 Years			1.970**	1.957**	1.974**	1.949**
			(0.711)	(0.719)	(0.726)	(0.732)
Recession Hardship x More than 5 Years			3.143***	3.096***	3.061***	3.030***
			(0.797)	(0.805)	(0.822)	(0.831)
Financial Optimism				-0.068	0.126	0.091
				(0.062)	(0.076)	(0.081)

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Table 2. Continued.

Negative Recession Experiences x Financial Optimism					-0.084***	-0.087***
					(0.023)	(0.026)
Recession Difficult x Financial Optimism						0.104
						(0.111)
Recession Hardship x Financial Optimism						0.009
						(0.135)
Age	-0.011	-0.009	-0.011	-0.015	-0.013	-0.013
	(0.011)	(0.011)	(0.010)	(0.011)	(0.010)	(0.010)
Female	-0.134	-0.154	-0.180	-0.177	-0.152	-0.153
	(0.203)	(0.196)	(0.196)	(0.196)	(0.192)	(0.191)
Nonwhite	0.156	0.207	0.314	0.351	0.366	0.355
	(0.409)	(0.392)	(0.376)	(0.376)	(0.362)	(0.356)
Marital Status						
Married	0.693*	0.675*	0.602*	0.580*	0.570	0.574*
	(0.296)	(0.289)	(0.289)	(0.289)	(0.292)	(0.289)
Divorced	0.337	0.338	0.325	0.327	0.345	0.325
	(0.347)	(0.348)	(0.347)	(0.338)	(0.335)	(0.327)
Widowed	0.303	0.295	0.196	0.180	0.137	0.156
	(0.488)	(0.491)	(0.483)	(0.485)	(0.474)	(0.477)
Education						
High School	-1.285**	-1.267**	-1.241**	-1.217**	-1.250**	-1.228**
	(0.473)	(0.473)	(0.460)	(0.454)	(0.451)	(0.451)
College	-1.357**	-1.302*	-1.330**	-1.322**	-1.344**	-1.314**
	(0.508)	(0.507)	(0.498)	(0.494)	(0.487)	(0.486)
Postgraduate	-1.596**	-1.526**	-1.544**	-1.538**	-1.549**	-1.523**
	(0.549)	(0.540)	(0.536)	(0.535)	(0.527)	(0.524)
Occupation						
Upper-white Collar	-0.011	-0.011	0.073	0.080	0.076	0.071
	(0.314)	(0.303)	(0.298)	(0.300)	(0.291)	(0.291)
Lower-white Collar	0.044	0.014	0.013	0.010	-0.022	-0.027
	(0.303)	(0.296)	(0.288)	(0.287)	(0.288)	(0.288)
Not Employed	0.203	0.176	0.218	0.240	0.351	0.353
	(0.302)	(0.294)	(0.293)	(0.293)	(0.286)	(0.287)

Continued on next page

Table 2. Continued.

Work Stability	0.104	0.070	-0.023	-0.012	0.076	0.075
	(0.401)	(0.403)	(0.396)	(0.394)	(0.390)	(0.384)
Income	0.001	0.001	0.001	0.001	0.001	0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Financial Strain	-0.104	-0.161	-0.160	-0.153	-0.167	-0.166
	(0.160)	(0.153)	(0.150)	(0.150)	(0.142)	(0.143)
Current Financial Situation	-0.050	-0.058	-0.067	-0.024	-0.050	-0.046
	(0.058)	(0.058)	(0.057)	(0.069)	(0.068)	(0.068)
Morbidity	0.267***	0.257***	0.239***	0.235***	0.217***	0.220***
	(0.052)	(0.049)	(0.050)	(0.051)	(0.050)	(0.050)
Psychological Distress	0.305	0.301	0.373*	0.348*	0.313	0.303
	(0.193)	(0.192)	(0.177)	(0.176)	(0.177)	(0.176)
Constant	1.387	1.155	1.421	1.803	0.455	0.676
	(0.983)	(0.971)	(0.966)	(1.031)	(1.023)	(1.087)
R^2	0.345	0.364	0.382	0.384	0.404	0.406

Note: Unstandardized regression coefficients with robust standard errors in parentheses. Reference categories are no effect/good (way affected by recession), recession is over (anticipated recession duration), never married (marital status), less than high school (education), and blue collar (occupation).
* p<0.05, ** p<0.01, *** p<0.001 (two-tailed tests).

Figure 1. Conceptual model of hypothesized processes

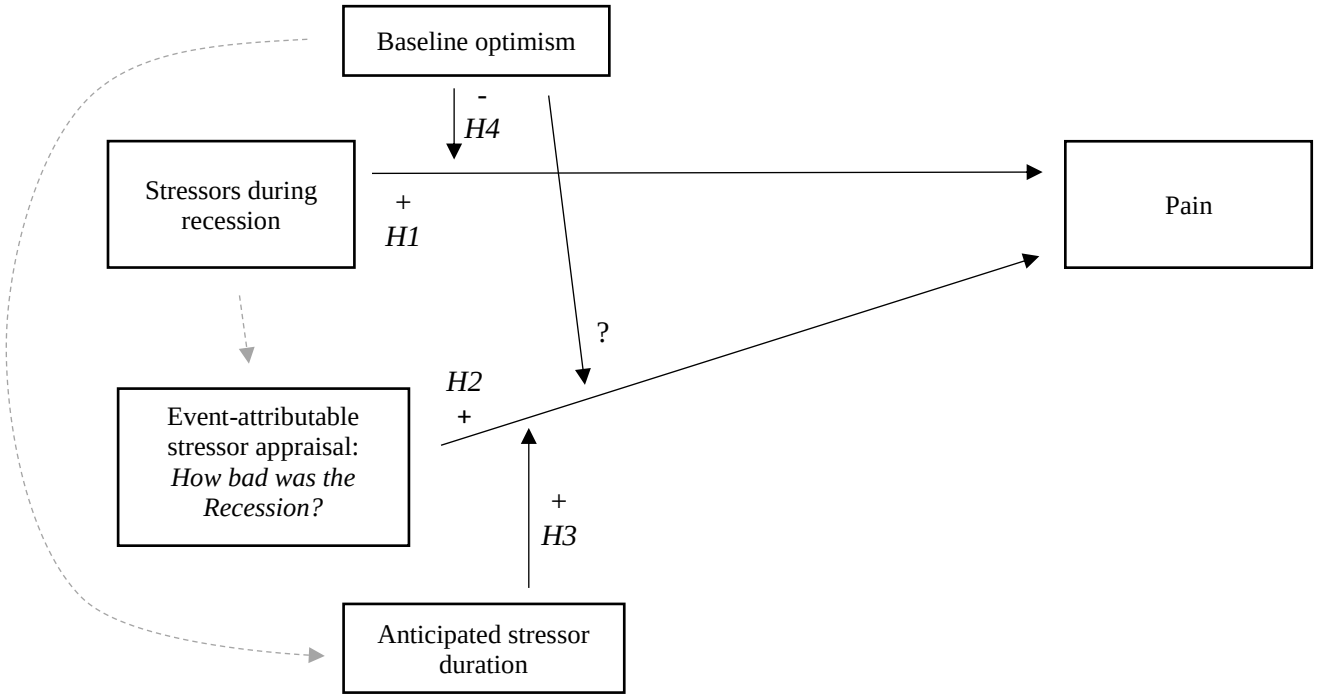
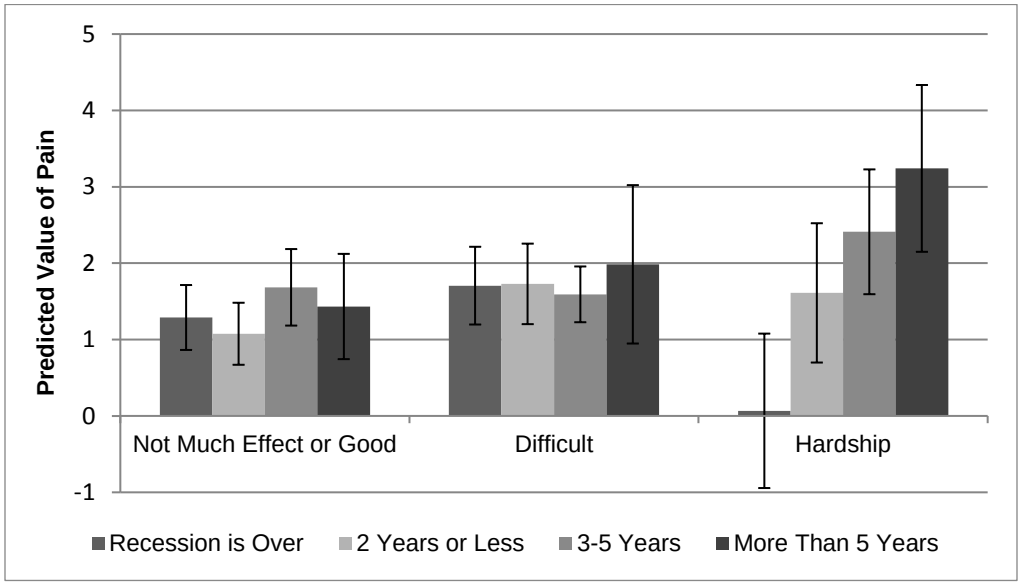
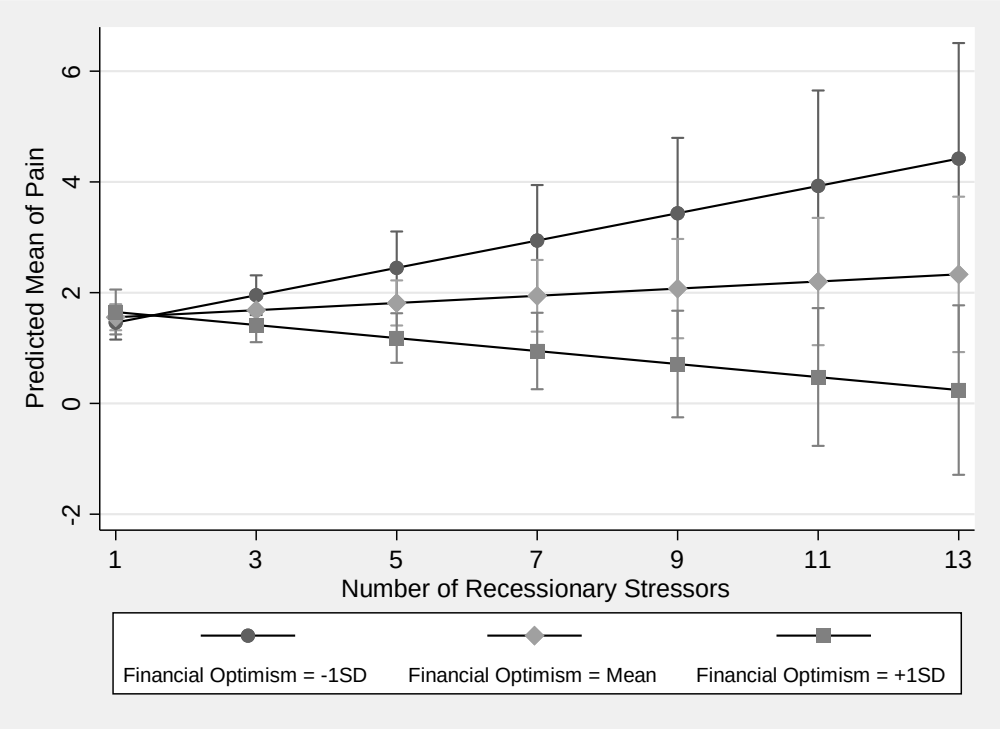


Figure 2. Moderating Effect of Anticipated Stressor Duration on the Relationship Between Event-Based Summary Appraisals of the Great Recession and Pain



Note: Based on the results from Model 6 in Table 2. 95% confidence intervals are displayed.

Figure 3. Moderating Effect of Financial Optimism on the Relationship Between Negative Recession Experiences and Pain



Note: Based on the results from Model 6 in Table 2. 95% confidence intervals are displayed.

Appendix 1. Negative recession experiences (N = 1,062)

	Way Affected by Recession			
Types of Experience	No Effect/Good	Difficult	Hardship	P-value
Employment				
"Lost a Job"	0.071	0.120	0.306	***
"Started a New Job You Did Not Like"	0.026	0.043	0.138	***
"Taken a Job Below Your Education/Experience"	0.051	0.110	0.263	***
"Taken on an Additional Job"	0.053	0.099	0.188	***
Home/Living Arrangement				
"Missed a Mortgage or Rent Payment"	0.024	0.026	0.225	***
"Threatened with Foreclosure/Eviction"	0.008	0.026	0.175	***
"Sold a Home for Less than It Cost You"	0.034	0.033	0.082	*
"Lost a Home to Foreclosure"	0.004	0.010	0.075	***
"Lost a Home to Something Other than Foreclosure"	0.008	0.013	0.063	***
"Family/Friends Moved in to Save Money"	0.067	0.110	0.231	***
"Moved in with Family/Friends to Save Money"	0.016	0.043	0.106	***
Financial				
"Declared Bankruptcy"	0.006	0.020	0.119	***
"Missed a Credit Card Payment"	0.051	0.089	0.231	***
"Missed Other Debt Payments"	0.026	0.018	0.175	***
"Increased Credit Card Debt"	0.116	0.276	0.363	***
"Sold Possessions to Make Ends Meet"	0.053	0.125	0.344	***
"Cut Back on Your Spending"	0.450	0.730	0.931	***
"Exhausted Unemployment Benefits"	0.039	0.054	0.204	***

* p<0.05, ** p<0.01, *** p<0.001 (two-tailed tests).