Unemployment, Measured and Perceived Decline of Economic Resources:
Contrasting Three Measures of Recessionary Hardships and Their Implications for Adopting Negative Health Behaviors

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ABSTRACT

Economic downturns could have long-term impacts on population health if they promote changes in health behaviors, but the evidence for whether people are more or less likely to adopt negative health behaviors in economically challenging times has been mixed. This paper argues that researchers need to draw more careful distinctions amongst different types of recessionary hardships and the mechanisms that may underlie their associations with health behaviors. We focus on unemployment experience, measured decline in economic resources, and perceived decline in economic resources, all of which are likely to occur more often during recessions, and explore whether their associations with health behaviors are consistent or different. We use population-based longitudinal data collected by the Michigan Recession and Recovery Study in the wake of the Great Recession in the United States. We evaluate whether those who had experienced each of these three hardships were more likely to adopt new negative health behaviors, specifically cigarette smoking, harmful and hazardous alcohol consumption, or marijuana consumption. We find that, net of controls and the other two recessionary hardships, unemployment experience was associated with increased hazard of starting marijuana use .Measured decline in economic resources was associated with increased hazard of cigarette taking up smoking and lower hazard of starting marijuana use. Perceived decline in economic resources was linked to taking up harmful and hazardous drinking. Our results suggest heterogeneity in the pathways that connect hardship experiences and different health behaviors. They also indicate that relying on only one measure of hardship, as many past studies have done, could lead to an incomplete understanding to the relationship between economic distress and health behaviors.

INTRODUCTION

Are people more or less likely to adopt negative health behaviors during economic downturns? In the aftermath of the late 2000s "Great Recession," a range of research has been directed at this question. The findings have been heterogeneous (for recent reviews see Burgard et al., 2013; Catalano et al., 2011). At the population level, lower use of harmful substances and healthier lifestyles have been documented by Ruhm (1995) and Ettner (1997), among others, and most recently by Xu (2013). A different set of studies has focused on the consequences for change in individuals' behaviors of directly experiencing events that typically happen more often during recessions, such as unemployment or decrease in economic resources. Some of these studies have shown that consumption of alcohol and drugs is higher among those who experience unemployment (Henkel, 2011). Others have argued that people are less likely to engage in health-conscious behaviors, such as eating a healthy diet, when they experience financial strain (Macy et al., 2013). What is still missing from this literature is a careful distinction among the different underlying mechanisms that could be connecting typical recessionary hardships to changes in different health behaviors. In this paper, we use prospective data from a sample of individuals in Southeast Michigan in the wake of the Great Recession to focus on the potentially varying associations between negative health behaviors, namely smoking, high alcohol consumption, and marijuana use, with three typical recessionary hardships: unemployment, decrease in economic resources, and perceived worsened economic situation.

Researchers studying changes in health behaviors that follow after an individual experiences a typical recessionary shock have often conceptualized job loss or unemployment as a catalyst of adopting new negative health behaviors or relapsing to old ones. For example, in a prospective study of young Swedes, Janlert and Hammarstrom (1992) showed that those who lost jobs and experienced unemployment had four times the rate of hazardous drinking compared to their peers, net of other characteristics that could be associated with both job loss and hazardous drinking. Their finding has also been supported by a prospective study of younger workers in the Norwegian population, who were more likely to consume alcohol as well as marijuana in the aftermath of a job loss (Hammer, 1992). In more recent work, Khlat and colleagues (2004) showed that French men who experienced unemployment had increased risk of heavy drinking, smoking, and consumption of psychoactive drugs. Moreover, Black and colleagues (2012) demonstrated that displaced workers had greater rates of smoking compared to those not displaced, and that smoking increases translated to their higher incidence of cardiovascular disease over time. These conclusions support the explanatory framework of the

stress hypothesis, which suggests that adopting negative health behaviors after a job loss is a coping strategy to deal with the stress of being stripped of a major social role and social networks (Hayes, 1981).

Additionally, increased stress may follow unemployment because of concurrent decrease in economic resources that can be stressful for the job loser or their family. However, it is important to recognize that unemployment and decrease in economic resources are two theoretically related but distinct constructs, and each may have its own consequences and therefore implications for health behaviors (Macy et al., 2013). Unemployment may bring a significant amount of anguish to the individuals who experience related financial trouble, but even net of financial hardship, it entails the loss of other positive aspects of work, from social interaction to the benefits associated with the enhancement of social status through employment (Burgard & Lin, 2013). Additionally, financial struggles can occur for reasons other than unemployment, and a decrease in economic resources not directly tied to a personal loss of employment could also generate change in health behaviors. Importantly, health behavioral consequences of a decrease in economic resources versus the experience of unemployment could differ in some instances. While unemployment may be associated with negative coping behaviors in response to stress, a decrease in economic resources may compel individuals to become more conservative in their spending on non-essential items, such as alcohol (Sutton & Godfrey, 1995). At the same time, longitudinal evidence presented by Dee (2001) shows that the prevalence of binge drinking rises during tougher economic periods, both among those who lose jobs and those who remain employed. Unemployment should therefore be considered independently from, as well as in connection with, changes in economic resources.

In this study, we build upon recent work by Macy and colleagues (2013) that called for a more careful distinction between experiences of unemployment versus decline in economic resources and examined how lowered working hours, unemployment and financial strain each were associated with changing health behaviors. While a commendable first step, their study did not consider another potentially important distinction: we additionally explore whether it is important to distinguish between a *perception* of financial strain that was reported by survey respondents versus one that was more objectively *measured* by assessing a change in their economic resources over time. The perception of worsened financial situation may not perfectly overlap with a decrease in economic resources, and the two could be associated with health behaviors differently. Objective decrease in economic resources need not be associated with negative health behaviors, especially if it is not perceived as stressful by the individual. By

contrast, self-reported financial strain is a direct expression of the stressfulness and pessimistic appraisal of one's financial situation, and could increase negative behaviors according to the stress hypothesis. The theoretical and analytical distinction between a measured decrease in economic resources and a perceived decrease in economic resources could have important implications for how we construct hypotheses about the adoption of negative health behaviors.

In this paper, we distinguish between three types of individual recessionary experiences, examining the associations between unemployment experiences, measured decrease in economic resources, and perceived decrease in economic resources, and the risk of subsequent take up of any one of the three negative health behaviors we focus on in this study: smoking, alcohol abuse, and marijuana use. We use the Michigan Recession and Recovery Study (MRRS), a longitudinal dataset initiated in the Detroit metro area in 2009-2010, with a follow-up interview in 2011, to explore the following research questions: (1) Are people who have had an unemployment experience more likely to adopt harmful health behaviors? (2) Are people who have experienced a measured decrease in economic resources more likely to adopt harmful health behaviors? (3) Are people who perceive a decrease in economic resources more likely to adopt harmful health behaviors?

DATA AND METHODS

Michigan Recession and Recovery Study (MRRS) data were collected in face-to-face interviews of a stratified random sample of English-speaking adults aged 19 to 64 who lived in Southeastern Michigan (Macomb, Oakland, and Wayne counties). MRRS was designed with an oversample of African Americans and includes mainly African American and non-Hispanic white respondents, reflecting the local residential composition. The baseline wave was fielded from October 2009 to April 2010 and included 914 respondents, with a response rate of 82.8%. Follow-up interviews were conducted from April to August of 2011, and 847 respondents were re-interviewed for a response rate of 94% of survivors. Survey weights address non-response and make the MRRS representative of adults aged 19 to 64 living in the three-county area in Southeastern Michigan. Data have been multiply imputed using IVEware and analyzed using Stata 13.0. We limit our analysis to those who participated at both interviews and provided complete (not imputed) answers to all questions used for constructing dependent variables (N = 842). More information about the survey design is provided elsewhere (citation blinded for review).

Measures of Unemployment Experience, Measured and Perceived Decrease of Economic Resources

Every respondent reported whether they were employed, unemployed or not in the labor force for each month between their first and second interview. We considered a respondent to have experienced unemployment if they said they were unemployed during any one month between the interviews (n = 242). On average, a respondent who experienced unemployment was unemployed for a total of 8.9 months.

We constructed a measure of a decrease in economic resources based on income-to-needs ratios evaluated at both waves. All respondents were asked about their total household income for the year prior to each interview (2008 for interviews conducted in late 2009/early 2010 and 2010 for interviews conducted in 2011). We used this information, along with information about the number of other adults and children in the household, to construct an income-to-needs ratio based on the U.S. Census thresholds for the respective years. We then compared each respondent's 2008 and 2010 income-to-needs ratios. The respondents whose income-to-needs ratio in 2010 was 75% or less of their ratio for 2008 were considered to have undergone a decrease in economic resources (n = 224).

Perceived decrease in economic resources was assessed with a survey item at the second interview that asked: "Since we last spoke to you, would you say your household's financial situation today has greatly improved, somewhat improved, remained the same, somewhat deteriorated or greatly deteriorated?" To create a perceived decrease indicator we combined the responses "somewhat deteriorated" and "greatly deteriorated" into the "decreased" category (n = 253). For reference, we provide a table with correlations between the measures in Appendix A.

Measures of Health Behaviors

We study the adoption of three harmful health behaviors between the first and second wave of the survey among those who were not engaging in this behavior at the first interview: tobacco smoking, harmful and hazardous alcohol consumption, and marijuana use. We define new smokers as people who said they did not smoke cigarettes regularly or occasionally at wave one, but did at wave two (n = 32; 5.4% weighted). Harmful and hazardous alcohol consumption was assessed according to the guidelines described by the Alcohol Use Disorder Identification Test (AUDIT) (Allen et al., 1997). Those respondents whose alcohol consumption was not judged to be harmful and hazardous in the past year at the first wave of the study, but who met

criteria at the second wave, were classified as newly engaging in harmful and hazardous drinking (n = 24; 4.0% weighted). Finally, we determined whether the respondents used marijuana during past twelve months. During both interviews, the respondents were asked to identify what substances were they taking "on their own." The interviewers specified that "on their own" meant either without a doctor's prescription, in larger amounts than prescribed, or for a longer period than prescribed. Respondents were given a booklet that listed different types of substances including, for example, amphetamines, painkillers, LSD and crack. Respondents were coded as new marijuana users if they reported no marijuana use at the first wave, but said they had used it at the second wave of the study (n = 38; 3.9% weighted).

Other Measures

In all analyses we also control for respondent's age and its squared term, gender, race (African American versus not African American), self-rated health (in poor or fair health versus in good, very good, or excellent health), and educational attainment (bachelor's degree or more versus less), married versus not, all measured at wave 2. To adjust for financial resources available at the second interview, a potential predictor itself of negative health behaviors, we also control for total household income in 2010 in its natural log form, also at wave 2.

Analytic Strategy

We first examined bivariate associations between measured or perceived decrease in economic resources or unemployment and each control variable by estimating logistic regression models using each variable as a sole predictor of the hardship in question. After that, we considered bivariate associations between these experiences and adoption of a new harmful health behavior. We then estimated complementary log-log regression models to examine the associations between adopting each new behavior and measured or perceived economic decrease or unemployment, net of other predictors. Finally, we re-estimated the complementary log-log models with all three negative experiences in the model, as well as all controls. In each model, we used an analytic sample of respondents who did not report that specific negative health behavior at the first interview, and we focus on new uptake of these behaviors. Our analyses account for the complex sample survey design and selection of the analytic sample with survey estimation procedures in Stata/SE 13.0. We performed all analyses using five multiply imputed datasets and relying on Stata's - mi svy- commands (StataCorp, 2011). Regression results below and in the tables are reported in hazard ratios.

RESULTS

Table 1 shows descriptive statistics of the sample stratified by whether or not the respondent experienced unemployment or measured or perceived decrease in economic resources. Respondents with an unemployment episode reported a significantly lower median income than those who did not ($30,999 vs. $75,000). They were also generally younger (40.0 vs. 44.9), more likely to be African American (31.5 vs. 19.8%), less likely to have earned a bachelor's degree (20.7 vs. 33.8) and were less likely to be married (38.1 vs. 65.0%) Those who experienced a measured decrease in economic resources between 2008 and 2010 had significantly lower median income at wave 2 compared to those who did not ($30,000 vs. $78,868). They were also significantly more likely to be African American (33.0 vs. 19.7%), less likely to have earned a bachelor's degree or more (33.4 vs. 20.1%), and less likely to be married (63.8 vs. 40.5%). The respondents who perceived a decrease in economic resources had significantly lower incomes at wave 2 ($52,000 vs. $70,000), were older (46.2 vs. 43.8), more likely to be African American (27.5 vs. 20.9%), and less likely to have earned a bachelor's degree (23.4 vs. 33.6%). Starting to smoke or to use marijuana was more common among those who reported an unemployment episode (11.3 vs. 3.8% and 11.3% vs. 1.8%, respectively). The respondents who experienced a measured economic decline were significantly more likely to become smokers between the data collection waves (16.3 vs. 2.5%). Moreover, those who perceived an economic decrease were more likely than those who did not to begin harmful and hazardous consumption of alcohol (7.4 vs. 2.8%).

Table 2 (Models 1 – 3) displays complementary log-log regression models with each harmful health behavior as a dependent variable predicted by unemployment experience, controlling for age and age-squared, the natural log of household income, sex, race, educational attainment, self-reported health, and marital status Those who reported at least a month of unemployment had a higher hazard of starting smoking (HR: 1.93) and also greater hazard of starting to use marijuana (HR: 5.93). Table 3 (Models 4 – 6) is analogous to Table 2, but focuses on a measured decrease in economic resources. We find that experiencing a decrease in economic resources predicted taking up tobacco smoking, consistent with the findings for the bivariate associations. Table 4 (Models 7 – 9) displays results for models using perceived decrease in economic resources as the main predictor, and shows higher likelihood of new harmful and hazardous alcohol consumption (HR: 2.74) even after adjusting for covariates.

In Table 5 (Models 10 - 12) we present complementary log-log models with all of the key predictors included simultaneously, as well as all controls. Coefficients for the controls have been omitted from this table to save space, but their pattern closely resembles that shown in previous tables. Results indicate that the association between unemployment and starting to smoke (Model 10) lose its statistical significance after including the indicators of measured and perceived decrease in economic resources, while the associations with measured economic decline became more prominent (HR: 7.16). Perceived decrease remained non-significant. The hazard of taking up harmful and hazardous drinking for those who reported a perceived decrease in economic resources became slightly larger (HR: 2.94) after including indicators for unemployment and measured economic decrease, while the other two recessionary experiences still did not predict changes in alcohol use. The strength of the association between unemployment and starting to use marijuana was slightly attenuated (HR: 5.41) in Table 5, but remained large and significant. Interestingly, after accounting for unemployment experience and perceived decrease in economic resources, the indicator for a measured decline became a significant predictor of not taking up marijuana use (HR: 0.24). Perceived economic decline remained non-significant.

DISCUSSION

The anticipated consequences of the late 2000s Great Recession for population health have been a subject of lively academic debate. Researchers have already documented that mortality tends to exhibit pro-cyclical patterns at the population level, due to factors including lowered intensity of industrial production, fewer traffic fatalities and fewer old age deaths in institutions (Miller et al., 2009; Ruhm, 2000). However, the literature on changes in health behaviors has seen fewer clear resolutions (Catalano et al., 2011). Understanding whether the adoption of negative health behaviors could be spurred by personal experience of recessionary hardships is a particularly important question to consider because negative health behaviors established or reestablished at a time of an economic downturn can last past the hard times and become a life-long habit.

There are at least two important reasons for the lack of consensus in the literature on changes in health behaviors during economic downturns. First, associations between various health behaviors and different economic changes may be heterogeneous. Different kinds of health behaviors are likely to be sensitive to changes in economic resources to varied degrees.

For instance, the stress of greater financial challenges could be more likely to spur new hazardous alcohol consumption than to encourage a non-smoker to start smoking. Moreover, different behaviors may be connected to changes in economic resources by a diverse set of underlying mechanisms (from stress to budgetary belt-tightening) that ultimately result in diverse outcomes across health behaviors.

Second, economic downturns bring multiple types of economic hardships to the population, such as unemployment and declines in household economic resources. Moreover, some individuals may be affected by one hardship, but not by others, some may experience multiple hardships, while others need not observe any negative effects on their own employment or financial situation at all. Focusing on only one type, such as an individual's own unemployment, may underestimate negative effects on health behaviors of those who did not lose a job, but whose well-being was affected by, for instance, a decrease in a number of hours available to them (via a drop in income) or the unemployment of others who normally contribute to household income. Different health behaviors as well as different types of recessionary hardships therefore need to be examined separately in the same analyses.

Findings

We found that net of the other hardships, having experienced unemployment between the first and second interview was associated with an increased hazard of becoming a marijuana user, but not with starting to smoke cigarettes or use alcohol in a harmful and hazardous manner. In this respect, our results differ from some of the previous research that found job loss to be a predictor of both increases in cigarette smoking and alcohol consumption (e.g. Khlat et al., 2004; Popovici & French, 2013). We suggest that adopting these negative health behaviors in the aftermath of an unemployment experience may be a reaction to the constellation of the multiple hardships that typically accompany it, rather than solely the unemployment experience. Furthermore, we also showed that measured decrease in economic resources was associated with greater hazard of starting to smoke cigarettes, but at the same time, a lower likelihood of starting marijuana use. Additional investigation will be required to understand this association, as there is limited research to date that explores the relationship between changes in economic hardship and illicit drug use (but see Arkes, 2007; Arkes, 2011). Finally, perceived decrease in economic resources was associated with an increased hazard of starting harmful and hazardous drinking. Our findings therefore demonstrate that different types of recessionary hardships may be associated with distinct kinds of changes in health behaviors. These results confirm our initial

hypothesis that relying on a single individual-level indicator of exposure to recessionary hardships, such as a recent unemployment, may lead us to underestimate the extent to which a broad array of recessionary hardships might catalyze different changes in health behaviors.

Limitations

Despite these novel findings, our study has several limitations that may influence the validity and generalizability of the results. Most importantly, our research design does not fully eliminate the possibility of uncontrolled confounding that could impact both changes in health behaviors and changes in economic well-being. For example, a divorce could in some instances lead to the worsening of personal economic situation as well as the adoption of negative health behaviors. There are alternative hypotheses that we are similarly unable convincingly to test with only two waves of data. In addition, we cannot completely rule out the possibility of reverse causality. In some instances, it may be possible for a negative health behavior to lead to material hardship. This could be a particularly salient problem for the estimates of the likelihood of adopting harmful or hazardous drinking after a job loss, because past research presents evidence for such an association running from alcohol use to job loss (Henkel, 2011).

The analytic sample used in this study is not large, and combined with the relative rarity with which adults change health behaviors (most health habits are formed in adolescence and early adulthood), this results in small numbers of positive cases of behavior adoption. We have used complimentary log-log models to alleviate some of the potential concerns about the rarity of behavioral changes, but these results should be interpreted with some caution and validated with larger samples. Additionally, our sample is comprised of working-age residents of Southeastern Michigan and this limits our ability to generalize to the United States population. Since our data is not nationally representative, we cannot rule out the influence of unmeasured community characteristics that could impact the relationship between changes in financial well-being and adopting new harmful health behaviors. Before extrapolating the results of our study to the general population, other studies are needed to verify the consistency of our findings in a variety of other communities.

For our indicator of “measured decrease in economic resources” we are relying on self-reported data, as for all the other measures. Information about income is difficult to collect and can sometimes be unreliable; for example, reports of measured income could even be influenced by a respondent’s perceived financial well-being, another focal measure. However, we find that

these two sets of measures do not have very high correlation (0.3, see Appendix A), which leads us to believe they measure different constructs. On the other hand, the low correlation of our measures could also be an artifact of how they were constructed, which is another limitation of our study. In the absence of prior work that used this strategy, we established arbitrary cut-offs for assessing what constituted a significant measured decrease in economic resources. While we conducted sensitivity analyses by exploring varied cut-off points and our findings appeared robust to change in specifications, what we understand to be a considerable change in income to needs ratio may not seem considerable to some respondents, or the reverse may be true for others, as a much smaller change than what we captured could represent a major hardship. Moreover, the ratio can change substantially for reasons that individuals need not find stressful, as, for example, losing or gaining an additional household member. In additional sensitivity analyses we considered only the respondents whose household size did not change between survey waves (67%). We found that the association between a decrease in financial resources and lower likelihood of starting marijuana use was no longer significant after excluding those whose household size had changed between waves. Nevertheless, we report the results for the full sample because we believe that, more often than not, a change in household size that is associated with a 25% decrease in income-to-needs ratio is an economically stressful event.

An additional limitation of our study is that we are not able to distinguish between involuntary and voluntary job losses when we evaluate whether a respondent had an unemployment experience. This is because many had multiple employment changes during the study period, some of which may have been voluntary while others were not. There is also heterogeneity in experiences we classify together as an "unemployment experience." While some respondents were unemployed for short periods, the unemployment spells of others were extended. It may be that recent job losers are particularly likely to change their behaviors or, that long-term unemployment is more likely to be associated with negative health behaviors. Further work with larger samples that will allow for stratification by voluntary and involuntary unemployment is needed to evaluate the effects of the duration of an unemployment spell on the likelihood of adopting new negative health behaviors.

It is also important to emphasize that our measures of health behaviors were based on single-item survey self-reports, with the exception of the AUDIT harmful and hazardous alcohol drinking scale. Some of the behaviors we are studying could be considered socially undesirable, and using marijuana is illegal for non-medical purposes. Moreover, unemployed respondents

may be especially motivated to not disclose their substance use, in fear of jeopardizing their job search or adding to the stigma they already face due to their disengagement from the paid labor force. That could lead to under-reporting of negative health behaviors in our survey. A pattern of under-reporting that could be particularly problematic for our study would be if a respondent who engaged in a certain type of behavior at both the first and second wave of the survey only reported this behavior at the second wave, perhaps as a consequence of feeling more comfortable with the survey and developing trust toward the interviewer. Unfortunately, there is little that could be done to address this issue in our survey, but other datasets that use biomarkers to assess substance use, for example, could bring further insight and precision into the examined associations. Additionally, in many cases, the observed new behaviors are likely to be relapses of old habits. Among the new smokers at the second wave, approximately 90% smoked at some point in the past prior to the first interview, even though they were not smokers at that first interview. We do not have retrospective information about our other health measures, but it is reasonable to assume that relapses make up the majority of the new cases on the other two behaviors as well.

CONCLUSION

Our study provides new insights into the relationship between changes in economic well-being and changes in health behaviors. We saw that although unemployment, measured decrease in economic resources, and perceived decrease in economic resources could be considered by some to capture the same construct of "recessionary hardship," such simplification would result in overlooking the diverse associations between each one of these and distinct changes (or lack of change) in health behaviors. Our results showed that different types of hardships had varying types of associations with the three behaviors we studied, supporting the hypothesis that there are multiple pathways between recessionary hardships and health behaviors, and these are not likely to be successfully reduced to a simple competition between stress versus belt-tightening explanations. This insight is not only relevant to researchers studying changes in health behaviors, but also to those designing public health interventions intended to protect populations at increased risk of adopting harmful health behaviors. In the future, it may also be illuminating to examine the relationship between improvements in economic situation and changes in health behaviors.

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