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A couple-level analysis of participation in physical activity during unemployment

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ABSTRACT

There is a well-documented negative correlation between unemployment and health. Yet, little research has examined how unemployment relates to participation in physical activity, and few researchers have considered how an individual's unemployment may affect the health of their spouse or partner. The purpose of this study is to answer three questions: 1. Is one's own unemployment associated with changes in physical activity participation? 2. Is one's partner's unemployment associated with changes in physical activity participation? 3. Do changes in physical activity behaviors associated with unemployment differ by gender? This study uses nationally representative, longitudinal data on couples in the United States, covering the period 1999–2013. These data, obtained from the Panel Study of Income Dynamics, are used to estimate fixed-effects models of the relationships between one's own, and one's partner's, unemployment and participation in physical activity. I find that for men unemployment is not associated with changes in physical activity time. For women, own unemployment is associated with increases in physical activity, whereas a partner's unemployment is associated with decreases in physical activity. I argue that unemployed women, unlike men, are able to take advantage of the increased availability of time through reduced labor supply to invest in their health during unemployment, which could have positive long-run consequences. Results suggest the importance of studying unemployment and health at the household level and suggest a need for further investigation into gender differences in unemployment and health.

Introduction

There is a well-documented negative correlation between unemployment and health (Jin, Shah, & Svoboda, 1995, Wilson & Walker, 1993), though there has been debate about the directionality of the relationship (Salm, 2009). Moreover, many studies have focused on broad measures of health or a few specific risk behaviors, such as smoking and alcohol consumption (e.g., Deb, Gallo, Ayyagari, Fletcher, & Sindelar, 2011, Luoto, Poikolainen, & Uutela, 1998), but few studies have focused on health-promoting behaviors such as physical activity (but see Colman & Dave, 2014, Dave & Kelly, 2012). There are a number of reasons to think that individuals experiencing unemployment might not engage in as many health-promoting behaviors as during employment (e.g., because of stress or depression), yet, like with smoking and alcohol consumption, there are also reasons to believe individuals might make healthier choices during unemployment. For example, the economic hardship that can accompany job loss may reduce one's ability to consume health care, along with vices like cigarettes, leading individuals to search for ways to maintain health without the use of medical care, perhaps through physical activity or diet. Furthermore, in the Grossman model of health capital individuals make investments in health, but time investments in health are limited by labor supply (Avendano & Berkman, 2014). In the case of unemployment, the labor supply barrier is eliminated and such time investments in health could be increased, even if material investments are decreased. Prior research demonstrates that lack of time is a commonly reported barrier to exercise (Nomaguchi & Bianchi, 2004, Sallis, Hovell, & Hofstetter, 1992, Trost, Owen, Bauman, Sallis, & Brown, 2003). In this study, I focus on physical activity behaviors because of their importance for long-term health (Courneya, Mackey, Bell, Jones, Field, & Fairey, 2003, Stewart, Hays, Wells, Rogers, Spritzer, & Greenfield, 1994) and because they are severely understudied in the context of unemployment research.

While one's own unemployment is a shock that seems to influence health and health behaviors, a partner's unemployment may also be stressful or bring about a reduction in resources (Mendolia, 2014, Westman, Elzion, & Horoutz, 2004), thus influencing one's own health and well-being. Researchers studying other aspects of family life have characterized unemployment as a household experience (see, e.g., Gough & Killewald, 2011, Lundberg,

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1985, Maloney, 1987). As a part of a couple, an unemployed individual could be buffered from adverse health outcomes because of the potential for resource sharing and social support. For example, Oppenheimer's (1997) theory of risk pooling suggests that couples can pool risk in ways that single individuals cannot, and this risk pooling could help attenuate the resource loss and other negative effects of unemployment. Furthermore, in a couple or family context there is the potential for a built-in support system beyond any type of resource pooling. Jackson (1992) found that spousal support was an effective buffer against economic strain, which could occur with unemployment, and she found that the shared experience of this strain was likely a driver of this buffering effect. Thus, having financial and emotional support from a partner may help an unemployed individual to make healthier choices in the face of a crisis like unemployment.

On the other hand, the potential for negative spillover of stress and anxiety between partners (Mendolia, 2014, Westman et al., 2004) could translate into negative outcomes for both unemployed individuals and their partners. Westman et al.'s (2004) study of couples in Israel found that economic hardship resulting from unemployment was a significant predictor of anxiety for both spouses in the household and that there was significant crossover of anxiety from the unemployed individual to the spouse and vice versa. Mendolia (2014) detected similar trends in couples when the husband was unemployed; both members of the couple were more likely to experience poor mental health. Stress and negative mental health outcomes for unemployed individuals and their partners could lead to a variety of negative health behaviors, including smoking, alcohol abuse, and other risk taking behaviors (Falba, Teng, Sindelar, & Gallo, 2005, Harris & Edlund, 2005, McKee, Maciejewski, Falba, & Mazure, 2003). Margolis (2013) provides similar evidence of cross-partner health behavior changes for smoking in the context of a new chronic disease diagnosis. Such couple-level analyses are limited in the research despite the well-known association between marriage and health (Ross, Mirowsky, & Goldsteen, 1990, Waite & Gallagher, 2000). To that end, in their 2010 review of research on families and health, Carr and Springer (2010) call for more attention to both dyadic analyses of health (those focusing on both members of a couple) and a focus on specific outcomes, rather than broad measures of health and well-being.

Gender may also play a role. Research suggests that while unemployment is detrimental to both men's and women's health (Brenner & Levi, 1987, Kessler et al., 1987), men may experience more negative outcomes because they may encounter stigma as a result of their failure to successfully enact the breadwinner role (Komarovsky, 1940, McFayden, 1995, Paul & Moser, 2009). Thus, the experience of unemployment for health in a household may differ depending on whether the male or female partner is the one experiencing the unemployment.

Building from this, and Carr and Springer's (2010, p. 743) argument that researchers need to focus on the conditions under which, and for whom, family structure and context matter for health, in this study I seek to answer the following research questions: 1. Is one's own unemployment associated with changes in physical activity participation? 2. Is one's partner's unemployment associated with changes in one's own physical activity participation? 3. Do changes in physical activity behaviors associated with unemployment differ by gender? Drawing on a number of different theoretical perspectives and prior research I analyze longitudinal data from the Panel Study of Income Dynamics (PSID) to determine whether individuals change their physical activity behaviors when they or their partners experience involuntary unemployment. I examine whether these changes differ by gender, and I test robustness with supplementary and subgroup analyses.

Background

Unemployment and health

Prior research has shown unemployment to be associated with a host of undesirable outcomes, including negative health outcomes like problem drinking (Deb et al., 2011, Luoto et al., 1998) and an increased risk of suicide (Voss, Nylen, Floderus, Diderichsen, & Terry, 2004). Unemployed individuals experience worse mental health (Gallo, Bradley, Siegel, & Kasl, 2000, McInerney, Mellor, & Nicholas, 2013, Mendolia, 2014) and a greater risk of smoking relapse (Falba et al., 2005). While much research has focused on negative health behaviors, in recent years there has been increased interest in examining the relationship between unemployment and health-promoting behaviors, such as physical activity or diet (Dave & Kelly, 2012). Scant research has examined whether unemployment is associated with time in physical activity (but see Colman & Dave, 2014), and there has been even less research on how the health behaviors and physical activity of other household members may be affected by an individual's unemployment.

The mechanisms for the negative relationship between unemployment and health include the substantial reduction in income and consumption that often accompanies job loss (Chan & Stevens, 2004, Stephens, 2004) and the loss of health insurance (Levy & Meltzer, 2004). Kessler et al. (1988) found substantial evidence that financial strain was an intervening variable in the relationship between unemployment and health. Economic hardship is also known to take a psychological toll (Ross et al., 1990). Considerable research suggests that stress and depression resulting from unemployment negatively influence health behaviors (Falba et al., 2005, Gallo et al., 2000). For example, as Falba and colleagues (2005) found, even though one might expect the loss of income that accompanies unemployment to result in less consumption of tobacco, unemployment was associated with an increased risk of continuing smoking or smoking relapse, which was likely at least partially related to an increase in psychological stress. At the couple level, unemployment-induced economic hardship has been associated with a significant risk of anxiety for both spouses in the household (Westman et al., 2004).

Theoretically, unemployment could also induce positive health behaviors such as by reducing the barriers (such as lack of time) to physical activity participation. This is consistent with the Grossman model of health capital. Under this model, individuals invest in health with time and other health inputs because health increases productivity and allows one to work in the labor force (Avendano & Berkman, 2014). Among workers, labor supply provides income, which allows individuals to purchase material inputs to health, but it costs these workers time to produce health inputs such as exercise (Avendano & Berkman, 2014). Thus, unemployed individuals could invest more in exercise because the unemployment frees up time. Indeed, Xu (2013) found that hours of work were negatively associated with physical activity, but the effects were primarily a result of changes in employment status rather than changes in hours conditional on being employed. Additionally, since part of the motivation for health investments is to increase productivity in the labor market (Avendano & Berkman, 2014), the unemployed may use this time to invest in exercise that could improve one's chances of reemployment and/or increase one's productivity upon reemployment.

Overall, the prior literature on unemployment and health leads me to two competing hypotheses:

Hypothesis 1 (H1). Unemployment will be associated with negative changes in physical activity participation.

Hypothesis 2 (H2). Unemployment will be associated with positive changes in physical activity participation.

The relationship between unemployment and health is not uniform. Important for this study, men and women are not equally likely to experience negative effects of unemployment for health. In terms of physical health, evidence suggests that unemployment is detrimental to both men's (Kessler et al., 1987) and women's (Brenner & Levi, 1987) health, but in terms of mental distress, evidence suggests that men have worse outcomes than women (Paul & Moser, 2009). Paul and Moser (2009) hypothesize that this difference may result in part because men's masculine identity is threatened with the loss of a job (Komarovsky, 1940, McFayden, 1995), whereas women have socially acceptable alternative roles to the worker role. They further hypothesize that women may also do better because there is less stigma associated with unemployment for women than for men.

This leads to my next hypothesis:

Hypothesis 3 (H3). The association between unemployment and changes in physical activity participation will differ by gender.

Marriage and health

In the literature, marriage is generally associated with health benefits (Carr & Springer, 2010, Ross & Mirowsky, 2013). Married individuals engage in less risky health behaviors (Waite & Gallagher, 2000), though they also weigh more and exercise less (Grzywacz & Marks, 1999, Jeffery & Rick, 2002, Umberson, 1992). Couples also display concordance of mental and physical health (Meyler, Stimpson, & Peek, 2007), which is positive when health behaviors and outcomes are positive, but is less favorable when health behaviors or outcomes are negative. In this study I consider both married and cohabiting couples. Research suggests that marriage provides more benefits for health than cohabitation, but that compared to being single, cohabiters also experience benefits (Carr & Springer, 2010, Ross & Mirowsky, 2013).

While married and unmarried individuals are not compared in the present study, the underlying premise of this literature is that the health behaviors of one spouse are not independent of the other spouse's experiences, desires, and behaviors. Here I draw comparisons to the Family Ecological Model, which posits that ecological factors shape the social and emotional environments of family and parents' experiences of chronic stress, which impact parents' dietary choices and physical activity, and in turn, affect children's diet and physical activity behaviors (Okechukwu, Davison, & Emmons, 2014). As developed by Okechukwu et al. (2014), this theoretical model, though focused on parents and children, gives support to the notion that one spouse's unemployment may influence the other spouse's behaviors and helps explain the concordance within couples seen in past literature for mental and physical health (Meyler et al., 2007). Thus, I hypothesize:

Hypothesis 4 (H4). An individual's unemployment will be associated with concordant changes in physical activity participation for both the individual and the individual's partner (i.e., if one's activity decreases so does the partner's and vice versa).

Ross and Mirowsky (2013) identify two major theoretical explanations for why marriage is beneficial to health: emotional support and economic support. Marriage increases the likelihood of emotional support compared to being unmarried, which reduces psychological distress and may thereby improve physical health (Ross et al., 1990). In the stress-buffering model of social support (Cohen & Wills, 1985), having the social support of a spouse helps to reduce the negative effects of stress from outside sources, such as the type of stress that might accompany a job loss. Overall, the stress-buffering model highlights the importance of focusing on couple-level outcomes, but it does not specifically suggest a direction for physical activity changes during unemployment because while social support helps to reduce the negative effects of unemployment, unemployment tends to also reduce social support (Gore & Mangione, 1983, House, 1981, Pearlin, Lieberman, Menaghan, & Mullan, 1981).

Economic support is also important. In the case of job loss, married people are more likely to retain health insurance than unmarried people because they can access coverage through their spouse (Bernstein, Cohen, Brett, & Bush, 2008, Jovanovic, Lin, & Chang, 2004). The benefits of marriage appear to vary by gender: the economic benefits of marriage may be larger for women, while the emotional support benefits may be stronger for men (Ross et al., 1990). Marriage also appears to protect men's health more than women's (Ross et al., 1990). For these reasons, and because unemployment may be a more negative experience for men than women as discussed earlier, we might expect the unemployment of a male partner to be most influential on the health of the couple. Thus, I hypothesize:

Hypothesis 5 (H5). The unemployment of the male partner will be associated with larger changes in physical activity participation for both men and women, compared to the unemployment of the female partner.

Correlates and theories of physical activity

One important reason to study physical activity is that it could potentially offset some of the negative effects of unemployment seen in other studies because it is good for both physical and psychological well-being (Courneya et al., 2003, Stewart et al., 1994). Participation in physical activity is correlated with a wide variety of variables, not all of which can be studied in this analysis. For example, motivation and self-efficacy are important (Dishman et al., 1985, Sallis & Owen, 2015), but measures are not available in my data set. Furthermore some of these variables, such as income and mental health, are likely mechanisms through which unemployment may affect physical activity, the analysis of which is beyond the scope of this study.

Prior research has indicated that perceived barriers to physical activity (including lack of time, mentioned above) are influential in determining participation in physical activity (Pan, Cameron, DesMeules, Morrison, Craig, & Jiang, 2009, Sallis et al., 1992, Trost et al., 2003). Importantly, such perceived barriers may also be more important for women because they often balance multiple competing roles (worker, wife, primary caregiver to children, etc.) (Pan et al., 2009).

In terms of physical activity, having extra time available for non-labor market pursuits could be most beneficial to those who already exercise, rather than those who might only be contemplating exercise; Dishman et al. (1985, p.167), citing The Perrier Study and Canada Fitness Survey, state: "The already active are…twice as likely to believe that a more flexible work schedule would increase their participation [in activity]." They argue that factors like time or resources may be important for individuals who already engage in exercise but far less important to those who are not already exercising. This suggests that changes in time in physical activity participation that might occur with unemployment may be more likely to occur on the intensive margin (i.e., changes in time spent among exercisers) than on the extensive margin (i.e., whether one participates in physical activity or not). Thus, I hypothesize:

Hypothesis 6 (H6). Unemployment will be associated with changes in physical activity participation at the intensive margin but not at the extensive margin.

Physical activity is also associated with a variety of demographic variables. For example, the probability of participating in physical activity increases with education (Brownson, Eyler, King, Brown, Shyu & Sallis, 2000), and this finding is robust in the literature (Pan et al. 2009, Trost et al. 2003). On the other hand, there is a repeatedly documented negative association between being nonwhite and being active in physical activity (Trost et al. 2003). In one study of women ages 40 and older, African American and American Indian/Alaskan Native women had much lower levels of activity than white women (Brownson et al. 2000). There is also evidence that having children may

be negatively associated with physical activity participation. While overall the literature suggests a weak or mixed positive association between being childless and participation in activity (Trost et al. 2003), there is evidence to suggest that the time constraints of parenting interfere with parents' ability to exercise (Nomaguchi & Bianchi 2004). I examine each of these possible demographic differences in subgroup analyses following the main analysis.

Methods

Data

I use nationally representative data from the 1999–2013 waves of the PSID, collected biannually. The PSID is a longitudinal study conducted by the University of Michigan that began in 1968 with a sample of 4,800 American households. Members of these original households and their descendants have been reinterviewed over time. My period of study begins in 1999 because that is the first year of the longitudinal data collection of physical activity participation. Because the PSID is a panel design, it allows me to follow respondents over time, examining changes in time spent in physical activity in response to changes in labor force participation. Furthermore, in the PSID, unlike many other data sets, data on employment status, physical activity, and a variety of demographic characteristics are available for both members of the couple. The PSID was approved by the Institutional Review Board at the University of Michigan. The data used for these analyses are publicly available and contain no unique identifiers, thereby ensuring respondent anonymity (Panel Study of Income Dynamics, 2016).

Sample

I restrict the sample to married and long-term cohabiting (> = 1 year) respondents (heads and wives/"wives") between the ages of 18 and 65 who are not unemployed at the time of the first interview and for whom both partners are residing in the household. Both individuals must be included in at least two years of the survey to be retained in the sample.[1] Responses to the survey questions are provided by the household member who is considered best able to answer the questions (Achen & Stafford, 2005).

Analytic strategy

In the main analysis I employ fixed-effects models, which allow me to examine how physical activity participation of both partners differs during periods of unemployment from participation during periods of employment. These models have the advantage of netting out time-invariant differences, so results are unbiased even if there exist unobserved time-invariant characteristics of individuals that are correlated with both their likelihood of unemployment and their physical activity participation (e.g., motivation or self-efficacy). I estimate match-specific individual-level models separately by gender, including own and partner's employment status in each model as predictors. This means that fixed effects for the individual are fixed only within the context of one specific couple, and subsequent marriages are treated as separate observations. The estimates of the relationship between unemployment and physical activity are identified based on the difference between the average number of workouts during spells of unemployment and the average number of workouts during periods of employment, net of other controls, for those who are employed at least one year and unemployed in at least one year.

Analyses are weighted using sample weights to be representative of the population. To weight the data, I use the year-specific PSID household-level weights, which have been rescaled to average one in each year. The immigrant sample of the PSID is included in my sample, and the weights reflect this. For fixed-effects models it is necessary to assign a single, time-invariant weight to each couple. I assign the couple the household sample weight from the first year in which they appear in the sample, but results using the sample weight from the last year in which the couple appears are nearly identical.

In Model 1, I estimate a match-specific fixed-effects model of the relationship between unemployment and the number of workouts reported, controlling for all time-varying variables. This provides evidence for *H1*, *H2*, and *H4*. I qualitatively examine the differences in estimates to assess *H3*. Finally, I test for differences in the coefficients on men's and women's unemployment using Wald tests to assess the evidence for *H5*. In Models 2a and 2b, I separately estimate match-specific fixed-effects models of the relationship between unemployment and any participation in physical activity (Model 2a), and unemployment and the number of workouts among participants reporting any participation in physical activity (Model 2b), controlling for all relevant time-varying covariates. These models provide evidence for *H6*.

I follow the main analysis with supplemental models and subgroup analyses as discussed briefly at the end of the Results section.

Dependent variables

The main dependent variable is the number of workouts per week. This is the sum of reports for light physical activity workouts, vigorous physical activity workouts, and strength training workouts completed on a weekly basis.[2] This variable is topcoded at the 95th percentile but still has a wide range from 0–21 workouts per week. Less than 10 percent of the sample reports having engaged in no physical activity. In supplementary analyses I break out light, vigorous, and strength training activities separately, and examine how each is similar to, or different from, the composite variable results.

Independent variables

The key independent variables are own unemployment and partner unemployment. These variables are constructed as three-category employment status variables. The omitted category is employed individuals (category 1). The variable takes a value of 2 when a respondent reports being involuntarily unemployed and looking for work, and a value of 3 for individuals voluntarily out of the labor force

[1] Unemployment may be associated with marital dissolution (Jalovaara, 2003), which limits the sample to those who do not immediately separate or divorce during an unemployment spell. In a supplemental fixed-effects analysis controlling for the Model 1 covariates (not shown), in the 1999–2013 waves of the PSID, during periods of unemployment, compared to periods of unemployment, men experience a 1 percentage point higher risk of separation or divorce ($p < .05$), and women experience a 10 percentage point lower risk of separation or divorce ($p < .001$). Descriptive results suggest that in about 5% of cases where separation or divorce occurs, the female partner was unemployed in the year prior to the separation or divorce, and in 8% of cases where separation or divorce occurs, the male partner was unemployed in the year prior to the separation or divorce.

[2] From 1999 to 2003 the questions were stated as follows: How often do you participate in light physical activity—such as walking, dancing, gardening, golfing, bowling, etc.? How often do you participate in vigorous physical activity or sports—such as heavy housework, aerobics, running, swimming, or bicycling? From 2005–2013 the questions were stated as follows: How often do you do light or moderate activities for at least 10 minutes that cause only light sweating or slight to moderate increases in breathing or heart rate? How often do you do vigorous physical activities for at least 10 minutes that cause heavy sweating or large increases in breathing or heart rate? How often do you do physical activities specifically designed to strengthen your muscles such as lifting weights? In a supplemental analysis I examined whether the change in the question wording was associated with different patterns of results (Table 5,Panels 7 and 8). The results of Model 1 are somewhat stronger when the more specific questions are used (2005 forward). Since the inclusion of the more general questions from earlier years results in more conservative estimates and sample size is somewhat limited, especially for subgroup analyses, I retain all years in the main analysis.

(OOLF). The unemployment category is the focal category for this analysis; the OOLF category is included for comparison. One variable captures the respondent's employment status, and a separate variable captures the partner's employment status.[3]

Control variables

I control for time-varying covariates that may be correlated with both unemployment and the amount of physical activity participation. Generally speaking, these covariates can be treated as plausibly exogenous to unemployment. In all models I control for the number of children and the age of the youngest child; region of residence; the identity of the household survey respondent (i.e., the male or female partner) since the survey uses proxy reporting; and self-rated health, the latter of which may influence participation in physical activity, though it is also potentially endogenous with unemployment. I also control for year and the state-level unemployment rate. State-level unemployment rate proxies for local labor market conditions experienced by the respondents.

In preliminary OLS models (Appendix Table A1), I control for race/ethnicity and education. In the fixed-effects models I cannot include controls for these time-invariant variables; I examine the potential for heterogeneity by these variables in subgroup analyses discussed at the end of the Results section. The OLS models also control for prior history of exercise, lagged self-rated health status, and lagged unemployment to capture relevant factors that influence one's physical activity participation.

Missing data

I first drop observations with zero weight, which pertain to households that were nonrespondents in the current wave of data collection but had valid responses in other years or were recontacted after they experienced a period of nonresponse (Gouskova, Heeringa, McGonagle, Schoeni, & Stafford, 2008). I drop all observations for which the current year-specific weight (164 observations; 0.6%) or the longitudinal weight (20 observations; 0.1%) is equal to zero. Next I drop observations with missing values on the dependent variables (1,181 observation; 4.2%), observations for which the respondent resides outside of the 50 states or for which the region of residence is missing (62 observations; 0.2%) and observations for which the values for covariates are missing (69 observations; 0.2%). This leaves me with a sample of 26,860 observations from 5,620 couples, which are observed an average of 4.8 times each.

Results

Descriptive statistics

Descriptive statistics for the sample are shown in Table 1 and refer to person years of data. Overall in 2–3% of observations men and women are unemployed; in total approximately 6.5% of observations come from couples that experience the unemployment of one or both partners at some wave of the survey. While this percentage may seem low, it is important to keep in mind that this is the percent unemployed at single points in time at the interviews, so it does not necessarily capture all people who experience unemployment during the year. Comparable percentages are seen in other studies of unemployment (e.g., Salm, 2009). The statistics are separated for those couples experiencing no unemployment throughout the survey and those experiencing the unemployment of one or more partners at some point over the course of the survey. Those couples experiencing unemployment at some point have a higher proportion of observations that are at younger ages on average, are from racial or ethnic minorities, are without a college degree, have children, and reporting slightly worse self-rated health.

Perhaps interestingly, in 87–92% of person-year observations at least minimal physical activity is reported. These percentages are slightly higher for those not experiencing unemployment compared

Table 1
Descriptive statistics, person-years.

	Not Unemployed Mean (SD)	Unemployed Mean (SD)	Range
Age of female partner	43.00 (11.03)	40.28 (11.08)	18–65
Age of male partner	44.86 (11.16)	42.21 (11.23)	18–65
Race/Ethnicity			
Female partner is black	.06	.12	0–1
Female partner is Latino	.07	.11	0–1
Male partner is black	.06	.15	0–1
Male partner is Latino	.07	.12	0–1
Education			
Female partner has college degree	.35	.24	0–1
Male partner has college degree	.37	.25	0–1
Children in household	.54	.58	0–1
Age of youngest child	7.12 (5.25)	7.07 (5.22)	1–17
Region			
Northeast	.19	.17	0–1
Midwest	.28	.26	0–1
South	.31	.31	0–1
West	.23	.26	0–1
Female partner unemployed	–	.45	0–1
Total number of losses, if unemployed	–	1.19 (0.47)	1–5
Male partner unemployed	–	.61	0–1
Total number of losses, if unemployed	–	1.31 (0.66)	1–5
Female partner out of the labor force	.25	.13	0–1
Male partner out of the labor force	.07	.01	0–1
State-level unemployment rate	6.24 (2.22)	7.14 (2.40)	2.6–13.3
Female partner any exercise	.91	.87	0–1
Number of workouts/week	6.61 (4.53)	6.31 (4.76)	0–19
Male partner any exercise	.92	.89	0–1
Number of workouts/week	7.15 (5.07)	6.71 (5.29)	0–21
Light activity participation, times/week			
Female partner	3.94 (2.56)	3.78 (2.69)	0–7
Male partner	3.96 (2.68)	3.69 (2.78)	0–7
Vigorous activity participation, times/week			
Female partner	2.06 (2.24)	1.94 (2.34)	0–7
Male partner	2.40 (2.44)	2.19 (2.46)	0–7
Strength training participation, times/week			
Female partner	0.96 (1.55)	0.81 (1.49)	0–5
Male partner	1.24 (1.97)	1.16 (1.97)	0–7
Female partner's self-rated health	2.24 (0.93)	2.50 (1.00)	1–5
Male partner's self-rated health	2.17 (0.93)	2.35 (1.01)	1–5
Respondent is female partner	.54	.59	0–1
Respondent is male partner	.45	.41	0–1
N	25099	1761	

[a]Descriptive statistics are weighted using household-level sample weights and refer to person-years. Times/week for activity participation and workouts is reported by participants as times/week, times/two-week period, times/month, or times/year and is converted to times/week for all respondents as reported here. Participants could report light activity, vigorous activity, and strength training that all occurred in one day; this activity pattern would be reported as 3 workouts/week in the descriptive statistics.

[3] I ran a robustness check using a variable that had categories of no partner unemployment, one partner's unemployment, and both partner's unemployment, but the standard errors were large, possibly due to small cell sizes.

Table 2
Model 1. Coefficients from fixed-effects analysis of unemployment on number of workouts per week.

	Male Partners		Female Partners	
Variable	*B*	*SE B*	*B*	*SE B*
Own Unemployment	-0.01	0.19	0.48*	0.21
Partner's Unemployment	0.08	0.22	-0.30[a]	0.18
Own OOLF	0.67**	0.21	0.42***	0.11
Partner OOLF	0.02	0.12	0.44*	0.19
1+ Children	-0.56**	0.16	-0.32*	0.14
2+ Children	0.03	0.12	0.22*	0.11
3+ Children	0.36*	0.16	0.38*	0.15
Age Youngest Child	0.05***	0.01	0.02[a]	0.01
Respondent is Husband	0.88**	0.19	-0.56**	0.19
Year (1999 omitted)				
2001	-0.12	0.10	-0.20*	0.10
2003	-0.24[a]	0.13	-0.42**	0.12
2005	1.20***	0.14	0.37**	0.13
2007	0.94***	0.14	0.28*	0.12
2009	0.70**	0.26	0.21	0.23
2011	0.93***	0.25	0.32	0.23
2013	0.90***	0.20	0.36*	0.18
State Unemp. Rate	0.03	0.04	0.02	0.04
Region (NE omitted)				
Midwest	-0.20	0.48	-0.27	0.53
South	0.19	0.44	0.05	0.48
West	-0.19	0.56	-0.03	0.57
Own Self-rated Health	-0.50***	0.06	-0.61***	0.06
Partner's Self-rated Health	-0.06	0.06	0.03	0.05
Constant	7.26***	0.46	7.82***	0.46
R^2 *Overall*	0.05		0.04	
Rho	0.48		0.45	
N (person-years)	26,860		26,860	

Note: All analyses are weighted.
[a] $p < .10$.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

to couples with some experience of unemployment. On average about six to seven workouts per week are reported across the groups. As can be seen in the lower portion of the table, the majority of activity reported falls into the "light" category as opposed to the "vigorous" or "strength training" categories.

Hypothesis testing

H1, H2, H3 and H4

I hypothesized that unemployment would be associated with negative changes in physical activity (*H1*). As a competing hypothesis to *H1*, I hypothesized that unemployment might actually be associated with positive changes in physical activity (*H2*). I further hypothesized that the associations would be different for men and women (*H3*). Additionally, I hypothesized that an individual's unemployment would be concordantly associated with changes in physical activity for the partner and the individual (*H4*). Results for Model 1, testing these hypotheses, are shown in Table 2. Perhaps surprisingly, the results do not support *H1*. There is no evidence that own unemployment is associated with negative changes in physical activity. On the contrary, for men there is no association between unemployment and changes in the number of workouts, and for women there is a *positive* and statistically significant association between unemployment and changes in number of workouts. Women report exercising more (about one-half workout per week) when they are unemployed compared to when they are employed. This result supports *H2* for women. The gender differences seen here support *H3*.

To determine the evidence for *H4* I turn to the coefficients for partner's unemployment. For men, there is again no association (negative or positive) between a partner's unemployment and their own physical activity participation. For women, there is a marginally significant negative association between a partner's unemployment and changes in physical activity. It appears that women exercise less (about one-third workout per week) when their partners are unemployed compared to when their partners are employed. One possible explanation for this finding that I will return to in the discussion is that women with unemployed partners may find themselves investing more time in the labor market to make up for lost household income and thus have less time available for physical activity. Overall, the results do not indicate concordance and thus do not support *H4*.

Although unemployment is the main focus of this analysis, an examination of the coefficients on being OOLF is also informative. Whereas only women experience a positive association between unemployment and physical activity during unemployment, both men and women report significantly more exercise during periods of being OOLF voluntarily compared to during periods of employment (about 0.4 to 0.7 more workouts per week). Additionally, although a partner's unemployment is negatively associated with a woman's physical activity, having an OOLF partner is positively associated with exercise (about 0.4 more workouts per week). It may be the case that when men leave the labor force voluntarily, and subsequently increase their own exercise, some of this exercise is shared time spent with their female partners. These findings are supportive of *H2*, though for being OOLF rather than for unemployment. Thus, the time-based explanation for physical activity participation and the Grossman model of health capital are supported; this is discussed further in the discussion section.

H5

I also hypothesized that the unemployment of a man would be associated with larger changes in physical activity for both men and women than the unemployment of a woman. To test this, I use Wald tests to compare the coefficients on own and partner unemployment for both men and women. As one might expect from a qualitative comparison of the coefficients in Table 2, the unemployment of the male partner is associated with larger negative changes in physical activity for women than their own unemployment ($F=7.98$, $p < .01$), though the magnitude of positive changes during women's own unemployment is larger than the magnitude of negative changes during a partner's unemployment. Thus, for women, *H5* is supported if we assign a negative direction to the changes, but it is not supported for positive changes. *H5* is not supported for men, and there are no significant changes in physical activity for men that are associated with own or partner's unemployment.

H6

Finally, I hypothesized that unemployment would be associated with changes in physical activity at the intensive margin but not at the extensive margin. To test this, I estimated separate models of any participation in physical activity (extensive margin) and number of workouts conditional on participation (intensive margin). Results are shown in Table 3. In Panel 1 the results for any physical activity are shown. An examination of the coefficients indicates that own and partner's unemployment are not associated with changes in physical activity at the extensive margin (participation or no participation). In Panel 2 the results for number of workouts conditional on any activity are shown. An examination of the coefficients indicates they are similar, though larger in magnitude, to the coefficients from Model 1 shown in Table 2. Thus, the evidence is supportive of *H6*. There are positive changes at the intensive margin during unemployment (for women) and being OOLF (men and women), but there is no evidence of transitioning into or out of physical activity (extensive margin) during unemployment.

Table 3
Models 2a and 2b. Selected coefficients from fixed-effects analysis of unemployment on any participation in physical activity and number of workouts per week conditional on participation.

	Male Partners		Female Partners	
Variable	*B*	*SE B*	*B*	*SE B*
Panel 1. Model 2a				
Any Physical Activity				
Own Unemployment	0.02	0.01	-0.005	0.02
Partner's Unemployment	0.02	0.01	0.004	0.01
Own OOLF	0.002	0.01	0.01	0.01
Partner OOLF	-0.01	0.01	0.02	0.01
Constant	0.99***	0.02	1.03***	0.02
R^2 *Overall*	0.03		0.04	
Rho	0.39		0.40	
N	26,860		26,860	
Panel 2. Model 2b				
Number of Workouts, Conditional on Activity				
Own Unemployment	-0.16	0.19	0.57**	0.21
Partner's Unemployment	0.03	0.22	-0.39*	0.18
Own OOLF	0.76***	0.20	0.39***	0.10
Partner OOLF	0.07	0.12	0.38*	0.19
Constant	7.34***	0.47	7.87***	0.48
R^2 *Overall*	0.05		0.04	
Rho	0.49		0.46	
N (person-years)	24,465		24,263	

Note: Models control for all covariates from Model 1. All analyses are weighted.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

Subgroup analyses

I assessed robustness by subgroup by estimating models comparing whites to non-whites, college graduates to non-college graduates, and estimating models limited to parents. The key coefficients (own and partner unemployment) for these models are shown in Table 4. Turning first to the results for parents only (Panel 1), the results are consistent with the Model 1 results. The coefficients for own and partner's unemployment in the models of women's physical activity participation are slightly larger in magnitude than in the main results. Thus, mothers are at least as likely as women overall to report more time in physical activity during unemployment, and they report lower levels of activity during a partner's unemployment, similar to women overall. The fact that time is more constrained for parents (because of their childrearing responsibilities) does not appear to change the basic pattern of results.

Table 4
Subgroup Analyses. Selected coefficients from fixed-effects analysis of unemployment on number of workouts per week (N varies depending on analysis).

	Male Partners		Female Partners	
Variable	*B*	*SE B*	*B*	*SE B*
Panel 1. Parents Only				
Own Unemployment	0.05	0.25	0.56*	0.26
Partner's Unemployment	-0.10	0.30	-0.43[a]	0.23
Panel 2. Whites vs. Non-Whites				
Own Unemployment (white)	0.02	0.22	0.49*	0.24
Partner's Unemployment (white)	-0.01	0.26	-0.31	0.20
Own Unemployment (non-white)	-0.46	1.02	0.28	0.95
Partner's Unemployment (non-white)	1.78*	0.91	-1.31	0.81
Panel 3. College vs. Non-College				
Own Unemployment (college)	0.94[a]	0.49	0.03	0.47
Partner's Unemployment (college)	-0.49	0.53	-0.25	0.45
Own Unemployment (non-college)	-0.29	0.22	0.39	0.24
Partner's Unemployment (non-college)	0.14	0.27	-0.15	0.21

Note: Models control for all covariates from Model 1. All analyses are weighted.
[a] $p < .10$,
* $p < .05$,
** $p < .01$,
*** $p < .001$.

The patterns for whites and non-whites (Panel 2) are generally similar to the main models, though the coefficients are more imprecisely estimated. For men, there is a marginally significant difference between whites and non-whites for partner's unemployment. For whites, men do not experience significant changes in activity during a partner's unemployment whereas for non-whites, men report nearly two workouts per week more when their partners are unemployed compared to when their partners are employed. A detailed analysis of this difference is beyond the scope of this study, but caution is warranted given the relatively small number of non-whites in this sample. Overall, the results do not suggest large negative effects for non-whites, contrary to what might be expected from the prior literature.

An examination of the results for college graduates and non-college graduates (Panel 3) suggests that the positive association between own unemployment and physical activity for women may be driven by women without a college degree, though again some of the coefficients are imprecisely estimated. Interestingly, college-educated men experiencing unemployment appear to exercise more during periods of unemployment (nearly one workout per week) compared to periods of employment, whereas this is not the case for non-college graduates. One possible explanation may be that prior to unemployment these college-educated men were working more hours than men without a college degree and thus had even more time freed up by the unemployment spell. Indeed, *t*-test results of hours of work in the year prior to unemployment (not shown) indicate that, among men who became unemployed, those with college degrees worked significantly more than those without college degrees in the year prior to the unemployment spell (approximately 32 hours per week vs. 25 hours per week). It is also possible that for these college-educated men, their education makes them more likely to see exercise as an important investment in health capital, though this is only speculative.

Supplementary analyses

In a further attempt to shed light on how individuals engage in physical activity during unemployment, I estimated supplementary models with light physical activity, vigorous physical activity, and strength training as outcomes, rather than focusing solely on number of workouts aggregated across exercise type. Additionally, I examined whether there were different patterns of results before and after the Great Recession; and whether being unemployed in two surveys in a row was associated with stronger results. The results of the key coefficients (own and partner unemployment) are shown in Table 5.

I start with the results of models estimated before and after the Great Recession (Panels 1 and 2). The coefficient on own unemployment for women is larger before the Great Recession but still substantively large and marginally significant after the Great Recession. The negative association between partner's unemployment and a woman's physical activity is not seen in these models, but the standard errors are relatively large.

In Panels 3, 4, and 5 I show the results for the models estimated with the separate activity outcomes. For men, the general pattern from Model 1 is retained (no changes for own or partner's unemployment). For women, the positive association between own unemployment and physical activity is seen for strength training activity, and the negative association between partner's unemployment and physical activity is seen for vigorous activity. While a further detailed analysis of activities

Table 5
Supplementary analyses. Selected coefficients from fixed-effects analysis of unemployment on number of workouts per week (N varies depending on analysis).

	Male Partners		Female Partners	
Variable	*B*	*SE B*	*B*	*SE B*
Panel 1. Before the Great Recession				
Own Unemployment	-0.27	0.28	0.90**	0.30
Partner's Unemployment	0.19	0.33	-0.05	0.27
Panel 2. After the Great Recession				
Own Unemployment	0.29	0.31	0.57[a]	0.32
Partner's Unemployment	0.22	0.37	-0.23	0.29
Panel 3. Light Activity				
Own Unemployment	0.05	0.05	0.01	0.06
Partner's Unemployment	0.07	0.06	0.01	0.05
Panel 4. Vigorous Activity				
Own Unemployment	-0.08	0.06	0.05	0.08
Partner's Unemployment	-0.004	0.07	-0.11[a]	0.07
Panel 5. Strength Training				
Own Unemployment	0.02	0.09	0.21*	0.08
Partner's Unemployment	0.03	0.11	-0.05	0.06
Panel 6. Multiple Years Unemployment				
Own Unemployment (1 year)	-0.06	0.19	0.30	0.21
Own Unemployment (2 years)	-0.06	0.54	1.41*	0.62
Partner's Unemployment (1 year)	0.08	0.22	-0.32[a]	0.18
Partner's Unemployment (2 years)	0.02	0.74	-0.52	0.46
Panel 7. Before Question Wording Changed				
Own Unemployment	0.05	0.37	0.44	0.37
Partner's Unemployment	0.30	0.38	0.40	0.40
Panel 8. After Question Wording Changed				
Own Unemployment	0.03	0.24	0.48[a]	0.25
Partner's Unemployment	-0.19	0.29	-0.42*	0.22

Note: Models control for all covariates from Model 1. All analyses are weighted.
[a] $p < .10$,
* $p < .05$,
** $p < .01$,
*** $p < .001$.

is not possible with these data, it may be interesting for future researchers to consider how women make decisions about what activities to engage in, in relation to their own employment status or their partner's. Finally, in Panel 6 I show results for multiple years of unemployment. For men, the results again retain the pattern from Model 1. For women being unemployed for two waves in a row is associated with large positive changes in physical activity participation compared to being unemployed in only one wave. But, partner's unemployment is only significantly associated with reduced physical activity for women when the partner is unemployed in one year and not for two years in a row. While few men are unemployed across two subsequent waves, it may also be the case that the adaptations women make to a partner's employment happen only at one point in time and do not change as the unemployment lengthens. We could imagine this being the case if women shift from part-time to full-time work with the unemployment of a partner and they simply continue working full time as the partner remains unemployed.

Discussion

The purpose of this study was to answer the following three questions: 1. Is one's own unemployment associated with changes in physical activity participation? 2. Is one's partner's unemployment associated with changes in physical activity participation? 3. Do changes in physical activity behaviors associated with unemployment differ by gender? There is a well-documented negative correlation between unemployment and health, but most studies have focused on broad measures of health or a few specific risk factors, such as smoking and alcohol consumption, rather than health-promoting behaviors, such as physical activity. On the one hand, the economic hardship and stress that often accompany unemployment may lead to reductions in health-promoting behaviors, much like they seem to lead to increases in negative behaviors such as smoking. On the other hand, models like the Grossman model of health capital suggest that time investments in health could increase with reductions in labor supply such as those that accompany unemployment because these time investments compete with labor time. In this way, physical activity may be unique as a health behavior that is positively influenced by unemployment. In this study I focused on the couple-level context of unemployment because unemployment is a household experience, and there are reasons to believe that the unemployment of one individual in a household may affect the behaviors or health outcomes of others within the household. Such dyadic analyses of health, especially in the context of unemployment, are limited.

The hypotheses and whether they were supported are summarized in Table 6. The results indicate that, contrary to prior research on health generally or negative health behaviors such as smoking, own unemployment is not associated with negative changes in physical activity. Thus, there is no evidence for *H1*. Rather, there are no changes in physical activity for men associated with unemployment, and for

Table 6
Summary of results.

Hypothesis	Result
Hypothesis 1: Unemployment will be associated with negative changes in physical activity participation.	Men: Not supported Women: Not supported
Hypothesis 2: Unemployment will be associated with positive changes in physical activity participation.	Men: Not supported Women: Supported
Hypothesis 3: The association between unemployment and changes in physical activity participation will differ by gender.	Between: Supported
Hypothesis 4: An individual's unemployment will be associated with concordant changes in physical activity participation for both the individual and the individual's partner.	Men: Not supported Women: Not supported
Hypothesis 5: The unemployment of the male partner will be associated with larger changes in physical activity participation for both men and women, compared to the unemployment of the female partner.	Men: Not supported Women: Partially supported[a]
Hypothesis 6: Unemployment will be associated with changes in physical activity participation at the intensive margin but not at the extensive margin.	Men: Not supported Women: Supported

[a] The hypothesis is supported only if we assign a negative direction to the changes. For a positive direction, it is not supported.

women the changes are positive. The result for women is consistent with *H2* and the Grossman model of health capital whereby these unemployed women invest more time in their health through physical activity when they have more free time because of reduced labor supply. This is also consistent with Xu's (2013) findings about the relationship between employment and activity, where entering the labor force was associated with reduced physical activity.

A partner's unemployment is also not associated with changes in physical activity for men, contrary to *H4*, but it is marginally significantly negatively associated with changes in physical activity for women. There are also larger changes with the unemployment of the male partner than the female partner, though for women only, which is consistent with *H5*. Economic support in marriage is thought to be a more important benefit for women compared to men (Ross et al., 1990), which could be part of the reason why women experience negative changes when partners become unemployed. Women may also increase their time in the labor market to help reduce the economic hardship arising from the unemployment, and this may be feasible since they are less likely to have been working full time than men. Such an increase in labor supply would reduce time available for exercise, consistent with the Grossman model of health capital. In supplementary analyses (not shown), I do not find evidence of changes in work hours for women after a partner's unemployment, but women are about 3 percentage points ($p < .05$) less likely to be OOLF when their partners are unemployed compared to when their partners are employed, suggesting some women may enter the labor force in response to the partner's unemployment. A third possibility is that, consistent with normative gender roles, women's responsibility for emotional work may lead them to cut back on physical activity during a partner's unemployment to provide additional emotional support to the family.

Overall, as noted, the associations differ by gender, consistent with *H3*, though unemployment does not seem to be detrimental for physical activity for either gender in the same way it seems to be associated with negative health behaviors such as smoking. Nonetheless, the fact that women experience positive changes in activity associated with unemployment, while men do not, suggests that the stigma associated with unemployment for men or the threat to masculinity that may occur with unemployment may hinder men's ability to take full advantage of the unemployment spell for increasing their participation in the investment of health capital through additional time in physical activity.

Finally, the results are consistent with *H6*, indicating that the changes in physical activity occur mainly at the intensive margin (increases in participation amount conditional on participating) rather than at the extensive margin (participation vs. no participation). This is consistent with early findings about the determinants of physical activity (e.g., Dishman et al., 1985), which indicated that barriers to physical activity such as time and resources may not be important to those who do not engage in activity and instead may be most salient to those who are already active. Thus, starting physical activity is very different from continuing or modifying activity, and this suggests that it is a somewhat unique health behavior, compared to other behaviors such as smoking.

The key findings of this study are thus four-fold. First, unlike prior literature, which finds unemployment to be associated with negative health behaviors and health outcomes, for physical activity there is either no association or a positive association, depending on gender. Though this is not a causal analysis, this suggests that physical activity, and possibly other health-promoting behaviors, may be affected by unemployment in fundamentally different ways than health risk behaviors, and it suggests the need for further research on unemployment and health-promoting behaviors.

Second, the results demonstrate the importance of studying unemployment and health at the dyadic level. Prior research on unemployment in families has indicated the importance of studying both partners for understanding labor supply and time in housework (e.g., Gough & Killewald, 2011). A small amount of research has examined the dyad with regard to unemployment and mental health (Mendolia, 2014, Westman et al., 2004). The negative results for women that are seen with a partner's unemployment, in contrast to the positive results for women seen with own unemployment suggest that we cannot simply concern ourselves with the health outcomes of the unemployed themselves, but we also need to consider their partners, and likely, in future studies, their children's health behaviors or health outcomes as well. This is consistent with the premise of the Family Ecological Model (Okechukwu et al., 2014), which is a promising theoretical framework for studying the family-level impacts of unemployment in future studies.

Third, in the context of unemployment and physical activity gender is important. While women appear to be able to take advantage of the reduction in labor supply that accompanies unemployment to invest time in health through physical activity, consistent with the Grossman model of health capital, this does not appear to be the case for men. While it may be that men simply spend their preferred amount of time in physical activity regardless of employment status and so have no incentive to change their activity levels in the face of unemployment, it may also be the case that the threat to masculine identity and stigma that often accompany unemployment for men (e.g., Komarovsky, 1940) make them reluctant to make changes to their activity levels that might signal their lack of employment. Furthermore, these threats may bring about depression, which is a known barrier to physical activity (Trost et al. 2003). A closer examination of men's time use, mental health status, and perceptions about re-employment might help to shed light on why no changes are seen for men with unemployment, but large positive changes are seen for being voluntarily OOLF.

Finally, changes in activity occur at the intensive margin—among those already participating in activity—rather than at the extensive margin. Compared to some of the other commonly studied health behaviors, this suggests that discussion of starting or stopping physical activity is a very different conversation than continuing physical activity or modifying physical activity time. Furthermore, the supplementary analyses suggest that most of the changes in physical activity that women experience are for a limited subset of activities: reduced vigorous activity when partners are unemployed, and increased strength training when women themselves are unemployed. Overall, these findings suggest a somewhat limited, yet still important, role for unemployment in women's participation in physical activity.

These results break new ground in our understanding of the relationship between unemployment and health and suggest a number of future directions for research, including further examination of family-level outcomes, more detailed analyses of activity participation, and analyses (perhaps qualitative) of the underlying motivations for changes (or lack thereof) to physical activity participation.

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Appendix A

See Table A1.

Table A1
Coefficients from OLS model of unemployment on number of workouts per week.

	Male Partners		Female Partners	
Variable	*B*	*SE B*	*B*	*SE B*
Own Unemployment	-0.34	0.21	0.32	0.27
Partner's Unemployment	0.11	0.28	-0.39*	0.19
Own OOLF	0.94***	0.22	0.45***	0.11
Partner OOLF	-0.08	0.13	0.67**	0.20
1+ Children	-0.34a	0.20	-0.63**	0.18
2+ Children	-0.02	0.14	0.11	0.13
3+ Children	0.26	0.18	0.33*	0.16
Age Youngest Child	0.01	0.01	0.03**	0.01
Respondent is Husband	0.73***	0.12	-0.73***	0.11
Year (1999 and 2001 omitted)				
2003	0.23a	0.12	-0.02	0.11
2005	1.57***	0.13	0.65***	0.12
2007	1.54***	0.13	0.79***	0.12
2009	1.88***	0.24	1.06***	0.22
2011	2.15***	0.23	1.19***	0.21
2013	2.06***	0.17	1.12***	0.16
Age	-0.04***	0.01	-0.03***	0.01
Black	-0.19	0.21	-0.36a	0.18
Latino	-1.31***	0.21	-1.14***	0.20
College Degree	0.18	0.13	0.04	0.12
State Unemp. Rate	-0.06	0.04	-0.06	0.04
Region (NE omitted)				
Midwest	0.22	0.19	0.29a	0.17
South	-0.10	0.18	0.14	0.16
West	0.05	0.20	0.44*	0.18
Lagged Self-rated Health	-0.69***	0.06	-0.66***	0.06
Lagged Exercise	2.60***	0.17	2.67***	0.15
Lagged Unemployment	-0.58*	0.24	-0.15	0.25
Constant	5.86***	0.49	6.34***	0.44
R^2	0.09		0.08	
N (person-years)	21,240		21,240	

Note: All analyses are weighted.
[a] $p < .10$.
[*] $p < .05$.
[**] $p < .01$.
[***] $p < .001$.

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