A Couple-Level Analysis of Unemployment and Health Behaviors*

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The literature linking unemployment, economic uncertainty, and health presents a long-standing paradox: aggregate unemployment or economic uncertainty is generally associated with improved population health, but individual unemployment is associated with worse individual health. In this paper I estimate the effects of unemployment and the recent recession on individuals' health behaviors and the health behaviors of their partners using data from the Panel Study of Income Dynamics. By drawing on the framework that unemployment is a household experience, this examination of health behaviors links population-level and family-level processes to provide insight into the micro-foundations that underlie the relationships between economy, employment, and health. The results of the analysis may shed light on possible avenues for health interventions for unemployed individuals and their families.

Background

A large literature examines the relationship between the business cycle (i.e., economic growth or recession) and various measures of population-level and individual-level health. Often this literature finds the relationship to be procyclical. That is, when the economy is growing, mortality is higher and the population has more negative health events. Conversely, during a recession individuals are healthier. Ruhm (2000) shows that total mortality and 80% of the sources of fatalities he studies exhibit procyclical fluctuation. On the other side of the economic spectrum, Halliday (2012) finds that poor local labor market conditions are associated with higher mortality risk for working age men. Researchers have found this relationship with regard to many aspects of health, not only mortality, although mortality is commonly studied.

In many ways the procyclical variation researchers find between economic health and physical health is surprising. In particular, when one examines individual outcomes during unemployment (which is more common during recessions), one tends to find the opposite pattern. That is, most research finds that unemployment has an adverse effect on health. After controlling for social class, poverty, age, and pre-existing morbidity, Wilson and Walker (1993) find this relationship. Other researchers have shown that unemployment is associated with an increased risk of suicide and death from undetermined causes (Voss et al. 2004). There is reason to think that these negative effects may also spill over to the spouses or partners of the unemployed. Indeed, Westman and colleagues (2004) find this to be the case in Israel. They argue that the economic hardship that arises from unemployment is a positive predictor of anxiety for both spouses, and there is significant crossover in both directions. Similarly, Mendolia (2012) finds that in couples with a husband who experiences a job loss, the couple is more likely to experience poor mental health.

So how do we resolve the findings of the population-level literature with those of the individual-level literature? Le (2010) argues that the unemployment and the unemployment rate (economic health) literatures are simply capturing effects on different individuals. If that is the case, what does it mean for individuals overall? Researchers studying other aspects of family life have characterized unemployment as a household experience (see, e.g., Gough and Killewald 2011, Lundberg 1985, Maloney 1987). To the extent that negative health outcomes result from stress and reduced income, we should expect spillover, but it is possible that the mechanisms that improve population health could also prevail. Can drawing on this household-level framework help us to identify and understand spillover effects in this context? These are some of the motivating questions of this paper.

The importance of this paper lies in trying to make sense of the paradox of health and economy. Being able to identify and understand the mechanisms behind the paradox may provide a better understanding of ways of intervening for the health of unemployed individuals. Furthermore, programs for the unemployed often do not extend their outreach beyond the unemployed individual to that individual's other family members such as a partner, although these partners may also be negatively affected by the unemployment.

Research Questions

    1. Do both unemployed individuals and their partners experience changes in health behaviors during the period of unemployment, and are any changes observed more consistent with the mechanisms proposed to explain negative effects of unemployment on individual health or those proposed to explain improvements in population health during recessions?

    2. Do the patterns in health behavior changes observed during the Great Recession differ from those observed in other time periods?

To answer the research questions I consider six outcomes: smoking, number of cigarettes smoked per day, drinking alcohol, number of binge drinking days per year, days per week of vigorous physical activity, and body mass index (BMI). Below I briefly outline what previous research has found for each of these outcomes.

Smoking Behaviors

Smoking is a commonly studied behavior in the literature. Researchers have considered beginning or resuming smoking as well as the quantity of cigarettes individuals smoke. With

regard to beginning or resuming smoking, unemployment and economic uncertainty both seem to increase the likelihood of smoking. Marcus (2012) finds that nonsmokers at baseline are more likely to start smoking during unemployment. Similarly, Falba et al. (2005) find that among older workers those experiencing an involuntary job loss were subsequently twice as likely to experience a smoking relapse, and Barnes and Smith (209) find that the decision to resume smoking is also positively and significantly affected by economic uncertainty.

A number of researchers have also found evidence that individuals increase the number of cigarettes they smoke when unemployed, although these findings are more mixed. Ruhm (2000) finds that the amount of smoking actually increases when the economy strengthens and that it declines during temporary economic downturns among heavy smokers (Ruhm 2005). Falba et al. (2005) find that individuals who were already smoking prior to involuntary job loss were smoking more cigarettes on average post-job loss if they had not been reemployed. On the other hand, Marcus (2012) found no intensification of smoking during unemployment.

Drinking Alcoholic Beverages

Consumption of alcohol during periods of economic downturn or unemployment has also been commonly studied. Much of the literature on alcohol focuses on economic health. For example, during periods of high unemployment, poorly educated, single, unemployed men in Finland were shown to have a significantly higher risk of heavy alcohol consumption compared to similar but employed men. This was also true for highly educated, single, unemployed women (Luoto et al. 1998). Davalos and colleagues (2011) report similar findings, with changes in the unemployment rate being positively associated with changes in binge drinking and alcohol abuse and dependence. Conversely, Johansson et al. (2006) demonstrate that alcohol consumption increases during periods of economic *expansion*, but the probability of being a drinker remains unchanged.

Ruhm and Black (2002) find that during poor economic times heavy drinkers actually decrease consumption of alcohol and light drinking rises. One study looking at individual unemployment finds that individuals who are more likely to respond to job loss by increasing drinking are already in a problematic range for alcohol consumption prior to the job loss (Deb et al. 2009). Thus, the previous literature on alcohol consumption is mixed, and it almost entirely revolves around quantities of alcohol rather than initiation of drinking or resuming drinking.

Exercise Behaviors and Body Mass Index

Recently more researchers have examined the relationship between economic health or unemployment and exercise behaviors. They have also looked at BMI, which is a measure of great interest to many health scholars because of the large portion of the population in the United States that is overweight or obese. Ruhm (2000) finds that when the economy strengthens physical activity is reduced, but during temporary economic downturns leisure-time physical activity rises, mostly among those who were completely inactive (Ruhm 2005). He observes the same relationship for BMI, with the declines during downturns coming mostly from the severely obese. Hruschka (2012) also finds that when populations experience resource declines they experience declines in BMI or decelerations in the growth of BMI. For example, the recent recession in the United States coincides with a deceleration in women's obesity across all income groups (Hruschka 2012). This may not be the case for all men, however. Charles and DeCicca (2008) find that worsening labor market conditions lead to weight gain among black men.

Studying unemployment, Marcus (2012) finds job loss is associated with slight but statistically significant increases in body weight. Together the findings of previous research inform my hypotheses as described below.

Hypotheses

        1. Individuals will have a higher likelihood of starting smoking or resuming smoking during periods of own or partner unemployment.

        2. Unemployed individuals who smoke will increase their cigarette consumption during the unemployment period.

        3. Individuals will have a higher likelihood of starting or resuming alcohol consumption during periods of own and partner unemployment.

        4. Unemployed individuals and their partners will have more days of binge drinking during the unemployment period.

        5. BMI will decrease for women but not men during periods of own and partner unemployment.

        6. Time in exercise will be increased during periods of own unemployment.

Data and Method

The data for the analysis come from the Panel Study of Income Dynamics (PSID). The PSID is a longitudinal survey that collects information on both (opposite-sex) partners in a couple that shares the same household. I use data from the 1999-2009 waves of the survey, which allows me to cover several pre-recession years as well as the recent recession.

        The analysis examines six outcome variables to test the hypotheses put forth in the previous section. First, I consider smoking behaviors. I examine the probability of beginning smoking, which I call "smoking take-up", or resumption of smoking, which would be the case for an individual who did not smoke in the previous period but smokes now and smoked in the past. I also examine whether there is an average increase in the number of cigarettes individuals

smoke on a daily basis. This analysis includes both smokers and non-smokers, where non-smokers have a value of zero on the number of cigarettes smoked.

Second, I study behaviors related to the consumption of alcoholic beverages. I estimate the probability of beginning drinking alcoholic beverages ("alcohol take-up") or resumption of consuming alcohol after a period of not consuming alcohol. Additionally, I examine whether there are changes in the number of days individuals report binge drinking per year. Binge drinking is defined as having 4 or more drinks in one day. This particular variable is only available in the 2005, 2007, and 2009 waves of the survey.

Finally, I study two measures related to physical activity and body composition. I estimate the effect of unemployment on the number of days per week spent in vigorous physical activity. Moderate to vigorous activity may play a role in overall health, along with weight management. In addition, I consider the effect of unemployment for BMI. BMI is a measure constructed in the following fashion: 1. Height is converted to meters; 2. Height in meters is multiplied by itself to obtain height in m^2; 3. Weight is converted to kilograms; 4. Weight in kilograms is divided by height in m^2. The researcher can then compare the computed BMI to a chart to determine where in the weight distribution an individual falls. The weight categories are the following: BMI<18.5=underweight; BMI 18.5-24.9=healthy; BMI 25-29.9=overweight; BMI>30=obese. Although BMI has limitations, which are discussed elsewhere in the literature, the criticisms of the measure are less important in this analysis because in the fixed-effects models I am comparing BMI within individuals. That is, I will be comparing the BMI of an individual at one time point to the BMI of that same individual at the next time point.

The key independent variables of interest are the unemployment of the male partner and the unemployment of the female partner. This is measured at the time of the survey. As such, I

underestimate the amount of unemployment in the sample because I do not consider unemployment spells that occur between survey waves. In later analysis I plan to examine the robustness of the results when those "in-between" spells are included in the analysis.

The controls necessarily vary slightly between the OLS and fixed-effects models because the fixed-effects models cannot make use of time-invariant variables. In the fixed-effects models I control for the number of children in the household, the age of the youngest child, the identity of the respondent because the survey uses proxy reporting, the year, and the state-level unemployment rate. I control for children and the age of the child because children may be related both to the likelihood of becoming unemployed and also the potential to change health behaviors. For example, an individual who smoked prior to having children might be tempted to go back to smoking during unemployment. But she might ultimately decide not to because she has children in the home. Controlling for year captures the possibility of time trends, and the state-level unemployment rate provides a broad sense of the economic constraints individuals face. In the OLS models I additionally control for several time-invariant characteristics. These include the age of the male and female partners, the race/ethnicity of the male partner, whether the male partner is an immigrant, and the education of the female and male partners.

Method

As mentioned briefly above, I use two methods in this analysis. First, I estimate OLS models of the relationship between unemployment and the health behavior outcomes. Yet we might expect that the kinds of individuals who are more likely to become unemployed are also the kind of individuals who are more likely to be less healthy. For example, having poorer health may contribute to the likelihood of being laid off. As such, I also estimate fixed-effects models to

examine how a change from employment to unemployment is associated with changes in health behaviors. Fixed-effects models account for time-invariant observed and unobserved characteristics that may be related to both unemployment and the outcomes. Although they cannot account for time-varying selection, they provide a good place to start for this analysis, as a way of improving on the OLS models.

After estimating the initial set of models, I estimate a set of fixed-effects models that interact an indicator variable for the period of the recent recession with the unemployment variable. These models will provide me with a way of answering the second research question about whether patterns of changes were different during the Great Recession.

Preliminary Results

Descriptive statistics for the sample are shown in Table 1. Median male partners' earnings are about twice the magnitude of median female partners' earnings: about $48,000 versus $23,000. This is consistent with the observation that male partners' weekly work hours are on average about twice those of female partners—about 42 hours versus 27 hours. At the time of observation the average age of male and female partners is around 40. In about 7% of observations male and female partners are black, and in about 4% of observations they are Latino. About 10% of observations are for couples that include a male partner who is an immigrant. The sample is fairly well educated, with about one-third holding a college degree. Unemployment is relatively low at the time of the surveys—individuals are unemployed in about 2% of person-year observations. In addition, those individuals who become unemployed mostly experience only one spell of unemployment, with the average number of observed unemployment spells for those

unemployed at some point in the observation period to be 1.14 for male partners and 1.07 for female partners. The state-level unemployment rate for the period averages 5.7%.

[Table 1 about here.]

Turning to the outcome measures, in about one-fifth of observations male partners smoke, while female partners smoke in about 16% of observations. Among those who report smoking, the average number of cigarettes smoked is fairly high, with an average of 17 cigarettes for male partners and 14 for female partners. In nearly three-quarters of observations for male partners and more than one-half of observations for female partners individuals consumed alcohol. Binge drinking is more common for male partners than for female partners—about 7 days per year for male partners versus 3 for female partners. Male partners and female partners average about one-half day per week in which they engage in vigorous physical activity. Finally, examining BMI, on average both male and female partners have BMI values that fall into the "overweight" range (as defined by the National Institutes of Health), with male partners' BMI values averaging 28 and female partners' averaging nearly 26. The overweight range is defined as BMI between 25 and 29.9. Examining the range of BMI in the sample does however indicate high heterogeneity.

To test the hypotheses I estimated models for the six outcome variables. I start with a discussion of the smoking results, shown in Table 2. For smoking take-up or resumption (after a period of not smoking), the OLS results indicate that a male partner's unemployment is associated with a 10% (p<.01) increase in the likelihood of his smoking. Similarly for female partners, the OLS results indicate that own and male partner's unemployment are associated with a 7% increase in the likelihood of smoking. However, in examining the fixed-effects models, these coefficients shrink and are no longer statistically significant. The fixed-effects models

show that male partners have a 3% (p<.05) increase in the likelihood of smoking when their

female partners are unemployed. This is a somewhat surprising outcome. Although I expected to

see spillover of health behaviors between partners, I expected the unemployed individual would

also experience a change in health behaviors. In this instance male partners appear to be

changing their smoking habits when their female partners are unemployed but not when they

themselves are unemployed. With regard to the number of cigarettes smoked, in the OLS models

the male partner's unemployment is associated with an increase of about 1.5 cigarettes per day

for both male and female partners. However, these results do not persist in the fixed-effects

models.

[Table 2 about here.]

The results for the smoking models indicated little change in smoking behaviors during

unemployment after controlling for time-invariant unobserved characteristics. As the results in

Table 3 show, there is even less behavioral change observed for alcohol consumption. In models

of alcohol take-up or resumption there are no statistically significant effects. In the models of

binge drinking days, the OLS model for female partners' binge drinking suggests that when male

partners are unemployed, female partners report about 1.2 (p<.05) fewer days of binge drinking

per year. This effect persists in the fixed-effects model, although the magnitude shrinks to 0.75

fewer days (p<.05). Thus, contrary to prior research, in this sample there do not appear to be

significant changes reported in alcohol consumption during periods of own or partner

unemployment.

[Table 3 about here.]

Finally, I turn to the results for time in vigorous physical activity and BMI. The OLS

model of male partner's physical activity suggests that during periods of own unemployment,

male partners report about 0.09 days less vigorous physical activity per week than during periods of employment (p<.05). Female partners similarly report about 0.06 fewer days of vigorous physical activity per week when the male partner is unemployed. However, these effects do not persist in the fixed-effects models. The results for BMI are a bit more troubling, especially for female partners. In the OLS model of the male partner's BMI, the results indicate that male partners' own unemployment is associated with a report of weight that corresponds to a BMI of about one-half point lower than during periods of employment[1]. This effect does not persist in the fixed-effects models. However, there is a much larger change for female partners. In the OLS model of the female partner's BMI, the results indicate that during periods of male partners' unemployment, the weight reported for female partners translates into a 1.2-point higher BMI (p<.01), as compared to periods in which the male partner is employed. This result persists, in the fixed-effects model, although the coefficient is reduced in magnitude. In the fixed-effects model, a change to unemployment from employment for the male partner is associated with a higher report of weight equivalent to about a half-point increase in BMI (p<.05). Thus, it appears that female partners may gain weight during periods in which their male partners are unemployed.

Interactions with Recession Indicator

Although overall these results do not suggest large changes in couples' health behaviors during periods of unemployment, one might believe that unemployment that coincides with an economic downturn would be more detrimental than that which occurs in growth times. To examine this possibility, I interact unemployment with an indicator variable that indicates the

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[1] Note that although BMI is made of height and weight measures, it is designed to be independent of changes in height. Therefore, we can interpret changes in BMI as changes in weight.

time period of the recent recession, namely the 2007 and 2009 surveys. In results not shown I find several interesting indicators of heterogeneity in effects. With regard to smoking, during the recession, female partners were marginally more likely to take-up or resume smoking if they were unemployed (8.1%, p<.10). Additionally, I find that during the recession male partners report smoking more cigarettes if their female partners are unemployed than in periods in which their female partners are employed (1.34, p<.05). In another example of spillover, during the recession female partners reported about 1.4 fewer days of binge drinking per year if their male partners were unemployed than in periods in which their male partners were employed.

There were also heterogeneous effects with regard to BMI. For male partners' BMI, during the recession male partners reported weights that corresponded with about 0.12 fewer BMI points if they were employed than if they were unemployed (p<.10). The story is more complicated for female partners. During the recession female partners, like male partners, reported weights that corresponded with lower BMIs if they were not unemployed (-0.15, p<.10). During the recession women who were unemployed also reported weights that corresponded to lower BMIs: they reported weights that corresponded with about a 1.2-point reduction in BMI (p<.01). Thus, consistent with previous population-level evidence, women seem to experience declines in BMI during recessions. However, this models also indicated that during periods of female partner unemployment that do not correspond with the recession, female partners reported higher weights that corresponded to nearly 0.8-point higher BMIs than during periods in which they were not unemployed (p<.05). The female partner's BMI seems to be an example of the classic paradox as a result: recessions seem to have positive effects on BMI (given an assumption that a reduction in BMI for most women is positive), while individual

unemployment, at least outside of recessions, is associated with negative effects on BMI, i.e., an increase in BMI.

Conclusions and Future Steps

Revisiting the hypotheses, the results are mixed. Hypothesis 1 suggested that male and female partners would be more likely to start smoking or resume smoking during own or partner unemployment. This hypothesis was partially supported. Male partners appear slightly more likely to smoke when their female partners are unemployed. During the recession period, unemployed female partners were more likely to smoke. Hypothesis 2 suggested that among smokers the number of cigarettes smoked would increase during own unemployment. I did not find support for this hypothesis. The recession interaction models indicate that the male partners of unemployed females smoke more cigarettes during these periods, but there is no indication this is also true when they themselves are unemployed.

Hypothesis 3 suggested that male and female partners would be more likely to start drinking alcohol or resume drinking alcohol during periods of own or partner unemployment. There was no support for this hypothesis. Hypothesis 4 suggested that during unemployment periods partners would increase their binge drinking. There was no support for this. In fact, in the recession models, the female partners of unemployed male partners report less binge drinking while the partner is unemployed.

Hypothesis 5 suggested that BMI would decrease for women and increase for men. This hypothesis was supported for women with regard to own unemployment in the recession model. The opposite finding was found in the main model, wherein female partners appear to gain weight when their male partners are unemployed. Finally, Hypothesis 6 suggested that time in

exercise would increase during periods of own unemployment. There was no support for this hypothesis.

Overall, the findings are mixed. As I revise and expand upon the preliminary results, I plan to test the robustness of the results to the inclusion of the unemployment spells that occur between waves. In addition, I may consider bringing in other sources of data, such as the American Time Use Survey to better understand the relationship between unemployment and exercise time, or the Medical Expenditure Panel Survey, which has fewer measures but a much larger population of individuals, which might facilitate further subgroup analyses. Finally, I plan to revise the tables to include the results of the interaction analyses.

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Health Behaviors Tables

Table 2. Models of husbands' and wives' unemployment on probability of smoking (linear probability model) and number of cigarettes consumed

	Ordinary Least Squares				Fixed Effects			
	Husband Smoking	Wife Smoking	Husband # Cigarettes	Wife # Cigarettes	Husband Smoking	Wife Smoking	Husband # Cigarettes	Wife # Cigarettes
Husband's unemployment	0.10 (0.03)**	0.07 (0.03)*	1.50 (0.56)**	1.44 (0.48)**	-0.02 (0.02)	0.01 (0.01)	-0.26 (0.32)	0.22 (0.27)
Wife's unemployment	0.04 (0.04)	0.07 (0.03)*	0.43 (0.70)	0.79 (0.50)	0.03 (0.02)*	0.03 (0.03)	0.45 (0.30)	0.31 (0.37)
Kids 1	-0.07 (0.02)***	-0.09 (0.02)***	-1.15 (0.41)**	-1.42 (0.28)***	-0.02 (0.01)	-0.02 (0.01)*	-0.23 (0.23)	-0.32 (0.16)*
Kids 2	-0.01 (0.01)	0.01 (0.01)	-0.06 (0.29)	0.21 (0.22)	0.01 (0.01)	0.01 (0.01)	0.12 (0.15)	0.09 (0.12)
Kids 3	0.04 (0.02)*	-0.01 (0.01)	0.41 (0.36)	0.08 (0.25)	-0.002 (0.01)	0.01 (0.01)	0.20 (0.19)	0.41 (0.14)**
Age youngest child	0.002 (0.001)+	0.01 (0.001)***	0.02 (0.03)	0.10 (0.02)***	-0.000 (0.001)	0.001 (0.001)	0.01 (0.02)	0.03 (0.01)*
Respondent is husband	-0.04 (0.01)**	-0.01 (0.01)	-0.72 (0.29)*	-0.10 (0.20)	0.01 (0.01)	0.01 (0.01)	-0.002 (0.37)	-0.02 (0.26)
Husband's age	-0.0003 (0.002)	0.002 (0.002)	0.03 (0.04)	0.04 (0.03)				
Wife's age	-0.002 (0.002)	-0.01 (0.002)**	-0.02 (0.04)	-0.07 (0.03)*				
Year	-0.004 (0.002)*	0.0001 (0.001)	-0.15 (0.03)***	-0.06 (0.02)**	-0.005 (0.001)***	-0.003 (0.001)**	-0.11 (0.02)***	-0.08 (0.01)***
Black	-0.02 (0.02)	-0.04 (0.02)*	-2.14 (0.30)***	-1.39 (0.23)***				
Latino	-0.10 (0.03)**	-0.07 (0.02)**	-3.10 (0.53)***	-1.48 (0.27)***				
Immigrant	-0.02 (0.02)	-0.11 (0.02)***	-1.36 (0.60)*	-1.80 (0.20)***				
Husband has BA/BS	-0.14 (0.02)***	-0.09 (0.01)***	-2.85 (0.32)***	-1.49 (0.21)***				
Wife has BA/BS	-0.09 (0.02)***	-0.09 (0.01)***	-1.76 (0.31)***	-1.33 (0.20)***				
State-level unemployment rate	-0.002 (0.003)	-0.001 (0.002)	-0.08 (0.06)	-0.01 (0.03)	-0.002 (0.001)+	-0.0004 (0.001)	-0.02 (0.02)	0.01 (0.02)
Constant	0.48 (0.03)***	0.39 (0.03)***	7.07 (0.66)***	5.16 (0.47)***	0.25 (0.01)***	0.18 (0.01)***	4.33 (0.23)***	2.59 (0.17)***
R^2	0.07	0.07	0.07	0.06	0.0002	0.001	0.002	0.002
Rho					0.81	0.80	0.79	0.75
N (observations)	14468	14468	14468	14468	14468	14468	14468	14468

Table 3. Models of husbands' and wives' unemployment on probability of consuming alcohol (linear probability model) and number of binge drinking days

	Ordinary Least Squares				Fixed Effects			
	Husband Alcohol	Wife Alcohol	Husband Binge Drink	Wife Binge Drink	Husband Alcohol	Wife Alcohol	Husband Binge Drink	Wife Binge Drink
Husband's unemployment	0.01 (0.03)	-0.03 (0.03)	1.52 (2.32)	-1.17 (0.47)*	0.04 (0.02)	-0.03 (0.02)	-5.03 (3.93)	-0.75 (0.34)*
Wife's unemployment	-0.04 (0.04)	0.05 (0.04)	0.42 (3.47)	1.35 (1.89)	-0.03 (0.02)	0.01 (0.03)	-0.18 (3.86)	2.86 (2.39)
Kids 1	-0.01 (0.02)	-0.08 (0.02)**	-2.25 (1.62)	-2.72 (0.73)***	0.002 (0.02)	-0.03 (0.02)	0.76 (3.00)	-1.26 (0.72)+
Kids 2	-0.01 (0.02)	0.02 (0.02)	-1.70 (1.43)	0.15 (0.57)	-0.01 (0.02)	0.04 (0.01)*	-2.47 (2.09)	-0.72 (0.98)
Kids 3	-0.01 (0.02)	-0.04 (0.02)+	-1.34 (1.25)	-0.80 (0.46)+	-0.01 (0.02)	0.01 (0.02)	-1.58 (1.28)	-0.01 (0.68)
Age youngest child	0.001 (0.002)	0.005 (0.002)**	0.18 (0.12)	0.09 (0.05)	-0.001 (0.001)	0.001 (0.001)	0.02 (0.21)	0.06 (0.05)
Respondent is husband	0.03 (0.02)*	0.01 (0.02)	-0.60 (0.98)	0.33 (0.55)	0.04 (0.02)*	0.04 (0.02)+	2.51 (3.44)	0.95 (1.31)
Husband's age	-0.01 (0.002)***	-0.003 (0.002)	-0.32 (0.17)+	0.01 (0.09)				
Wife's age	0.002 (0.002)	-0.0003 (0.002)	0.15 (0.19)	-0.07 (0.09)				
Year	0.001 (0.002)	0.01 (0.002)**	-0.16 (0.36)	0.10 (0.15)	-0.001 (0.001)	0.005 (0.001)***	-0.05 (0.36)	0.20 (0.19)
Black	-0.09 (0.03)***	-0.16 (0.03)***	-2.51 (1.42)+	-1.86 (0.37)***				
Latino	-0.01 (0.03)	-0.10 (0.04)**	-5.72 (3.30)+	-2.01 (1.17)+				
Immigrant	-0.08 (0.03)**	-0.26 (0.03)***	-1.77 (1.88)	-1.72 (0.54)**				
Husband has BA/BS	0.09 (0.02)***	0.12 (0.02)***	-3.33 (1.12)**	-0.37 (0.52)				
Wife has BA/BS	0.06 (0.02)**	0.10 (0.02)***	-1.92 (1.09)+	0.84 (0.63)				
State-level unemployment rate	0.01 (0.003)**	0.002 (0.003)	0.29 (0.27)	0.03 (0.10)	0.003 (0.002)+	0.0004 (0.002)	0.12 (0.26)	0.002 (0.13)
Constant	0.79 (0.04)***	0.65 (0.04)***	18.16 (3.35)***	5.51 (1.65)**	0.68 (0.02)***	0.52 (0.02)***	6.84 (3.22)*	1.43 (1.46)
R²	0.04	0.09	0.01	0.01	0.005	0.002	0.000	0.003
Rho					0.67	0.66	0.68	0.64
N (observations)	14468	14468	7584	7710	14468	14468	7584	7710

Table 4. Models of husbands' and wives' unemployment on number of days spent in heavy physical activity and body mass index (BMI)

	Ordinary Least Squares				Fixed Effects			
	Husband Activity	Wife Activity	Husband BMI	Wife BMI	Husband Activity	Wife Activity	Husband BMI	Wife BMI
Husband's unemployment	-0.09 (0.03)**	-0.06 (0.03)*	-0.57 (0.30)[+]	1.22 (0.41)**	-0.08 (0.06)	-0.03 (0.03)	0.07 (0.17)	0.45 (0.18)*
Wife's unemployment	0.09 (0.15)	-0.04 (0.03)	0.41 (0.39)	0.18 (0.42)	0.10 (0.11)	-0.09 (0.07)	-0.03 (0.22)	0.18 (0.24)
Kids 1	-0.02 (0.03)	-0.05 (0.02)*	-0.26 (0.23)	-0.30 (0.30)	-0.02 (0.05)	-0.08 (0.05)[+]	-0.04 (0.13)	0.22 (0.16)
Kids 2	-0.06 (0.04)	0.03 (0.02)	0.17 (0.16)	0.01 (0.21)	-0.02 (0.03)	0.03 (0.03)	0.05 (0.08)	0.04 (0.10)
Kids 3	0.02 (0.03)	0.04 (0.02)	0.20 (0.21)	0.45 (0.30)	-0.01 (0.04)	-0.01 (0.05)	0.07 (0.10)	-0.10 (0.12)
Age youngest child	0.01 (0.01)	0.002 (0.002)	0.01 (0.02)	0.02 (0.02)	0.002 (0.003)	0.003 (0.003)	0.01 (0.01)	-0.01 (0.01)
Respondent is husband	0.03 (0.03)	-0.03 (0.01)*	0.21 (0.16)	-1.72 (0.19)***	0.05 (0.04)	-0.03 (0.04)	0.08 (0.12)	-1.09 (0.20)***
Husband's age	-0.003 (0.004)	0.002 (0.002)	-0.01 (0.02)	-0.002 (0.02)				
Wife's age	0.001 (0.003)	-0.001 (0.002)	0.03 (0.02)	0.03 (0.03)				
Year	0.02 (0.01)*	0.02 (0.003)***	0.12 (0.02)***	0.13 (0.02)***	0.01 (0.003)***	0.02 (0.004)***	0.14 (0.01)***	0.19 (0.01)***
Black	-0.07 (0.03)**	0.03 (0.04)	0.63 (0.30)*	2.99 (0.39)***				
Latino	-0.06 (0.05)	0.02 (0.04)	0.85 (0.28)**	0.70 (0.40)[+]				
Immigrant	0.02 (0.04)	-0.03 (0.02)	-0.73 (0.24)**	0.37 (0.34)				
Husband has BA/BS	-0.06 (0.03)*	-0.02 (0.02)	-0.98 (0.20)***	-1.73 (0.24)***				
Wife has BA/BS	-0.07 (0.03)**	-0.04 (0.02)*	-0.68 (0.20)**	-1.30 (0.24)***				
State-level unemployment rate	-0.03 (0.01)[+]	-0.01 (0.004)*	-0.01 (0.03)	0.04 (0.04)	-0.01 (0.006)*	-0.01 (0.006)*	-0.02 (0.02)	-0.02 (0.02)
Constant	0.70 (0.09)***	0.45 (0.04)***	26.92 (0.41)***	24.81 (0.50)***	0.54 (0.04)***	0.48 (0.03)***	27.17 (0.11)***	24.99 (0.14)***
R^2	0.01	0.01	0.03	0.11	0.003	0.01	0.01	0.04
Rho					0.72	0.41	0.85	0.88
N (observations)	9770	9276	14468	14468	9770	9276	14468	14468

Table 1. Descriptive Statistics (person-year observations)

	Mean (SD)	Range
Husband's median earnings	47880.00 (52896.43)	0-285000
Wife's median earnings	23243.08 (27967.14)	0-131100
Husband's age	42.43 (9.90)	18-60
Wife's age	40.59 (9.92)	15-60
Husband is Black	0.07	0-1
Husband is Latino	0.04	0-1
Wife is Black	0.07	0-1
Wife is Latino	0.04	0-1
Husband is immigrant	0.10	0-1
Husband has BA/BS	0.33	0-1
Wife has BA/BS	0.31	0-1
Husband's unemployment	0.02 (0.15)	0-1
Wife's unemployment	0.02 (0.12)	0-1
State-level unemployment rate	5.68 (2.04)	2.60-13.30
Urban	0.96	0-1
Husband's weekly work hours	41.86 (14.94)	0-80
Wife's weekly work hours	26.73 (17.39)	0-65
Respondent is wife	0.56	0-1
Respondent is husband	0.43	0-1
Husband's total unemployment spells (if ever unemployed)	1.14 (0.39)	1-4
Wife's total unemployment spells (if ever unemployed)	1.07 (0.26)	1-3
Husband smokes	0.21	0-1
Wife smokes	0.16	0-1
Husband number of cigarettes (smokers only)	16.94 (11.37)	0-130
Wife number of cigarettes (smokers only)	13.82 (8.74)	0-154
Husband consumes alcohol	0.70	0-1
Wife consumes alcohol	0.57	0-1
Husband's days of binge drinking (4+ drinks)	7.42 (33.31)	0-365.00
Wife's days of binge drinking	2.77 (17.02)	0-365.00
Husband's days of heavy physical activity	0.55 (1.03)	0-22.00
Wife's days of heavy physical activity	0.47 (0.53)	0-10.86
Husband's BMI	28.00 (4.67)	12.20-59.68
Wife's BMI	25.63 (5.87)	12.90-68.16