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Cumulative Effects of Job Characteristics on Health♦

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Introduction

We examine the cumulative impact of physically demanding or environmentally hazardous job characteristics on health. Work-life, including adverse working conditions, is a potential source of poor health and disparities in health, yet these factors get relatively little attention in the health economics literature. Individuals work many hours over their life, so their cumulative exposure to working conditions can be an important source of health disparities. A better understanding of differences in exposure and impacts across age, race, and gender may lead to solutions to these problems.

There is much research suggesting that accumulated stressors, such as those from work, may lead to poor health. Specifically, research from biologic and physiologic studies shows evidence that longer exposure to adverse conditions is likely to result in greater harm to health. To address the issue of the harmful impacts of cumulative exposure, we use the rich, panel-data available in the Panel Study of Income Dynamics (PSID). The PSID includes measures of both health and occupation as well as other factors. We merge PSID data with time-varying job characteristics from the Dictionary of Occupational Titles (DOT) (USDOL, 1991). The longitudinal nature of the PSID data allows us to develop measures of cumulative exposure and to control for lagged measures of health. We use 5-year windows of exposure to job conditions to measure adverse working conditions and then to estimate the effects of these conditions on self reported health status. Access to data on health earlier in life helps to mitigate concerns over self-selection into jobs based on the ability to handle these potentially adverse conditions.

Our results are estimated using ordered probit/random effects estimators and suggest that individuals who work in jobs with ‘adverse’ conditions experience declines in their health.

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Importantly, and in contrast to much of the extant literature, we find distinctive difference in the impact of job characteristics by demographic group. For instance, for black men, we find that a one standard deviation increase in cumulative physical demands decreases health by an amount that is equal to a decrease of a year of schooling. We find very small effects, however, for white men. We find that exposure to physically demanding jobs significantly decreases the health of young women and exposure to harsh environmental conditions decreases the health of older women. We also find evidence that job characteristics are more detrimental to the health of white female workers. In addition, we report suggestive evidence that earned income, also job-related, may cushion some of the health impact of physical demands and harsh environmental conditions for some groups of workers. These results are robust to inclusion of dummies on ten broad occupational categories; the dummies control for all other occupational invariant factors. Evidence that certain characteristics of occupations negatively affect workers' health may provide insights into how to limit work-related causes of health decline. Evidence on who is most vulnerable to the negative health impacts may help to prioritize those populations most at risk and in need of help.

Our work advances the knowledge base in several ways. We focus on the cumulative impact of occupation, rather than incremental impacts. Because we have longitudinal data we can develop a 5 year measure for exposure to job characteristics. This focus on cumulative impacts may be important—while individuals can often overcome temporary stressors without lasting health consequences, chronic stressors have been shown to result in the over production of cortisol and other biologic responses, leading to later health problems (Seeman, Singer et al. 1997; Miller and O'Callaghan 2002). Also, because of the longitudinal data, we can control for childhood ('initial') and lagged health, as well as use ordered probit/random effects estimators. Controlling for initial health helps to mitigate the degree to which people self-select into occupations when young based on their health. The large sample size allows us to stratify the sample by gender, age and race subgroup yielding distinctive differences across these groups. These advances may help to develop a better understanding of the impact of job characteristics on workers' health.

Background Literature

Recent medical and epidemiologic literature indicate the importance of the cumulative burden of job characteristics and other factors, such as poverty and low social and economic status, on health (see for instance Michie and Williams, 2002, for a review of the impact on mental health). The findings confirm that the body reacts to physical, social and psychological stresses in physiologic and biologic ways. The short term response may be beneficial or adaptive (e.g. increased levels of adrenalin and other hormones), allowing one to focus to meet a work deadline or escape a potential workplace injury. However, if stress is suffered over a long period of time, the body can respond in maladaptive ways. Continual stressors that increase hormonal levels can damage the functioning of the brain as well as the immune system (McEwen 1999, 2000, McEwen and Seeman 1999). The term 'allostatic load' was coined by McEwen (2000) and refers to the physiological costs of chronic exposure or cumulative strain. Biological and physiological measures have been used to identify and quantify allostatic load. In turn, allostatic load has been found to compromise physical health (Seeman et al. 2001 and Seeman et al. 2002). Thus poor physical health can be a consequence of long-term exposure to stressful job conditions.

An influential set of longitudinal studies of British civil servants examine how occupation per se affects health (Marmot and Smith 1997; Bosma, Marmot et al. 1997). The key finding is that lower occupational status is associated with worse health, even when controlling for demographics, health habits and income, among other factors. These papers focus on social position, occupational stress, and job control as mechanisms for this relationship. Low social

position is thought to increase allostatic load, which in turn harms health. This set of studies examines various dimensions of health, including coronary heart disease, self-reported health, morbidity and health related behaviors (Bosma, Marmot et al. 1997). This research was conducted primarily in countries with universal health insurance, thus demonstrating that occupation matters for reasons beyond health insurance. That a gradient would be found even among a set of British (or other) government workers with relatively secure jobs, health insurance coverage and a relatively narrow set of job types is perhaps surprising, yet reinforces the value of using occupation as an informative determinant of health.

There are relatively few studies on work conditions, such as exposure to physical demands, and health in the economics literature. Recent work by Case and Deaton (2003 Case and Deaton (2005) provide evidence that low-paid, manual work damages self-assessed health to a greater extent than highly paid, skilled work. Furthermore, they find that the deterioration in health is faster for blue-collar workers approaching retirement age. Their results are robust to including important controls such as education and income. A limitation of their work is that they use repeated cross sectional data rather than panel data. Therefore, they are not able to track individuals over time, but rather examine individuals in a given occupation across the age span. Another economic study uses historical data from the mid-nineteenth century to examine occupational categories and finds only a limited effect of occupation (Ferrie 2001). Choo and Denny (2006) also use a cross sectional database (Canadian) and confirm the findings in Case and Deaton (2003 in Case and Deaton (2005) as well as show that the results are robust to including lifestyle choices (smoking, obesity) and controls for chronic diseases (e.g. diabetes, heart disease, cancer, etc).¹ These studies use cross-sectional data and cannot control for initial health conditions nor examine cumulative effects.

Robone et al. (2008) use longitudinal data from the British Household Panel Survey to examine the health impact of working during the day versus the evening (or rotations), perceived pay and promotion opportunities, worker location (e.g. employer versus home), worker satisfaction, type of job contract (e.g. fulltime versus part-time) as well as other measures². The authors find that a high level of employability has a positive impact on self-reported health and psychological health for those with temporary jobs. Also, they provide evidence that for part-time workers, being unsatisfied with their number of hours worked has a deleterious impact on health. Like the cross-sectional research outlined above, this study focused on contemporaneous effects rather than cumulative effects.

Several epidemiologic studies use PSID data on United States workers and their jobs from 1968 to 1991 to examine the cumulative effects of job stress and control on subsequent mortality. They find that cumulative exposure to low control jobs and passive work significantly increases mortality (Amick, Kawachi et al. 1998; Amick and Celentano, 1991).³ However, they do not control for early and lagged health; the results in Contoyannis et al. (2004) show strong persistence in health, suggesting the need for controls for lagged health in the analysis.

In related work, some of the limitations of earlier studies have begun to be addressed. In a paper that is most similar to this paper, Lakdawalla and Philipson (2007) merged occupation and health information from the National Longitudinal Study of Youth 1979 (NLSY) with

¹A related emerging body of work is research linking initial occupational choices with later health outcomes. Sindelar et al. (2007) presents the first such evidence. Fletcher (2008) examines the association between first occupation and health in old age using sibling fixed effects. Fletcher and Sindelar (2008) instrument for first occupation and find large effects of blue color employment on later health.

²See Datta Gupta and Kristensen (2008) for other evidence on associations between job satisfaction and health.

³Karasek et al. (1988) examine the relationship between job characteristics and myocardial infarction using the US Health Examination Survey and the Health and Nutrition Examination Survey, which is cross-sectional data.

occupation characteristics information from the Dictionary of Occupational Titles. These authors focus on the effects of cumulative exposure to physical demands of jobs on the overweight status of workers. Lakdawalla and Philipson show that men who are employed in the most fitness-demanding occupations are 14 percent lighter than men employed in the least demanding occupations, and men in the most strength-demanding occupations are 15 percent heavier than men in occupation at the bottom of the strength distribution. The authors also use the NLSY dataset to show that there is substantial variation in the physical demands placed on workers across occupations.

In this paper, we extend the basic strategy of Lakdawalla and Philipson to focus on the effects of physical demands and harsh environmental conditions on the self-reported health status of working age adults. In contrast to their study, we control for initial health (between the ages of 0 and 16) and lagged health to control for the health production process preceding the windows of exposure found in our data. In addition, we examine whether the effects of exposure to harsh job conditions are cushioned or worsened by income, and examine whether the net effect of longer hours worked is to increase exposure to job characteristics and worsen health or whether longer hours worked are due to a better ability to cope with the conditions. Finally, we show that our main results are robust to inclusion of dummies on ten broad occupational categories; the dummies control for all other invariant occupational factors.

Data and Empirical Model

Our empirical model draws on literature that estimates education production functions as well as the seminal work in the health economics literature of Grossman (1972). In Grossman, health status transitions over time in a simple way:

$$H_t = \delta H_{t-1} + I_t \quad (1)$$

where in this case health status at time t is a linear function of the depreciated health status from the previous period plus any health investments made in the current period. Thus, if we unravel this function recursively, we can see that health status at period t is a function of the health endowment (at time = 0) and the summation of the subsequent discounted investments made between the initial time period and the current time period:

$$H_t = \delta^t H_0 + \sum_{k=1}^t \delta^{k-1} I_k \quad (2)$$

Broadening the health transition function to reflect the idea that there can be both positive investments and negative investments (“expenditures”) of health over time due to environmental factors, starting to smoke, etc., we have:

$$H_t = \delta^t H_0 + \sum_{k=1}^t \delta^{k-1} (I_k - E_k) \quad (3)$$

The aggregated health expenditures, E , are akin to the concept of allostatic load or cumulative burden engendered by exposure to long-term stresses. Unfortunately, no datasets contain rich enough information on the full set of health investments and expenditures in health for an individual’s full history. Therefore, in order to examine shorter term

cumulative effects of occupational conditions that may reduce health status, we estimate equations of the following form:

$$H_t = \rho H_{t-5} + \theta \sum_{k=t-5}^t E_k + X_t \beta + \alpha H_0 + \varepsilon_t \quad (4)$$

This formulation assumes that prior health status captures the history of net investments made up until the point at which prior health is measured. Here we measure prior health status five periods before the current. We chose five periods somewhat arbitrarily with the idea that we need to allow enough time to elapse so that we can estimate the effects of negative health investments on health. We examine alternative time frames as well to check the robustness of our results.

We concentrate on negative health investments from job exposures to physical demands and adverse environmental conditions. Individual level characteristics are controlled for in order to adjust for heterogeneity in the health transition equation. We also are able to control for initial health status.

To the extent that individuals make (unobserved to the researcher) positive investments in health to offset health losses, our estimates of θ may understate the true decrements to health caused by job conditions. Specifically, the theory of compensating wage differentials suggests that individuals may accept harsher job conditions in order to obtain higher income, *cet. par.* (Rosen, 1986). To the extent that workers accept worse working conditions in order to achieve higher wages, they could use the higher income to invest in their health. Thus when such investments are omitted, our estimates of θ may understate the full decrement caused by adverse job conditions. We explore this below to some extent by controlling for labor income flows. In addition, we control for hours worked in an alternative specification. Due to potential endogeneity of these factors, our preferred specification is as above, without these factors; however, we provide the alternatives as robustness specifications.

Data and measures

The data for this study are from the Panel Study of Income Dynamics (PSID), which is a longitudinal study of a representative sample of U.S. individuals and their families. We match data on job characteristics from the Department of Labor's Dictionary of Occupational Titles (DOT). The PSID emphasizes the dynamic aspects of economic and demographic behavior, and it contains a wide range of information, including occupation and health.⁴ Starting with a national sample of approximately 4,800 U.S. households in 1968, the PSID re-interviewed individuals from these households every year until 1997, and every other year since that time.⁵ New households were added as the children of the panel families grew older and formed their own family units. At the conclusion of the 2001 data collection, the PSID had collected information spanning as many as 34 years for some observations⁶.

⁴The PSID is conducted by the Survey Research Center, Institute for Social Research at the University of Michigan, and has been primarily funded by the National Science Foundation and the National Institute on Aging.

⁵Since we have no data in 1998, we use the data between 1993–1997 to construct the five-year cumulative measures for individuals surveyed in 1999. Results that drop the observations from 1999 are nearly identical to those presented below and are available upon request.

⁶While the initial response rate in 1968 was somewhat low (76 percent), annual response rates for follow-up were exceedingly high. These ranged from 88.5 percent in 1969 to between 96.9 and 98.5 percent following. Given the cumulative effect of even small yearly dropout rates, attention to potential selection bias is always warranted. However, a National Science Foundation commissioned study found that only a negligible portion of attrition in the PSID is systematic.

In this paper, we focus on self-reported health status as our primary outcome of interest, which takes one of five values: excellent, very good, good, fair, and poor. We focus on this measure for both practical and substantive reasons. This is the only health outcome available in the PSID before 1999 and is also the most often used measure in this literature. This outcome has also been shown to be highly correlated with many objective measures of health, such as mortality and many morbidities (Idler and Benyamini 1997). Of course, this measure is not perfect. For example, Jorges (2008) shows evidence that self reported health status is sometimes answered in a relative sense⁷. For example, white males may report their health status relative to other white males. Since our analysis is stratified by gender, race, and age, our results will overcome this specific measurement issue to some extent. While self-reported health status measures are imperfect, there are also issues with alternative measures⁸. For example, Bound (1991) shows that there are potential biases from both self reported subjective and objective measures of health (see also Baker et al. 2004 for further evidence of biases when using self-reported objective measures). Some biases may be due to differential access to health care, such as measures of “ever receiving a diagnosis for condition X”. Other biases may be due to standard misreporting from embarrassment or imperfect recall or other factors. These issues of subjective health measures should be kept in mind when interpreting the results.

We are also able to control for lagged health. Health status is retrospectively reported by the respondent in 1999. The survey asked: “Consider your health when you were growing up, from birth to age 16. Would you say that your health during that time was excellent, very good, good, fair, or poor?” We use the responses in a 5 part ordered outcome of self-reported health (see Smith 2009 for evidence of the usefulness of this measure).

As health status is only reported beginning in the 1984 wave of the PSID, our sample of PSID respondents come from the surveys conducted between 1984–1999.⁹ This creates an unbalanced sample of 75,000 person-years for males and 85,000 person-years for females. Controlling for lagged health decreases the sample sizes to 37,000 person-years for males and 43,000 person-years for females. The primary reason that our analytical sample is smaller is that it requires an extra year of data to measure health prior to our five year window of exposure to job characteristics.

We merge the DOT characteristics by 3-digit occupation code and year to individuals in the PSID. The data describing job characteristics are taken from two waves of the DOT (1977 and 1991) that use the standard 3-digit Census occupational categorical codes. In particular, for each job we use one assessment of physical demands needed and combine several assessments of the environmental conditions into a scale. The environmental conditions that we use include assessments of extreme heat, extreme cold, exposure to weather, wet and/or humid conditions, and atmospheric conditions.¹⁰ We use principal component analysis to combine the environmental conditions into a single index of exposure.¹¹ The physical demands category we focus on is strength, which is expressed by one of five terms:

⁷In Appendix Table 1, we present the distribution of health status by stratified samples. There are evident differences by race, gender, and income, although it is difficult to know whether these differences are a result of differential reporting styles or different exposures to other environmental factors.

⁸See also Jorges (2007), Kapteyn et al. (2007) and Bago d’Uva et al., (2008)

⁹The PSID Occupational Codes switch to 2000 3-digit codes after 1999.

¹⁰We present descriptive statistics for the job characteristics in Appendix Table 2 by occupational category.

¹¹Principal component analysis is a statistical technique for dimension reduction that transforms a number of correlated variables into a smaller number of uncorrelated variables. The transformed variables are calculated as linear functions of the original variables so that the information loss due to dimension reduction is minimized. Because location and scale parameters (i.e. mean and variance of the transformed variables) are undetermined, a researcher must specify them. In this paper, we construct only one variable from many DOT variables and normalize it by setting the mean equal to zero and the variance equal to one. See Ingram and Neumann (2005) and Bacolod and Blum (forthcoming) for other economic applications of principal component analysis that use the DOT. We present the factor weights in the Data Appendix.

Sedentary, Light, Medium, Heavy, and Very Heavy.¹² In order to determine this overall rating, DOT makes an assessment of the worker's involvement in several domains of activities, including position (standing, walking, or sitting), duration and intensity of lifting, pushing, and pulling objects, and the amount of controls (buttons, knobs, pedals, etc.) used during the job. In order to merge this information with our primary dataset, we linearly interpolate the DOT data for years outside of the DOT years of 1977 and 1991.

In order to measure cumulative exposure to strength and environmental requirements, we add the scores over the five year period. Because the cumulative score is the aggregation across all five years, it is more akin to a continuous variable than a categorical. In order to capture the churning in and out of the labor force of some individuals, we also control for the amount of the previous five years that the individual was out of the labor force¹³. These two measures are standardized across the whole population.¹⁴ Hours worked and yearly labor market earnings are also aggregated to obtain a five year total. We compare results across alternative specifications—four, five and six year cumulative exposure alternatives. We have also examined the use of “discounted” cumulative exposure, where characteristics that are more proximate to the health measure are given more weight. Our results are qualitatively the same and are available upon request.

We use a relatively parsimonious set of control variables, including age, a quadratic in age, years of schooling, self-employment status, marital status, time out of the labor force, self-reported health when young, year dummies and in some specifications cumulative weekly work hours and labor income. Unfortunately, several potentially important variables are not adequately measured in the PSID, including measures of risk preference as well as job characteristics such as health insurance.¹⁵ In order to capture broad measures of access to health insurance as well as other occupational characteristics, we control for occupational fixed effects in robustness checks (see Appendix Table 3). Note that job characteristics are measured at the 3-digit level while we use ten broad occupational categories in our fixed effects.¹⁶

In order to examine heterogeneity in the 5-year cumulative effects of exposure to job characteristics and other variables, our specifications are estimated separately by gender and also stratified by age and race of the workers. We stratify a priori because differences by subgroup have been found in previous studies of health production functions. In addition, labor market conditions and responses are well-known to vary by gender, age and race, as we show in Table 2. Self-reports of health may vary systematically by these characteristics

¹²Sedentary work involves sitting most of the time with brief periods of walking or standing. Examples of sedentary work includes jobs that take dictation or transcribe notes, writing news stories, or works as a dispatcher. Very heavy work involves exerting in excess of 100 pounds of force occasionally, 50 pounds frequently, or 20 pounds constantly. Examples include lifting lumber, loading and unloading trucks, and transferring adult patients between bed and conveyance in hospitals. See U.S. Department of Labor (1991).

¹³During times of not employed, we assume that the physical demands and environmental exposures are equal to zero.

¹⁴We have also estimated all models where the job characteristic measures are standardized by gender. The results are nearly identical and available upon request.

¹⁵One potential way to correct for individual heterogeneity such as risk preference would be to control for individual fixed effects. The issue with controlling fixed effects is that we are examining the effects of cumulative occupational characteristics rather than incremental characteristics, which is difficult to implement with fixed effects. For example, for two adjacent person-years of an individual: with fixed effects we would only be able to estimate the incremental, one-year effect of occupational characteristics rather than our goal of estimating cumulative effects because the measure of cumulative occupation characteristics would be identical for four out of five years.

¹⁶We also examine the use of a measure of risk tolerance, where respondents were asked questions on their willingness to take gambles. This measure is limited for several reasons: it was asked only in 1996 (only individuals in the sample in 1996 have data), it is not a pre-labor market variable, and it is only a single, noisy measure of risk tolerance (see Kimball et al. (2009) for additional details of the measure). We show in results available upon request that this measure does not seem to explain our results linking exposure to job characteristics to health status for women—for men, any differences in results were based on the sample composition changes (due to missing data) that occurred when using the risk tolerance measure rather than controlling for the measure.

as well (see Appendix Table 1), thus the stratification helps to address potential differences in self-reported health as well.

Summary statistics of our samples of men and women are displayed in Table 1. Men in our sample are slightly healthier than women (currently, previously, and initially)¹⁷. Men are more likely to report being self employed and earn more labor income than women. Women and men sort into different occupations, with key difference being that men are more likely to be in the categories of craftsman, operative and laborer while women are more likely to be in the service sector. Women have more spells out of the labor force while men have higher physical demands on average as well as better environmental conditions.

Table 2 stratifies the working conditions descriptive statistics by subgroups, including race, education, and age. For both men and women, non-white workers have worse job conditions, lower incomes, and work fewer hours. Examining the job conditions by educational attainments, we find that men with more than a high school diploma work in jobs with substantially better working conditions. The picture is more mixed for women—high school dropouts have lower physical demands but harsher environmental conditions. Older workers generally face lower physical demands and less harsh environmental conditions compared with young workers (<40 years old).

Results

Equation 4 is estimated using ordered probit, random effects estimation procedures. This method is used to account for the fact that the dependent variable, self-rated health, is measured in ordered categorical values and allows an individual-level time invariant random component along with an idiosyncratic error term (see Contoyannis, et al 2004).¹⁸

Estimates for Males

In Table 3, we begin our baseline ordered probit/random effects regression analyses linking cumulative job exposure to current self-reported health status. Column 1 reports baseline results while columns 2 and 3 stratify the results by race and columns 4 and 5 stratify the results by age group.¹⁹ We find evidence, consistent with prior studies, that health decreases with age, and education is positively associated with health. Like Contoyannis et al. (2004), we find strong persistence in health²⁰. For males, we find a statistically significant association in the full sample between environment exposures and health status but not for physical demands, though both estimates are in the hypothesized direction (column 1). When we further stratify the analysis, we find that physical demands are associated with lower health for non-white males and older males. A one standard deviation increase in the five-year cumulative physical demands reduces health by 0.056 units over five years for non-whites, which is comparable to a reduction of nearly a year of schooling.²¹ Likewise, for older male workers (age>40), we find that a one standard deviation increase in physical demands reduces health by 0.08 units, which is similar to a 2/3 year decrease in schooling. We also find that this decrease in health for older workers is approximately the same as the

¹⁷While men are more often found to have a lower self-report than women, our sample is composed of workers which could explain our somewhat different finding.

¹⁸The random effect ordered probit specification is estimated with STATA using the program *reoprob.ado*, written by Frechette (2001).

¹⁹Results that do not control for initial health status are similar and available upon request.

²⁰Correcting for autocorrelation in our context is not straightforward, given the atypical lag structure we use. The reader will note, though, that our primary interest in this analysis is not the coefficient on lagged health, as in Contoyannis et al. (2004), but instead our main interest is the coefficient on cumulative job conditions. However, results for our coefficient of interest are nearly identical to the results presented here if we employ standard corrections such as the “arima” command in Stata with a six period lag structure and are available upon request.

²¹Results that use 4 or 6-year lags instead of 5-year lags are similar and available upon request.

reduction in health from aging several years using a linear age control (results not shown). For young workers, we find evidence of a negative relationship between environmental conditions and health. We find no evidence of links between job exposures and health for white workers.

In Table 4, we extend the analysis from Table 3 by controlling for two additional job attributes—cumulative income and weekly hours worked. We add these variables separately in the analysis in order to first examine the “total effects” of our focal job attributes and then secondly to examine descriptively how the results change when additional job characteristics are controlled. Labor income may be used to offset decrements to health from exposure to environmental conditions. Hours worked could be capturing at least two distinct processes—workers who are healthier could be able to work longer hours and/or workers who work longer hours are exposed to job conditions for longer periods. In all cases, we find that income is positively related to health, as are weekly hours worked.²² For males, the coefficient on cumulative hours worked is positive and significant but very small in magnitude, potentially indicating offsetting effects of these two processes. We also find that, compared to results from Table 3, the new results suggest that labor income may moderately cushion the negative effects of job exposures on health since the physical demands-health links for non-whites and older workers are reduced and no longer statistically significant. However, these results for hours of work and income are only suggestive.

Estimates for Females

In Table 5 we shift our analysis to examine the links between job characteristics and health status for female workers. Overall, we find larger coefficients than those found for men, suggesting that strength demands and harsh environmental conditions are more harmful to self-reported health status for women as compared to men. For the full female sample, both job conditions are linked with lower health. A one standard deviation increase in cumulative physical demands exposure reduces health over five years by 0.065 units, which is similar to a reduction of a 1/2 year of education. A one standard deviation increase in harsh environmental conditions reduce health by 0.026 units over five years, which is similar to a reduction of one-sixth years of schooling. When we separate the results by race, we find that work conditions lower health in white women to a larger extent than non-white women. When we separate the results into old (>40) and young workers, the effects of physical demands deteriorate health more for younger workers than older workers, and environmental conditions show the opposite relationship.

In Table 6, we again extend our first set of results for females by controlling for cumulative labor income and weekly hours worked. As we found for men, income is positively related to health for women too. Unlike men, cumulative weekly work hours are negatively associated with health for women, though never statistically significant. We also find only slight decreases in the links between negative job conditions and health after these controls are added (comparing Table 5 with Table 6). However, these results for hours of work and income are only suggestive.

Strengths and limitations—The linking of DOT data on to PSID data allow us to analyze the effects of job characteristics on health while controlling for lagged health, initial health and other factors in a large national sample. This paper advances the knowledge base by: 1) focusing on cumulative impacts, reflecting contemporary biologic and physiologic findings about the importance of cumulative impacts of adverse conditions on health; 2)

²²It is important to note that there is evidence that subjective health reports have been shown to be correlated with income, which raises the potential that the influence of cumulative income measures could be biased (Bago d’Uva et al. (2008)). These biases should be kept in mind when interpreting the results.

controlling for initial health which helps to mitigate the degree to which people self-select into occupations when young based on their health; 3) using a measure of 5 year lagged health to control for the cumulative impact of occupation on health prior to the period under study; 4) examining subgroup differences in response to job conditions; and 5) showing that our results are robust to a variety of specification checks.

While our study contributes to the literature in several ways, there are several limitations with our approach. The potential endogeneity of occupation and occupational change does not allow our estimates to have a causal interpretation, though endogenous switching out of jobs with harsh conditions in order to mitigate negative effects on health suggests our estimates could be lower bounds of the causal effects of harsh conditions on health. We also have limited information on whether workers invest in their health to offset the decrements caused by poor job conditions, which would also make our estimates conservative. That labor income is positively and significantly related to health suggests individuals may spend money to compensate for the negative impacts of the conditions of their jobs. Use of self-reported health is both a strength and a weakness—it is a comprehensive measure but is not an objective measure. However, self-reported health has been shown to be a good predictor of objective measures (Idler and Benyamini 1997). Finally, there are several potential pathways by which adverse conditions might affect health that we are unable to fully measure, including body mass index (BMI²³), health insurance status, or other mechanisms. While some portion of the effects of these potential mechanisms should be subsumed in our lagged health measures, important effects could remain.

Discussion and Conclusion

We present evidence linking cumulative exposure to physical demands and harsh environmental conditions at work to a comprehensive measure of health for a national sample of workers. Our method of controlling for early and also lagged health help to both 1) address early self-selection into occupations based on health and 2) isolate the contribution of cumulative exposure to changes in health over a five year time period. These factors result in what we think is likely the best current evidence linking cumulative exposure to poor job conditions to a global measure of health. We find that both job conditions can harm health and that the impacts vary considerably by gender, age and racial subgroups.

To the extent that compensating wage differentials are important in labor markets, our first set of results that do not control for earnings could underestimate the negative impact of poor working conditions. That is, individuals may accept worse working conditions in return for higher income. Individuals could use the higher income to invest in their health. While income earned may cushion the impact to some extent, in contrast, hours worked may increase exposure to job conditions for women. We are able to control for both of these in our alternative specifications.

Indeed, when we control for income (and hours) in the regressions, the impact of poor working conditions is smaller in absolute value, especially for women. This suggests that compensating wage differentials may not be important empirically in our estimates; this finding is consistent with the mixed, often weak results found from empirical tests of compensating wages differentials (Rosen, 1986).

Our results indicate that some demographic subgroups are at considerable risk for decrements in health due to job characteristics, thus suggesting that workplace policies could

²³Height and weight is only asked in the PSID in two year of our data.

provide targeted ways to address health disparities. In addition to improving the health of individuals, firms too may benefit financially through reduced absenteeism, increased productivity on the job and lower health insurance premiums. Thus firms might have the incentive to address the adverse working conditions and health disparities if they were provided with information and methods to cost-effectively address the problems. There is a need for new workplace or governmental policies to be developed and implemented to blunt the impacts of adverse working conditions in order to promote good health and reduce disparities.

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Data Appendix

In order to retain observations, we edit the data in several ways. For occupational codes, there are several problems that we address. For individuals with missing occupational codes who are working, we fill in codes where that occupational codes in the year $t+1$ and the year $t-1$ is the same. We also fill in codes if the $t-1$ information is available in that wave but not $t+1$. When the occupations in $t-1$ and $t+1$ differ, we fill in the occupational characteristics at year t with the average. After these corrections, if there are still missing occupation codes, missing occupational observations are replaced with the average occupational measures over four years and a dummy variable is created to reflect missing data. As mentioned in the text, unemployed waves are given a value of 0 for the occupational characteristics and we control for the number of unemployed waves for each 5-year cumulative measure.

All income is CPI-adjusted to reflection 1999 dollars.

Principal Component Analysis Results

Below, we present the underlying variables in our environmental conditions factor:

<u>Factor Loadings</u>			
Variable	Factor1	Factor2	Uniqueness
Exposure to Weather	0.24	0.25	0.88
Cold	0.46	−0.06	0.78
Hot	0.56	−0.13	0.67
Wet/Humid Conditions	0.68	−0.03	0.54
Atmospheric Conditions	0.29	0.23	0.86
<u>Scoring Coefficients</u>			
Variable	Factor1		
Exposure to Weather	0.101		
Cold	0.212		
Hot	0.279		
Wet/Humid Conditions	0.419		
Atmospheric Conditions	0.126		

Table 1

Descriptive Statistics
PSID Analysis Sample: Men and Women

Variable	Men			Women		
	Obs	Mean	Std.	Obs	Mean	Std.
Current Self Rated Health Status	34721	3.70	1.04	41178	3.56	1.03
Cumulative Physical Demands (standardized)	34721	-0.01	0.96	41178	0.05	0.98
Cumulative Environmental Conditions (standardized)	34721	-0.12	0.79	41178	-0.03	0.89
Nonwhite	34721	0.29	0.45	41178	0.36	0.48
Age	34721	42.61	9.91	41178	42.25	10.40
Years of Schooling	34721	13.26	2.40	41178	13.00	2.19
Self Employed	34721	0.14	0.35	41178	0.07	0.25
Married	34721	0.81	0.39	41178	0.69	0.46
Labor Income (\$10,000s)	34721	3.97	4.27	41178	1.72	2.01
Weekly Work Hours	34721	38.95	17.91	41178	25.36	19.51
Cumulative Labor Income	34721	19.32	19.44	41178	8.12	8.26
Cumulative Weekly Work Hours	34721	198.72	69.92	41178	126.72	83.21
Initial Health (between age 0 and 16)	34721	4.32	0.73	41178	4.19	0.78
Out of the Labor Force Proportion	34721	0.09	0.23	41178	0.27	0.37
Lag Self Rated Health Status	34721	3.85	1.01	41178	3.66	1.02
Professional (Current)	34665	0.17	0.38	41131	0.17	0.37
Manager (Current)	34665	0.17	0.37	41131	0.08	0.27
Sales (Current)	34665	0.05	0.21	41131	0.04	0.18
Clerical (Current)	34665	0.04	0.20	41131	0.21	0.40
Craftsman (Current)	34665	0.19	0.39	41131	0.01	0.12
Operative (Current)	34665	0.14	0.35	41131	0.07	0.25
Laborer (Current)	34665	0.05	0.22	41131	0.01	0.09
Farmer (Current)	34665	0.02	0.14	41131	0.00	0.05
Service (Current)	34665	0.07	0.25	41131	0.14	0.35
Home Maker (Current)	34665	0.00	0.02	41131	0.01	0.11
Not Employed (Current)	34665	0.10	0.30	41131	0.26	0.44

Table 2

Work Condition Differences By Group

Variable	All Men			All Women		
	Obs	Mean	Std Dev	Obs	Mean	Std Dev
Cumulative Physical Demands (standardized)	34721	0.42	0.87	41178	-0.32	0.91
Cumulative Environmental Conditions (standardized)	34721	-0.01	0.90	41178	-0.16	0.75
Cumulative Labor Income	34721	19.32	19.44	41178	8.12	8.27
Cumulative Weekly Work Hours	34721	198.72	69.93	41178	126.72	83.21
<u>Non White</u>						
Cumulative Physical Demands (standardized)	9952	0.53	0.96	14909	-0.26	0.99
Cumulative Environmental Conditions (standardized)	9952	0.22	1.02	14909	0.01	0.96
Cumulative Labor Income	9952	13.12	10.33	14909	6.92	6.66
Cumulative Weekly Work Hours	9952	175.80	74.44	14909	122.49	83.22
<u>White</u>						
Cumulative Physical Demands (standardized)	24769	0.37	0.82	26269	-0.35	0.85
Cumulative Environmental Conditions (standardized)	24769	-0.10	0.83	26269	-0.25	0.58
Cumulative Labor Income	24769	21.82	21.57	26269	8.81	8.99
Cumulative Weekly Work Hours	24769	207.93	65.82	26269	129.12	83.11
<u>HS Dropouts</u>						
Cumulative Physical Demands (standardized)	4651	0.50	1.18	5839	-0.58	1.12
Cumulative Environmental Conditions (standardized)	4651	0.31	0.93	5839	0.17	1.00
Cumulative Labor Income	4651	9.34	7.47	5839	3.20	4.25
Cumulative Weekly Work Hours	4651	158.41	89.55	5839	76.72	81.12
<u>HS Graduates</u>						
Cumulative Physical Demands (standardized)	12896	0.69	0.83	16880	-0.28	0.94
Cumulative Environmental Conditions (standardized)	12896	0.15	0.96	16880	-0.07	0.82
Cumulative Labor Income	12896	15.01	9.58	16880	6.54	6.18
Cumulative Weekly Work Hours	12896	194.22	68.19	16880	124.90	81.40
<u>HS Plus</u>						
Cumulative Physical Demands (standardized)	17174	0.19	0.72	18459	-0.28	0.77
Cumulative Environmental Conditions (standardized)	17174	-0.21	0.79	18459	-0.34	0.51
Cumulative Labor Income	17174	25.27	24.57	18459	11.12	9.64

<u>Variable</u>	<u>All Men</u>			<u>All Women</u>		
	<u>Obs</u>	<u>Mean</u>	<u>Std Dev</u>	<u>Obs</u>	<u>Mean</u>	<u>Std Dev</u>
Cumulative Weekly Work Hours	17174	213.02	59.69	18459	144.20	78.77
<u>Old Workers</u>						
Cumulative Physical Demands (standardized)	18185	0.31	0.93	20594	-0.35	0.95
Cumulative Environmental Conditions (standardized)	18185	-0.09	0.80	20594	-0.15	0.78
Cumulative Labor Income	18185	21.30	23.64	20594	8.47	8.75
Cumulative Weekly Work Hours	18185	193.55	77.52	20594	125.19	85.89
<u>Young Workers</u>						
Cumulative Physical Demands (standardized)	16536	0.54	0.76	20584	-0.30	0.85
Cumulative Environmental Conditions (standardized)	16536	0.09	0.99	20584	-0.17	0.73
Cumulative Labor Income	16536	17.16	13.05	20584	7.77	7.74
Cumulative Weekly Work Hours	16536	204.41	59.97	20584	128.25	80.41

Table 3

The Effects of Cumulative Job Characteristics on Health Status for Men

Outcome Specification	SRHS OPRE Males	SRHS OPRE Non White	SRHS OPRE White	SRHS OPRE Old	SRHS OPRE Young
Sample					
Cumulative Physical Demands (standardized)	-0.020 (0.024)	-0.056 (0.040)	0.001 (0.030)	-0.080 ** (0.031)	0.067 * (0.035)
Cumulative Environmental Conditions (standardized)	-0.027 * (0.016)	-0.027 (0.027)	-0.022 (0.018)	0.027 (0.024)	-0.064 *** (0.021)
Lagged Health	0.116 *** (0.010)	0.109 *** (0.016)	0.117 *** (0.013)	0.196 *** (0.014)	0.132 *** (0.016)
Age	-0.078 *** (0.009)	-0.103 *** (0.017)	-0.062 *** (0.011)	-0.154 *** (0.024)	-0.009 (0.050)
Age-squared	0.048 *** (0.010)	0.072 *** (0.019)	0.031 ** (0.012)	0.128 *** (0.024)	-0.050 (0.075)
Non White	-0.304 *** (0.038)			-0.323 *** (0.050)	-0.284 *** (0.051)
Education	0.145 *** (0.009)	0.083 *** (0.014)	0.177 *** (0.010)	0.137 *** (0.011)	0.138 *** (0.013)
Self Employed	0.046 (0.030)	0.102 (0.065)	0.038 (0.035)	0.024 (0.039)	0.087 * (0.047)
Married	-0.112 *** (0.026)	-0.142 *** (0.040)	-0.069 ** (0.033)	-0.132 *** (0.037)	-0.090 ** (0.036)
Unemployment Spells	-0.629 *** (0.089)	-0.773 *** (0.150)	-0.555 *** (0.109)	-0.933 *** (0.114)	-0.356 *** (0.145)
Initial Health	0.478 *** (0.025)	0.343 *** (0.035)	0.568 *** (0.028)	0.425 *** (0.034)	0.547 *** (0.035)
Constant	2.049 *** (0.142)	3.322 *** (0.423)	0.517 * (0.308)	3.673 *** (0.641)	1.602 *** (0.591)
Observations	34721	9952	24769	19579	15142
R-squared	0.401	0.356	0.402	0.450	0.288

SRHS: self reported health status. OPRE: Ordered Probit/Random Effects Estimator

Robust standard errors clustered at the individual level in parentheses,

*** p<0.01,

** p<0.05,

* p<0.1.

Additional Controls: missing initial health dummy, missing self employed information and year fixed effects.

Table 4

The Effects of Cumulative Job Characteristics on Health Status for Men
Controls for Income and Weekly Work Hours

Outcome Specification	SRHS OPRE Males	SRHS OPRE Non White	SRHS OPRE White	SRHS OPRE Old	SRHS OPRE Young
Cumulative Physical Demands (std)	0.002 (0.025)	-0.034 (0.043)	0.029 (0.030)	-0.050 (0.033)	0.080 ** (0.036)
Cumulative Environmental Conditions (std)	-0.028 * (0.016)	-0.019 (0.027)	-0.026 (0.018)	0.030 (0.024)	-0.064 *** (0.022)
Lagged Health	0.122 *** (0.010)	0.117 *** (0.017)	0.120 *** (0.013)	0.204 *** (0.014)	0.142 *** (0.016)
Age	-0.090 *** (0.009)	-0.113 *** (0.018)	-0.079 *** (0.012)	-0.173 *** (0.025)	-0.028 (0.051)
Age-squared	0.059 *** (0.010)	0.076 *** (0.020)	0.048 *** (0.013)	0.145 *** (0.024)	-0.030 (0.076)
Non White	-0.272 *** (0.039)			-0.321 *** (0.052)	-0.238 *** (0.051)
Education	0.136 *** (0.008)	0.065 *** (0.014)	0.173 *** (0.011)	0.120 *** (0.011)	0.129 *** (0.013)
Self Employed	0.036 (0.031)	0.140 ** (0.066)	0.020 (0.036)	0.010 (0.040)	0.083 * (0.048)
Married	-0.015 (0.028)	-0.096 ** (0.044)	0.051 (0.035)	0.044 (0.042)	-0.056 (0.038)
Unemployment Spells	-0.236 ** (0.109)	-0.220 (0.189)	-0.184 (0.133)	-0.389 *** (0.140)	-0.161 (0.177)
Initial Health	0.486 *** (0.025)	0.327 *** (0.034)	0.583 *** (0.029)	0.430 *** (0.033)	0.561 *** (0.034)
Cumulative Weekly Work Hours	0.001 *** (0.000)	0.001 *** (0.001)	0.001 *** (0.000)	0.002 *** (0.000)	0.001 (0.000)
Cumulative Labor Income	0.004 *** (0.001)	0.015 *** (0.002)	0.004 *** (0.001)	0.005 *** (0.001)	0.005 *** (0.002)
Constant	2.076 *** (0.146)	3.376 *** (0.441)	0.562 * (0.316)	3.868 *** (0.656)	0.339 (0.861)
Observations	34721	9952	24769	19579	15142
R-squared	0.404	0.365	0.403	0.453	0.290

SRHS: self reported health status. STD: standardized. OPRE: Ordered Probit/Random Effects Estimator

Robust standard errors clustered at the individual level in parentheses,

*** p<0.01,

** p<0.05,

* p<0.1.

Additional Controls: Missing initial health, missing self employed information and year fixed effects.

Table 5

The Effects of Cumulative Job Characteristics on Health Status for Women

Outcome Specification	SRHS OPRE Females	SRHS OPRE Non White	SRHS OPRE White	SRHS OPRE Old	SRHS OPRE Young
Sample					
Cumulative Physical Demands (std)	-0.065 *** (0.022)	-0.020 (0.036)	-0.103 *** (0.030)	-0.051 (0.032)	-0.100 *** (0.031)
Cumulative Environmental Conditions (std)	-0.026 *** (0.012)	-0.025 (0.015)	-0.043 ** (0.018)	-0.034 * (0.018)	-0.010 (0.018)
Lagged Health	0.122 *** (0.009)	0.115 *** (0.014)	0.127 *** (0.012)	0.179 *** (0.013)	0.158 *** (0.013)
Age	-0.040 *** (0.008)	-0.068 *** (0.013)	-0.026 ** (0.011)	-0.128 *** (0.023)	0.011 (0.039)
Age-squared	0.008 (0.009)	0.030 ** (0.015)	-0.005 (0.012)	0.098 *** (0.022)	-0.066 (0.060)
Non White	-0.631 *** (0.035)			-0.719 *** (0.052)	-0.545 *** (0.044)
Education	0.141 *** (0.008)	0.104 *** (0.013)	0.160 *** (0.011)	0.131 *** (0.010)	0.137 *** (0.011)
Self Employed	-0.014 (0.032)	0.072 (0.065)	-0.025 (0.037)	-0.003 (0.045)	-0.038 (0.048)
Married	0.056 ** (0.024)	0.102 *** (0.035)	-0.007 (0.033)	0.115 *** (0.036)	0.055 * (0.033)
Unemployment Spells	-0.383 *** (0.060)	-0.374 *** (0.105)	-0.387 *** (0.077)	-0.504 *** (0.086)	-0.303 *** (0.085)
Initial Health	0.512 *** (0.021)	0.366 *** (0.030)	0.609 *** (0.032)	0.455 *** (0.027)	0.547 *** (0.027)
Constant	0.960 *** (0.212)	2.115 *** (0.339)	-0.098 (0.275)	3.325 *** (0.602)	1.373 *** (0.449)
Observations	41178	14909	26269	22128	19050
R-squared	0.402	0.348	0.368	0.449	0.292

SRHS: self reported health status. STD: standardized. OPRE: Ordered Probit/Random Effects Estimator

Robust standard errors clustered at the individual level in parentheses,

*** p<0.01,

** p<0.05,

* p<0.1.

Additional Controls: Missing initial health, missing self employed information and year fixed effects.

Table 6

The Effects of Cumulative Job Characteristics on Health Status for Women
Controls for Income and Weekly Work Hours

Outcome Specification	SRHS OPRE Females	SRHS OPRE Non White	SRHS OPRE White	SRHS OPRE Old	SRHS OPRE Young
Cumulative Physical Demands (std)	-0.061 *** (0.023)	-0.013 (0.036)	-0.101 *** (0.030)	-0.047 (0.032)	-0.093 *** (0.031)
Cumulative Environmental Conditions (std)	-0.022 * (0.013)	-0.024 (0.016)	-0.039 ** (0.019)	-0.024 (0.018)	-0.008 (0.018)
Lagged Health	0.122 *** (0.009)	0.120 *** (0.014)	0.124 *** (0.012)	0.180 *** (0.013)	0.157 *** (0.014)
Age	-0.043 *** (0.008)	-0.070 *** (0.013)	-0.031 *** (0.011)	-0.139 *** (0.023)	0.011 (0.039)
Age-squared	0.010 (0.009)	0.031 ** (0.015)	-0.002 (0.012)	0.108 *** (0.022)	-0.067 (0.060)
Non White	-0.636 *** (0.036)			-0.732 *** (0.051)	-0.544 *** (0.044)
Education	0.133 *** (0.008)	0.090 *** (0.015)	0.150 *** (0.011)	0.122 *** (0.010)	0.132 *** (0.011)
Self Employed	-0.022 (0.032)	0.034 (0.068)	-0.021 (0.038)	-0.027 (0.045)	-0.032 (0.049)
Married	0.067 *** (0.024)	0.120 *** (0.036)	-0.005 (0.033)	0.128 *** (0.037)	0.061 * (0.033)
Unemployment Spells	-0.330 *** (0.075)	-0.335 *** (0.133)	-0.334 *** (0.093)	-0.441 *** (0.107)	-0.281 *** (0.109)
Initial Health	0.524 *** (0.020)	0.366 *** (0.032)	0.624 *** (0.029)	0.472 *** (0.028)	0.547 *** (0.027)
Cumulative Weekly Work Hours	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Cumulative Labor Income	0.006 *** (0.002)	0.010 ** (0.004)	0.006 *** (0.002)	0.009 *** (0.003)	0.005 (0.003)
Constant	1.061 *** (0.221)	2.331 *** (0.366)	0.043 (0.284)	3.599 *** (0.610)	-0.242 (0.660)
Observations	41178	14909	26269	19050	22128
R-squared	0.402	0.350	0.368	0.293	0.449

SRHS: self reported health status. STD: standardized. OPRE: Ordered Probit/Random Effects Estimator

Robust standard errors clustered at the individual level in parentheses,

*** p<0.01,

** p<0.05,

* p<0.1.

Additional Controls: Missing initial health, missing self employed information and year fixed effects.

Appendix Table 1

Distribution of the Self Reported Health Status Variable by Sub-Groups

Males	All	Non White	White	Old	Young
1. Poor Health	0.03	0.05	0.03	0.05	0.01
2. Fair Health	0.09	0.15	0.07	0.12	0.06
3. Good Health	0.27	0.33	0.25	0.30	0.25
4. Very Good Health	0.35	0.29	0.38	0.33	0.38
5. Excellent Health	0.25	0.19	0.28	0.21	0.29
Females	All	Non White	White	Old	Young
1. Poor Health	0.03	0.05	0.02	0.05	0.01
2. Fair Health	0.11	0.18	0.07	0.15	0.07
3. Good Health	0.32	0.39	0.27	0.33	0.31
4. Very Good Health	0.34	0.25	0.39	0.31	0.37
5. Excellent Health	0.20	0.12	0.25	0.16	0.24

Sample sizes are the same as the regression tables

Appendix Table 2

Occupational Characteristics Descriptive Statistics by Occupational Category

Variable	Obs	Mean	Std Dev
<u>Clerical</u>			
Physical Demands	20946	1.57	0.57
Environmental Conditions	20946	-0.25	0.11
<u>Manager</u>			
Physical Demands	17096	1.77	0.33
Environmental Conditions	17096	-0.19	0.09
<u>Sales</u>			
Physical Demands	6449	1.96	0.18
Environmental Conditions	6449	-0.20	0.09
<u>Service</u>			
Physical Demands	17537	2.76	0.52
Environmental Conditions	17537	0.50	1.21
<u>Operative</u>			
Physical Demands	17353	2.82	0.38
Environmental Conditions	17353	0.29	0.95
<u>Homemaker</u>			
Physical Demands	1212	2.91	0.25
Environmental Conditions	1212	0.28	0.38
<u>Craftsman</u>			
Physical Demands	15027	2.92	0.50
Environmental Conditions	15027	0.19	0.73
<u>Laborer</u>			
Physical Demands	4911	3.55	0.45
Environmental Conditions	4911	0.94	1.43
<u>Farmer</u>			
Physical Demands	1778	3.73	0.30
Environmental Conditions	1778	0.15	0.56

Notes: Variables are the raw (not population standardized) values from the environmental conditions and physical demands scales

Appendix Table 3

Results Controlling for Occupational Dummies: Males and Females

Outcome Specification	SRHS OPRE/FE	SRHS OPRE/FE	SRHS OPRE/FE	SRHS OPRE/FE	SRHS OPRE/FE	SRHS OPRE/FE	SRHS OPRE/FE	SRHS OPRE/FE	SRHS OPRE/FE	SRHS OPRE/FE
Sample	Males	Non White	White	Old	Young	Females	Non White	White	Old	Young
Cumulative Physical Demands (std)	-0.019 (0.026)	-0.033 (0.045)	0.001 (0.033)	-0.083 *** (0.034)	0.092 *** (0.039)	-0.082 *** (0.024)	-0.042 (0.039)	-0.115 *** (0.033)	-0.059 (0.036)	-0.115 *** (0.034)
Cumulative Environmental Conditions (std)	-0.027 * (0.016)	-0.022 (0.027)	-0.021 (0.019)	0.031 (0.024)	-0.068 *** (0.022)	-0.025 *** (0.012)	-0.026 * (0.015)	-0.040 *** (0.019)	-0.027 (0.018)	-0.009 (0.018)
Manager	0.006 (0.032)	0.067 (0.076)	-0.004 (0.035)	0.011 (0.042)	0.005 (0.052)	0.022 (0.033)	0.074 (0.064)	0.006 (0.038)	0.118 ** (0.047)	-0.079 (0.049)
Sales	-0.118 *** (0.047)	-0.152 (0.106)	-0.106 * (0.055)	-0.117 * (0.063)	-0.094 (0.076)	0.072 (0.046)	0.157 * (0.092)	0.047 (0.054)	0.161 ** (0.067)	0.007 (0.064)
Clerical	-0.028 (0.049)	-0.117 (0.082)	-0.014 (0.056)	-0.029 (0.064)	-0.071 (0.075)	-0.046 * (0.027)	-0.056 (0.047)	-0.047 (0.034)	0.029 (0.041)	-0.113 *** (0.039)
Craftsman	-0.006 (0.036)	-0.066 (0.067)	0.016 (0.043)	0.055 (0.050)	-0.054 (0.055)	0.055 (0.067)	-0.048 (0.111)	0.122 (0.084)	0.114 (0.103)	0.020 (0.088)
Operative	-0.010 (0.039)	0.019 (0.066)	-0.051 (0.049)	-0.043 (0.055)	-0.074 (0.058)	-0.026 (0.039)	-0.014 (0.059)	-0.048 (0.056)	0.076 (0.060)	-0.118 *** (0.054)
Laborer	0.036 (0.047)	0.001 (0.076)	0.042 (0.062)	0.162 ** (0.068)	-0.112 * (0.067)	0.078 (0.080)	0.024 (0.120)	0.126 (0.108)	0.099 (0.126)	0.021 (0.110)
Farmer	0.355 *** (0.087)	0.239 (0.194)	0.390 *** (0.102)	0.429 *** (0.118)	0.266 *** (0.131)	-0.133 (0.152)	-0.247 (0.284)	-0.083 (0.183)	-0.112 (0.190)	-0.068 (0.250)
Service	0.014 (0.046)	0.015 (0.071)	0.005 (0.064)	-0.011 (0.067)	0.006 (0.067)	0.052 * (0.031)	0.077 (0.047)	0.014 (0.042)	0.084 * (0.046)	-0.021 (0.043)
Home maker	0.640 (0.415)	0.288 (0.543)	1.159 * (0.673)	0.186 (0.544)	1.504 * (0.819)	-0.000 (0.067)	0.094 (0.094)	-0.106 (0.100)	0.135 (0.092)	-0.202 * (0.109)
Observations	34665	9926	24739	19545	15120	41131	14892	26239	22108	19023
R-squared	0.404	0.365	0.404	0.453	0.290	0.402	0.351	0.368	0.450	0.293

SRHS: self reported health status, STD: standardized. Robust standard errors clustered at the individual level in parentheses.

*** p<0.01,
** p<0.05,
* p<0.1.

Same controls as Tables 4 and 6, with additional of occupational dummies.