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Job Characteristics, Job Preferences, and Physical and Mental Health in Later Life

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Abstract

Existing research linking SES with work primarily focuses on the precursors (educational attainment) and outcomes (income) of work, rather than asking how diverse facets of work influence health. Using four waves of data from the Wisconsin Longitudinal Study, we evaluate whether multiple measures of respondent job characteristics, respondent preferences for those characteristics, and their interaction substantially improve the fit of sociological models of men's and women's physical and mental health at midlife and old age compared to traditional models using educational attainment, parental SES, and income. We find that non-wage job characteristics predict men's and women's physical and mental health over the lifecourse, although we find little evidence that the degree to which one's job accords with one's job preferences matters for health. These findings expand what we know about how work matters for health, demonstrating how the manner and condition under which one works has lasting impacts on wellbeing.

Keywords

work; health; job characteristics; inequality

Research on the SES-health gradient consistently demonstrates that better educated and wealthier individuals have lower rates of morbidity and mortality compared to their less well-off peers (Elo 2009; Mullahy, Robert, and Wolfe 2004; National Center for Health Statistics 2011; Sorlie, Backlund, and Keller 1995). However, much of the research on inequality and health has focused on the precursors (i.e. educational attainment) and outcomes (i.e. income) of work, rather than asking how more diverse facets of work and remuneration, as well as the match between those job rewards and preferences for them, may influence health and health disparities (e.g. Gakidou et al. 2010; Kawachi and Kennedy 1999; Lynch et al. 2000; Pickett and Wilkinson 2015).

We argue that two key features of jobs and the labor market have the potential to influence health. First, jobs vary on a large number of *characteristics* besides pay and prestige. Jobs differ in the generosity of their benefits, the safety and cleanliness of the workplace, the number of hours worked, the security of employment, and other important characteristics. These job characteristics may impact health in a number of ways. For instance, those whose employers offer generous health and retirement benefits are likely to be protected against the

effects of negative health or income shocks, workers whose jobs are physically demanding may (all else equal) be less likely to become obese but also more likely to acquire musculoskeletal disorders, and those with low job security or long hours may experience a great deal of work-related stress. Furthermore, these non-wage amenities vary in their relationship to pay (Cousineau, Lacroix, and Girard 1992; Dale-Olsen 2006; Kalleberg, Reskin, and Hudson 2000; Viscusi 1978, 1993), suggesting that pay cannot substitute for the influence of work characteristics on health. Prior research supports this proposed connection between job characteristics and health (e.g. Bakker and Demerouti 2007; Brand et al. 2007; Karasek 1979; Li, Yang, and Cho 2006; Warren et al. 2004; Stansfeld et al. 1995), although much of this research has relied on limited measures of work characteristics, cross-sectional research designs, and limited health indicators that do not consider both physical and mental health. In response, recent reviews have called for research examining more than one work characteristic at a time and attention to how work influences health both contemporaneously and later in the life course (Burgard and Lin 2013; Elo 2009).

Second, individuals vary in their preferences for job *characteristics* and the degree to which they obtain jobs that *match* these preferences. We argue that workers in jobs with traits that are well matched to their preferences may derive health benefits from this alignment compared to those who are not matched, even when experiencing the same job characteristics. Two social psychology theories—Runciman's (1966) relative deprivation theory and Michalos's (1985) multiple discrepancy theory—argue that dissatisfaction arises from differences between what one desires and what one has. Research applying this perspective has found that falling short of one's desired occupation is associated with lower psychological well-being and job satisfaction (Carr 1997; Hardie 2014). However, no research has yet examined how the gap between desired job characteristics and actual job characteristics is associated with mental health outcomes. In addition, we argue that psychological stress arising from a mismatch between preferences and obtained job characteristics may damage individuals' physical health, given that prior research finds strong support for an association between stress and physical health (House 2002; Pearlin et al. 1981).

Using data from the Wisconsin Longitudinal Study (WLS), we build on prior literature by investigating how the multifaceted nature of work improves our understanding of health inequality beyond traditional measures of SES for physical and mental health outcomes. We employ a wide range of health outcomes at three points in the life course: in middle age (age 53), just after retirement (age 65), and in early old age (age 72) in order to assess how work shapes health aging in later life. Furthermore, we test whether the degree of worker-job congruity improves models of health outcomes net of traditional stratification measures and a suite of occupational characteristics. We examine these relationships separately for men and women, because numerous studies demonstrate that gender is differentially associated with employment opportunities, job amenities, work preferences, and health (e.g., Budig 2002; Correll 2004; Eccles 1994; Glavin, Schieman, and Reid 2011; Krueger and Burgard 2011; O'Neill 2003; Reskin and Roos 1990; Ridgeway and Correll 2004).

THEORETICAL BACKGROUND

Work Characteristics and Health

Research shows that socioeconomic status is clearly an important factor shaping health and contributes to health disparities (e.g., Marmot, Shipley & Rose 1984; Meyer, Castro-Schilo, and Aguilar-Gaxiola 2014; Phelan, Link, and Tehranifar 2010). Yet it is also important to study the conditions of work, and variations in workers' preferences for and experiences of them, as contextual factors in health, over and above the impact of socioeconomic status. Jobs offer pecuniary and non-pecuniary rewards, both of which can contribute to health and health disparities. In addition to pay, work can offer economic security through job stability and fringe benefits, which offset other costs and protect against the economic impact of unplanned emergencies. Non-pecuniary rewards attached to jobs may also influence health. Work conditions vary according to the setting and tasks required to complete the work; the non-essential rewards attached to positions in order to attract workers with the desired qualifications to apply for the position; and organizational characteristics influencing the authority structure, job security, and the nature of work supervision. These characteristics may matter for both physical and mental health outcomes. Jobs that are tiring, unclean, and dangerous may have a direct impact on physical health through the risk of accidents, injuries, and exposure to toxic substances (Clougherty, Souza, and Cullen 2010; Meyer, Castro-Schilo, and Aguilar-Gaxiola 2014). In addition, the stress associated with working in dangerous occupations may be associated with physical health outcomes, both because chronic stress induces cumulative wear and tear on the body (Juster, McEwen, and Lupien 2010; Thoits 2010) and because working in more stressful jobs is associated with insalubrious health behaviors (e.g. Kouvonen et al. 2005). Stress is also directly related to mental health (Pearlin 1999), and thus working in jobs with greater risk and less security likely has an impact on workers' mental health and wellbeing (Stansfeld and Candy 2006). Finally, jobs that satisfy individuals' need for autonomy and competence fulfill what self-determination theory characterizes as "innate psychological needs" (Ryan and Deci 2000, p. 65). In the absence of such rewards, workers may suffer from mental health problems stemming from stress.

Research using the WLS has found that indices of physical and psychosocial job characteristics contribute to workers' physical health outcomes and depressive sympotomology (Brand et al. 2007; Warren et al. 2004). This research offers important evidence that variations in job characteristics impact health, but relies on cross-sectional associations and indexed measures of job characteristics and health. Another study using the WLS showed that, compared to working in a white collar job, working in a blue collar job in young adulthood is predictive of a host of worse health outcomes in middle adulthood (Fletcher 2011). Other research using the Whitehall II study supports the contention that job characteristics are predictive of mental health and wellbeing (Stansfeld et al. 1999; Stansfeld et al. 1995). Additional research using the WLS found that job authority was associated with changes in depression over time, although in opposite directions for men and women (Pudrovska and Karraker 2014).

Most of this prior research examines the link between job characteristics in middle age with health at the same age (except see Pudrovska and Karraker 2014). It is important to consider, however, how job characteristics in midlife impact health concurrently and in older age. First, according to the life course perspective, early life events have cascading influence over later life wellbeing (Elder 1998). Research on aging also suggests that one's experiences in midlife set the stage for health and wellbeing in older age (Lachman 2004; Lachman, Teshale, and Agrigoroaei 2015; Vartanian and McNamara 2004). Thus, we expect that the characteristics of work will continue to be associated with health into retirement and old age. Second, given the increasing longevity of the lifespan, it is important to understand factors that promote "successful" or healthy" aging (Baltes and Smith 2003; Rowe and Kahn 2015). Healthy aging, according to the World Health Organization, is "the process of developing and maintaining the functional ability that enables well-being in older age" (World Health Organization 2015, p. 28) and takes several factors into account, including functional ability, well-being (including happiness), and health characteristics such as vital measurements (e.g., blood pressure) and illnesses and diseases.

In the current study, we build on research in the areas of work,health, and successful aging by testing two hypotheses:

H1a: Job characteristics are associated with physical health outcomes in midlife and older age, net of traditional SES measures.

H1b: Job characteristics are associated with mental health outcomes in midlife and older age, net of traditional SES measures.

Our analyses expand on prior research by examining health at three points in the lifecourse, considering a more complete set of job characteristics, and modeling a wide range of both physical and mental health outcomes.

Work Characteristics, Work Preferences, and Characteristic-Preference Discrepancies

Job characteristics vary in the degree to which they are valued by workers, and workers vary in the cluster of characteristics they deem most important when judging jobs (Daw and Hardie 2012; Halaby 2003), which may have important health consequences. Runciman's (1966) relative deprivation theory argues that dissatisfaction stems from the gap between what an individual wants and has. Michalos's multiple discrepancy theory (1985) also incorporates this perspective, suggesting that individuals' satisfaction with life is dependent upon several comparisons, including the similarity (or lack thereof) between one's goals and present circumstances. Research supports this view, showing that the gap between occupational aspirations and outcomes (Carr 1997; Hardie 2014) and the gap between hoped for and expected work characteristics (Pisarik and Shoffner 2009) lead to lower psychological wellbeing. Additionally, Kalleberg (1977) incorporated subjective values and outcomes into a study of job satisfaction, showing that job values (operationalized as ratings job characteristics' importance to the worker) were negatively associated with job satisfaction net of the job characteristics of one's job, while job characteristics were positively associated with job satisfaction net of values. More generally, research has shown that a feeling of low personal control—which may be brought on or exacerbated by working

in an undesirable job—is associated with psychological distress (Mirowsky and Ross 1989; Rosenfield 1989).

Combining this literature in social psychology with research on the importance of work for wellbeing suggests that the expectation-outcome gap may influence health outcomes through its relationship to stress. Research has shown that chronic stress undermines physical and mental health over time (Kessler 1997; Pearlin 1989), and that it is related to forms of role strain, including (but not limited to) role captivity, or the condition of serving a role one would prefer to not undertake (Kessler 1997). Given the centrality of work settings and activities to people's daily lives, we argue that the discomfort arising from working in a job one would prefer not to increases stress. Furthermore, given the interdependence of life course events across time, we argue that this gap between preferred and obtained job characteristics will continue to impact wellbeing into older age. We propose two hypotheses:

H2a: Working in jobs with characteristics an individual does not want (or has a lower preference for) is negatively associated with physical health in midlife and older age.

H2b: Working in jobs with characteristics an individual does not want (or has a lower preference for) is negatively associated with mental health in midlife and older age.

Gender, Work, and Health

Gender may moderate the association between work and health. Work is marked by gender-differentiated sorting into jobs (Correll 2004; Eccles 1994; Reskin and Roos 1990; Ridgeway and Correll 2004), inequality in earnings (Budig 2002; O'Neill 2003), and inequality within households (Craig and Mullan 2010; Sayer 2005). Some research shows that the association between work and physical health is weaker for women than men (Krueger and Burgard 2011; MacIntyre and Hunt 1997), but the association between work and mental health is stronger for women (Glavin, Schieman, and Reid 2011). Gender also shapes preferences for job characteristics and the likelihood of working in jobs that fulfill certain preferences (Correll 2004; Eccles 1994). Furthermore, the negative impact of a job characteristic preference-outcome mismatch may be lessened for women if they anticipate spending less time in the paid labor market. Alternatively, it may have a stronger association with health if the women who are working entered the paid labor force due to family need. For these reasons, we will examine the work-health association separately for men and women.

DATA AND METHODS

Data

We use data from the Wisconsin Longitudinal Survey (WLS) to assess the influence of diverse job characteristics and preference-characteristic interactions on physical and mental health outcomes in later life over and above the impact of traditional measures of attainment. The WLS has followed a randomly sampled one-third of all high school graduates from Wisconsin (N=10,317) since their graduation in 1957. These male and female, almost

exclusively white, high school graduates were interviewed in 1957, 1964, 1975, 1992, 2004, and 2011. Although this sample is broadly representative of white high school graduates from their cohort (see http://www.ssc.wisc.edu/wlsresearch/about/description.php), it is limited by its geographic, racial, and educational scope. We use multiple imputation to retain all possible cases; see Appendix A for more measurement and method details.

Health Outcomes

We draw on a range of measures of physical and mental health outcomes associated with healthy aging and measured in 1992 (when the respondents were approximately age 53), 2004 (age 65), and 2011 (age 72). We measure respondents' self-rated health, functional limitations, number of days spent sick in bed, number of days spent in the hospital, body mass index, number of health problems they selected from a list (Health Index), number of diagnosed illnesses selected from a list, the Physical Composite Scores of the SF-12 survey battery (PCSU), and self-reported health limitations. Items associated with functioning (limitations, days spent in bed and in hospitals, and the PCSU) are most directly associated with healthy aging, while measures of illnesses, BMI, and health problems are related to the longer term risk of declines in capacity.

We also include a number of measures of mental health status available in the WLS: respondents' number of lifetime depressive episodes, indicating chronicity of depression; current depressive symptoms using the CES-D scale; a measure of sustained depressive symptomology during the respondent's worst depressive episode; an index of hostility; and an omnibus measure of mental health is captured using the Mental Composite Scores of the SF-12 survey (MCSU). Mental health status is also a fundamental component of healthy aging (World Health Organization 2015), as disorders such as depression can interfere with daily living. The MCSU, like the PCSU, is a functionality measure (Burdine et al. 2000), incorporating items that measure vitality and social functioning (Ware, Kosinski, and Keller 1996). We use these measures in all years that they are available.

Job Preferences Variables (1975)

In 1975, when WLS participants were about age 35, they were asked about their preferences for 12 job characteristics on an ordinal (1= "not very important at all," 2= "somewhat important" and 3= "very important") scale: "How important is/are ____ in judging jobs in general?" These questions covered respondent preferences for: "the pay", "fringe benefits", "how interesting the work is", "how clean the work is", "how tiring the work is", "the hours you work", "how highly people regard the job", "job security", "the amount of freedom you have", "not being under too much pressure", "the chance to get ahead", and "the chance to use your abilities". Three additional questions asked respondents about their preferences for co-workers, supervisors, and helping people, but there was no matching information about job characteristics for jobs held in the WLS data, so we do not use them.

Job Characteristics Variables (1992)

In 1992, respondents rated their current jobs across numerous dimensions. We identified measures for twelve job characteristics that matched available measures of job preferences

from 1975. Data from the 1992 wave are ideal because we can use this year's data to compare job characteristics years after respondents' preferences were stated, but before most of the sample had retired. We measure all but one of these characteristics using survey items collected by the WLS. For our final measure, we used the educational requirements of a job as a proxy for the respondent's chances to *use abilities* in his or her job. To capture this, we used a measure of the percentage of people in the 1970 census who held a similar job and had completed at least one year of college. Full measurement details are provided in Appendix A.

Traditional Measures of Attainment (1957, 1992)

We employ four traditional measures of attainment and life chances. First, we measure respondent education in 1992, measured by self-report, and placed in four categories – high school only (reference category), some college, a four-year college degree, and post-baccalaureate education. Second, we use a measure of respondents' parental SES in 1957, created by WLS staff as a factor-weighted measure of father's years of schooling, mother's years of schooling, and parental income. Third, we use the Nakao-Treas occupational prestige measure (Nakao and Treas 1994) associated with respondents' occupation in 1992. However, since this measure is also used as a job trait, this only comes into play as a contributor to change in fit in the preference-characteristic interaction models described below. Finally, we use a measure of respondent yearly income in 1992.

Methods

We proceed with our analysis in four steps. First, we provide and discuss descriptive statistics for all variables used in our analysis. Second, we examine the results of a series of regression analyses of the set of physical and mental health outcomes (measured in 1992, 2004, and 2011) discussed above. For each dependent variable, we estimate three nested models. Model A includes all four traditional measures of attainment listed above. In Model B we estimate a model that includes all 1992 job characteristics discussed above in addition to the traditional attainment variables. Model C adds the twelve 1975 job preference variables and twelve characteristic-preference interaction terms. Job preference variables are measured prior to job outcome variables, thus addressing the concern that respondents' current job characteristics will influence their preferences. Ordinary least squares regression is used to analyze non-count interval/ratio or ordinal (Self-Rated Health) dependent variables; negative binomial regression is used to analyze three count variables (Hospital Days, Bed Days, and Illnesses). We analyze some continuous dependent variables that were not clearly count variables using OLS on versions of the dependent variable transformed as $Y'=\ln(Y+1)$ (Health Limitations, Health Index, Depressive Episodes, Depressive Symptoms, and Functional Limitations). We model job characteristics as z-scores, and job preferences categorically (using "not very important" as the reference category) to avoid assuming linear effects.

Third, we compare the fit of nested models of the same dependent variables using F-tests for the joint significance of the added independent variables, which are asymptotically equivalent to AIC/BIC comparisons but are more feasible to use with multiply imputed data. In the first stage of this step, we perform F-tests for the job characteristics variables to

identify the contribution of job characteristics to improvement in fit over standard SES measures. Similarly, we test for the value-added of preferences and preference-characteristic interactions by performing an F-test for the joint significance of these variables.

In the fourth stage of the analysis, we re-estimate all regression models using occupational fixed effects models – that is, using variation in health outcomes and job characteristics and preferences among respondents in the same occupation to identify our effects. When i indexes individuals and j indexes occupations, this model can be estimated as follows for dependent variables modeled via linear regression:

$$\left(Y_{ij} - \bar{Y}_j\right) = \alpha + \sum_k \beta_k \left(X_{kij} - \bar{X}_{kj}\right) + e_{ij} \quad (1)$$

Thus, each variable is expressed as deviations from the occupational mean, which removes the effects of unobserved covariates that are constant within occupational groups. This is the estimation method that we employ for dependent variables modeled via OLS or logged OLS models. For the dependent variables modeled via NBRMs, all modeled variables are also differenced against occupation-specific means, but estimated using NBRMs.

We use these fixed effects methods to determine whether any improvements in fit are attributable to occupational sorting. If we find that job characteristics and characteristic-preference interactions substantially improve fit in the standard regressions but not in the fixed effects regressions, these improvements in fit would be better attributed to selection into occupations rather than the effects of job characteristics and characteristic-preference interactions themselves. However, if similar patterns are observed in the fixed effects models as in the non-fixed effects models, we can conclude that occupational sorting is not the primary basis for our findings.

Our analysis adopts a purposefully broad approach to measurement: We model 33 different dependent variables using gender-stratified models, fitting 6 models apiece to each outcome. We argue that demonstrating the extent of consistency of our findings is an important contribution of this paper. However, this choice comes with two tradeoffs: First, we are testing an unusually large number of hypotheses. To address this, we will frequently refer to the expected number of statistically significant improvement in fit statistics and compare that to the observed number, to determine whether our results are attributable to multiple testing. Second, because we predict a wide variety of physical and mental health outcomes, we cannot substantively interpret findings for each dependent variable to the usual extent within the space available. Instead, we focus our interpretation on the degree to which our focal independent variables add predictive value to physical and mental health dependent variables generally for men and women, and the degree to which these findings are attributable to occupational sorting.

RESULTS

Descriptive Statistics

Table 1 presents variable means and standard deviations for the traditional attainment, job characteristics, and job preferences variables employed in this analysis. A superscripted “a” next to the variable name indicates statistically significant gender differences based on bivariate regression. Table 2 provides descriptive statistics on the dependent variables by gender and year. Superscripted letters a through c indicate statistically significant gender differences in 1992, 2004, and 2011 respectively.

Several patterns emerge in Table 2. First, many physical health indicators, but not all, show declining health with old age. Older adults report more functional health limitations, greater BMI, more negative health symptoms (Health Index), and more illnesses as they age. Their PCSU scores also decline. Self-rated health first declines and then improves with age, which is consistent with prior research showing that self-rated health improves in older age, perhaps due to comparisons they make to their and others’ expectations of health in old age (Ferraro 1980). Looking at mental health indicators, depressive chronicity and severity appear to decrease over time and the MCSU score improves over time. The CESD score for both men and women and hostility for men initially decrease between ages 53 and 65 before increasing between ages 65 and 72. Among women, hostility shows steady declines. Overall, women report worse mental health in all areas except hostility and more physical health problems.

In the analyses below, we evaluate how the fit of models predicting each of these health outcomes improves, or does not, with the inclusion of job characteristics and indictators of preference-outcome job characteristic mismatch. To better understand how these health indicators cluster, we also conducted supplementary factor analysis on all health indicators, separately by year (available from authors by request). Our findings show that at ages 53 and 65, health problems cluster into four factors in almost identical ways: physical health problems (self-rated health, BMI, PCSU, number of physical health symptoms, and number of illnesses); health problems that interfere with daily life (number of days in bed, number of hospital days, and functional limitations); current mental health problems (MCSU, depressive symptoms in the past two weeks, and hostility); and history of depression (chronicity and severity). At age 72, factor analyses reveal two factors that split along 1) physical health and 2) mental health dimensions.

Regression Results: SF-12 Physical and Mental Health Components

Our analyses consist of over 90 regression models. Accordingly, we cannot display our full set of results here. Thus, in Table 3, we show full regression results for the fully specified model of two dependent variables of interest – the physical and mental health components of the 2004 SF-12 survey instrument, fit separately for men and women using Models A, B, and C. We chose these two outcomes to highlight because they are important indicators of functional health, and thus are important for understanding healthy aging. For the remaining models, we summarize the significance of all joint characteristics and interactions in Tables 4 and 5.

As shown in Table 3, traditional measures of attainment exert significant influence on physical health in later life, but less consistently for mental health. Higher educational attainment significantly predicts improved physical health for men and women, as does yearly income. Occupational prestige is a significant predictor of improved physical health for men only, and parental SES is not significantly associated with male or female physical health in later life net of other measures of SES. When it comes to mental health outcomes in 2004, these measures are not as predictive; post-baccalaureate degrees are associated with worse mental health for men in all models and for women in the fully specified model. Income and parental SES do not significantly predict this outcome for men or women. Occupational prestige is a significant predictor for both sexes in Model A.

Second, several job characteristics have statistically significant main effects on physical and mental health in Model B, but the patterns differ across outcomes and gender. For men, income, cleanliness, prestige, security, and the number of hours one works all positively predict physical health, while how tiring a job is was associated with worse physical health, net of other modeled factors. For women, income, cleanliness, security, and the chance to get ahead all positively predict physical health. For men, benefits, job security, feeling free from time pressure, and the chance to get ahead are significantly, positively associated with mental health; for women, mental health is negatively associated with benefits and positively associated with job security, freedom, and the chance to get ahead.

Third, there is modest evidence for an association between characteristic-preference interactions and health. Model C shows significant interactions between multiple preferences and associated job characteristics when predicting physical health. For instance, there is a negative interaction between very important ratings of cleanliness and cleanliness itself on physical health for men, a positive interaction between the use abilities metric and the somewhat important rating for mental health for men, and a positive interaction between the hours variable and the very important rating for mental health for men. Weaker evidence for a preference-characteristic interaction is observed for women, who show a positive interaction between the chance to get ahead metric and a somewhat important rating for physical health. Overall, this is weak evidence in favor of this hypothesis for men and highly limited evidence in favor of this hypothesis for women.

Assessing Improvements in Model Fit: Physical Health Outcomes

Table 4 reports the results of nested regression models A, B, and C for physical health outcomes in later life, comparing model fit between A and B (the “+ Characteristics” column) then B and C (the “+Preferences & Interactions” column), with and without fixed effects specifications. The results show that including controls for job characteristics are jointly significant predictors of a wide variety of physical health outcomes for both men and women. These job characteristics significantly improve fit for both men and women for every physical health outcome measured in 1992. In 2004, there are two exceptions (men’s illnesses, women’s BMI), but otherwise the rule that job characteristics significantly improve the fit of these models holds. In 2011, there are four exceptions to this rule: BMI for men and women, bed days for women, and illnesses for men. Nonetheless, these measures improve model fit in 8 out of the 12 dependent variable/gender combinations tested. This

pattern is less strong, but still pronounced, when applied to occupational fixed effects regressions for these same outcomes (on the right-hand side of Table 4). All of these results yield substantially more significant improvements in fit than we would expect if these were solely due to chance. Under the null hypothesis of random false positives, we would expect *40×.05=2* significant results for these tests. Instead, there were 34 significant results for the non-FE models and 27 for the FE models. This result is extremely unlikely under the null hypothesis – in 40 binomial trials with p=.05, the probability of obtaining at least either 23 or 33 successes is <0.000001. Although space limitations prevent us from delving into the details of each of these results in the typical manner, these overall patterns give clear evidence that multidimensional job characteristics are a potentially important and largely ignored factor for aging adults' physical and mental health.

In contrast, out of the 40 non-FE tests performed (20 physical health outcome variables times two gender groups), only one had a statistically significant improvement in fit associated with adding the preference-characteristics interaction terms – BMI for men in 2004. Although it is possible that this is a real effect, when performing 40 tests of statistical significance, one would expect an average of two false positives with a type I error rate of .05, so this pattern of effects is consistent with randomness. However, there is stronger evidence for preference-characteristic compatibility effects in the occupational FE results. Although we would expect two statistically significant improvements in fit in 40 tests, we find 6: all for Bed Days – in all three years examined, for both men and women) Therefore, it is possible that, net of preference-based occupational selection, Bed Days is a robust exception to the overall rule of insignificant improvement in model fit from preference-characteristic interactions.

Assessing Improvements in Model Fit: Mental Health Outcomes

Table 5 reports the results of a series of models predicting mental health in later life for men and women. The inclusion of a more diverse set of job characteristics when predicting mental health outcomes in later life exerts a jointly significant effect in a majority of these models. For men and women, the effects of these characteristics are jointly significant for CES-D outcomes in 1992, 2004, and 2011; hostility outcomes in all three years for men and in 1992 and 2004 for women; and MCSU outcomes in 2004 and 2011 (the only years this measure was available). Additionally, this effect is significant for men, but not women, on depressive symptoms in 1992 and 2011. Overall, adding job characteristics to the model significantly improved fit in 17 out of 26 tests (65.4%) for non-FE models. This result is highly improbable under the null hypothesis, since in 26 binomial trials with a .05 probability of success, the probability of 17 or more successes is <.000001. Notably, the outcomes associated with job characteristics indicate present mental health symptomology and functionality, not chronicity and severity. Thus, work characteristics seem to be associated with general wellbeing in midlife and older ages, but are less strongly associated with the presence of repeated and severe depression. The FE models replicate these findings except in the case of 1992 Depressive Symptoms for men, and 2011 MCSU for women. Therefore, most of these results do not appear to be attributable to the effects of occupational sorting.

We find little evidence in support of an association between preference-characteristic interactions and mental health outcomes. In the non-FE models reported on the left hand side of Table 5, only 3 out of 26 tests yielded statistically significant evidence of improvement in model fit for mental health outcomes, and only two did so in the FE results. These counts of significant results are higher than the number of significant results expected under chance (1.3 in each set of models), but this number of successes is a statistically realistic outcome, since in 26 binomial trials with a .05 probability of success, at least 3 successes occurs 13.9% of the time, and at least two successes occurs 37.6% of the time. In short, there is more robust evidence in favor of the preference-characteristic interaction hypothesis than was found for physical health outcomes, where it was limited to a single dependent variable, but it is potentially consistent in aggregate with the null hypothesis. We conclude that there is weak or outcome-specific evidence in favor of the hypothesis that preference-characteristic interactions meaningfully contribute to mental health differences among aging adults.

DISCUSSION AND CONCLUSION

Research on the SES-health gradient has revealed important associations between traditional measures of SES and health. Less research has sought to specify the complex relationship between work as a multifaceted set of experiences and health (except see Brand et al. 2007; Li, Yang, and Cho 2006; Warren et al. 2004; Stansfeld et al. 1995). Furthermore, research in this area has often included a limited set of work characteristics and a cross sectional frame, leading to calls for research examining a complex set of work characteristics and utilizing a life course perspective (Burgard and Lin 2013; Elo 2009; Juster, McEwen, and Lupien 2010; Thoits 2010). The current study answers that call, and contributes further to this literature by examining how job characteristic preferences matter in the association between work and health.

First, we find that work characteristics are predictive of a wide range of physical and mental health outcomes in midlife and old age after accounting for socioeconomic rewards associated with work. Specifically, we find that, for men, work characteristics are associated with fourteen of our twenty physical health outcomes in our most stringent (FE) models (66.7%) and, for women, work characteristics are associated with thirteen of our twenty physical health outcomes in FE models (65%). Furthermore, men’s work characteristics are associated with nine of thirteen mental health outcomes in FE models (69.2%), and the same is true of six of 13 mental health outcomes (46.2%) among women. Thus, for both physical and mental health, associations between work characteristics and health outcomes were not largely attributable to occupational sorting. Looking at this findings in light of our factor analysis of health outcomes, we find that work characteristics are associated with both physical health problems and health problems that interfere with daily life. However, we find that work characteristics are more consistently associated with indicators of current mental health outcomes (CESD, hostility, and MCSU) than those indicating a history of depression (chronicity and severity).

Second, our hypotheses regarding job characteristic preferences and outcomes were largely not supported. If the gap between what an individual wants and has leads to lower levels of

satisfaction and wellbeing (Michalos 1985; Runciman 1966), this association appears not to contribute to physical and mental health outcomes, with a handful of exceptions – most notably, Bed Days. It is possible that a combined measure of the number of job characteristics preferred and obtained versus not obtained (e.g., a worker is employed in a job that fits 40% of his or her preferred characteristics vs. 60% of them) may do a better job of predicting health outcomes. More precise measures of preferences (e.g., whether a worker prefers to work more or fewer hours than he or she currently works) could also be used to operationalize the preferences-outcomes interaction. Alternatively, preferences for job characteristics may change over time or may reflect a current position rather than an accurate assessment of one's ideal working environment. These possibilities should be explored in future research.

These findings contribute to the literature on work and health in several ways. First, we draw attention to how the context of work shapes health over the life course. We do not claim that traditional measures of life chances exert no effects on physical or mental health outcomes once expanded measures of job outcomes and preferences are incorporated into regression models. However we claim that, in many cases, multidimensional job characteristics are independently associated with physical and mental health outcomes in ways that substantially improve the fit of our regression models. Given the equally strong evidence for the association between job characteristics and physical health and job characteristics and mental health, we argue that the overall association between work and health operates both through direct means (e.g., working conditions can create hazards for injury or exposure to toxins) and indirect means (e.g., working conditions can contribute to stress, resulting in the deterioration of mental and physical health over time).

Second, we find that occupational sorting plays a surprisingly small role in explaining these outcomes. It appears that it is job amenities themselves, not the occupations they are attached to or the preferences that workers hold for them, that are associated with health outcomes. Insofar as these associations are causal, which we cannot test, this suggests that improving the conditions and amenities of work, rather than optimizing the labor market's matching process, is the most promising means by which work could be used as a policy lever to improve health in later life.

Finally, these findings speak to the applicability of relative deprivation and multiple discrepancy theory to healthy aging. Although we find robust evidence that diverse job amenities contribute to workers' physical and mental health, we find little persuasive evidence that preference and outcome congruity does the same. This finding contradicts what would be expected on the basis of the career adaptability literature (e.g., Savickas 1995), which emphasizes that psychological outcomes are best when workers exercise their agency to dynamically align their values and their careers. Of course, it may be that workers respond to these gaps by seeking new employment that is better aligned with their preferences. It may also be that the role of preferences in this model is disadvantaged by its earlier period of measurement compared to occupational outcomes. This discrepancy is helpful to reduce concerns that worker rationalization of circumstances explains any associations, but it does add 17 years through which their effects must persist, during which time preferences and circumstances may change dramatically. Nonetheless, on the basis of

our analysis, preference-outcome congruity plays a decidedly minor role in differentiating mental and physical health outcomes in later life. Future research should investigate how long job preference-characteristic alignment effects on work well-being persist and whether simply having “enough” of one’s preferred work characteristics is associated with health outcomes.

Our analysis is subject to a number of limitations. For one, our measures of job preferences only indicate the importance of certain job characteristics, not the level of that characteristic. One could say that work hours was very important, for example, and prefer to work long hours or at least full time, but not less. Other preferences, such as pay, most likely map on to a linear conceptualization where more is always ideal. However, we do not have enough information from the survey to identify these fine-grained preferences. Second, it is possible that early health conditions shape one’s preferences, which introduces a potential problem with endogeneity. Unfortunately, the WLS does not ask about health until the 1992 wave, thus precluding us from controlling for early health. Third, our job characteristic preference measures were obtained in 1975 and are used to assess how job characteristics in 1992 met these earlier expectations. Given the 17-year gap, preferences may have changed. An alternative option would be to use contemporaneous measures of preferences in 1992. We did not do this because of the potential for endogeneity (one’s job characteristics might shape preferences). Although we would prefer to test the 1992 preference measures as a sensitivity analysis for our findings, job characteristic preferences in this year were measured on a 7-point instead of 3-point scale, with all measures relative to high pay, and with only partial topical overlap with the 1975 measures. Fourth, our sample is limited. Only high school graduates were eligible to be part of the WLS sample, which makes them members of a relatively advantaged population. Furthermore, the WLS sample is nearly entirely racially homogeneous, geographically restricted, and cohort bounded. Future research should confirm the importance of these associations with health outcomes from a more diverse dataset with appropriate measures.

Nonetheless, our findings provide support for a novel approach to the study of healthy aging by bridging this literature with theory and research on the social psychology of work. By investigating a full set of job rewards, how these match individual preferences, and a wide range of physical and mental health outcomes at midlife, retirement, and old age, these findings suggest new ways in which psychological stress resulting from work processes may influence workers’ health in later life. In particular, we argue that researchers should pay greater heed to the daily experiences of work, in addition to the pecuniary rewards associated with work, when seeking to understand individual health and wellbeing.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1:

Socioeconomic, Occupational Outcome, and Occupational Preference Descriptive Statistics, by Gender and Survey Wave

	Men			Women		
	N	Mean	S.D.	N	Mean	S.D.
Traditional Attainment (1957, 1992)						
Education (1992)						
High school only[a]	3961	0.52	0.50	4175	0.63	0.48
Some College	3961	0.16	0.37	4175	0.16	0.37
College degree[a]	3961	0.14	0.35	4175	0.12	0.33
Grad/professional school[a]	3961	0.18	0.38	4175	0.09	0.29
Parental SES (1957)	3961	16.29	11.10	4175	16.04	11.07
Occupational Outcomes (1992)						
Income[a]	3961	0.39	1.17	4175	−0.32	0.66
Benefits[a]	3950	0.19	0.90	4143	−0.19	1.05
Interesting[a]	3942	0.20	0.96	4098	−0.18	0.98
Clean[a]	3952	−0.13	1.08	4159	0.12	0.90
Tiring[a]	3954	−0.08	0.99	4163	0.07	1.01
Occupational Prestige[a]	3959	0.11	1.02	4175	−0.10	0.97
Security[a]	3938	−0.07	1.00	3947	0.03	0.97
Freedom[a]	3905	−0.10	0.93	3793	0.11	0.99
Time Pressure	3954	0.00	0.95	4159	−0.00	1.04
Ahead[a]	3951	0.06	0.97	4152	−0.05	1.02
Use Abilities	3959	0.01	1.06	4175	−0.01	0.94
Hours[a]	3958	−0.40	0.86	4157	0.38	0.97
Occupational Preferences (1975)						
Wages[a]	3939	2.17	0.61	3219	2.12	0.62
Benefits[a]	3939	2.30	0.67	3219	2.25	0.72
Interesting[a]	3939	2.80	0.44	3219	2.85	0.39
Clean[a]	3939	1.62	0.70	3218	1.88	0.74
Tiring[a]	3938	1.70	0.70	3218	2.00	0.73
Occupational Prestige[a]	3938	2.15	0.77	3219	2.11	0.79
Security	3939	2.51	0.66	3219	2.47	0.70
Freedom[a]	3939	2.47	0.63	3219	2.33	0.65
Time Pressure[a]	3939	1.83	0.75	3219	2.13	0.73

	Men			Women		
	N	**Mean**	**S.D.**	**N**	**Mean**	**S.D.**
Ahead[a]	3939	2.56	0.62	3219	2.37	0.69
Use Abilities	3939	2.85	0.38	3219	2.84	0.40
Hours[a]	3939	1.84	0.74	3219	2.41	0.69

[a]: Statistically significant (p.≤05) mean gender differences in the 1992 imputation according to the results of simple bivariate regressions between the variable in question and gender, which is statistically equivalent to a t-test but compatible with mi-set data in Stata. See Appendix A for a full description of the occupational outcomes and occupational preferences variables, and the main text for a full description of the traditional attainment measures.

SOURCE: Wisconsin Longitudinal Study of 1957

Table 2:

Health Outcomes Descriptive Statistics, by Gender and Survey Wave

	Men									Women								
	1992			2004			2011			1992			2004			2011		
	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.
Health Outcomes																		
SRH[ac]	3876	4.13	0.67	3242	3.77	0.98	2687	3.96	0.69	3969	4.16	0.68	3518	3.78	0.98	2844	4.00	0.67
Functional Limits[bc]	--	--	--	3220	1.36	1.88	2684	2.08	2.17	--	--	--	3390	2.32	2.37	2825	2.82	2.44
Bed Days[abc]	3876	2.32	10.31	3219	1.95	9.01	2685	2.09	10.28	3961	2.97	10.81	3393	2.71	12.22	2835	2.77	12.84
Hospital Days	3876	0.34	1.89	--	--	--	--	--	--	3963	0.28	1.44	--	--	--	--	--	--
BMI[ab]	3876	27.55	3.84	3221	28.37	4.32	2685	29.01	4.83	3936	26.13	4.86	3368	27.63	5.43	2820	28.71	6.07
Health Index[abc]	3876	3.66	3.03	3221	8.03	4.98	2686	7.65	5.23	3969	4.74	3.53	3399	9.08	4.90	2832	8.57	5.40
Illnesses[abc]	3876	0.95	1.13	3221	1.67	1.66	2685	1.94	1.65	3969	1.21	1.36	3403	2.05	1.81	2837	2.72	1.99
PCSU[bc]	--	--	--	3217	49.33	8.92	2683	46.68	10.14	--	--	--	3374	47.72	10.23	2809	45.92	10.80
Health Limitations	3876	0.10	0.30	--	--	--	--	--	--	3965	0.12	0.32	--	--	--	--	--	--
Mental Health Outcomes																		
Depressive Episodes[b]	3826	0.71	3.41	3225	0.51	2.29	--	--	--	3860	0.77	2.84	3328	0.70	2.47	--	--	--
CES-D[abc]	3875	15.55	13.88	3220	12.60	12.9	2683	15.09	14.07	3961	17.96	16.48	3396	14.89	14.49	2828	16.69	15.24
Hostility[c]	3875	1.82	2.49	3220	1.15	2.18	2683	1.24	2.25	3958	1.87	2.66	3395	1.21	2.17	2826	1.09	2.05
MCSU[bc]	--	--	--	3217	55.65	6.19	2683	56.40	6.43	--	--	--	3374	55.14	6.68	2809	55.76	6.83
Depressive Symptoms[abc]	3877	0.61	1.46	3224	0.53	1.36	2690	0.47	1.26	3906	1.10	2.03	3328	1.01	1.89	2778	0.78	1.65

NOTE: Letters indicate statistically significant mean gender differences –

[a]for 1992,

[b]for 2004,

[c]for 2011– according to the results of simple bivariate regressions between the variable in question and gender, which is statistically equivalent to a t-test but compatible with mi-set data in Stata.

SOURCE: Wisconsin Longitudinal Study of 1957

Table 3:

Ordinary Least Squares Regression Model of Omnibus Physical and Mental Health, by Gender, 2004

	PCSU 2004						MCSU 2004					
	Men (N=3,136)			Women (N=2,629)			Men (N=3,136)			Women (N=2,629)		
	[A]	[B]	[C]	[A]	[B]	[C]	[A]	[B]	[C]	[A]	[B]	[C]
Education												
HS Only (Ref.)												
Sm College	1.543***	1.319***	1.305***	−0.643	−0.698	−0.746	−0.398	−0.487	−0.581	−0.329	−0.429	−0.521
Coll. Deg.	1.945***	1.756***	1.565***	2.081***	2.479***	2.363***	−0.417	−0.465	−0.583	−0.535	−0.692	−0.905 *
Post-BA	1.995***	2.174***	2.097***	1.829 **	2.168 **	2.160 **	−0.770 **	−0.819 *	−0.854 *	−0.707	−0.908	−1.263 **
Par. SES	−0.0288	−0.0714	−0.111	0.132	0.00133	−0.0402	0.000	0.0205	−0.00538	0.113	0.0439	0.0130
Income	0.608***	0.501***	0.828 **	0.845***	0.707 **	−0.161	0.0945	0.0235	0.0493	0.216	0.181	0.298
Pref.=Somewhat			0.287			−0.875			0.226			−0.412
Pref.=Very			0.110			−1.309			0.126			−0.581
Int. xSomewhat			−0.468			1.061			−0.146			−0.122
Int. xVery			−0.406			0.876			0.0735			−0.465
Prestige	0.461 **	0.552 *	0.587	0.280	0.171	0.262	0.358 **	0.170	0.0886	0.336 **	0.261	−0.0122
Pref.=Somewhat			0.401			1.190 **			−0.373			0.515
Pref.=Very			0.528			1.167 *			−0.676 **			0.159
Int. xSomewhat			−0.0373			−0.744			0.113			0.356
Int. xVery			−0.170			0.346			0.0392			0.278
Benefits		0.305	−0.251		0.311	0.709		0.229 *	0.309		−0.329 **	−0.580 *
Pref.=Somewhat			−0.389			0.178			0.210			0.392
Pref.=Very			−0.309			0.295			0.480			0.304
Int. xSomewhat			0.853			−0.447			−0.102			0.447
Int. xVery			0.473			−0.429			−0.129			0.121
Interesting		0.169	−0.0872		−0.0583	2.831		0.0971	−0.129		0.246	1.923
Pref.=Somewhat			1.058			−1.063			0.0919			−0.457
Pref.=Very			0.932			−0.0742			0.0957			−0.980
Int. xSomewhat			0.217			−2.522			0.204			−1.952

	PCSU 2004						MCSU 2004					
	Men (N=3,136)			Women (N=2,629)			Men (N=3,136)			Women (N=2,629)		
	[A]	[B]	[C]	[A]	[B]	[C]	[A]	[B]	[C]	[A]	[B]	[C]
Int. xVery			0.217			−3.059			0.173			−1.727
Clean		0.659***	0.869***		0.834***	0.607		0.141	0.125		0.0985	0.0337
Pref.=Somewhat			−0.00907			0.388			−0.154			−0.0392
Pref.=Very			0.404			0.382			0.246			−0.393
Int. xSomewhat			−0.417			0.134			−0.154			0.0589
Int. xVery			−0.960*			0.331			0.451			0.255
Tiring		−0.354*	−0.434		−0.278	−0.0635		−0.00530	−0.168		0.0797	−0.253
Pref.=Somewhat			−0.538			0.579			0.0679			−0.374
Pref.=Very			−1.029			0.564			−0.467			−0.185
Int. xSomewhat			0.0210			−0.478			0.388			0.423
Int. xVery			0.565			0.0668			0.00846			0.439
Security		0.552***	0.303		0.696***	0.850		0.435***	0.613		0.421**	0.601
Pref.=Somewhat			−0.0669			−1.552**			0.186			0.257
Pref.=Very			−0.703			−1.656**			−0.0991			0.688
Int. xSomewhat			0.0672			−0.243			−0.185			−0.153
Int. xVery			0.324			−0.311			−0.182			−0.181
Freedom		−0.103	−0.372		−0.0250	0.403		0.0468	−0.00380		0.298*	−0.106
Pref.=Somewhat			−0.362			−0.138			−0.833			0.364
Pref.=Very			−0.224			−0.429			−0.844			0.559
Int. xSomewhat			0.211			−0.356			−0.00697			0.268
Int. xVery			0.376			−0.639			0.116			0.565
Time Pressure		−0.230	−0.337		0.184	−0.315		0.252*	0.153		−0.0357	−0.0959
Pref.=Somewhat			−0.0394			0.241			−0.599**			−0.736*
Pref.=Very			−0.0658			−0.643			−1.236***			−1.035**
Int. xSomewhat			0.343			0.735			0.202			0.0321
Int. xVery			−0.0277			0.491			0.0900			0.174
Ahead		0.170	0.111		0.539***	−0.357		0.507***	0.228		0.379***	0.599
Pref.=Somewhat			0.996			0.0331			−0.276			0.157

	PCSU 2004						MCSU 2004					
	Men (N=3,136)			Women (N=2,629)			Men (N=3,136)			Women (N=2,629)		
	[A]	[B]	[C]	[A]	[B]	[C]	[A]	[B]	[C]	[A]	[B]	[C]
Pref.=Very			1.025			0.488			−0.365			−0.846
Int. xSomewhat			−0.143			1.180*			0.0588			−0.434
Int. xVery			0.169			0.648			0.349			−0.106
Use Abils.		−0.547	0.112		−0.204	−1.588		0.0795	−2.033		−0.0586	−0.137
Pref.=Somewhat			−3.374			1.621			0.571			1.290
Pref.=Very			−3.141			2.293			1.085			1.919
Int. xSomewhat			0.0683			0.821			2.559*			0.223
Int. xVery			−0.753			1.543			2.013			0.0151
Hours		0.351*	0.476		0.0584	0.372		−0.181	−0.405*		−0.131	−0.397
Pref.=Somewhat			−0.0951			−0.648			0.463			0.121
Pref.=Very			0.342			0.0243			0.370			0.164
Int. xSomewhat			−0.138			−0.536			0.0932			0.387
Int. xVery			−0.163			−0.285			1.098***			0.178
Constant	48.15***	48.42***	50.65***	47.02***	47.19***	46.24***	55.85***	55.74***	56.10***	55.07***	55.29***	54.71***

NOTE:

*: p<.05;

**: p<.01. Results in models [A] and [B] use only cases with full information in the model [C] specification.

SOURCE: Wisconsin Longitudinal Study of 1957

Table 4:

Joint Significance Tests for Job Characteristics and Preferences and Interactions on Physical Health Outcomes, by Gender

			Non-FE				FE			
			+ Characteristics		+Preferences & Interactions		+ Characteristics		+Preferences & Interactions	
	Reg. Model	Gender	F-statistic	p-value	F-statistic	p-value	F-statistic	p-value	F-statistic	p-value
1992 Models										
BMI	OLS	Men	**1.866**	**0.034**	1.088	0.314	1.357	0.179	0.948	0.575
		Women	**1.775**	**0.047**	1.011	0.453	0.812	0.639	0.926	0.619
SRH	OLS	Men	**6.562**	**0.000**	0.928	0.614	**5.662**	**0.000**	0.924	0.623
		Women	**3.736**	**0.000**	0.926	0.618	**3.158**	**0.000**	0.779	0.864
Hospital Days	NBRM	Men	**2.657**	**0.002**	0.757	0.892	1.553	0.098	1.140	0.234
		Women	**1.780**	**0.046**	0.853	0.755	0.630	0.819	0.478	0.999
Bed Days	NBRM	Men	**5.225**	**0.000**	0.821	0.807	**6.670**	**0.000**	**2.553**	**0.000**
		Women	**5.056**	**0.000**	0.884	0.700	**10.622**	**0.000**	**4.413**	**0.000**
Illnesses	NBRM	Men	**3.308**	**0.000**	0.811	0.822	1.007	0.439	0.246	1.000
		Women	**2.835**	**0.001**	1.324	0.066	0.851	0.597	0.511	0.998
Health Index	ln OLS	Men	**2.986**	**0.000**	0.606	0.986	**2.801**	**0.001**	0.534	0.997
		Women	**3.112**	**0.000**	0.970	0.531	**2.745**	**0.001**	0.943	0.586
Health Limitations	ln OLS	Men	**6.041**	**0.000**	0.825	0.800	**5.383**	**0.000**	0.856	0.749
		Women	**5.597**	**0.000**	0.731	0.917	**4.194**	**0.000**	0.711	0.933
2004 Models										
BMI	OLS	Men	**2.593**	**0.002**	**1.376**	**0.044**	**2.376**	**0.005**	1.307	0.077
		Women	1.220	0.263	0.799	0.837	0.875	0.572	0.729	0.918
PCSU	OLS	Men	**5.108**	**0.000**	0.624	0.980	**3.660**	**0.000**	0.656	0.968
		Women	**3.733**	**0.000**	0.938	0.596	**3.542**	**0.000**	0.897	0.674
SRH	OLS	Men	**7.662**	**0.000**	0.900	0.669	**7.418**	**0.000**	0.898	0.673
		Women	**6.021**	**0.000**	0.900	0.668	**3.556**	**0.000**	0.932	0.606
Bed Days	NBRM	Men	**2.351**	**0.005**	0.797	0.842	**2.421**	**0.004**	**1.782**	**0.001**
		Women	**1.832**	**0.038**	1.204	0.158	**3.629**	**0.000**	**4.351**	**0.000**
Illnesses	NBRM	Men	0.529	0.897	0.903	0.664	1.092	0.362	0.607	0.986
		Women	**1.841**	**0.037**	0.948	0.576	**1.845**	**0.036**	0.682	0.955

			Non-FE				FE			
			+ Characteristics		+Preferences & Interactions		+ Characteristics		+Preferences & Interactions	
	Reg. Model	**Gender**	**F-statistic**	**p-value**	**F-statistic**	**p-value**	**F-statistic**	**p-value**	**F-statistic**	**p-value**
Health Index	ln OLS	Men	**3.050**	**0.000**	1.056	0.369	**3.268**	**0.000**	0.974	0.524
		Women	**2.424**	**0.004**	1.047	0.387	**2.206**	**0.010**	1.043	0.393
Functional Limitations	ln OLS	Men	**4.642**	**0.000**	0.643	0.973	**3.597**	**0.000**	0.642	0.974
		Women	**2.914**	**0.001**	1.065	0.354	**2.836**	**0.001**	1.044	0.391
2011 Models										
BMI	OLS	Men	1.417	0.150	1.087	0.317	1.397	0.160	0.979	0.514
		Women	0.638	0.811	0.807	0.825	0.511	0.909	0.747	0.900
PCSU	OLS	Men	**4.846**	**0.000**	0.824	0.801	**3.255**	**0.000**	0.762	0.883
		Women	**2.703**	**0.001**	0.832	0.788	**2.166**	**0.011**	0.818	0.809
SRH	OLS	Men	**5.673**	**0.000**	0.748	0.899	**3.736**	**0.000**	0.885	0.697
		Women	**1.995**	**0.021**	0.580	0.991	1.258	0.237	0.546	0.995
Bed Days	NBRM	Men	**2.661**	**0.001**	0.462	0.999	**5.055**	**0.000**	**2.449**	**0.000**
		Women	1.142	0.320	1.024	0.427	**3.210**	**0.000**	**3.678**	**0.000**
Illnesses	NBRM	Men	0.933	0.513	0.810	0.823	0.611	0.835	0.656	0.969
		Women	**2.632**	**0.002**	0.901	0.668	1.537	0.103	0.474	0.999
Health Index	ln OLS	Men	**2.921**	**0.000**	0.828	0.794	**2.228**	**0.009**	0.815	0.815
		Women	**2.599**	**0.002**	0.906	0.657	**2.670**	**0.001**	0.878	0.709

NOTE: ‘F’ indicates F-statistics for joint significance of the indicated independent variables (job characteristics for “+Characteristics”; job preferences and preference-characteristic interactions for “+Preferences & Interactions”). Significant F-statistics are bolded. Regression model strategies are: OLS (ordinary least squares regression) and NBRM (negative binomial regression model)

SOURCE: Wisconsin Longitudinal Study of 1957

Table 5:

Joint Significance Tests for Mental Health Outcomes, by Gender

			Non-FE				FE			
			+ Characteristics		+Preferences & Interactions		+ Characteristics		+Preferences & Interactions	
	Reg. Mod.	Gender	F	p	F	p	F	p	F	P
1992 Models										
CES-D	OLS	Men	**9.278**	**0.000**	**1.582**	**0.007**	**8.615**	**0.000**	**1.456**	**0.022**
		Women	**10.025**	**0.000**	0.912	0.645	**6.775**	**0.000**	0.871	0.722
Hostility	OLS	Men	**5.023**	**0.000**	1.083	0.323	**5.304**	**0.000**	1.060	0.362
		Women	**3.886**	**0.000**	0.638	0.975	**4.425**	**0.000**	0.622	0.981
Depress. Episodes	ln OLS	Men	0.861	0.587	0.481	0.999	0.693	0.760	0.418	1.000
		Women	1.263	0.234	0.576	0.992	1.296	0.214	0.481	0.999
Depress. Symptoms	ln OLS	Men	**2.291**	**0.007**	0.650	0.971	1.614	0.081	0.592	0.989
		Women	1.183	0.289	0.923	0.625	1.025	0.422	0.762	0.885
2004 Models										
CES-D	OLS	Men	**9.644**	**0.000**	**1.443**	**0.025**	**7.791**	**0.000**	1.321	0.069
		Women	**5.833**	**0.000**	0.726	0.920	**4.691**	**0.000**	0.621	0.981
Hostility	OLS	Men	**4.211**	**0.000**	1.158	0.212	**3.617**	**0.000**	1.041	0.396
		Women	**3.356**	**0.000**	0.949	0.573	**2.842**	**0.001**	0.968	0.536
MCSU	OLS	Men	**4.326**	**0.000**	1.252	0.115	**3.574**	**0.000**	1.047	0.386
		Women	**2.988**	**0.000**	0.765	0.880	**2.724**	**0.001**	0.789	0.851
Depress. Episodes	ln OLS	Men	1.418	0.150	0.498	0.999	0.768	0.685	0.446	1.000
		Women	1.093	0.361	0.813	0.818	0.979	0.466	0.725	0.921
Depress. Symptoms	ln OLS	Men	1.331	0.193	0.759	0.888	0.784	0.668	0.673	0.959
		Women	1.189	0.285	0.889	0.689	0.956	0.489	0.809	0.823
2011 Models										
CES-D	OLS	Men	**6.836**	**0.000**	1.320	0.070	**5.220**	**0.000**	1.039	0.401
		Women	**4.568**	**0.000**	1.053	0.375	**3.134**	**0.000**	1.017	0.442
Hostility	OLS	Men	**2.769**	**0.001**	**1.776**	**0.001**	**1.896**	**0.030**	**1.406**	**0.035**
		Women	1.379	0.168	0.942	0.587	1.322	0.199	0.851	0.757
MCSU	OLS	Men	**3.475**	**0.000**	0.702	0.940	**3.297**	**0.000**	0.647	0.971

			Non-FE				FE			
			+ Characteristics		+Preferences & Interactions		+ Characteristics		+Preferences & Interactions	
	Reg. Mod.	Gender	F	p	F	p	F	p	F	P
Depress. Symptoms	ln OLS	Women	**1.811**	**0.041**	0.671	0.960	1.598	0.085	0.655	0.968
		Men	**2.169**	**0.011**	0.952	0.568	**2.168**	**0.011**	0.864	0.735
		Women	0.717	0.736	0.542	0.996	0.987	0.458	0.509	0.998

NOTE: ‘F’ indicates F-statistics for joint significance of the indicated independent variables (job characteristics for “+Characteristics”; job preferences and preference-characteristic interactions for “+Preferences & Interactions”). ‘p’ indicates the p-value associated with this F-statistic. Bolded figures indicate statistical significance.

SOURCE: Wisconsin Longitudinal Study of 1957