Incongruence between workload and occupational norms for time pressure predicts depressive symptoms

Michael T. Ford & Jiafei Jin

Published online: 29 Nov 2013.

Submit your article to this journal ⬈

Article views: 181

View related articles ⬈

View Crossmark data ⬈

Routledge
Taylor & Francis Group

Incongruence between workload and occupational norms for time pressure predicts depressive symptoms

Michael T. Ford[1] **and Jiafei Jin**[2]

[1]University at Albany, SUNY, Albany, NY 12222, USA
[2]Southwestern University of Finance and Economics, Chengdu, China

In light of recent scholarship on the role of fairness and legitimacy in occupational strain, we tested in two studies the hypothesis that workload is more strongly associated with depressive symptoms when it exceeds occupational norms for time pressure. First, analyses of an occupationally heterogeneous sample revealed that when workers reported workload levels that exceeded occupational norms for time pressure they were more likely to report depressive symptoms, even after controlling for depressive symptoms from a prior assessment approximately 10 years earlier. A second cross-sectional study found similar results, with some of the effect accounted for by psychological contract violation. These findings suggest that workload is most strongly associated with depressive symptoms to the extent that it exceeds occupational norms for time pressure. Psychological contract violation may explain some of these effects.

Keywords: Workload; Job demands; Job stress; Psychological contract violation; Fairness.

The prominent theoretical models of occupational stress typically draw from Lazarus and Folkman's (1984) transactional stress theory, which, when applied to the workplace, states that aspects of the work environment influence appraisals of the situation as self-relevant, hindering, and/or challenging (Podsakoff, LePine, & LePine, 2007; Webster, Beehr, & Love, 2011). This appraisal is accompanied by psychological, physical, and behavioural responses. Quantitative workload (Spector & Jex, 1998) has been identified as an important factor in the experience of worker strain from this perspective because it presents workers with tasks that are difficult and sometimes unpleasant to accomplish. However, recent evidence suggests that work demands are associated with physical and psychological strain not only because they are threatening or unpleasant, but also because they are sometimes perceived as unfair or illegitimate (Elovainio, Leino-Arjas, Vahtera, & Kivimaki, 2006; Kottwitz et al., 2008; Robbins, Ford, & Tetrick, 2012). The perceived illegitimacy of one's workload may contribute to the prediction of strain beyond the workload levels alone.

From this latter perspective, we propose that stress reactions to high levels of workload are much stronger when workload violates the norms and expectations that are based on the working conditions of occupational peers. In other words, workers are expected to react negatively to high levels of workload when they expect and/or feel entitled to low levels of workload based on their occupational role. There is evidence that individuals strive for fairness and equity, even when self-interest is not at stake (Cropanzano, Goldman, & Folger, 2003; Skarlicki & Rupp, 2010), suggesting that, by violating principles of fairness, stressor illegitimacy will influence psychological strain beyond the effects of stressors alone. When one's workload is incongruent with occupational role norms, it is expected that workers will see this as a violation of the implicit expectations they have for their working conditions, increasing feelings of illegitimacy and in turn influencing psychological strain.

This study tests the extent to which workload influences depressive symptoms differentially across occupations that differ in their normative levels of time pressure. First, this is tested by examining whether such incongruence predicts the onset of and/or increases in depressive symptoms. In an attempt to verify the mediating role of perceived illegitimacy in these effects, this is followed by a cross-sectional examination of whether the hypothesized incongruence effect can be explained by psychological contract violation, which refers to the violation of a worker's implicit expectations

Correspondence should be addressed to Michael T. Ford, University at Albany, SUNY, Social Science 399, 1400 Washington Avenue, Albany, NY 12222, USA. E-mail: mford@albany.edu

(Morrison & Robinson, 1997). Evidence confirming our hypotheses will highlight job–occupation congruence as an important sense-making factor influencing fairness perceptions and stress reactions to workload. This may also provide insight into why workload influences psychological strain differentially across occupations.

JOB–OCCUPATION MISFIT AND THE LEGITIMACY OF WORK STRESSORS

There is evidence that the normative characteristics of one's occupational role moderate the effect of workload on stress reactions. In a previous analysis of a nationally representative (US) heterogeneous sample of workers, job–occupation misfit was conceptualized as the difference between a job's demands and autonomy and the demands and autonomy that would be expected given one's occupational role (Ford, 2012). Job–occupation misfit was operationalized as the difference between self-reported demands and autonomy and Occupational Information Network (O*NET) ratings on similar dimensions. Edwards' (e.g., Edwards, 1996; Edwards & Parry, 1993) response surface analysis methods were used to test the effects of this job–occupation incongruence. Results showed that misfit on self-reported characteristics and O*NET ratings was associated with higher levels of depression and lower levels of job satisfaction.

Two important questions remain unanswered from this analysis and are critical to clarifying the causal role of incongruence. First, it is unclear whether this job–occupation incongruence predicts the *onset of* or *increases in* depressive symptoms over time. It is important to test for and verify this temporal precedence because it is possible that depressive symptoms actually lead to an increase in job–occupation incongruence by resulting in lower work performance and less desirable work role conditions (Frese, 1982). We argue that this is not entirely the case. Instead, we hypothesize that job–occupation incongruence with respect to workload leads to higher depressive symptoms. To more rigorously test this causal direction, we need to assess the extent to which job–occupation incongruence influences depressive symptoms after controlling for prior depressive symptoms.

A second important unanswered question is the explanation for why job–occupation incongruence is associated with psychological strain. To make the case for job–occupation incongruence as a cause of psychological strain, it is critical that we empirically verify explanatory theoretical mediators of this effect. One plausible explanation for the effect of job–occupation incongruence on depressive symptoms is that this incongruence leads to a discrepancy between the working conditions one feels entitled to and those that are delivered, resulting in a psychological contract violation. Research on emotional responses to unfair treatment and more basic research on anger and hostility suggest that a failure to
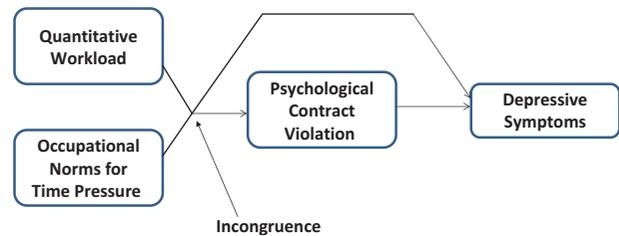

Figure 1. Summary illustration of study hypotheses.

meet obligations leads to intense negative emotional reactions from workers (Berkowitz & Harmon-Jones, 2004; Spencer & Rupp, 2009; Weiss, Suckow, & Cropanzano, 1999). Occupational norms set standards against which workers can judge the legitimacy and fairness of their working conditions. A failure to meet these standards results in a failure to provide working conditions that workers feel entitled to. This almost by definition leads to a psychological contract violation, which is a relatively strong predictor of employee strain and dissatisfaction (Gakovic & Tetrick, 2003). See Figure 1 for a depiction of this hypothesized framework.

If workload only predicts depressive symptoms to the extent that it exceeds normative or "legitimate" levels, there will be a curvilinear relationship between workload and depression. Across workload levels that are below occupational norms, workload is less likely to be associated with increases in depressive symptoms through psychological contract violation. It is only when the conditions exceed what is perceived as legitimate that workload is expected to increase depressive symptoms, with psychological contract violation as one potential explanation for this effect.

OCCUPATIONS AS AN ORGANIZING FRAMEWORK

Central to our hypothesis is that one's occupational role influences a worker's workload expectations. Dierdorff, Rubin, and Morgeson (2009, p. 974) defined an occupation as "a collection of work roles with similar goals that require the performance of distinctive activities as well as the application of specialized skills or knowledge to accomplish these goals". Taking Johns' (2006) conceptual framework for context, occupations represent omnibus context, whereas the specific activities, expectations, and requirements of occupations represent discrete context. This discrete context provides the backdrop within which work role enactment occurs (Dierdorff & Morgeson, 2007). Whereas work *positions* are specific to an organization and work *roles* are specific to individuals, occupations provide a transcendent organizing framework for the creation of positions and work roles across organizations. Individuals in different organizations that share the same occupation will usually share many job attributes, meaning that some of the disparity

in working conditions across individuals is a function of the disparities in conditions across occupations. Thus, it makes theoretical sense that work characteristics at the occupational level of analysis have been shown to predict work-related stress and health outcomes (e.g., Dierdorff & Ellington, 2008; Ford & Wiggins, 2012), even though the work role characteristics within these occupations vary considerably.

The US Department of Labor has classified the US workforce into approximately 900 occupations (US Bureau of Labor Statistics, 2010). The O*NET developers have used this structure to collect normative data on each occupation on a variety of dimensions. O*NET ratings have been provided by analysts and incumbents (Peterson et al., 2001) and updated several times over the past decade and a half, giving us normative empirical data on the work role characteristics one might expect in an occupation. The dimension of work time pressure is of interest here given its implications for expected levels of workload.

Occupational norms are likely to influence the expectations workers have for the workload they encounter on their jobs, in turn influencing the extent to which these stressors lead to psychological strain and depressive symptoms. Workers draw on mental representations of prototypical workers and an occupation's cultural values to guide their work role expectations (Beyer & Hannah, 2002; Moss & Frieze, 1993). Unlike properties of the physical environment such as temperature and lighting, psychological stressors are difficult to measure and interpret in and of themselves, meaning workers must use social information to make sense of their stressors and determine if they are legitimate (Salancik & Pfeffer, 1978). Some of this social information comes from peers within one's occupational group and may include peers outside of one's organization (Wallace, Leicht, & Raffalovich, 1999). Workers are likely to hold general workload expectations based on the occupational role they are fulfilling and the cues they get from workers in similar occupational roles. These expectations should influence stress reactions to workload. Accordingly, Semmer, Jacobshagen, Meier, and Elfering's (2007) "stress-as-offense-to-self" perspective describes demands as particularly stressful when the demands are not typical for one's profession or are inconsistent with one's occupational role identity.

As already noted, not all individuals within the same occupational role have the same work role characteristics. Work role characteristics deviate from occupational norms in part because of the discretion of the organization and the work group. Individuals whose workloads exceed what is typical given their occupational situations may blame their organizations for the incongruence. When this deviation is undesirable, this may lead to psychological contract violation because it involves a failure to meet the work role characteristics one feels entitled to. This psychological contract violation involves intense negative emotions directed at others in the organization, increasing overall strain (Conway &

Briner, 2002; Robinson & Morrison, 2000). Thus, we would expect job–occupation workload incongruence to lead to depressive symptoms through this violation of expectations.

WORKLOAD AND OCCUPATIONAL NORMS FOR TIME PRESSURE

As noted earlier, quantitative workload has been shown in cross-sectional and longitudinal research to be related to psychological strain (de Lange, Taris, Kompier, Houtman, & Bongers, 2003; Karasek, 1979). To the extent that workload is associated with strain through the depletion of resources, as the Conservation of Resources theory (Hobfoll, 1989) would suggest, the effect on strain would be linear, with each unit of increase in stressors leading to a corresponding depletion of time, energy, and other personal resources. However, drawing from theoretical and empirical perspectives on the role of fairness and legitimacy in work stress (e.g., Robbins et al., 2012; Semmer et al., 2007), we hypothesize that the effects of workload on psychological strain, depressive symptoms specifically, vary as a function of occupational norms for time pressure. We focus on time pressure because it is the underlying factor in much of the workload that workers experience.

Time pressure, which is part of the O*NET context content model, refers to the frequency with which a job requires one to meet strict, externally imposed deadlines. Strict deadlines are important sources of workload because they force workers to complete work within a time schedule that is imposed by an external force and may be inconvenient to them. Such demands are likely to force workers to work without breaks or perform outside of their scheduled hours because they must adapt their own schedules to externally imposed demands instead of tailoring tasks to their own schedules. Occupations rated high on time pressure include several types of executives, journalists, pharmacists, drivers, food service workers, and health care workers.

Workload at the individual *job* level is typically operationalized with scales that reflect the extent to which work must be performed within a short period of time, closely mapping on to this occupational dimension of time pressure. For example, Spector and Jex's (1998) quantitative workload inventory, asks "How often does your job require you to work very fast?", "How often does your job leave you with little time to get things done?", and "How often do you have more work than you can do well?" Implicit in ratings of these items is the extent to which work must be done within a short period of time. The closest representation of this construct at the occupational level in the O*NET content model is time pressure. Indeed, the previous analysis of respondents to the National Study of the Changing Workforce cited earlier (Ford, 2012) found that incongruence between self-reported workload and

occupational norms for time pressure was related to job dissatisfaction and depression.

In this study, we aim to extend this finding by examining whether incongruence between workload and occupational norms for time pressure predicts the onset of and increases in depressive symptoms by controlling for prior depressive symptoms. Furthermore, we explore psychological contract violation as a mechanism to explain some of this effect. In other words, we hypothesize that workers expect lower levels of workload when in an occupation that is normatively low in time pressure. These workers will perceive high workload as illegitimate and displeasing, in turn leading to increases in depressive symptoms. By contrast, workers in occupational roles that are typically high in time pressure are predicted to be less likely to experience depressive symptoms in response to heavy workload because heavy workload is seen as a legitimate part of their work roles. We posit psychological contract violation as a potential mediating explanation or this effect.

> *Hypothesis 1:* Incongruence between workload and occupation-based norms for time pressure predicts depressive symptoms, after controlling for prior depressive symptoms.
> *Hypothesis 2:* Incongruence between workload and occupation-based norms for time pressure is associated with psychological contract violation.
> *Hypothesis 3:* Psychological contract violation partially mediates the association between job–occupation incongruence and depressive symptoms.

OVERVIEW OF STUDIES

These hypotheses were tested in two studies on the relationship between job–occupation workload incongruence and depressive symptoms. In the first study, archival data spanning a 10-year period are analysed to assess the extent to which job–occupation incongruence predicted depressive symptoms after controlling for prior depressive symptoms. In the second study, psychological contract violation was tested as a mediator of the relationship between job–occupation incongruence using cross-sectional data. These studies and analyses aimed to extend and further solidify previous findings and provide stronger evidence for the causal role of job–occupation workload incongruence in psychological strain.

STUDY 1

Method

Participants and procedure

We tested the first hypothesis with a longitudinal sample of participants from the Midlife Development in the United States (MIDUS) series (Brim et al., 2007;

Ryff et al., 2011; Ryff, Seeman, & Weinstein, 2011). Researchers originally contacted potential participants for the MIDUS study between January of 1995 and January of 1996 through random-digit dialling via telephone. A small number of siblings of the phone respondents were also sampled and researchers oversampled five metropolitan areas and some twin pairs. Those who took the phone survey were later sent a paper-and-pencil survey, with both surveys asking questions about work, health, and well-being. There were 7108 participants in the initial 1995–1996 study. Between 2004 and 2006 MIDUS researchers attempted to contact all of the 7108 original phone survey participants. Researchers were able to contact 4963 participants for a follow-up phone interview, making for a longitudinal retention rate of 70%. Of these, 4032 completed the follow-up survey, resulting in a completion rate of 81%.

Finally, psychological and physical health data were collected from a subsample of these participants in a project entitled the MIDUS II Biomarkers Project (Ryff, Seeman, & Weinsteen, 2011). These data were collected from each participant after they participated in the second follow-up survey between 2004 and 2006, with an average lag of 28 months between the second follow-up survey and this health examination among participants included in this analysis. Eligible participants were contacted by one of three data collection sites in the US and were invited to come for a psychological and physical health examination. Of the participants in the first two data collections, 1054 participated in the Biomarkers Project (26.1% of the 2004–2006 sample). The Biomarkers Project data collection took place between 2004 and 2009. The Biomarkers project participants were 54.7% female and averaged 55.3 years of age, whereas the 4032 original participants who did not participate were 53% female and averaged 55.5 years of age. This suggests that the Biomarkers sample was similar to the overall sample, at least with respect to age and gender.

To be eligible for our analysis, participants had to be working full time at the time of the 2004–2006 data collection. Additionally, because some twins and siblings were included in the original sample, one person was selected from each sibling or twin pair. To avoid any bias in the selection of these individuals, we kept the first person listed in the dataset from each pair. Thus, no family had more than one participant in this analysis. There were 485 participants who met this criterion. Of these participants, 51.9% were women and 69.6% were married. With respect to race, 90.5% were White, 3.7% were Black or African American, and 5.8% were of another race or did not report on their race; 4.6% were Hispanic or Latino. Participants averaged 51.1 years of age at the time of the second MIDUS survey and worked an average of 40.8 hours per week at their main job. As stated previously, participants worked in a variety of occupational roles.

Measures
Baseline depressive symptoms. Baseline depressive symptoms were measured in the first MIDUS 1995–1996 survey. The World Mental Health Organization Composite Diagnostic Interview Short Form (WHO CIDI-SF) was the source of the items (see Kessler, Andrews, Mroczek, Ustun, & Wittchen, 1998, for more details). For this measure, participants were first asked if they had felt sad, blue, or depressed for 2 or more weeks over the previous 12 months. Participants who said "yes" to this were then asked how long the feeling lasted. Respondents who said "all day long" or "most of the day" were then asked how often they felt sad, blue, or depressed. Respondents who said "every day" or "almost every day" were then asked a series of seven questions about their depression. Specifically, they were asked, "During two weeks in in the past 12 months, when you felt sad, blue, or depressed, did you … (1) lose interest in things?, (2) feel more tired out or low on energy than is usual?, (3) lose your appetite?, (4) have more trouble falling asleep than usual?, (5) have a lot more trouble concentrating than usual?, (6) feel down on yourself, no good, or worthless?, and (7) think a lot about death? The number of "yes" responses to the seven items was used as a measure of depressed affect at the time of this survey. Those whose depressed mood did not meet the threshold for frequency or longevity in order to be asked the seven follow-up questions were coded as having a depression of zero. Because of the nature of the scoring of the scale, a coefficient alpha was not computed.

Workload.   Workload was measured in the MIDUS follow-up survey conducted between 2004 and 2006 using Karasek and Theorell's (1990) 5-item job demands scale. An example item from this scale is "How often do you have to work very intensively—that is, you are very busy trying to get things done?" Response options were on a 5-point scale ranging from "never" to "all of the time". This scale had a coefficient alpha of .78.

Occupational norm for time pressure. Participants reported their occupations as part of the second survey. These occupations were originally coded to the nearest matching Census occupation code. These codes were then converted to the Standard Occupational Classification codes, which were used to import ratings from the O*NET 17.0 database. The time pressure rating from the O*NET database was used as a measure of occupational norms for time pressure. Time pressure was assessed with the mean O*NET rating on the item asking O*NET survey participants, "How often does your current job require you to meet strict deadlines?" Responses were provided on a 5-point scale ranging from "never" to "every day". O*NET database developers collected ratings on these and many other variables from job incumbents through a large-scale project funded by the US Department of Labor (see Peterson

et al., 2001, for more details). The median interrater agreement coefficient for the ratings of individual items in the original data collection for the O*NET job context database was .83 (Strong, Jeanneret, McPhail, Blakley, & D'Egidio, 1999), suggesting acceptable reliability for individual item ratings.

Depressive symptoms at follow-up. As part of the Biomarkers project, participants completed the Mood and Symptoms Questionnaire (MASQ; Watson et al., 1995), a widely used measure of mood. Part of the MASQ is a 12-item depressive symptoms scale asking participants how much they had felt or experienced a series of symptoms of depression over the past week. This scale had a coefficient alpha of .89 among the participants in this analysis.

Analysis plan
   To assess the effects of incongruence between occupational-level time pressure and work role characteristics we used Edwards' (1996; Edwards & Parry, 1993) response surface method, which specifies polynomial regression models, to predict depressive symptoms. We chose Edwards' response surface method because it has been shown convincingly to be superior to alternative tests of congruence (e.g., Edwards & Cooper, 1990). The most straightforward alternative to response surface method would be to test the effect of the difference score between the occupation and the work role. However, this approach only captures the additive main effects of each without actually assessing the incremental influence of congruence beyond these main effects (Edwards & Cooper, 1990). Including the interaction between workload and occupational norms for time pressure and the quadratic terms for each accounts for the curvilinear and interactive nature of incongruence effects (see Edwards & Cooper, 1990, for the derivation of these formulas).
   This response surface method involved testing the following equation:

$$\text{Time 3 Depressive Symptoms} = \text{Intercept}$$
$$+ \, B_0 \, (\text{Time 1 Depressive Symptoms})$$
$$+ \, B_1 \, (\text{workload}) + B_2(\text{timepressure}) + B_3\left(\text{workload}^2\right)$$
$$+ \, B_4 \, (\text{workload} * \text{timepressure})$$
$$+ \, B_5 \, (\text{time pressure}^2),$$

where "workload" refers to the self-reported ratings of workload at Time 2, and "time pressure" refers to the O*NET ratings of time pressure for the worker's occupation at Time 2.
   This equation was tested in two steps. In the first step, the main effects of workload and time pressure were entered. In the second step, the square and interaction terms were entered. A significant increase in variance explained by this second step suggests that

misfit between the work role and the occupation has an incremental effect beyond each factor individually. To further assess the influence of incongruence, it is also important to interpret the curvature of the response surface along the line of incongruence (i.e., $y = -x$, or when workload equals the negative of the occupational norm). This line of incongruence moves from left to right in the response surfaces shown in Figures 2 and 3. If job–occupation incongruence has an effect on depressive symptoms, there should be a positive curvature along the line of incongruence. At the midpoint of this line, both workload and occupational norms are equal and at their scale midpoints, whereas incongruence increases as one moves farther away from this midpoint in either direction. It is for this reason that

the quadratic terms must also be entered in the equation. Because incongruence increases at low and high ends of this line of incongruence, there should be positive curvature along this line. Thus, to evaluate the hypothesis regarding the effects of incongruence, we analysed the change in R-square with the addition of the quadratic and interactive terms and the curvature along the line of incongruence. As seen in the equation, we controlled for depressive symptoms at Time 1 to determine the extent to which incongruence predicted change in depressive symptoms from Time 1 to Time 3. We also controlled for the lag between the Time 2 assessment of workload and the Time 3 assessment of depressive symptoms because this lag was not the same for all individuals.
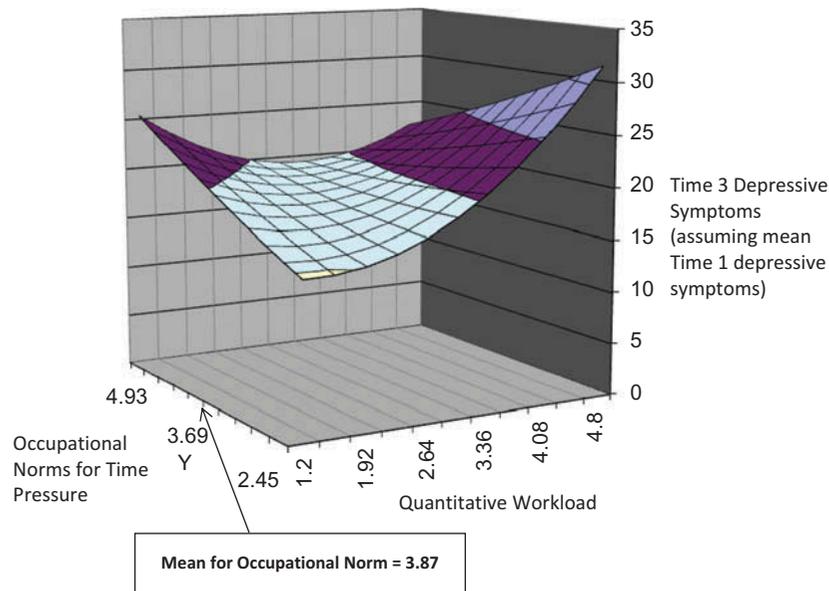

Figure 2. Study 1: Response surface modelling predicting depressive symptoms with workload and occupational norms for time pressure, controlling for baseline depressive symptoms.
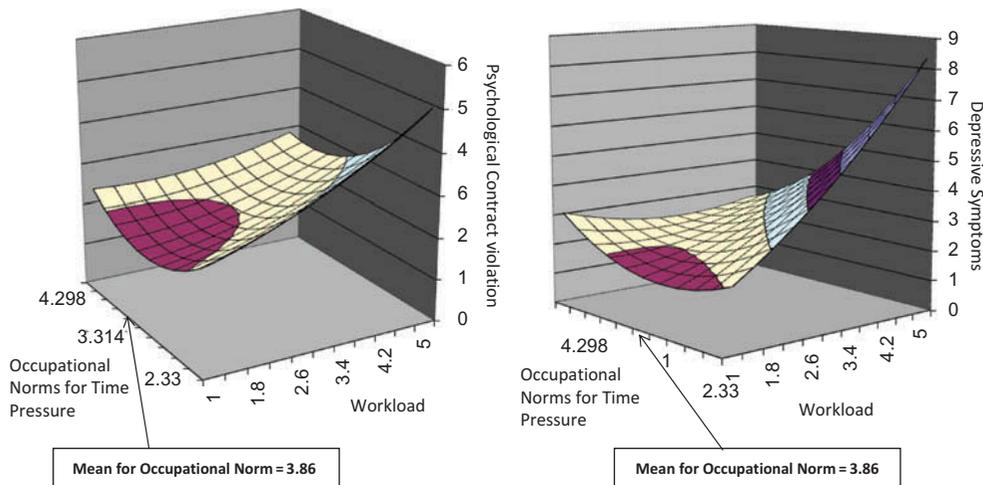

Figure 3. Study 2: Response surface modelling predicting psychological contract violation and depressive symptoms with workload and occupational norms for time pressure.

Results

Table 1 shows the means, standard deviations, and correlations among the study variables. The original scoring was used for the depression scales, which is why the means and standard deviations for these scales differed so much from those for the demands and time pressure scales. Results from the polynomial regression analyses are shown in Table 2 . As seen in the results, workload at Time 2 had a significant main effect on Time 3 depressive symptoms after controlling for Time 1 depressive symptoms, $\beta = .19$, $p < .05$. In Step 3 of the hierarchical regression, the addition of the square terms for workload and the occupational norm for time pressure, along with the interaction term, explained a significant amount of additional variance in Time 3 depressive symptoms, $\Delta R^2 = .02$, $p < .05$. Because of the highly skewed distribution of the Time 1 depressive symptoms variable, we retested this model controlling for negative affect/mood as measured at Time 1, which had less of a skewed distribution. Results controlling for Time 1 negative affect/mood were similar, suggesting these significant results were not a function of the skewed

TABLE 1
Means, standard deviations, and correlations among Study 1 variables ($N = 485$)

	Mean	SD	1	2	3
Depressive symptoms at Time 1	0.82	1.95	—		
Occupational norm for time pressure at Time 2[a]	3.87	0.38	−.06	—	
Workload at Time 2	3.05	0.64	.10*	.07	—
Depressive symptoms at Time 3	18.46	6.24	.17*	.01	.21*

*$p < .05$. [a]Ratings from O*NET database.

TABLE 2
Study 1: Polynomial regression results

	Standardized regression weights predicting Time 3 depressive symptoms		
Lag between Time 2 and Time 3	−.09	−.10*	−.11*
Time 1 depressive symptoms	.15*	.13*	.14*
Workload		.19*	.19
Time pressure (occupation)		.02	.30
Workload squared			.88*
Workload × Time pressure			−.99*
Time pressure squared			.14
R^2 (ΔR)^2	.03* (.03*)	.07* (.04*)	.09* (.02*)

*$p < .05$. Each column represents an additional hierarchical regression step. ΔR^2 refers to the increase in variance explained relative to the previous step.

distribution of Time 1 depression. Additionally, we used Edwards' method for testing the curvature along the line of incongruence (see http://public.kenan-flagler.unc.edu/faculty/edwardsj/SPSSResponseSurfaceAnalysis.htm). This yielded a significant curvature estimate of 3.74, $p < .05$. Figure 2 shows the three-dimensional response surface across levels of workload and occupational norms for time pressure. As seen in Figure 2, depression levels were the lowest when workload at Time 2 was at or slightly below the norm for time pressure. Depressive symptoms increased the most among workers who had high levels of workload and were in occupations where high levels of time pressure were not the norm. These results supported Hypothesis 1.

Discussion

Results from Study 1 supported the hypothesis that job–occupation workload incongruence predicts increases in depressive symptoms. This extends previous work that showed incongruence of this nature was correlated with depressive symptoms but had not demonstrated it was associated with increases over time. Thus, these results provide stronger evidence for the causal role of job–occupation workload incongruence in psychological strain. However, these analyses did not test any mediating mechanisms that might explain a causal effect of job–occupation workload incongruence on depressive symptoms. Thus, we expanded on this study with a cross-sectional examination of psychological contract violation as a potential mediator to further test our theoretical framework. Although cross-sectional studies are not ideal for testing causal relations, we have longitudinally based evidence from the Study 1 for causality. Results supporting the hypothesis of psychological contract violation as a mediator will provide further evidence for a pathway explaining the effects found in Study 1 and in previous research.

STUDY 2

Method

Participants

Participants for this study were recruited through an online panel via Qualtrics.com, a survey participant recruiting mechanism that has been used in several recent publications in the organizational sciences (DeCelles, DeRue, Margolis, & Ceranic, 2012; Long, Bendersky, & Morrill, 2011). Because we needed to recruit participants from a wide variety of occupations, a heterogeneous panel such as this one was ideal for the purpose of this study. Participants were recruited with an initial e-mail requesting their participation in a survey on work and stress. Participants had to be working and part of a dual-earning couple to be eligible for the study and they were compensated with a nominal amount of credits

that could be used towards online purchases. As part of a larger study, some participants were also asked if they were interested in allowing their spouses to participate. To avoid problems with the nesting of data within spouses, we focused this analysis only on the original respondents.

In total, there were 1017 participants who responded to the recruitment e-mail with completed questionnaires. We further restricted the sample to those who were working at least 20 hours per week, reducing the sample to 865 participants. Participants were asked to provide their job titles and to briefly describe their main job duties. Two research assistants independently coded these occupations and final decisions on these codes were made by the first author. Ultimately, 822 of the participants reported an occupation that could be coded. The remaining 43 participants either did not report an occupation or reported one that was not clear enough to categorize.

Of the 822 participants included in the study, 64.2% were women, 90.6% were White, 5.9% were Black or African American, 2.8% were Asian, and 0.7% were from another racial category; 5.6% were Hispanic or Latino. As stated before, all participants were married and 44% had at least one child under the age of 18 living with them. The participants' average age was 46 and they worked an average of 39.6 hours per week. Participants worked in a variety of occupational roles, fulfilling the needs of the study.

Measures

Workload.   Workload was measured with Spector and Jex's (1998) Quantitative Workload Inventory. This measure asks participants to answer questions about how frequently they must perform tasks in a limited amount of time. Responses were provided on a 5-point scale ranging from less than one per month or never to several times per day. The coefficient alpha for the scale in this study was .88.

Psychological contract violation. Robinson and Morrison's (2000) four-item measure was used to assess psychological contract violation. This measure includes questions about whether participants felt their organizations failed to fulfill their obligations and were blameworthy for this failure. Participants responded to the questions on a 5-point scale ranging from "strongly disagree" to "strongly agree". The coefficient alpha for this scale was .95.

Depressive symptoms. Depressive symptoms were measured with a six-item depression scale entitled the K6 (Kessler et al., 2003) that is frequently used to diagnose psychological illness. This scale asked participants how often in the previous 30 days they had felt nervous, hopeless, restless or fidgety, so depressed that nothing could cheer you up, that everything was an effort, and worthless. Responses were on a 5-point

scale ranging from "never" to "very often". This scale had a coefficient alpha of .92.

Occupation-based norms

As in Study 1, participants were asked to provide their job title and their primary job duties. As noted earlier, two research assistants independently categorized these to the closest matching six-digit Standard Occupational Classification code. The first author then reviewed these codes and made a final decision about the code that would be assigned to each occupation. These codes were used to import data from the O*NET 17.0 database. The time pressure rating was once again used as a measure of occupational norms for time pressure, with the same ratings used as in Study 1.

Analysis plan

To assess the effects of incongruence between occupational-level time pressure and workload, we once again used Edwards' (1996; Edwards & Parry, 1993) response surface methods, this time to predict psychological contract violation and depressive symptoms. The only difference between this analysis and the Study 1 analysis was that here we did not control for baseline depressive symptoms. Finally, mediation tests were conducted using bootstrapping analytical procedures (Preacher & Hayes, 2008) to assess the extent to which psychological contract violation accounted for the association between job–occupation incongruence and depressive symptoms.

Results

Means, standard deviations, and correlations among study variables are shown in Table 3. First, to re-examine Hypothesis 1 and to test Hypothesis 2, we analysed the incongruence between workload and occupational norms for time pressure as a predictor of psychological contract violation and depressive symptoms. The results from the regression models are reported in Table 4. Results from the two-step hierarchical regression models described previously suggest that incongruence was a significant predictor of psychological contract violation, Step 2 $\Delta R^2 = .01$, $p < .05$. The estimate of the curvature along the line of incongruence, .40, $p < .05$, was also significant, suggesting that incongruence was positively

TABLE 3
Means, standard deviations, and correlations among Study 2 variables (N = 822)

	Mean	SD	1	2	3
Workload	3.14	1.15	—		
Psychological contract violation	2.15	1.09	.30*	—	
Depression	2.12	0.93	.31*	.36*	—
Time pressure[a]	3.86	0.45	.09*	.01	−.05

*p < .05. [a]Ratings from O*NET databases.

TABLE 4
Study 2: Polynomial regression results

	DV = psychological contract violation		DV = depression			Indirect effect on depression
Workload	.31*	.40	.32*	.68*	.57	.12
Time pressure (occupation)	−.02	−.52	−.07*	−.24	−.09	.15
Workload squared		.40*		.30	.18	.12*
Workload × Time pressure		−.53		−.72*	−.56	−.15
Time pressure squared		.66		.38	.19	.19
Psychological contract violation					.29*	
ΔR^2	.09*	.01*	.10*	.01*	.08*	

Standardized beta weights are presented for each variable and interaction term. *$p < .05$. Each column represents an additional hierarchical regression step for the focal dependent variable. ΔR^2 refers to the increase in variance explained relative to the previous step.

associated with psychological contract violation. As seen in Table 4, there was a similar effect of incongruence between job and occupation in predicting depressive symptoms, $\Delta R^2 = .01$, $p < .05$. The estimate of the curvature along the line of incongruence, .29, $p < .05$, was also significant, providing evidence for the hypothesized incongruence effects. Three-dimensional plots of the effects on psychological contract violation and depression, shown in Figure 3, support the hypothesis in that workload was more strongly associated with psychological contract violation and depression when workers were in occupations that normally had low levels of time pressure. In other words, the associations between workload and depression were stronger when workload exceeded norms for time pressure. These results provide support for Hypotheses 1 and 2.

Finally, to test the extent to which the association between job–occupation workload incongruence and depressive symptoms was mediated by psychological contract violation, we used Preacher and Hayes' (2008) bootstrap method for estimating mediated effects with multiple predictors. Bootstrap methods are appropriate for this situation because the indirect mediated effects are usually not normally distributed and confidence intervals need to be corrected for this bias. The macro for this analysis was downloaded from Andrew F. Hayes' website (http://afhayes.com/spss-sas-and-mplus-macros-and-code.html) and is described in a manuscript that is currently unpublished (Hayes & Preacher, 2013) but is an extension of a previously published bootstrap method (Preacher & Hayes, 2008). We used the percentile bootstrap confidence intervals to test the significance of the indirect effects of the elements of the polynomial regression model and specified that 10,000 samples be used in computing confidence intervals. To analyse the indirect effects of incongruence on depressive symptoms through psychological contract violation, we entered the main effects for workload and occupational norm for time pressure as covariates and tested the omnibus indirect effects of the Step 2 terms, which included the square and interaction terms, beyond the main effects.

See Table 4 for the standardized indirect effects of each component of the polynomial regression model on depression through psychological contract violation. These indirect effects were computed by multiplying the coefficient from the model predicting psychological contract violation by the coefficient for psychological contract violation predicting depression. The significance of the indirect effects was tested using the 95% confidence intervals from the bootstrap analyses. Results indicate that the quadratic workload term had a significant indirect effect, whereas the interaction and the quadratic occupation for time pressure had nonsignificant indirect effects individually. The omnibus indirect effect of the quadratic and interaction terms in predicting depression through psychological contract violation did not overlap with zero, indirect effect = .002, $p < .05$, meaning this indirect effect of incongruence was significant. These results provide support for Hypothesis 3, showing that some of the association between job–occupation incongruence and depression is explained by psychological contract violation. When controlling for psychological contract violation, the omnibus effects of the quadratic and interaction terms were no longer significant, $p = .19$, providing further support that the effect of incongruence on depression is at least in part explained by psychological contract violation.

GENERAL DISCUSSION

Results from this study suggest that the effect of workload on depressive symptoms is not universal across occupations. Workers in this study appeared to react most negatively to workload when it was incongruent with and exceeded occupational norms for time pressure. In Study 1, workers who reported workload levels that exceeded occupational norms for time pressure had the highest levels of depressive symptoms, even after controlling for prior depressive or negative affective symptoms. Those whose workload was at or slightly below norms for time pressure reported fewer depressive symptoms. One proposed reason for this effect was that this

type of incongruence leads to a psychological contract violation, which in turn results in psychological strain. Study 2 provided some cross-sectional evidence for this hypothesis, finding that psychological contract explained some of the association between job–occupation incongruence and depressive symptoms in a new sample. Thus, the effects of job–occupation incongruence on depressive symptoms were replicated across two different, occupationally heterogeneous samples. The second study also provided some evidence for psychological contract violation as a theoretical mechanism linking job–occupation incongruence to psychological strain. These results suggest high levels of workload influence strain not only through the depletion of resources but also through perceptions of illegitimacy, and that occupational norms may provide one basis for the perceived legitimacy of workload and curvilinear effects of workload on psychological strain.

Implications for theory on workload and psychological strain

Workload, using Conservation of Resources Theory (Hobfoll, 1989) as a meta-framework, has long been considered to influence psychological strain through the depletion of cognitive, emotional, and physical resources. However, there is evidence from this study that the normatively based legitimacy of one's workload, some of which is a function of one's occupation or profession, influences the effect of workload on psychological strain. Workers in occupations with normatively high levels of time pressure who were in jobs with high levels of workload were unlikely to report depressive symptoms. Only workers in normatively low-pressure occupations tended to report depressive symptoms in these high-workload situations. Providing evidence that perceived legitimacy of working conditions may account for this effect, Study 2 found that psychological contract violation at least partially mediated cross-sectional associations between job–occupation workload incongruence and depressive symptoms. In other words, workload was associated with psychological contract violation and depression primarily to the extent that it exceeded occupational norms. This adds to the growing literature suggesting that the fairness and perceived legitimacy of working conditions, in addition to the conditions themselves, is a major factor in the strain that workers experience (Kottwitz et al., 2008; Semmer, Tschan, Meier, Facchin, & Jacobshagen, 2010). This is also concordant with basic research on active negative emotions such as anger and frustration that highlights the role of illegitimate events in stress responses (Berkowitz & Harmon-Jones, 2004). These results also provide a theoretical basis for and capture some nonlinearity in the relationship between work stressors and strain, suggesting this nonlinearity is conditional in part upon the norms of one's occupation. In both studies, workload became more strongly associated with depressive symptoms as it exceeded occupational norms for time pressure. By highlighting the role of normative-based legitimacy in stress reactions to workload, these findings call for further research on other standards against which workers compare their work situations when determining the legitimacy of working conditions and making sense of them. These standards might also include the worker's past experiences, coworkers in different occupations, and what was promised during socialization.

These results appear to have important theoretical implications for understanding workplace-related depression; however, it is unclear whether the effects of job–occupation incongruence on depression generalize to physical health criteria. Physical symptoms and somatic complaints have been found to be correlated with stressors such as heavy workload (Nixon, Mazzola, Bauer, Krueger, & Spector, 2011), but it not clear whether such effects would be contingent on occupational norms the way depressive symptoms appeared to be in the samples studied here. Heavy workload is likely to result in increased effort expenditure and more difficulty detaching from work during off-time (Sonnentag & Bayer, 2005), regardless of occupational norms, simply because these responses are driven by task demands. Yet, it is also possible that, when workload is seen as illegitimate, this activates additional stress responses that are physically harmful in the long term. Research has shown that unfair treatment and psychological contract violation are associated with poorer physical health (Robbins et al., 2012; Wager, Fieldman, & Hussey, 2003). Unfair treatment has also been linked to sleep problems, suggesting that illegitimate situations make it more difficult to rest outside of work (Hietapakka et al., 2013). To the extent that job–occupation incongruence contributes to perceived unfairness and activates emotions associated with this type of treatment, this may have implications for physical stress responses that make detachment and recovery more difficult and could still contribute to physical health problems beyond the effects of workload alone. This raises new theoretical and practical questions about occupational health and stress that deserve further research attention.

Finally, although psychological contract violation was found as a possible explanation for the differential effects of workload on depressive symptoms across occupations, it is possible that other factors also help explain the effects of incongruence. Workers in normatively low-pressure occupational roles may also lack the personal or social resources needed to cope with high demand levels. For example, workers may have insufficient occupational training to deal with heavy workload or lower levels of social support from coworkers or family members outside of work. Some of the occupations typically high in time pressure, such as executives, pharmacists, and attorneys, are also high in pay and other material forms of compensation, giving workers

in these situations greater resources to cope with the demands of heavy workload. Research has shown that an imbalance between the effort put towards work and the rewards received from work is an important factor in occupational strain (Siegrist, 1996) and this imbalance may play a role in the elevated stress reactions among workers in occupational roles that are normatively low in time pressure. Workers in lower-paying occupations in particular may receive fewer resources from work to balance out the demands placed on them. Thus, although results from Study 2 point to psychological contract violation as a potential explanation for differential reactions to workload across occupations, other explanations for these differential reactions exist and need to be further explored.

Although the Study 1 results provide evidence that job–occupation incongruence in workload may be a causal factor in the development of depressive symptoms, these results do not rule out the possibility that depressive symptoms also cause job–occupation incongruence. As seen in Table 1, in Study 1 depression at Time 1 was correlated with workload at Time 2, meaning that individuals with higher levels of depression may have been more prone to end up in situations where workload exceeded occupational norms. Other research suggests that poor psychological or physical health is indeed associated with subsequent increases in job demands and other potentially unfavourable conditions (Ford et al., in press; Frese, 1982), and this may manifest in workload levels that come to exceed occupational norms, in turn leading to more depressive symptoms. These reciprocal dynamics among workload and psychological well-being have been studied in more detail elsewhere (e.g., de Lange, Taris, Kompier, Houtman, & Bongers, 2004) and may provide more complete explanations for why job–occupation incongruence emerges.

Practical implications

These results extend our understanding of when and why workers react negatively to high workload levels and suggest that work roles should be designed with occupational norms and legitimacy in mind. Workers whose occupational roles typically involve low levels of time pressure are likely react negatively to increases in demands and work pace. Asking workers to perform work that is in alignment with occupational norms, on the other hand, may be less likely to lead to psychological strain. Organizations should also pay close attention to the resources available to workers in occupations that are typically lower in time pressure, as some of these occupations may be associated with lower levels of socioeconomic status and held by workers with fewer personal and social resources to cope with high workload levels.

It should be noted that workload among workers in occupations where high workload is the norm may still be related to strain. It just appears from the results that the effects are weaker among these workers than among workers where time pressure is not the norm. Stressors in high-pressure occupations might influence strain through other mechanisms that deplete resources and make work unpleasant. Deviations from occupational norms may exacerbate already known associations between workload and worker strain by adding the unfairness and illegitimacy as additional sources of strain.

A final practical implication of this study is the usefulness of O*NET ratings as benchmarks to better understand worker expectations and abilities to handle occupational stressors. As noted earlier, organizations might consider taking care to avoid developing workload levels that substantially deviate negatively from occupational norms. O*NET ratings provide one basis for understanding how occupational roles are typically structured. Direct use of items from O*NET questionnaires on employee surveys may even be useful for comparing an organization's work roles to occupational benchmarks, providing potentially more useful normative comparison points than industry- or national-level norms that do not consider occupational differences.

Limitations

This set of studies has some important limitations that should be considered when interpreting its results. First, although both longitudinal and cross-sectional data were included, a quasiexperiment or a study where expectations were measured at the start of employment would have offered a purer test of the causal effect of workload on depressive symptoms. Ideally, a future study might also capture the expected workload of workers as they enter a new job along with some of the determinants of workload expectations, including occupational norms and the organization's socialization practices. Changes in worker strain over time as a function of demands that deviate from expectations would provide stronger evidence for a causal connection among the variables assessed here. Relatedly, evidence for psychological contract violation as a mediator was based on cross-sectional data, meaning that it is not possible to make strong empirically based inferences about the causal ordering of job–occupation incongruence, psychological contract violation, and depressive symptoms. The proposed causal ordering of these variables relies heavily on theory, and the evidence from Study 1 suggesting incongruence does indeed predict depressive symptoms. However, this does not rule out reverse causation.

Another notable limitation is that the O*NET measure of time pressure does not precisely correspond with established measures of workload. We chose to use existing measures of occupational norms and workload in an attempt to fit the concept of job–occupation incongruence with existing theoretical frameworks and scales for assessing the work role stressors and occupational

context. Future research might consider using the actual O*NET items in individual worker questionnaires to assess job–occupation incongruence more directly. Results from such an analysis might be even stronger than those observed here, although they might also be more difficult to integrate with existing models of work stress and job demands.

A final limitation should be noted in interpreting the results of the tests of mediation. Although the indirect effects of incongruence on depression through psychological contract violation were significant, it is not clear how strong these mediated effects are. Incongruence between workload and occupational norms for time pressure explained approximately 1% of the variance in depression in Study 2 beyond the main effects of each. Psychological contract violation explained a significant proportion of this 1%. This offers an important explanation, but, because the size of the mediated effect was relatively modest, there may be other mediators that help further explain the effect of incongruence observed here. It is therefore important not to overstate the potential mediating role of psychological contract violation even though it is consistent with theory.

CONCLUSION

This study expands on previous research by demonstrating that workload is a stronger predictor of depressive symptoms among workers in occupations with normatively low levels of time pressure. Psychological contract violation, or the extent to which workers blame their organizations for failing to provide working arrangements they are entitled to, was shown to be one mechanism through which this job–occupation incongruence may be associated with depressive symptoms. Further research is needed delving into other explanations for these effects and incorporating longitudinal mediated models, but it generally appears that workload has a curvilinear association with depressive symptoms, with some of this curvilinearity dependent on occupational norms. Workers may look to their occupational peers and their own history within the same occupation as reference points in making sense of their work situation. From this perspective, work demands influence strain not only by presenting workers with unpleasant conditions, but also by threatening and/or fulfilling their goals for fair and legitimate work arrangements that align with occupational and professional norms and expectations.

REFERENCES

Berkowitz, L., & Harmon-Jones, E. (2004). Toward an understanding of the determinants of anger. *Emotion, 4*, 107–130.

Beyer, J. M., & Hannah, D. R. (2002). Building on the past: Enacting established personal identities in a new work setting. *Organization Science*, 13, 636–652.

Brim, O. G., Baltes, P. B., Bumpass, L. L., Cleary, P. D., Featherman, D. L., Hazzard, W. R., … Shweder, R. A. (2007). *National survey of midlife development in the United States*, 1995–1996 [Computer file]. ICPSR02760-v4. Ann Arbor, MI: DataStat/Boston, MA: Harvard Medical School, Dept. of Health Care Policy [producers]. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor].

Conway, N., & Briner, R. B. (2002). A daily diary study of affective responses to psychological contract breach and exceeded promises. *Journal of Organizational Behavior*, 23, 287–302.

Cropanzano, R., Goldman, B., & Folger, R. (2003). Deontic justice: The role of moral principles in workplace fairness. *Journal of Organizational Behavior*, 24, 1019–1024.

DeCelles, K. A., DeRue, D. S., Margolis, J. D., & Ceranic, T. L. (2012). Does power corrupt or enable? When and why power facilitates self-interested behavior. *Journal of Applied Psychology*, 97, 681–689.

de Lange, A. H., Taris, T. W., Kompier, M. A. J., Houtman, I. L. D., & Bongers, P. M. (2003). "The *very* best of the millennium": Longitudinal research and the demand-control-(support) model. *Journal of Occupational Health Psychology, 8*, 282–305.

de Lange, A. H., Taris, T. W., Kompier, M. A. J., Houtman, I. L. D., & Bongers, P. M. (2004). The relationships between work characteristics and mental health: Examining normal, reversed, and reciprocal relationships in a 4-wave study. *Work & Stress, 18*, 149–166.

Dierdorff, E. C., & Ellington, J. K. (2008). It's the nature of the work: Examining behavior-based sources of work-family conflict across occupations. *Journal of Applied Psychology*, 93, 883–892.

Dierdorff, E. C., & Morgeson, F. P. (2007). Consensus in work role requirements: The influence of discrete occupational context on role expectations. *Journal of Applied Psychology*, 92, 1228–1241.

Dierdorff, E. C., Rubin, R. S., & Morgeson, F. P. (2009). The milieu of managerial work: An integrative framework linking work context to role requirements. *Journal of Applied Psychology*, 94, 972–988.

Edwards, J. R. (1996). An examination of competing versions of the person-environment fit approach to stress. *Academy of Management Journal*, 39, 292–339.

Edwards, J. R., & Cooper, C. L. (1990). The person-environment fit approach to stress: Recurring problems and some suggested solutions. *Journal of Organizational Behavior*, 11, 293–307.

Edwards, J. R., & Parry, M. E. (1993). On the use of polynomial regression equations as an alternative to difference scores in organizational research. *Academy of Management Journal, 36*, 1577–1613.

Elovainio, M., Leino-Arjas, P., Vahtera, J., & Kivimaki, M. (2006). Justice at work and cardiovascular mortality: A prospective cohort study. *Journal of Psychosomatic Research*, 61, 271–274.

Ford, M. T. (2012). Job-occupation misfit as an occupational stressor. *Journal of Vocational Behavior*, 80, 412–421.

Ford, M. T., Matthews, R. A., Wooldridge, J. D., Mishra, V., Kakar, U., & Strahan, S. R. (in press). The influence of time lags on occupational stressor-strain effects: A review of longitudinal studies. *Work & Stress*.

Ford, M. T., & Wiggins, B. K. (2012). Occupational-level interactions between physical hazards and cognitive ability and skill requirements in predicting injury incidence rates. *Journal of Occupational Health Psychology, 17*, 268–278.

Frese, M. (1982). Occupational socialization and psychological development: An underemphasized research perspective in industrial psychology. *Journal of Occupational Psychology*, 55, 209–224.

Gakovic, A., & Tetrick, L. E. (2003). Psychological contract breach as a source of strain for employees. *Journal of Business and Psychology, 18*, 235–246.

Hayes, A. F., & Preacher, K. J. (2013). Statistical mediation analysis with a multicategorical independent variable. *British Journal of Mathematical and Statistical Psychology*. Advance online publication. doi: 10.1111/bmsp.12028.

Hietapakka, L., Elovainio, M., Heponiemi, T., Presseau, J., Eccles, M., Aalto, A. M., … Sinervo, T. (2013). Do nurses who work in a fair organization sleep and perform better and why? Testing potential

psychosocial mediators of organizational justice. *Journal of Occupational Health Psychology, 18*, 481–491.

Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. *American Psychologist, 44*, 513–524.

Johns, G. (2006). The essential impact of context on organizational behavior. *Academy of Management Review, 31*, 386–408.

Karasek, R. A. (1979). Job demands, job decision latitude, and mental strain: Implications for job redesign. *Administrative Science Quarterly, 24*, 285–308.

Karasek, R. A., & Theorell, T. (1990). *Healthy work: Stress, productive, and the reconstruction of working life*. New York, NY: Basic Books.

Kessler, R. C., Andrews, G., Mroczek, D., Ustun, B., & Wittchen, H.-U. (1998). The World Health Organization Composite International Diagnostic Interview Short Form (CIDI-SF). *International Journal of Methods in Psychiatric Research, 7*, 171–185.

Kessler, R. C., Berglund, P., Demler, O., Jin, R., Koretz, D., Merikangas, K. R., … Wang, P. S. (2003). The epidemiology of major depressive disorder: Results from the National Comorbidity Survey Replication (NCS-R). *Journal of American Medical Association, 289*, 23.

Kottwitz, M., Meier, L. L., Jacobshagen, N., Kalin, W., Elfering, A., Henig, J., & Semmer, N. K. (2008). Illegitimate tasks associated with higher cortisol levels among male employees when subjective health is relatively low: An intra-individual analysis. *Scandinavian Journal of Work, Environment, and Health, 34*, 337–344.

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York, NY: Springer.

Long, C. P., Bendersky, C., & Morrill, C. (2011). Fairness monitoring: Linking managerial controls and fairness judgments in organizations. *Academy of Management Journal, 54*, 1045–1068.

Morrison, E. W., & Robinson, S. L. (1997). When employees feel betrayed: A model of how psychological contract violation develops. *Academy of Management Review, 22*, 226–256.

Moss, M. K., & Frieze, I. H. (1993). Job preferences in the anticipatory socialization phase: A comparison of two matching models. *Journal of Vocational Behavior, 42*, 282–297.

Nixon, A. E., Mazzola, J. J., Bauer, J., Krueger, J. R., & Spector, P. E. (2011). Can work make you sick? A meta-analysis of the relationships between job stressors and physical symptoms. *Work & Stress, 25*, 1–22.

Peterson, N. G., Mumford, M. D., Borman, W. C., Jeanneret, P. R., Fleishman, E. A., Levin, K. Y., … Dye, D. M. (2001). Understanding work using the Occupational Information Network (O*NET): Implications for practice and research. *Personnel Psychology, 54*, 451–492.

Podsakoff, N. P., LePine, J. A., & LePine, M. A. (2007). Differential challenge stressor-hindrance stressor relationships with job attitudes, turnover intentions, turnover, and withdrawal behavior: A meta-analysis. *Journal of Applied Psychology, 92*, 438–454.

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40*, 879–891.

Robbins, J. M., Ford, M. T., & Tetrick, L. E. (2012). Perceived unfairness and employee health: A meta-analytic integration. *Journal of Applied Psychology, 97*, 235–272.

Robinson, S. L., & Morrison, E. W. (2000). The development of psychological contract breach and violation: A longitudinal study. *Journal of Organizational Behavior, 21*, 525–546.

Ryff, C. D., Almeida, D. M., Ayanian, J. S., Carr, D. S., Cleary, P. D., Coe, C., … Williams, D. (2011). *National survey of midlife development in the United States (MIDUS II), 2004–2006* [Computer file]. ICPSR04652-v5. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor]. doi:10.3886/ICPSR04652.v5.

Ryff, C. D., Seeman, T., & Weinstein, M. (2011). *National survey of midlife development in the United States (MIDUS II): Biomarker bibliographic citation: Project, 2004–2009* [Computer file]. ICPSR29282-v2. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor]. doi:10.3886/ICPSR29282.v2

Salancik, G. R., & Pfeffer, J. (1978). A social information processing approach to job attitudes and task design. *Administrative Science Quarterly, 23*, 224–253.

Semmer, N. K., Jacobshagen, N., Meier, L. L., & Elfering, A. (2007). Occupational stress research: The "stress-as-offense-to-self" perspective. In J. Houdmont & S. McIntyre (Eds.), *Occupational health psychology: European perspectives on research, education, and practices* (Vol. 2, pp. 42–60). Castelo da Maia: ISMAI Publishing.

Semmer, N. K., Tschan, F., Meier, L. L., Facchin, S., & Jacobshagen, N. (2010). Illegitimate tasks and counterproductive work behavior. *Applied Psychology: An International Review, 59*, 70–96.

Siegrist, J. (1996). Adverse health effects of high-effort/low-reward conditions. *Journal of Occupational Health Psychology, 1*, 27–41.

Skarlicki, D. P., & Rupp, D. E. (2010). Dual processing and organizational justice: The role of rational versus experiential processing in third-party reactions to workplace mistreatment. *Journal of Applied Psychology, 95*, 944–952.

Sonnentag, S., & Bayer, U.-V. (2005). Switching off mentally: Predictors and consequences of psychological detachment from work during off-job time. *Journal of Occupational Health Psychology, 10*, 393–414.

Spector, P. E., & Jex, S. M. (1998). Development of four self-reported measures of job stressors and strain: Interpersonal conflict at work scale, organizational constraints scale, quantitative workload inventory, and physical symptoms inventory. *Journal of Occupational Health Psychology, 3*, 356–367.

Spencer, S., & Rupp, D. E. (2009). Angry, guilty, and conflicted: Injustice toward coworkers heightens emotional labor through cognitive and emotional mechanisms. *Journal of Applied Psychology, 94*, 429–444.

Strong, M. H., Jeanneret, P. R., McPhail, S. M., Blakley, B. R., & D'Egidio, E. L. (1999). Work context: Taxonomy and measurement of the work environment. In N. G. Peterson, M. D. Mumford, W. C. Borman, P. R. Jeanneret, & E. A. Fleishman (Eds.), *An occupational information system for the 21st century: The development of O2NET* (pp. 127–145). Washington, DC: American Psychological Association.

US Bureau of Labor Statistics. (2010). Retrieved from http://www.bls.gov/soc.

Wager, N., Fieldman, G., & Hussey, T. (2003). The effect on ambulatory blood pressure of working under favourably and unfavourably perceived supervisors. *Occupational and Environmental Medicine, 60*, 468–474.

Wallace, M., Leicht, K. T., & Raffalovich, L. E. (1999). Unions, strikes, and labor's share of income: A quarterly analysis of the United States, 1949–1992. *Social Science Research, 28*, 265–288.

Watson, D., Weber, K., Assenheimer, J. S., Clark, L. A., Strauss, M. E., & McCormick, R. A. (1995). Testing a tripartite model: I. Evaluating the convergent and discriminant validity of anxiety and depression symptom scales. *Journal of Abnormal Psychology, 104*, 3–14.

Webster, J. A., Beehr, T. A., & Love, K. (2011). Extending the challenge-hindrance model of occupational stress: The role of appraisal. *Journal of Vocational Behavior, 79*, 505–516.

Weiss, H. M., Suckow, K., & Cropanzano, R. (1999). Effects of justice conditions on discrete emotions. *Journal of Applied Psychology, 84*, 786–794.