# Does Educational Attainment Promote Job Satisfaction?

## The Bittersweet Trade-offs Between Job Resources, Demands, and Stress


## Abstract

Education is considered one of the most critical human capital investments. But does formal educational attainment "pay off" in terms of job satisfaction? To answer this question, in Study 1 we use a meta-analytic technique to examine the correlation between educational attainment and job satisfaction ($k$ = 74, $N$ = 134,924) and find an effect size close to zero. We then build on the job demands-resources (JD-R) model and research that distinguishes between working conditions and perceived stress to theorize that educational attainment involves notable trade-offs. In Study 2 we develop and test a multipath, two-stage mediation model using a nationally representative sample to explore this idea. We find that, while better-educated individuals enjoy greater job resources (income, job autonomy, and job variety), they also tend to incur greater job demands (work hours, task pressure, job intensity, and time urgency). On average, these demands are associated with increased job stress and decreased job satisfaction, largely offsetting the positive gains associated with greater resources. Given that the net relationship between education and job satisfaction emerges as weakly negative, we highlight that important trade-offs underlie the education-job satisfaction link. In supplemental analyses, we identify boundary conditions based on gender and self-employment status (such that being female exacerbates, and being self-employed attenuates, the negative association between education and job satisfaction). Finally, we discuss the practical implications for individuals and organizations, as well as alternative explanations for the education-job satisfaction link.


*Keywords*: education, job satisfaction, job demands-resources (JD-R) model, stress

According to Aristotle, "the roots of education are bitter, but the fruit is sweet." Indeed, education is considered one of the most critical investments in human capital. Higher educational attainment can lead to more attractive job opportunities, greater labor force flexibility, and more rewarding jobs (Becker, 1964; Dickson & Harmon, 2011; Ng et al., 2005; Oreopoulos & Salvanes, 2011). Despite the potential for education to yield many benefits, some studies point in the opposite direction. For example, educational attainment has been negatively associated with organizational commitment (Angle & Perry, 1981; Morris & Sherman, 1981), job involvement (Lounsbury & Hoopes, 1986), and organizational identification (Gould & Werbel, 1983). Furthermore, higher levels of education and overqualification (which is often based on education; McKee-Ryan & Harvey, 2011) can lead to burnout, turnover intentions, job search behavior, and voluntary turnover (Erdogan & Bauer, 2009; Maslach et al., 2001; Maynard & Parfyonova, 2013). Of course, there are many indicators of what constitutes a "better" (or "worse") job. We focus on job satisfaction because it is arguably the most studied construct related to "how people think about and relate to their work and jobs" (Judge et al., 2017, p. 357). Currently, it is not clear that more formally educated employees are more satisfied at work.

To determine what we could glean about the relationship between the attainment of institutional education (hereafter, simply "education") and job satisfaction, we performed a meta-analytic technique on 74 independent samples since the year 2000 (Study 1). The link between education and job satisfaction had an effect size close to zero, but we reasoned there is likely more to the story than could be detected by a simple (albeit powerful) test of this correlation. Following Kluger and Tikochinsky (2001, p. 419), we conducted a second study to highlight how "additional factors must be taken into account to understand the [commonsense] phenomenon under study." Specifically, we drew on the job demands-resources (JD-R) model

(Demerouti et al., 2001) to theorize that education is associated with trade-offs that may help explain our meta-analytic finding (Study 2). We then tested a multipath, two-stage mediation model using a nationally representative, publicly available data set (see Appendix A), which improved the study's generalizability, transparency, and reproducibility (see Barnes et al., 2018). We found that better-educated individuals enjoy greater job resources (income, job autonomy, and job variety) and incur greater job demands (work hours, task pressure, job intensity, and time urgency), which explain job stress and job satisfaction in the hypothesized directions. The scripts we used for all analyses and data for Study 1 can be found on the Open Science Framework.[1]

## Study 1

To analyze the relationship between education and job satisfaction based on the extant literature, we first conducted a review to identify published articles related to job satisfaction since the year 2000. Specifically, we used a Boolean search of the keywords "job satisfaction" OR "work satisfaction" OR "employee satisfaction" in the following journals: *Journal of Applied Psychology, Academy of Management Journal, Organizational Behavior and Human Decision Processes, Personnel Psychology, Journal of Management, Journal of Organizational Behavior, Journal of Occupational and Organizational Psychology, Journal of Vocational Behavior, Journal of Business and Psychology, Journal of Business Venturing,* and *Entrepreneurship Theory and Practice*.[2] This review yielded 381 articles. Of those, 295 did not include education. Another 22 did not provide codeable information. Thus, our review covered 64 articles and 72 independent samples. We also included samples from two nationally representative data sets.[3]

[1] osf.io/ucyz2
[2] We initially searched for words in the title, abstract, and subject. This search often returned several thousand articles, most of which were irrelevant for our purposes. Therefore, we narrowed the search to the title and abstract. For comparison with Study 2, and to keep the search manageable, we searched for articles published since 2000.
[3] We also included the sample used in Study 2 and a sample from the British Household Panel Survey (from a prior version of this manuscript; for details, see Appendix B). The results did not change when excluded.

Thus, our analysis is based on 65 manuscripts ($k$ = 74 and $N$ = 134,924). Appendix B lists each study and provides coding, reliability, sample size, and effect size information. We note that none of the reviewed articles examined the direct (or indirect) relationship between education and job satisfaction; education was exclusively a control. According to Bernerth and Aguinis (2016), education is the fourth most common covariate (at 23%) in job satisfaction studies.

Because the effect of education varies across different groups (e.g., based on gender, race, etc.), and is thus likely to vary across studies, we used a random-effects model (Hunter & Schmidt, 2004) and also corrected for observed correlations of the sampling error and measurement unreliability. We used the *metafor* software package in R (Viechtbauer, 2010). As reported in Table 1, the sample-size-weighted mean observed correlation corrected for unreliability ($\hat{\bar{\rho}}$) spanned around zero ($\hat{\bar{\rho}}$ = -.010, $p$ = .58, 95% CI = [-.046, .026]). The Q test-statistic for homogeneity (Q = 283.32) had a $p$-value of .00, suggesting significant heterogeneity between studies. The presence of heterogeneity can also be inferred from the $I^2$, implying that close to 71 percent of the variability in the effect-size estimates is due to differences between studies. To explore this heterogeneity, we performed group analyses by examining whether there was a significant difference between studies that used a single-item (global) versus multi-item (facet) job satisfaction measure and between studies that used a multi-item (global) versus multi-item (facet) job satisfaction measure. These tests ($Q_b$ = .01, $p$ = .92 and $Q_b$ = .75, $p$ = .39, respectively) indicated that differences between these groups were statistically nonsignificant.

Overall, the effect size for the relationship between education and job satisfaction neared zero.[4] Because education was a covariate (versus primary variable of interest) in the reviewed studies, we do not expect publication bias due to the "file drawer problem" to be of concern.

[4] While Ng et al. (2005) found a weak, but positive relationship between education and job satisfaction, their meta-analysis consisted of studies published prior to 2004. Differences between their findings and ours (including the

## Study 2

In Study 2, we also expect to find an effect size close to zero. But, importantly, our aim is to further investigate the nature of the education-job satisfaction link by illuminating potential trade-offs associated with investments in education. Drawing on the JD-R model, we theorize that, relative to less-educated employees, the highly educated are more apt to attain jobs that provide them with greater resources but also involve greater demands. These working conditions tend to be associated with job stress and satisfaction (i.e., primary and secondary appraisals, respectively; Lazarus & Folkman, 1984, 1987). As such, we expect that *resources* decrease stress and increase job satisfaction, while *demands* increase stress and decrease job satisfaction (see Figure 1). While the educated may benefit in many ways, we test this trade-off story to provide one explanation for the near zero effect that emerged in Study 1. In supplemental analyses, we explore gender and self-employment status as boundary conditions.

### Education and Job Satisfaction via Job Resources and Stress

We first theorize that job resources help explain the education-job satisfaction link. Resources involve the rewards derived from one's work and the nature of the work itself (Demerouti et al., 2001). Here, we focus on income, job autonomy, and job variety. All three resources are prominent in the JD-R model (Bakker & Demerouti, 2007, 2017; Demerouti et al., 2001) and its precursors (e.g., Hackman & Oldham, 1975; Karasek, 1979). Most notably, the potential to earn more money continues to be one of the top reasons people attend college (Eagan et al., 2017). And higher education requires self-direction and involves acquiring a range of knowledge and critical thinking skills (Arnold & King, 1997; Bowen, 1997). Thus, it should not be surprising that education is positively associated with income (e.g., Ng et al., 2005; Ng &

---

gender analysis in Study 2) may be due to changes in the economy (and a betted educated female workforce), suggesting the importance of considering the time period studied in future work on the education-job satisfaction link.

Feldman, 2009), as well as job autonomy (i.e., discretion and control) and variety (Oreopoulos & Salvanes, 2011; Ross & Reskin, 1992; Seybolt, 1976). Whether valued in their own right or because they enable the acquisition or protection of other resources (Bakker & Demerouti, 2007; Hobfall, 1989), income, autonomy, and variety likely operate as first-stage mediators between education and job satisfaction (with reduced job stress linking these resources with satisfaction).

Indeed, while extrinsic rewards can diminish intrinsic *motivation* (Deci et al., 1999), the job satisfaction of the highly educated may still be "bought" via higher income. Pay satisfaction is a core component of job satisfaction (Smith et al., 1969), and those with higher pay report being more satisfied (Judge, Piccolo, et al., 2010). Earning more also enhances opportunities for work recovery (Leana & Meuris, 2015; Saxbe et al., 2011), including more "pleasant" off-job activities (Bennett et al., 2018; Demerouti et al., 2009) that may improve work engagement (Demerouti et al., 2012; ten Brummelhuis & Bakker, 2012) and help manage stressors and strain (Geurts & Sonnentag, 2006; Sonnentag & Fritz, 2007).

Job autonomy and variety may also yield higher job satisfaction due to having freedom (when to work, how to work, and what to do at work [Karasek, 1979; Morgeson & Humphrey, 2006]) and using a range of capabilities (Fried & Ferris, 1987), respectively. Such resources create a sense of accomplishment and meaningfulness (Hackman & Oldham, 1980). Autonomy and variety are also associated with increased work engagement (Christian et al., 2011; Mauno et al., 2007) and decreased burnout (Demerouti et al., 2001; Hakanen et al., 2011). These insights are relevant because engaged employees are less likely to experience work stress (Bakker et al., 2014, p. 391) and tend to report higher job satisfaction (e.g., Rich et al., 2010). In contrast, burnout is inextricably linked to stress (Pines & Keinan, 2005) and undermines job satisfaction

(Schaufeli & Buunk, 2002). Thus, it follows that autonomy and variety tend to lower stress and improve job satisfaction (Fried & Ferris, 1987; Humphrey et al., 2007). Altogether, we expect:

> *Hypotheses 1:* (*H1a*) Education is positively associated with job resources (i.e., income, job autonomy, and job variety), (*H1b*) job resources are negatively associated with job stress, and (*H1c*) education is indirectly and positively associated with job satisfaction, as mediated by job resources and job stress.

**Education and Job (Dis)Satisfaction via Job Demands and Stress**

So far, our logic is consistent with the dominant narrative regarding educational investment—attaining higher education should yield a more satisfying job. But, from a JD-R perspective, it is also important to consider the role of job demands. These working conditions generally require sustained physical and/or psychological effort and may be costly (Demerouti et al., 2001). Thus, as the second step in our theorizing, we argue that job demands operate as a countervailing mechanism to the resources pathway between education and job satisfaction.

We focus on hours worked and qualitative demands that reflect task pressure, job intensity, and time urgency, all of which are prominent in the literature (e.g., Crawford et al., 2010; Kristensen et al., 2004). Valuable insights have been gained from distinguishing between challenge and hindrance demands (e.g., Podsakoff et al., 2007). However, the same working conditions do not have similar meanings for all employees (Mazzola & Disselhorst, 2019; Webster et al., 2011). Thus, we do not make the challenge-hindrance distinction here, but we do differentiate between demands and perceived job stress. Thus, consistent with Bliese et al. (2017), we separate aspects of the job from the subjective reactions to those working conditions. Importantly, the highly educated tend to attain jobs in which they incur high-pressure, intense, and time-sensitive work (Hakanen et al., 2011; Judge, Klinger, et al., 2010; Wilk & Cappelli, 2003). Such job demands can become stressful (Cavanaugh et al., 2000) and costly if employees cannot adequately recover from their work (Bakker & Demerouti, 2007; Bennett et al., 2018;

Sonnentag & Fritz, 2015). Relative to the less-educated, highly educated employees report more work-related rumination, anxiety, and stress (Moen et al., 2013; Perko et al., 2017; Smith, 2001).

When stress is too high, it threatens the attainment of personal goals and, thus, can reduce job satisfaction (Begley & Czajka, 1993; Hendrix et al., 1985; Sullivan & Bhagat, 1992). Thus, greater job demands incurred by the highly educated may also help explain the education-job satisfaction link. For example, hours worked can lead to increased stress (Parker & DeCotiis, 1983; Perlow, 1999) and decreased job satisfaction (Clark & Oswald, 1996). Other demands may operate similarly: Negative experiences can result from having too much to accomplish with too little time (i.e., time pressure/work intensity [Schaubroeck et al., 1989]). Some research indicates that similar demands inherently imply greater stress (Motowidlo et al., 1986; Parker & DeCotiis, 1983) and predict lower job satisfaction (Verhofstadt et al., 2007; cf. Judge et al., 2000; Judge, Klinger, et al., 2010; Ng et al., 2005; Ng & Feldman, 2009). In sum, education may undermine job satisfaction via increased job demands and perceived stress. We do not imply that the highly educated are generally worse off, but, concurrent with H1a-c, we expect:

> *Hypotheses 2:* (*H2a*) Education is positively associated with job demands (i.e., hours worked and qualitative demands), (*H2b*) job demands are positively associated with job stress, and (*H2c*) education is indirectly and negatively associated with job satisfaction, as mediated by job demands and job stress.

**Sample**

We tested our model using data from the Household, Income, and Labour Dynamics in Australia (HILDA) survey—a nationally representative panel study of Australian households. The Australian Government funds the HILDA survey through the Department of Social Services. The survey collects information on many aspects of life, such as economic and personal wellbeing, labor markets, and family life. Like other major household panels, the coverage is broad and includes a core set of topics that appear in every wave and others that appear less

frequently (see https://melbourneinstitute.unimelb.edu.au/hilda/for-data-users). Based on people residing in private dwellings in Australia, the initial sample was selected in 2001 by identifying a sample of 488 Census Collection Districts and selecting a representative number of households within each district. New respondents received a "New Entrant Brochure"[5] explaining the survey. Data were collected through self-report surveys and in-person interviews, usually at the home of the respondent. Phone interviews were a last resort. Interviews varied in length from wave to wave but rarely exceeded 83 minutes per household. Because there is little within-person variation in education and 2005 was the first year in which most variables used to create our indices were available, we used only 2005 data for our analyses (which are cross-sectional).[6] Our sample included 16,958 full- and part-time (wage- and self-) employed individuals, ages 18 to 65 ($M$ = 35, $SD$ = 13; 50% male). Respondents were compensated with a $25 (AUD) check at this wave. For more information, see Watson and Wooden (2012).

**Measures**

*Education* reflects the number of years of education completed. We imputed these values from variables that measure respondents' highest educational level, age left school, and the highest year of school completed (Summerfield et al., 2016). For example, we assigned 12 years of education to a respondent who completed secondary education and 16 years to someone with a college degree. We did not measure the actual time spent obtaining a degree because it can vary with the number of degrees or time spent studying that did not lead to a degree. This

[5] https://melbourneinstitute.unimelb.edu.au/__data/assets/pdf_file/0008/3115484/BrochureW19M.pdf
[6] As Kennedy (2008) describes, when at all possible, it is best to approach data analyses with ordinary least squares regression applied to cross-sectional data. Moreover, the intraclass correlation coefficient strongly indicates that the data can be reliably aggregated to the person level without losing important variation (ICC(1) = .96; $p < .00$; Bliese, 1998, p. 359). With this in mind, we analyzed data at the person level in a single year so as to simplify the analysis and not induce contamination (i.e., bias) in our empirical estimates.

approach is common in the economics of education literature (Card, 1999) and among studies that use the HILDA survey (e.g., Nikolaev, 2016; Shields et al., 2009).

We use several measures that use Likert scales. *Job satisfaction* was assessed with "All things considered, how satisfied are you with your job," which is a reliable and valid proxy for global job satisfaction (e.g., Wanous et al., 1997), from 0 (*totally dissatisfied*) to 10 (*totally satisfied*). This item was strongly correlated ($r$ = .85) with a facet-level index of job satisfaction based on "the work itself," "total pay," "hours worked," "job security," and "flexibility."

Job stress, job autonomy, job variety, and qualitative demands were latent measures based on multiple items assessed using Likert-type scales from 1 (*strongly disagree*) to 7 (*strongly agree*). See Appendix C for evidence of content, convergent, discriminant, and nomological validities. We conceptualized *job stress* as a reaction to various working conditions with "My job is more stressful than I had ever imagined" and "I fear that the amount of stress in my job will make me physically ill" ($\alpha$ = .80). These items have been used in prior work (e.g., Hessels et al., 2017; Wu, 2016), are similar to the scale developed by Motowidlo et al. (1986), and capture experiences of stress (rather than any categorical demand/stressor). Within the JD-R literature, job resources may help achieve work goals, reduce physiological and psychological costs that stem from job demands, or stimulate personal growth (Demerouti et al., 2001). Thus, we captured *job autonomy* with "I have a lot of freedom to decide when I do my work," "I have a lot to say about what happens at my job," and "I have a lot of freedom to decide how I do my own work" ($\alpha$ = .82). We captured *job variety* with "My job requires me to learn new things," "I use many of my skills and abilities in my current job," and "My job provides me with a variety of interesting things to do" ($\alpha$ = .74). These items are prominent in prior studies (e.g., Crawford et al., 2010) and consistent with our theorizing as it relates to education. Measures of *qualitative*

*demands* often include pressure to complete tasks, job intensity, and time urgency (e.g., Crawford et al., 2010). We used the following items to capture job demands that match this conceptualization, originate from earlier related research (e.g., Karasek, 1979; Karasek et al., 1998), and are similar to items used in recent research (e.g., Xie et al., 2008): "I don't have enough time to do everything at work," "My job requires me to work intensely," and "My job requires me to work fast" ($\alpha = .72$).[7]

To measure *income*, we used the logarithmic transformation of respondents' labor earnings (wages and salaries from all employment) for the fiscal year. *Hours worked* reflects total time spent on work each week (including paid or unpaid overtime).

Finally, following prior research on job satisfaction, we controlled for *gender* (Bernerth & Aguinis, 2016; 0 = male, 1 = female), *age* and *age squared* (Clark et al., 1996), *marital status* (Ng et al., 2005; 0 = not married, 1 = married), and *self-employment status* (Benz & Frey, 2008; 0 = wage-employed, 1 = self-employed [i.e., "employee of one's own business" or "employer/self-employed" was selected]). Consistent with other national surveys (Global Entrepreneurship Monitor [GEM], 2016; OECD, 2016), eight percent of participants were self-employed, about one-third of whom were women. The results are robust to the exclusion of these covariates and to the inclusion of the Big Five traits (which we include in an alternative analysis, as they are associated with job satisfaction [Judge et al., 2002]; see Appendix D).

We report the descriptive statistics and bivariate correlations in Table 2. The correlation between education and job satisfaction is negative but trivial in magnitude. Yet, as we theorized, the relationship is more nuanced. Below, we demonstrate that the highly educated tend to enjoy greater resources but also incur demands and the associated stress that accompany their jobs.

**Analytical Approach**

[7] We dropped "My job is complex and difficult" due to its low factor loading in our confirmatory factor analysis.

We estimated a series of structural equation models in Stata 16 using the *sem* command, which relies on a maximum likelihood estimator (Baron & Kenny, 1986; Preacher & Hayes, 2008). We used Satorra-Bentler standard errors to correct for potential non-normality, and we used a bootstrapping technique to calculate bias-corrected confidence intervals using 10,000 bootstrapped samples for the indirect, direct, and total mediation effects. These models indicated that our proposed mediators separately mediated the education-job satisfaction relationship (see Table 3). As expected, income, job autonomy, and job variety each mediated the positive indirect effect of education on job satisfaction. Also as expected, hours worked, qualitative demands, and job stress each mediated the negative indirect effect of education on job satisfaction. Given the support for these effects, we then proceeded to estimate a single omnibus model, including the covariates described.[8] We necessarily included the direct effects from education to job stress and from education to all the resources and demands (i.e., first stage mediators) to job satisfaction.

**Primary Results**

Prior to hypothesis testing, we conducted a confirmatory factor analysis to examine the factor structure of our multi-item variables. We fit the data to a four-factor model in which items loaded onto their respective latent variables, which provided a reasonably acceptable fit ($\chi^2(38) = 5681.7$, CFI = .92, SRMR = .07, RMSEA = .09). Our full model explains 28% and 25% of the variation in job stress and job satisfaction, respectively. Figure 2 reports direct effects for each pathway.[9] Table 4 reports indirect, direct, and total effects of education on stress and satisfaction.

[8] In Appendix D, we present models (1) with no controls, (2) controlling for the Big Five personality traits, and (3) controlling for time since educational attainment. Moreover, in a series of robustness tests (available upon request), we controlled for job tenure, occupation tenure, and occupation type, used an alternative five-item (facet-like) measure of job satisfaction, examined future job satisfaction and different timing in our variables (using an expanded version of the HILDA data set across multiple waves), and replicated our indirect effects using Mplus 8.5. All results were similar or identical to those reported in the main text.

[9] The $\chi^2$ statistic was highly significant ($p > \chi^2 = 0.00$). However, the $\chi^2$ exact-fit test is extremely sensitive to discrepancies from expected values at increasing sample sizes (e.g., see Barrett, 2007). With a sample size greater than 10,000 observations (such as ours), the $\chi^2$ test is almost always significant (Burnham & Anderson, 2002).

We report unstandardized effects below ($p$'s < .01 unless noted otherwise), and we include both unstandardized and standardized effects in Figure 2.

First, we found that education is positively associated with resources (H1a), which are negatively associated with stress (H1b). Specifically, education is positively associated with income ($B$ = .12), autonomy ($B$ = .09), and variety ($B$ = .12). Also as expected, autonomy ($B$ = -.12) and variety ($B$ = -.03) are negatively associated with job stress. However, income is positively associated with stress ($B$ = .06). Thus, the indirect effect of education on job stress (via resources only) is negative but quite small (indirect effect = -.008, 95% CI [-.012, -.004]).

Next, our results indicated that education is indirectly and positively associated with job satisfaction, as mediated by job resources and job stress. Specifically, autonomy ($B$ = .27) and variety ($B$ = .48) are positively associated with job satisfaction, and stress is negatively associated with job satisfaction ($B$ = -.47). Though, the magnitude of income's effect on job satisfaction nears zero ($B$ = .02, $p$ = .21). Ultimately, the indirect net effect of education on job satisfaction (via resources alone and via resources and job stress) is positive (indirect effect = .086, 95% CI [.079, .095]), providing support for H1c. These results indicate that the more highly educated experience higher job satisfaction. Our results suggest that this is, in part, because they have more intrinsically rewarding jobs (i.e., autonomy and variety) and thus less stressful working conditions. So far, our results support the narrative that higher education is associated with an array of job resources that can help improve employees' job satisfaction.

However, our second set of hypotheses highlights how higher education can also be associated with undesirable (perhaps unexpected) outcomes. First, we found that education is positively associated with job demands (H2a), and job demands are positively associated with job stress (H2b). Specifically, education is associated with longer hours worked ($B$ = .69) and

greater qualitative demands (*B* = .07). In turn, hours worked (*B* = .02) and qualitative demands (*B* = .46) are positively associated with job stress. We also found that the indirect effect of education on job stress (via hours worked and qualitative demands) is positive overall (indirect effect = .045, 95% CI [.040, .050]).

Next, our results indicate that education is indirectly and negatively associated with job satisfaction through job demands and job stress. Specifically, hours worked (*B* = -.003) and qualitative demands (*B* = -.03) are negatively associated with job satisfaction. And, as we reported above, stress and job satisfaction are inversely related (*B* = -.47). Ultimately, the indirect net effect of education on job satisfaction (via demands alone and via demands and stress) is negative (indirect effect = -.025, 95% CI [-.029, -.022]; H2c). Thus, these findings suggest that those with higher education experience somewhat lower job satisfaction, in part, because of the greater job demands they encounter and thus more stressful working conditions.

Importantly, as suggested by the JD-R model, we interpret both sets of results in combination. Given that job stress is an important aspect of our model, we first note that education's total effect on stress, via both job resources and demands, is positive (total indirect effect = .056, 95% CI [.047, .066]). Thus, overall, highly educated employees experience greater job stress. Regarding job satisfaction, our results indicate that education's positive indirect effect via job resources and job stress (.086) is partially offset by education's negative indirect effect via job demands and job stress (-.025). Yet, even after accounting for all of these paths, we still found a negative direct association between education and job satisfaction (*B* = -.096, 95% CI [-.108, -.084]). Ultimately, education's negative association with job satisfaction (i.e., the direct effect, the indirect effect via demands, and the indirect effect via demands and stress) offsets its positive association with job satisfaction (i.e., the indirect effects via resources and via both

resources and stress), such that the total (net) effect of education on job satisfaction is negative, albeit quite small (total effect = -.043, 95% CI [-.056, -.031]).

Although our analyses cannot provide evidence of causal effects, a positive total (net) relationship between education and job satisfaction did not emerge. Thus, while the highly educated may receive an array of positive returns on their educational investment, our findings suggest that studying the direct relationship between education and job satisfaction on its own may be unfruitful or misleading in light of countervailing mechanisms.

**Supplemental Analyses**

Next, we explored whether gender and self-employment status operate as moderators, altering various pathways between education and job resources, demands, and stress. First, women still face workplace adversity (Weyer, 2007) that can undermine the positive returns on their educational investment (Heilman & Chen, 2003; Stevenson & Wolfers, 2009). This dynamic is particularly important given the reversal of the gender gap in education, with more women completing higher education than men (OECD, 2017). As such, we explored the notion that the education-job satisfaction link is negative and stronger for women. Using our HILDA survey sample, we conducted a group comparison analysis. We allowed the path coefficients (structural paths) and the error variances to differ across the two groups (males and females). We also tested (using the post estimation command *estat ginvariant* in Stata 16) whether each path in our model is significantly different between the two groups (or should be treated as equal).

As reported in Figure 3, we found a significantly stronger negative direct association between education and job satisfaction for women than men. Our results also indicate that highly educated women are more likely to earn higher income and experience greater job variety than their male counterparts. But they report significantly less autonomy, greater qualitative

demands—which is associated with greater job stress—and more hours worked. Overall, the total effect of education on job stress (via resources and demands) is considerably stronger for women (total effect = .073, 95% CI [.060, .087]) than for men (total effect = .041, 95% CI [.028, .054]). Similarly, with regard to job satisfaction, while education has a small negative effect for men (total effect = -.021, 95% CI [-.040, -.003]), the effect is much larger for women (total effect = -.061, 95% CI [-.078, -.044]). These results suggest that, compared to their male counterparts, highly educated women experience more stress at work and lower job satisfaction. These negative experiences may stem from empowerment messages that imply women are responsible for solving gender inequality at work (Kim et al., 2018). Such messages may prompt highly educated women (versus men) to shoulder greater responsibility in the household and in the labor market to adhere to gender role expectations while advancing their careers. Of course, we need future research to explore the many explanations that may underlie the differential effects of educational attainment for women vis-à-vis men.

Finally, relative to traditional occupations, self-employment offers considerable flexibility to organize one's work schedule, choose the content of one's work, and decide how to respond to job demands (Nikolaev et al., 2019; Stephan, 2018). As such, we explored the notion that self-employment weakens the relationship between education and job satisfaction. To do so, we conducted a group comparison analysis between the self-employed and (wage-)employed using the same data and parameters described above for our gender analysis.

As reported in Figure 4, we found that better educated workers in self-employment (versus wage-employment) report lower income, less autonomy, less variety, and slightly greater qualitative demands, but fewer hours worked. Quite notably, we found that the net association between education and job stress (via resources and demands) is positive and stronger for the

wage-employed (total effect = .062, 95% CI [.052, .072]) while weaker with a near zero effect for the self-employed (total effect = .007, 95% CI -.021, .034]). Regarding job satisfaction, our results indicate that, while education has a near zero net association with job satisfaction for the self-employed (total effect = -.013, 95% CI [-.049, .023]), education has a negative net association for the wage-employed (total effect = -.048, 95% CI [-.060, -.034]). Altogether, compared to their wage-employed counterparts, those in self-employment seem to be more insulated from the adverse effects of education on job stress and satisfaction. We contend that illuminating this boundary condition is notable for the educated and organizations that value (and want to retain) their educated employees. But again, we cannot determine causality.

## Discussion

Neither our meta-analysis in Study 1 nor the total effect that emerged in Study 2 indicated that the highly educated tend to report higher job satisfaction. Drawing on the JD-R model and distinguishing between working conditions and job stress, we theorized that the story is more nuanced. In Study 2, we found that, despite being associated with greater resources (and indirectly less stress and higher job satisfaction), education is also associated with greater demands (and indirectly more stress and lower job satisfaction). Ultimately, our work suggests a trade-off story: The fruit of education may be described as sweet, but also somewhat bitter.

In terms of contributions, career success studies have largely investigated education's effect on extrinsic outcomes, such as income. Notably, Ng and colleagues' (2005) meta-analysis included education and job satisfaction. But given changes in the economy and an increasingly educated workforce (Fry et al., 2018), we believe our meta-analysis, which is based on more recent empirical work, provides additional value. Importantly, Study 1 revealed a near zero correlation and set the groundwork for our second contribution. Study 2 identified two

countervailing pathways from education to job satisfaction that indicate the nuance of the relationship missed when looking at a simple main effect. Also, building on the JD-R model, we demonstrated how resources and demands operate as explanatory mechanisms. Indeed, we have offered one explanation. But the positive and negative pathways that emerged in our primary and supplemental analyses provide a basis for further theorizing on the impact of education.

**Practical Implications**

We do not suggest avoiding higher education to achieve higher job satisfaction. Rather, while our indirect effects are relatively small, a realistic calculation of trade-offs between desirable working conditions and experiences of stress and job satisfaction may still help workers make decisions that suit their priorities or recalibrate their values. Leaders may also consider better ways to manage the greater demands encountered by their highly educated employees so that exploiting an organization's, arguably, greatest human capital does not backfire. For example, by removing incentives to adopt excessive work hours, organizations can avoid inadvertently pressuring employees to incur stress that undermines job satisfaction. Indeed, redefining the ideal worker away from someone "totally dedicated to their [job] and always on call" may improve organizational outcomes (Reid & Ramarajan, 2016, p. 86). This redefinition of the ideal worker may benefit the highly educated as they are susceptible to incurring demands and experiencing job stress in kind. Such progress may help attract and retain top talent.

**Limitations and Future Directions**

Despite its advantages, our archival data set (Study 2) required us to rely on a single-item measure of job satisfaction and limited our use of established measures and relevant variables. For instance, perhaps a more robust measure of stress or assessing strain would better capture the negativity associated with demands and alter the net effect. Moreover, scholars have long

identified two dimensions of job demands: challenges and hindrances (Cavanaugh et al., 2000), which reflect ostensibly "good" versus "bad" stressors (Lazarus, 1966; Selye, 1974). While these dimensions play distinct roles in employees' experiences and outcomes (Crawford et al., 2010; Podsakoff et al., 2007), we could not draw on this framework due to data availability.

However, in some contexts, making a priori distinctions between challenge and hindrance demands can be arbitrary. Indeed, recent studies highlight the role of idiosyncratic appraisals and how employees can perceive so-called challenge demands as hindrances and vice versa (Bakker & Demerouti, 2017; Mazzola & Disselhorst, 2019; Searle & Auton, 2015; Webster et al., 2011). Thus, challenges (such as high workload) may only yield positive outcomes when appraised as opportunities versus threats (González-Morales & Neves, 2015). Here, we assessed job stress as a phenomenological experience and general reaction to one's working conditions. In the future, investigation of the subjective appraisals of each job demand as challenging or hindering may provide additional insights into how the highly educated experience their jobs.

Also, we offered a set of indirect effects as an explanation for the null effect (or weak negative effect in Study 2) of education on job satisfaction. But there are additional potential explanations that may be illuminating based on theory (e.g., the Big-Fish-Little-Pond effect [Huguet et al., 2009]), empirics (e.g., Western-sample restriction of range [Diener & Oishi, 2000]), or the inclusion of moderators (e.g., worker age [Truxillo et al., 2012]) and alternative outcomes (e.g., life satisfaction [Adams et al., 1996], job security [Kraimer et al., 2005], and career mobility [Baruch et al., 2016]). Nonetheless, the current study serves to provide new insights into the relationship between education and job satisfaction and, hopefully, stimulate additional inquiry. For example, beyond job characteristics, we hope that future research explores whether an expectation-reality gap also underlies the education-job satisfaction link.

Indeed, education generates higher job expectations, which appear more difficult to meet (Jebb et al., 2018). Due to their investments, the highly educated may even have unrealistic expectations about how they fare relative to others. Thus, examining social comparison processes may be fruitful. Because childhood socioeconomic status affects educational attainment (Bradley & Corwyn, 2002), accounting for this variable would help clarify the extent to which education versus expectations is associated with job satisfaction. Our post-hoc analyses also revealed that being female exacerbates and being self-employed attenuates the negative education-job satisfaction link. These findings suggest the need for further theorizing (e.g., from a gendered [Clark, 1997] and an entrepreneurship [Carter, 2011] perspective, respectively) and empirical investigation of workers' differential expectations.

Furthermore, we were surprised to find a positive relationship between income and job stress (contrary to H1b). Future research may explore whether income is more likely to provide resources for non-work life (a *life* resource versus *job* resource) and thus reduce non-work stress rather than work stress. In fact, exploratory findings suggest that education may increase job stress via income (indirect effect = .012, 95% CI [.010, .015]). Variation in one's work centrality or job involvement may also shed light on the effects of income in different (work versus non-work) domains.

Finally, we examined a snapshot in time. Prior work indicates that effects of job rewards remain positive over time, whereas job costs increasingly undermine job satisfaction (Rusbult & Farrell, 1983) and negative (versus positive) experiences are generally stronger, compound more quickly, and prevail (Rozin & Royzman, 2001). Because job demands are inevitable, future work may seek to understand how, in the long run, the highly educated may better calibrate their job expectations or leverage their resources to better manage job stress and enhance job satisfaction.

References

Adams, G. A., King, L. A., & King, D. W. (1996). Relationships of job and family involvement, family social support, and work–family conflict with job and life satisfaction. *Journal of Applied Psychology*, *81*(4), 411.

Angle, H. L., & Perry, J. L. (1981) An empirical assessment of organizational commitment and organizational effectiveness. *Administrative Science Quarterly*, *26*, 1-14.

Arnold, K. D., & King, I. C. (1997). *College student development and academic life: Psychological, intellectual, social, and moral issues*. Hoboken, NJ: Taylor & Francis.

Bakker, A. B., & Demerouti, E. (2007). The job demands–resources model: State of the art. *Journal of Managerial Psychology*, *22*, 309–328.

Bakker, A. B., & Demerouti, E. (2017). Job demands-resources theory: Taking stock and looking forward. *Journal of Occupational Health Psychology*, *22*, 273-285.

Bakker, A. B., Demerouti, E., & Sanz-Vergel, A. I. (2014). Burnout and work engagement: The JD-R approach. *Annual Review of Organizational Psychology and Organizational Behavior, 1,* 389–411.

Barnes, C. M., Dang, C. T., Leavitt, K., Guarana, C. L., & Uhlmann, E. L. (2018). Archival data in micro-organizational research: A toolkit for moving to a broader set of topics. *Journal of Management*, *44*(4), 1453-1478.

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*, 1173–1182.

Barrett, P. (2007). Structural equation modelling: Adjudging model fit. *Personality and Individual Differences*, *42*, 815–824.

Baruch, Y., Altman, Y., & Tung, R. L. (2016). Career mobility in a global era: Advances in managing expatriation and repatriation. *Academy of Management Annals*, *10*(1), 841-889.

Becker, G. S. (1964). *Human capital: A theoretical and empirical analysis, with special reference to education*. Chicago, IL: University of Chicago Press.

Begley, T. M., & Czajka, J. M. (1993). Panel analysis of the moderating effects of commitment on job satisfaction, intent to quit, and health following organizational change. *Journal of Applied Psychology*, *78*, 552–556.

Bennett, A. A., Bakker, A. B., & Field, J. G. (2018). Recovery from work-related effort: A meta-analysis. *Journal of Organizational Behavior*, *39*, 262–275.

Benz, M., & Frey, B. S. (2008). Being independent is a great thing: Subjective evaluations of self-employment and hierarchy. *Economica*, *75*, 362–383.

Bernerth, J. B., & Aguinis, H. (2016). A critical review and best-practice recommendations for control variable usage. *Personnel Psychology*, *69*, 229-283.

Bliese, P. D. (1998). Group Size, ICC Values, and Group-Level Correlations: A Simulation. *Organizational Research Methods*, *1*(4), 355–373.

Bliese, P. D., Edwards, J. R., & Sonnentag, S. (2017). Stress and wellbeing at work: A century of empirical trends reflecting theoretical and societal influences. *Journal of Applied Psychology*, *102*, 389–402.

Bowen, H. R. (1997). *Investment in learning*. Baltimore, MD: JHU Press.

Bradley, R. H., & Corwyn, R. F. (2002). Socioeconomic status and child development. *Annual Review of Psychology*, *53*, 371-399.

ten Brummelhuis, L. L., & Bakker, A. B. (2012). Staying engaged during the week: The effect of off-job activities on next day work engagement. *Journal of Occupational Health Psychology*, *17*, 445–455.

Burnham, K. P., & Anderson, D. R. (2002). *Model selection and multimodel inference: A practical information-theoretic approach* (2nd ed.). New York, NY: Springer.

Card, D. (1999). The causal effect of education on earnings. In O. C. Ashenfelter & D. Card (Eds.), *Handbook of labor economics* (Vol. 3, Part A, pp. 1801–1863). Amsterdam, Netherlands: Elsevier.

Carter, S. (2011). The rewards of entrepreneurship: Exploring the incomes, wealth, and economic well–being of entrepreneurial households. *Entrepreneurship Theory and Practice*, *35*(1), 39-55.

Cavanaugh, M. A., Boswell, W. R., Roehling, M. V., & Boudreau, J. W. (2000). An empirical examination of self-reported work stress among U.S. managers. *Journal of Applied Psychology*, *85*, 65–74.

Christian, M. S., Garza, A. S., & Slaughter, J. E. (2011). Work engagement: A quantitative review and test of its relations with task and contextual performance. *Personnel Psychology*, *64*, 89–136.

Clark, A. E. (1997). Job satisfaction and gender: why are women so happy at work?. *Labour economics*, *4*(4), 341-372.

Clark, A. E., & Oswald, A. J. (1996). Satisfaction and comparison income. *Journal of Public Economics*, *61*, 359–381.

Clark, A., Oswald, A., & Warr, P. (1996). Is job satisfaction U-shaped in age? *Journal of Occupational and Organizational Psychology*, *69*, 57–81.

Crawford, E. R., LePine, J. A., & Rich, B. L. (2010). Linking job demands and resources to employee engagement and burnout: A theoretical extension and meta-analytic test. *Journal of Applied Psychology*, *95*, 834–848.

Deci, E. L., Koestner, R., & Ryan, R. M. (1999). A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation. *Psychological Bulletin, 125,* 627–668.

Demerouti, E., Bakker, A. B., Geurts, S. A. E., & Taris, T. W. (2009). Daily recovery from work-related effort during non-work time. In S. Sonnentag, P. L. Perrewé, & D. C. Ganster (Eds.), *Current perspectives on job-stress recovery: Research in occupational stress and well-being* (Vol. 7, pp. 85–123). Bingley, UK: JAI Press.

Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. B. (2001). The job demands–resources model of burnout. *Journal of Applied Psychology*, *86*, 499–512.

Demerouti, E., Bakker, A. B., Sonnentag, S., & Fullagar, C. J. (2012). Work related flow and energy at work and at home: A study on the role of daily recovery. *Journal of Organizational Behavior*, *33*, 276–295.

Dickson, M., & Harmon, C. (2011). Economic returns to education: What we know, what we don't know, and where we are going—some brief pointers. *Economics of Education Review*, *30*, 1118–1122.

Diener, E., & Oishi, S. (2000). Money and happiness: Income and subjective well-being across nations. *Culture and subjective well-being*, 185-218.

Eagan, M. K., Stolzenberg, E. B., Zimmerman, H. B., Aragon, M. C., Whang Sayson, H., & Rios-Aguilar, C. (2017). *The American freshman: National norms fall 2016.* Los Angeles: Higher Education Research Institute, UCLA. Retrieved from www.heri.ucla.edu

Erdogan, B. & Bauer, T. N. (2009). Perceived overqualification and its outcomes: The moderating role of empowerment. *Journal of Applied Psychology*, *94*, 557-565.

Fried, Y., & Ferris, G. R. (1987). The validity of the job characteristics model: A review and meta-analysis. *Personnel Psychology*, *40*, 287–322.

Fry, R., Igielnik, R., & Patten, E. (2018). How Millennials today compare with their grandparents 50 years ago [Web log]. Retrieved from https://www.pewresearch.org/fact-tank/2018/03/16/how-millennials-compare-with- their-grandparents/

Geurts, S.A.E., & Sonnentag, S. (2006). Recovery as an explanatory mechanism in the relation between acute stress reactions and chronic health impairment. *Scandinavian Journal of Work, Environment & Health*, *32*, 482-492.

Global Entrepreneurship Monitor (GEM). (2016). *Global Entrepreneurship Monitor 2015/16 Global Report*. Retrieved from https://www.gemconsortium.org/report

González-Morales, G. M., & Neves, P. (2015). When stressors make you work: Mechanisms linking challenge stressors to performance. *Work & Stress*, *29*, 213-229.

Gould, S. & Werbel, J. D. (1983). Work involvement: A comparison of dual wage earner and single wage earner families. *Journal of Applied Psychology*, *68*, 313-319.

Hackman, J. R., & Oldham, G. R. (1975). Development of the job diagnostic survey. *Journal of Applied Psychology*, *60*, 159–170.

Hackman, R. J., & Oldham, G. R. (1980). *Work redesign*. San Francisco, CA: Addison Wesley.

Hakanen, J., Bakker, A. B., & Jokisaari, M. (2011). A 35-year follow-up study on burnout among Finnish employees. *Journal of Occupational Health Psychology*, *16*, 345–360.

Heilman, M. E., & Chen, J. J. (2003). Entrepreneurship as a solution: The allure of self-employment for women and minorities. *Human Resource Management Review*, *13*, 347–364.

Hendrix, W., Ovalle, N.K., & Troxler, R.G. (1985). Behavioral and physiological consequences of stress and its antecedent factors. *Journal of Applied Psychology*, *70*, 188-201.

Hessels, J., Rietveld, C. A., & van der Zwan, P. (2017). Self-employment and work-related stress: The mediating role of job control and job demand. *Journal of Business Venturing*, *32*, 178-196.

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

Huguet, P., Dumas, F., Marsh, H., Régner, I., Wheeler, L., Suls, J., . . . Nezlek, J. (2009). Clarifying the role of social comparison in the big-fish–little-pond effect (BFLPE): An integrative study. *Journal of Personality and Social Psychology, 97*(1), 156-170.

Humphrey, S. E., Nahrgang, J. D., & Morgeson, F. P. (2007). Integrating motivational, social, and contextual work design features: A metaanalytic summary and theoretical extension of the work design literature. *Journal of Applied Psychology*, *92*, 1332–1356.

Hunter, J. E., & Schmidt, F. L. (2004). *Methods of meta-analysis: Correcting error and bias in research findings*. Thousand Oaks, CA: Sage.

Jebb, A. T., Tay, L., Diener, E., & Oishi, S. (2018). Happiness, income satiation and turning points around the world. *Nature Human Behavior*, *2*, 33-38.

Judge, T. A., Bono, J. E., & Locke, E. A. (2000). Personality and job satisfaction: The mediating role of job characteristics. *Journal of Applied Psychology, 85*(2), 237-249.

Judge, T. A., Heller, D., & Mount, M. K. (2002). Five-factor model of personality and job satisfaction: A meta-analysis. *Journal of Applied Psychology, 87*(3), 530–541.

Judge, T. A., Klinger, R. L., & Simon, L. S. (2010). Time is on my side: Time, general mental ability, human capital, and extrinsic career success. *Journal of Applied Psychology*, *95*, 92-107.

Judge, T. A., Piccolo, R. F., Podsakoff, N. P., Shaw, J. C., & Rich, B. L. (2010). The relationship between pay and job satisfaction: A meta-analysis of the literature. *Journal of Vocational Behavior*, *77*, 157–167.

Judge, T. A., Weiss, H. M., Kammeyer-Mueller, J. D., & Hulin, C. L. (2017). Job attitudes, job satisfaction, and job affect: A century of continuity and of change. *Journal of Applied Psychology, 102*(3), 356-374.

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

Karasek, R., Brisson, C., Kawakami, N., Houtman, I., Bongers, P., Amick, B., (1998). The job content questionnaire (JCQ): An instrument for internationally comparative assessments of psychosocial job characteristics. *Journal of Occupational Health Psychology*, *3*, 322–355.

Kennedy, P. (2008). *A Guide to Econometrics (2nd Edition ed.)*. Oxford, UK: Blackwell.

Kim, J. Y., Fitzsimons, G. M., & Kay, A. C. (2018). Lean in messages increase attributions of women's responsibility for gender inequality. *Journal of Personality and Social Psychology, 115*(6), 974-1001.

Kluger, A. N., & Tikochinsky, J. (2001). The error of accepting the "theoretical" null hypothesis: The rise, fall, and resurrection of commonsense hypotheses in psychology. *Psychological Bulletin*, *127*(3), 408–423.

Kraimer, M. L., Wayne, S. J., Liden, R. C., & Sparrowe, R. T. (2005). The role of job security in understanding the relationship between employees' perceptions of temporary workers and employees' performance. *Journal of Applied Psychology*, *90*(2), 389.

Kristensen, T.S., Bjorner, J.B., Christensen, K.B., Borg, V. (2004). The distinction between work pace and working hours in the measurement of quantitative demands at work. *Work & Stress*, *18*, 305–322.

Lazarus, R. S. (1966). *Psychological Stress and the Coping Process*. McGraw-Hill: New York.

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

Lazarus, R. S., & Folkman, S. (1987). Transactional theory and research on emotions and coping. *European Journal of Personality*, *1*, 141-169.

Leana, C. R., & Meuris, J. (2015). Living to work and working to live: Income as a driver of organizational behavior. *Academy of Management Annals*, *9*, 55-95.

Lounsbury, J. W., & Hoopes, L. L. (1986). A vacation from work: Changes in work and nonwork outcomes. *Journal of Applied Psychology*, *71*, 392-401.

Maslach, C., Schaufeli, W. B., & Leiter, M. P. (2001). Job burnout. *Annual Review of Psychology*, *52*, 397-422.

Mauno, S., Kinnunen, U., & Ruokolainen, M. (2007). Job demands and resources as antecedents of work engagement: A longitudinal study. *Journal of Vocational Behavior*, *70*, 149-171.

Maynard, D. C., & Parfyonova, N. M. (2013). Perceived overqualification and withdrawal behaviours: Examining the roles of job attitudes and work values. *Journal of Occupational and Organizational Psychology*, *86*, 435-455.

Mazzola, J. J., & Disselhorst, R. (2019). Should we be "challenging" employees?: A critical review and meta-analysis of the challenge-hindrance model of stress. *Journal of Organizational Behavior*, *40*, 949-961.

McKee-Ryan, F. M., & Harvey, J. (2011). "I have a job, but…" A review of underemployment." *Journal of Management*, *37*, 962-996.

Moen, P., Lam, J., Ammons, S., & Kelly, E. (2013). Time work by overworked professionals: Strategies in response to the stress of higher status. *Work and Occupations*, *40*, 79–114.

Morgeson, F. P., & Humphrey, S. E. (2006). The Work Design Questionnaire (WDQ): Developing and validating a comprehensive measure for assessing job design and the nature of work. *Journal of Applied Psychology*, *91*, 1321–1339.

Morris, J. H., & Sherman, J. D. (1981). Generalizability of an organizational commitment model. *Academy of Management Journal*, *24*, 512-526.

Motowidlo, S. J., Packard, J. S., & Manning, M. R. (1986). Occupational stress: Its causes and consequences for job performance. *Journal of Applied Psychology*, *71*, 618–629.

Ng, T. W. H., Eby, L. T., Sorensen, K. L., & Feldman, D. C. (2005). Predictors of objective and subjective career success: A meta-analysis. *Personnel Psychology*, *58*, 367–408.

Ng, T. W. H., & Feldman, D. C. (2009). Age, work experience, and the psychological contract. *Journal of Organizational Behavior*, *30*, 1053–1075.

Nikolaev, B. (2016). Does other people's education make us less happy? *Economics of Education Review*, *52*, 176–191.

Nikolaev, B., Boudreaux, C. J., & Wood, M. (2019). Entrepreneurship and subjective well-being: The mediating role of psychological functioning. *Entrepreneurship Theory and Practice*. https://doi.org/10.1177/1042258719830314

OECD. (2016). Employment - self-employment rate - OECD data. *OECD*. Retrieved from https://data.oecd.org/emp/self-employment-rate.htm

OECD. (2017). *Education at a glance 2017: OECD indicators*. Retrieved from https://doi.org/10.1787/eag-2017-en

Oreopoulos, P., & Salvanes, K. G. (2011). Priceless: The nonpecuniary benefits of schooling. *Journal of Economic Perspectives*, 25, 159–184.

Parker, D. F., & DeCotiis, T. A. (1983). Organizational determinants of job stress. *Organizational Behavior and Human Performance*, *32*, 160-177.

Perko, K., Kinnunen, U., & Feldt, T. (2017). Long-term profiles of work-related rumination associated with leadership, job demands, and exhaustion: A three-wave study. *Work & Stress*, *31*(4), 395-420.

Perlow, L. A. (1999). The time famine: Towards a sociology of work time. *Administrative Science Quarterly*, *44*, 57–81.

Pines, A. M., & Keinan, G. (2005). Stress and burnout: The significant difference. *Personality and Individual Differences*, *39*, 625-635.

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*(3), 879-891.

Reid, E., & Ramarajan, L. (2016). Managing the high-intensity workplace. *Harvard Business Review*, *94*(6), 78-85.

Rich, B. L., LePine, J. A., & Crawford, E. R. (2010). Job engagement: Antecedents and effects on job performance. *Academy of Management Journal*, *53*, 617–635.

Ross, C. E., & Reskin, B. F. (1992). Education, control at work, and job satisfaction. *Social Science Research*, *21*, 134-148.

Rozin, P., & Royzman, E. B. (2001). Negativity bias, negativity dominance, and contagion. *Personality and Social Psychology Review, 5*, 296–320.

Rusbult, C. E., & Farrell, D. (1983). A longitudinal test of the investment model: The impact on job satisfaction, job commitment, and turnover of variations in rewards, costs, alternatives, and investments. *Journal of Applied Psychology*, *68*, 429–438.

Saxbe, D. E., Repetti, R. L., & Graesch, A. P. (2011). Time spent in housework and leisure: Links with parents' physiological recovery from work. *Journal of Family Psychology*, *25*, 271–281.

Schaubroeck, J., Cotton, J. L., & Jennings, K. R. (1989). Antecedents and consequences of role

stress: A covariance structure analysis. *Journal of Organizational Behavior*, *10*, 35-58.

Schaufeli, W.B. & Buunk, B.P. (2002) Burnout: An overview of 25 years of research and theorizing. M.J. Schabracq, J.A.M. Winnubst, C.L. Cooper (Eds.), *Handbook of work and health psychology* (pp. 383-425). Chichester: Wiley.

Searle, B. J., & Auton, J. C. (2015). The merits of measuring challenge and hindrance appraisals. *Anxiety, Stress, & Coping*, *28*, 121–143.

Selye, H. (1974). Stress without distress. Philadelphia: Lippincott.

Seybolt, J. W. (1976). Work satisfaction as a function of the person-environment interaction. *Organizational Behavior and Human Performance*, *17*, 66-75.

Shields, M. A., Price, S. W., & Wooden, M. (2009). Life satisfaction and the economic and social characteristics of neighbourhoods. *Journal of Population Economics*, *22*, 421–443.

Smith, A. (2001). Perceptions of stress at work. *Human Resources Management Journal*, *11*, 74-86.

Smith, P. C., Kendall, L. M., & Hulin, C. L. (1969). *The measurement of satisfaction in work and retirement*. Chicago: Rand McNally.

Sonnentag, S., & Fritz, C. (2007). The recovery experience questionnaire: Development and validation of a measure for assessing recuperation and unwinding from work. *Journal of Occupational Health Psychology*, *12*, 204–221.

Sonnentag, S., & Fritz, C. (2015). Recovery from job stress: The stressor-detachment model as an integrative framework. *Journal of Organizational Behavior*, *36*, S72-S103.

Stephan, U. (2018). Entrepreneurs' mental health and well-being: A review and research agenda. *Academy of Management Perspectives*, *32*, 290-322.

Stevenson, B., & Wolfers, J. (2009). The paradox of declining female happiness. *American Economic Journal: Economic Policy*, *1*, 190–225.

Sullivan, S. E., & Bhagat, R. S. (1992). Organizational stress, job satisfaction, and job performance: Where do we go from here? *Journal of Management*, *18*, 353–374.

Summerfield, M., Freidlin, S., Hahn, M., La, N., Li, N., Macalalad, N., O'Shea, M., . . .Wooden, M. (2016). *HILDA User Manual – Release 15*. Retrieved from https://melbourneinstitute.unimelb.edu.au/data/assets/pdf_file/0007/2194342/HILDA_User_Manual_Release_15.0.pdf

Truxillo, D. M., Cadiz, D. M., Rineer, J. R., Zaniboni, S., & Fraccaroli, F. (2012). A lifespan perspective on job design: Fitting the job and the worker to promote job satisfaction, engagement, and performance. *Organizational Psychology Review*, *2*(4), 340-360.

Verhofstadt, E., De Witte, H., & Omey, E. (2007). *Higher educated workers: Better jobs but less satisfied? International Journal of Manpower*, *28*(2), 135-151.

Viechtbauer, W. (2010). Conducting meta-analyses in R with the metafor package. *Journal of statistical software, 36*(3), 1-48.

Wanous, J. P., & Reichers, A. E. (1996). Estimating the reliability of a single-item measure. *Psychological Reports*, *78*(2), 631-634.

Wanous, J. P., Reichers, A. E., & Hudy, M. J. (1997). Overall job satisfaction: How good are single-item measures? *Journal of Applied Psychology*, *82*(2), 247.

Watson, N., & Wooden, M. P. (2012). The HILDA survey: a case study in the design and development of a successful household panel survey. *Longitudinal and Life Course Studies*, *3*, 369-381.

Webster, J. R., 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.

Weyer, B. (2007). Twenty years later: Explaining the persistence of the glass ceiling for women leaders. *Women in Management Review*, *22*, 482–496.

Wilk, S. L., & Cappelli, P. (2003). Understanding the determinants of employer use of selection methods. *Personnel Psychology*, *56*, 103–124.

Wu, C. H. (2016). Personality change via work: a job demand–control model of big-five personality changes. *Journal of Vocational Behavior*, *92*, 157–166.

Xie, J. L., Schaubroeck, J., & Lam, S. S. K. (2008). Theories of job stress and the role of traditional values: A longitudinal study in China. *Journal of Applied Psychology*, *93*, 831–848.

Table 1
*Education and Job Satisfaction: Meta-Analytic Findings*

| *Variable* | *k* | *N* | $\bar{r}$ | $SD_r$ | $\hat{\rho}$ | $SD_\rho$ | 80% CV | 90% CI | % ARTV |
|---|---|---|---|---|---|---|---|---|---|
| Education | 74 | 134,924 | -0.009 | 0.016 | -0.010 | 0.018 | [-.034, 0.013] | [-0.046, 0.026] | 39% |

*Note*. $k$ = number of correlations meta-analyzed; $N$ = total sample size; $\bar{r}$ = sample-size-weighted mean observed correlation; $SD_r$ = sample-size-weighted standard deviation of the observed correlations; $\hat{\rho}$ = sample-size-weighted mean observed correlation corrected for unreliability; $SD_\rho$ = standard deviation $\hat{\rho}$; 80% CV = 80% credibility interval around $\hat{\rho}$; 90% CI = 90% confidence interval around $\hat{\rho}$; % ARTV = percent variance due to corrected artifacts. All analyses were conducted using random-effects meta-analyses based on the Hunter-Schmidt method (2004) to correct for observed correlations for sampling error and measurement unreliability. For single-item job satisfaction measures, we followed Wanous and Reichers (1996) and used $\alpha = .7$. Because education was a demographic variable, and no reliability information was reported, we followed Ng et al. (2005) and used $\alpha = 1$.

Table 2
*Descriptive Statistics and Correlations*

| | Mean | *SD* | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Education | 12.66 | 2.17 | 1.00 | | | | | | | | | | | |
| 2. Job Satisfaction | 7.60 | 1.74 | −.06 | 1.00 | | | | | | | | | | |
| 3. Job Stress | 2.78 | 1.47 | .09 | −.30 | 1.00 | | | | | | | | | |
| 4. Qualitative Demands | 4.59 | 1.34 | .15 | −.10 | .42 | 1.00 | | | | | | | | |
| 5. Hours Worked | 35.33 | 14.74 | .10 | −.03 | .26 | .25 | 1.00 | | | | | | | |
| 6. Job Autonomy | 4.04 | 1.57 | .13 | .27 | −.05 | .05 | .16 | 1.00 | | | | | | |
| 7. Job Variety | 4.79 | 1.38 | .20 | .27 | .12 | .34 | .29 | .34 | 1.00 | | | | | |
| 8. Income | 10.18 | 1.11 | .23 | .00 | .19 | .19 | .57 | .20 | .24 | 1.00 | | | | |
| 9. Gender | .50 | .50 | .05 | .02 | −.02 | −.02 | −.33 | −.09 | −.06 | −.23 | 1.00 | | | |
| 10. Age | 34.35 | 13.03 | .06 | .07 | .10 | .02 | .16 | .21 | .09 | .31 | −.01 | 1.00 | | |
| 11. Self-Employed | .08 | .27 | .03 | .04 | .01 | .03 | .13 | .31 | .07 | .06 | −.09 | .20 | 1.00 | |
| 12. Married | .61 | .49 | .12 | .02 | .09 | .08 | .19 | .16 | .11 | .30 | −.03 | .35 | .13 | 1.00 |

*Note.* $N = 16,958$. All correlations greater than .02 are significant at $p < .01$ (two-tailed test).

Table 3
*Mediation Models for Separate Indirect and Total Effects of Education on Job Satisfaction*

| | Education→ Mediator | Mediator→ Job Satisfaction | Indirect Effect [95% CI] | Total Effect [95% CI] |
|---|---|---|---|---|
| Income | .117 (.004) | .029 (.013) | .003 [.000, .006] | -.046 [-.058, -.033] |
| Job Autonomy | .085 (.005) | .440 (.013) | .037 [.033, .042] | -.046 [-.058, -.033] |
| Job Variety | .119 (.005) | .525 (.016) | .063 [.057, .069] | -.046 [-.058, -.033] |
| Hours Worked | .688 (.050) | -.003 (.001) | -.002 [-.003, -.000] | -.046 [-.058, -.033] |
| Qualitative Demands | .071 (.004) | -.068 (.016) | -.005 [-.007, -.002] | -.046 [-.058, -.033] |
| Job Stress | .061 (.005) | .446 (.014) | -.027 [-.032, -.023] | -.046 [-.058, -.033] |

*Note.* Table reports the results of structural equation models linking education to job satisfaction through separate mediators, indirect mediation effects, total mediation effects. Satorra-Bentler standard errors are reported in parentheses, and bias-corrected confidence intervals based on bootstrapped standard errors with 10,000 replications are reported in brackets.

Table 4
*Indirect Effects, Direct Effects, and Total Effects of Education on Job Stress and Job Satisfaction*

| | Outcome: | | | | | |
|---|---|---|---|---|---|---|
| | Job Stress | | | Job Satisfaction | | |
| | $B$ | 95% CI | $\beta$ | $B$ | 95% CI | $\beta$ |
| Indirect effect via job resources | -.008 | -.012, -.004 | -.014 | .086 | .079, .095 | .108 |
| Indirect effect via job demands | .045 | .040, .050 | .083 | -.025 | -.029, -.022 | -.031 |
| Direct effect | .020 | .011, .029 | .036 | -.096 | -.108, -.084 | -.119 |
| Total effect | .056 | .047, .066 | .105 | -.043 | -.056, -.031 | -.054 |

*Note.* Table reports indirect effects, direct effects, and total effects of education on job stress and job satisfaction based on our primary structural equation model. Indirect effects on job satisfaction include indirect effects via both job resources/job demands alone and via job resources/job demands and job stress. $B$ = unstandardized coefficient, 95% CI = bias corrected 95% confidence interval based on bootstrapped standard errors with 10,000 replications, $\beta$ = standardized coefficient.

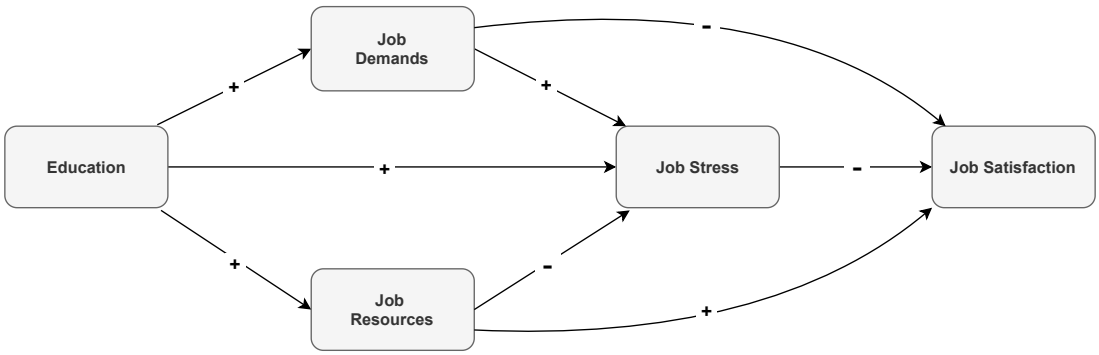


*Figure 1.* Conceptual model linking education, job stress, and job satisfaction through job demands and job resources.

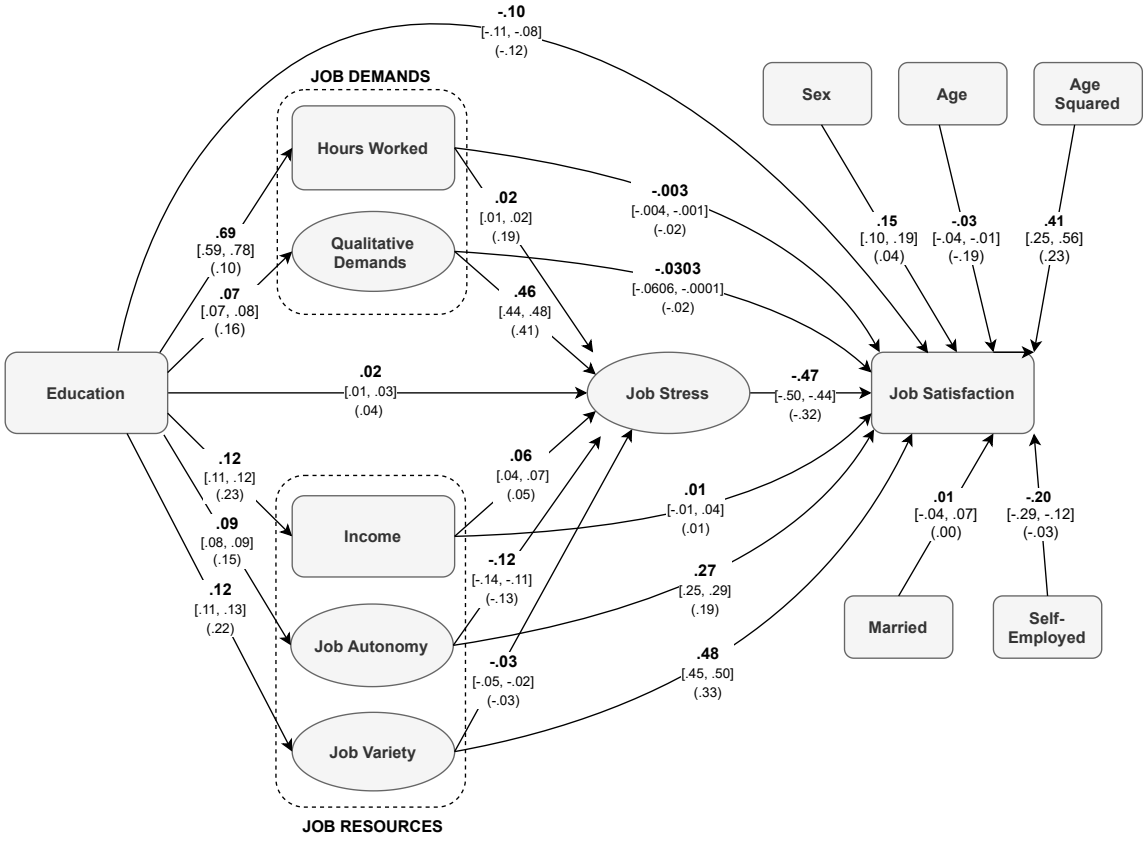


*Figure 2.* Effects of education on job satisfaction via job demands, job resources, and job stress. $N$ = 16,958. Unstandardized coefficients are reported with 95% confidence intervals in brackets and standardized coefficients in parentheses. $R^2$ (job stress) = .28, $R^2$ (job satisfaction) = .25. All effects are statistically significant at $p < .01$ unless the confidence interval overlaps with zero. Consistent with our modeling approach, ellipses and rectangles indicate latent and observed variables, respectively.

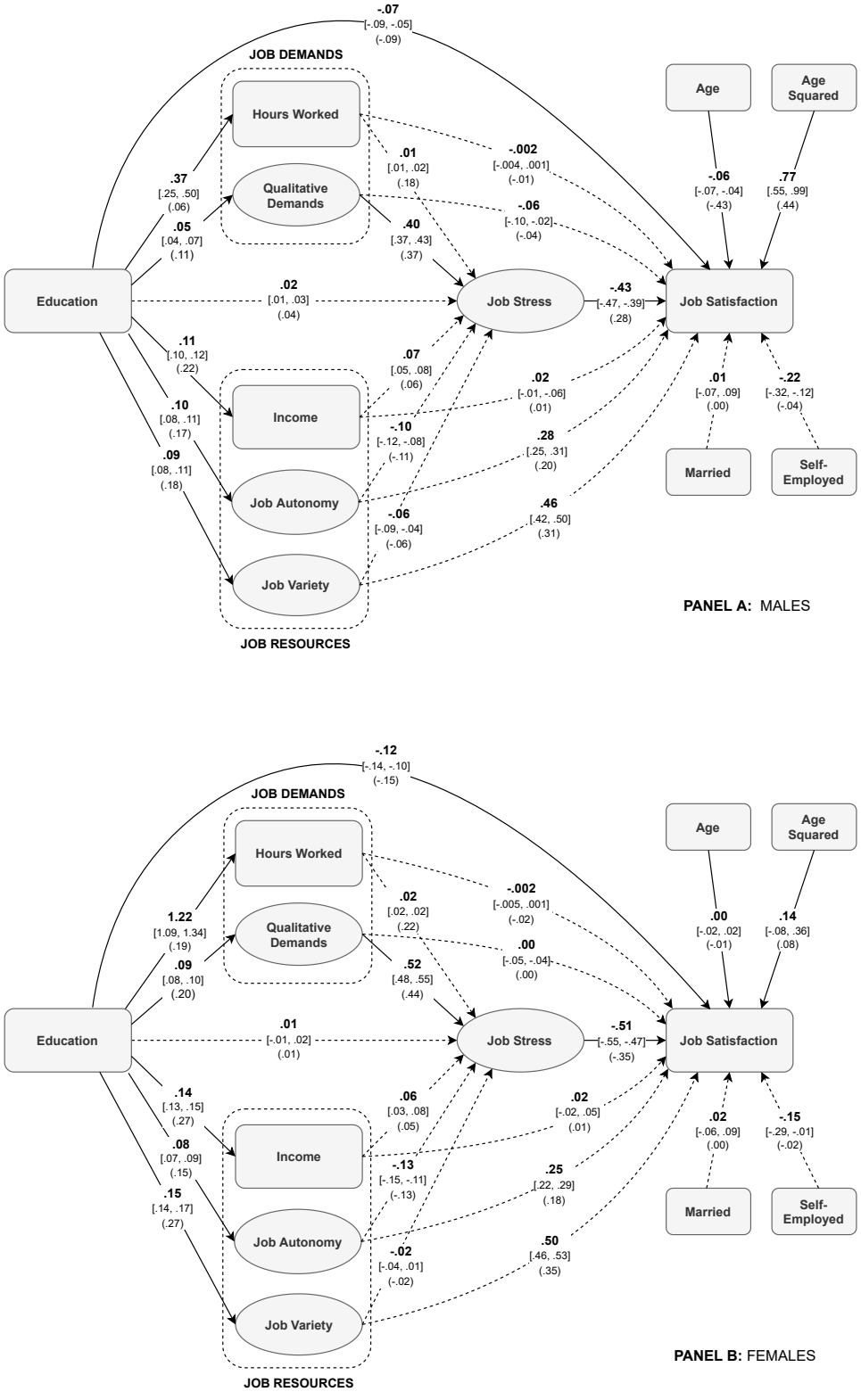


*Figure 3.* Effects of education on job satisfaction by gender. $N$ (males) = 8,398, $N$ (females) = 8,560. Solid lines represent significantly different paths between groups ($p < 0.01$). Unstandardized coefficients are reported with 95% confidence intervals in brackets and standardized coefficients in parentheses. Males: $R^2$ (job stress) = .26, $R^2$ (job satisfaction) = .23. Females: $R^2$ (job stress) = .30, $R^2$ (job satisfaction) = .26. All effects are significant at $p < .01$ unless the confidence interval overlaps with zero. Consistent with our modeling approach, ellipses and rectangles indicate latent and observed variables, respectively.

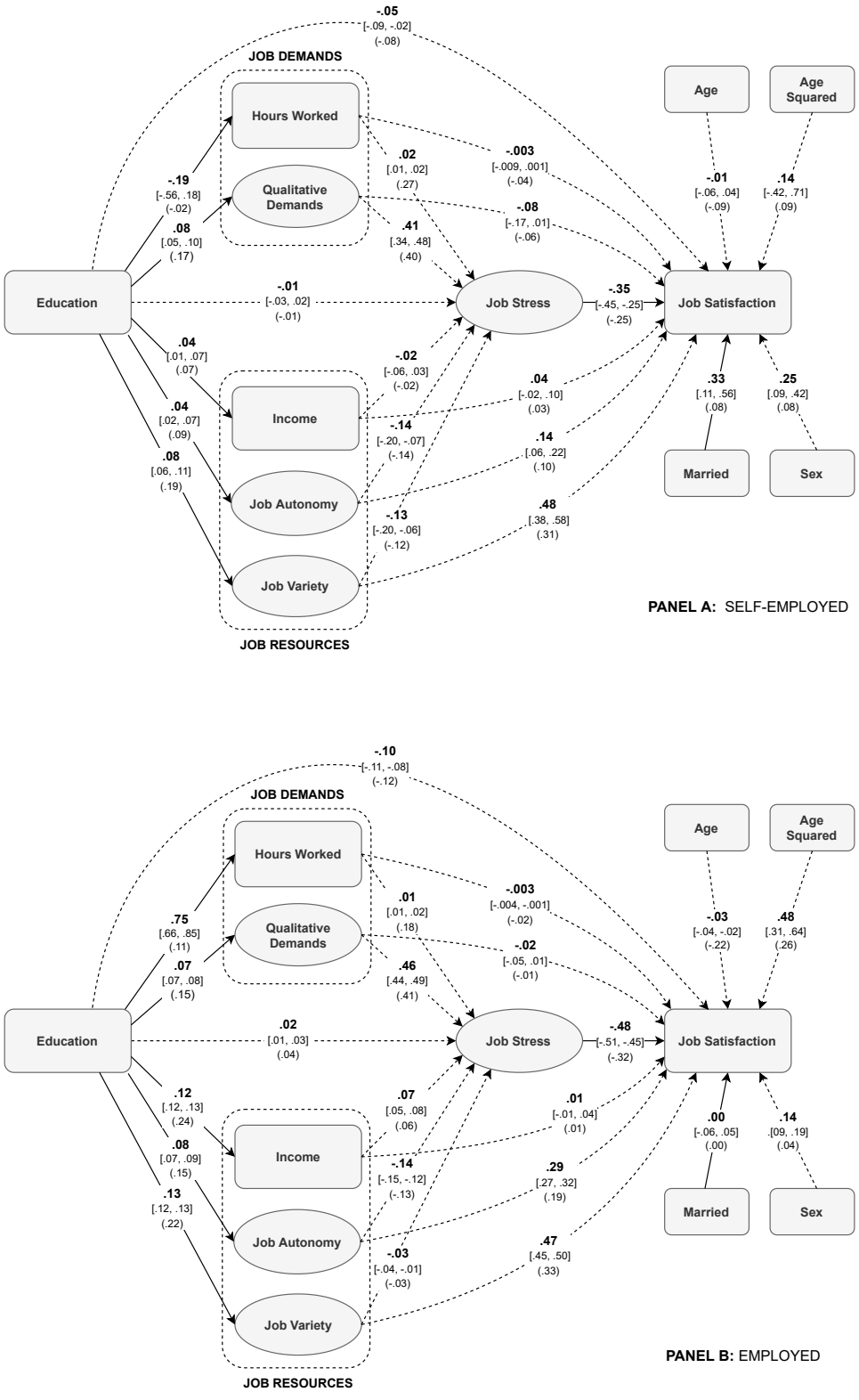


*Figure 4.* Effects of education on job satisfaction by employment status. $N$ (self-employed) = 1,371, $N$ (employed) = 15,587. Solid lines represent significantly different paths between groups ($p < 0.01$). Unstandardized coefficients are reported with 95% confidence intervals in brackets and standardized coefficients in parentheses. Self-Employed: $R^2$ (job stress) = .26, $R^2$ (job satisfaction) = .20. Employed: $R^2$ (job stress) = .28, $R^2$ (job satisfaction) = .25. All effects are significant at $p < .01$ unless the confidence interval overlaps with zero. Consistent with our modeling approach, ellipses and rectangles indicate latent and observed variables, respectively.