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Effects of workload on teachers' functioning: A moderated mediation model including sleeping problems and overcommitment

Tiphaine Huyghebaert^{1,2}, Nicolas Gillet¹, Nicolas Beltou¹, Fanny Tellier³,
& Evelyne Fouquereau¹

¹Département de psychologie, Université de Tours, Tours Cedex 1, France

²AD Conseil, Malakoff, France

³Département de psychologie, Université de Montréal, QC, Canada

Corresponding Author :

Tiphaine Huyghebaert

Université de Tours

UFR Arts et Sciences Humaines, Département de psychologie

3 rue des Tanneurs, 37041, Tours Cedex 1, France.

tiphaine.huyghebaert@univ-tours.fr

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Abstract

This study investigated the mediating role of sleeping problems in the relationship between workload and outcomes (emotional exhaustion, presenteeism, job satisfaction, and performance), and overcommitment was examined as a moderator in the relationship between workload and sleeping problems. We conducted an empirical study using a sample of 884 teachers. Consistent with our predictions, results revealed that the positive indirect effects of workload on emotional exhaustion and presenteeism, and the negative indirect effects of workload on job satisfaction and performance, through sleeping problems, were only significant among overcommitted teachers. Workload and overcommitment were also directly related to all four outcomes, precisely they both positively related to emotional exhaustion and presenteeism and negatively related to job satisfaction and performance. Theoretical contributions and perspectives, as well as implications for practice are discussed.

Keywords: job demands; overcommitment; recovery; emotional exhaustion; teachers

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Introduction

It is well-established that teachers' psychological health, attitudes, and behaviors are adversely affected by stressful psychosocial work characteristics (e.g., Bartholomew, Ntoumanis, Cuevas, & Lonsdale, 2014). Indeed, prior studies using different conceptual frameworks have shown highly demanding work environments to be related to impaired individual functioning in terms of higher emotional exhaustion, lower job satisfaction, elevated levels of sleep-related complaints, and adverse outcomes including higher presenteeism and lower performance (e.g., Miraglia & Johns, 2016).

While exploring the mechanisms that might underlie these effects of job demands on individual and organizational functioning, prior research has identified recovery as a mediating variable in the relationship between stressful work characteristics and poor health (Geurts & Sonnentag, 2006). Research also emphasized sleep to play a prominent role in the recovery process, and past studies showed that work stressors were positively associated with sleeping problems (Elovainio et al., 2015). In addition, disturbed sleep has been positively related to psychological health impairment and presenteeism, and negatively associated with job satisfaction and performance (e.g., Drake, Roehrs, Richardson, Walsh, & Roth, 2004).

These findings on the importance of work stressors and sleep in relation to employee health, attitudes and behaviors appear of great importance for the teaching profession as numerous changes have been imposed on schools and teachers during the past decades, and teachers are increasingly subjected to external pressures from policymakers, parents, and society at large. This intensification results in teachers' perception of an ever-expanding teaching role and of a significant increase in workload. In line with this taxing context, in the present study we apprehended workload as a hindrance stressor (i.e., a demand unnecessarily obstructing personal growth and goal attainment) rather than a challenge stressor (i.e., a demand to be overcome in order to learn and achieve) (LePine, Podsakoff, & LePine, 2005). Although many work stressors may affect teachers' functioning, in the present research, we offer to focus specifically on workload as the unsuccessful management of workload is a serious issue in many occupations and many organizations, and teachers feel powerless in the face of this demand and its many correlates and consequences (Bowling, Alarcon, Bragg, & Hartman, 2015). "Workload refers to the amount of work an employee is required to complete in a given amount of time, along with the effort it takes to complete it" (Nixon, Mazzola, Bauer, Krueger, & Spector, 2011, p. 9). Yet, excessive workload is an important psychosocial risk factor, which was found to significantly and positively associate with adverse outcomes such as emotional exhaustion (Hakanen, Bakker, & Schaufeli, 2006).

In line with these issues, we conducted a study that aimed to examine the effect of workload on psychological health impairment (i.e., emotional exhaustion), job attitudes (i.e., job satisfaction), and behaviors (i.e., presenteeism and performance) in a sample of French teachers, but also to explore some variables that may underlie (i.e., sleeping problems) and moderate these relations (i.e., overcommitment). Specifically, this research aimed to contribute to theory and practice in several ways.

First, we aimed to gain a better understanding of the consequences associated with teachers' workload. Previous research conducted in various occupational settings found workload to positively relate to emotional exhaustion and presenteeism, and to negatively relate to job satisfaction and performance (e.g., Wirtz, Rigotti, Otto, & Loeb, 2017). We sought to examine whether these effects applied to a specific sample of teachers. Indeed, teachers' functioning deserves particular attention as it relates to important outcomes including the efficiency of their instructional behaviors or students' achievement (e.g., McLean & McDonald Connor, 2015). These serious issues make it even more important to understand how to promote teachers' job satisfaction and job performance, and understand the factors that may help prevent their emotional exhaustion and presenteeism.

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Second, although previous studies have well explored how workload relates to individual functioning, less is known about the mechanisms explaining these relationships. Our research intended to explore such mediating processes. We based our work within the effort-recovery theory (Meijman & Mulder 1998) and the conceptual approach of incomplete recovery (Geurts & Sonnentag, 2006), and examined the mediating role of sleeping problems in the relationship between workload and individual functioning. Indeed, prior research found disturbed sleep to mediate the relationship between work stressors and poor psychological health (Hanson, Chungkham, Åkerstedt, & Westerlund, 2014). Even though previous studies have demonstrated sleeping problems to be a valuable mechanism to explain the effect of job demands such as workload on psychological health impairment (e.g., emotional exhaustion), less is known about how sleeping problems may explain the effect of job demands on teachers' attitudes (i.e., job satisfaction) and behaviors (i.e., job performance and presenteeism). Nonetheless, it is fundamental to identify levers to act on these outcomes in teachers. For instance, teachers' job satisfaction not only is good for their own functioning but also positively impacts students' achievement (Banerjee, Stearns, Moller, & Mickelson, 2017). Similarly, teachers' perceived performance has positive effects on students' academic achievement (Caprara, Barbaranelli, Steca, & Malone, 2006). Additionally, presenteeism may lead to productivity loss, health decline, and negative job attitudes (Gustafsson & Marklund, 2011; Lu, Cooper, & Lin, 2013). We thus offered to extend the knowledge associated with the mediating role of sleeping problems in the relationship between workload and these crucial outcomes for teachers.

Third and finally, we aimed to explore how teachers may not be equal in the face of workload, depending on their degree of overcommitment. Indeed, past research found overcommitment to be associated with some of the issues of interest in our study such as workload and sleeping problems, as well as emotional exhaustion (e.g., Feuerhahn, Kühnel, & Kudielka, 2012). Although other variables could play a moderating role between workload and outcome variables (e.g., self-efficacy), we focused on overcommitment as it is argued to be of particular importance in professions that involve a high degree of control over work activities, such as teaching (Lehr, Hillert, & Keller, 2009). Moreover, overcommitment appears particularly relevant with regards to teachers' sleeping problems as it was found to predict acute stress reactions in teachers, especially during recovery periods (von Känel, Bellingrath, & Kudielka, 2013). Overcommitment is defined as "a set of attitudes, behaviors and emotions that reflect excessive striving in combination with a strong desire of being approved and esteemed" (Siegrist, 2001, p. 55) and was shown to moderate the relationship between job demands and individual consequences (Feuerhahn et al., 2012). However, to date, the moderating role of overcommitment in the relationship between workload and individual and organizational outcomes through incomplete recovery remains to be explored, even more so in teachers. Therefore, we framed our work within the effort-reward imbalance model (Siegrist, 1996) by studying overcommitment as a dysfunctional coping pattern leading to maladaptive outcomes (Siegrist, 2001). Precisely, we offered to examine how overcommitment may interact with workload to explain individual maladaptive (i.e., emotional exhaustion and presenteeism) and adaptive (i.e., job satisfaction and performance) functioning through recovery processes (i.e., sleeping problems).

In sum, this study sought to contribute to a better understanding of the effects of workload on various personal and organizational outcomes in a sample of French teachers. We examined whether sleeping problems mediated the relationships between workload on one hand, and emotional exhaustion, job satisfaction, presenteeism, and performance on the other hand. We also investigated a boundary condition associated with workload's direct and indirect relationships to outcomes by investigating overcommitment as a moderator (see Figure 1).

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Workload, Sleeping Problems, and Work Outcomes

Past research has found workload to positively relate to emotional exhaustion and presenteeism, and negatively to job satisfaction and performance (e.g., Wirtz et al., 2017). Indeed, hindrance stressors (e.g., excessive workload), because they constrain and interfere with workers' self-realization (Cavanaugh, Boswell, Roehling, & Boudreau, 2000) and do not allow for their psychological needs to be satisfied (Albrecht, 2015), are associated to more maladaptive functioning and less adaptive functioning. Additionally, in a recent meta-analysis, Nixon et al. (2011) showed that workload was positively associated with sleep disturbance and fatigue. One could thus argue that sleeping problems may explain the effects of workload on maladaptive functioning. Indeed, excessive workload may yield to impaired sleep quality as exposure to stressful work environments leads to a continuous activation of the psycho-physiological system, which does not allow for complete recovery and may translate into symptoms such as psychosomatic complaints or impaired sleep (Geurts & Sonnentag, 2006). In turn, the impairment of sleep quality can have adverse effects on employee health and organizational performance (e.g., Åkerstedt, Kecklund, Alfredsson, & Selen, 2007).

According to the effort-recovery model (Meijman & Mulder, 1998), job demands require physical and psychological efforts. Indeed, under optimal circumstances, the psychophysiological systems that were activated during work return to and stabilize at a baseline level after a short respite from work. However, when workers experience high demands such as workload, they allot more resources to their job and therefore need more time to replenish those resources (Sonnentag & Fritz, 2015). Paradoxically, excessive workload most usually comes with extra time spent at work, which does not allow for such respite. Hence, the recovery process may be incomplete, and the psychophysiological systems remain activated. In this case, employees must invest compensatory effort to adequately perform at work, which can lead to increased load reactions and higher demands on recovery processes (Pereira & Elfering, 2014). This cumulative process induced by excessive workload may therefore result in sleeping problems (Sluiter, de Croon, Meijman, & Frings-Dresen, 2003). Indeed, excessive workload may lead to teachers to ruminate about the many tasks that kept them aroused all day and about ways to take care of all of their workload the next day, thus not allowing them the necessary relaxation to fall asleep or lead to agitated or restless sleep (i.e., sleeping problems) (e.g. Pereira & Elfering, 2014).

The incomplete recovery resulting from excessive workload may in turn lead to a variety of adverse consequences. Prior research showed that the cumulative process induced by excessive workload lead to emotional exhaustion (Sluiter et al., 2003). Indeed, because they spend a lot of resources at work to deal with high workload (e.g., energetic, emotional, attentional resources), and because incomplete recovery does not allow them to restore these resources, teachers may eventually feel drained and unable to deal with their daily demands and interactions at work (i.e., emotional exhaustion). Past studies also showed that poor recovery experiences led to higher levels of presenteeism and to lower levels of satisfaction and performance (e.g., Sonnentag & Fritz, 2015). Indeed, those employees who lack sleep because of their high workload may still go to work in order to avoid their workload from piling up, even though they do not have the energy to attend to their job (i.e., presenteeism) (Miraglia & Johns, 2016). We conceptualized presenteeism in line with Koopman et al.'s (2002) definition of what they refer to as decreased presenteeism, which points out to situations where employees are physically present at work but experience reduced productivity and decreased work quality because of their health problems. Moreover, because those employees with poor sleep quality cannot recover as needed, they are more likely to go back to work lacking energy to perform their tasks efficiently (i.e., low performance) (Fritz, Yankelevitch, Zarubin, & Barger, 2010). Finally, since affective experiences related to work

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have the power to affect evaluative judgments about one's job, employees who lack sleep because of their workload might feel irritated and be more prone to evaluate their job in a negative light (i.e., low job satisfaction).

Some research did confirm that sleeping problems mediated the effects of job demands on employee health. For instance, Pereira and Elfering (2014) showed that sleep fragmentation explained the effect of social stressors at work on psychosomatic health impairment. Because teachers work in a very specific setting, we aimed to verify whether similar effects could be found in this particular population, and on a broader range of outcomes. Indeed, in the present research, we sought to build upon these findings and extend them by exploring how sleeping problems may mediate the effect of job demands on a wider variety of outcomes, including psychological health, attitudes, and behaviors, in a specific sample of teachers. More specifically, we tested whether sleeping problems partially mediated the relationships between workload on one hand, and emotional exhaustion, presenteeism, job satisfaction, and performance on the other hand. We expected this mediation to be partial – versus total – because research indicated that other mechanisms can contribute to explain the effects of workload on individual consequences (e.g., Boudrias et al., 2011). The two following hypotheses were formulated.

Hypothesis 1: Sleeping problems partially mediate the positive effects of workload on emotional exhaustion and presenteeism, respectively.

Hypothesis 2: Sleeping problems partially mediate the negative effects of workload on job satisfaction and performance, respectively.

The Moderating Role of Overcommitment

The effort-reward imbalance model (Siegrist, 1996) offers theoretical support to understand how overcommitment may accentuate the adverse effect of workload on individual functioning. This model proposes that employees' well-being depends on the balance between investments and efforts in the job and rewards or resources obtained from the job. Imbalance between high efforts and low rewards is known to lead to reduced well-being (see van Vegchel, de Jonge, Bosma, & Schaufeli, 2005). In essence, overcommitted teachers make tenfold investments and efforts in their job, yet they get the same rewards and resources as teachers who are not overcommitted, which makes them more inclined to sense that their efforts are disproportionately more important than the rewards they obtain. This perceived imbalance may expose them more to an impairment of their recovery processes, psychological health, attitudes, and behaviors.

Prior studies have demonstrated that all individuals are not equal in the face of job demands, and that various personal and work characteristics may moderate the relationship between workload and incomplete recovery. For instance, overcommitment was shown to moderate the relationship between perceived job demands and emotional exhaustion, such that the positive association was stronger for highly overcommitted employees (Feuerhahn et al., 2012). Additionally, prior research demonstrated that excessive work behaviors could directly lead to poor recovery experiences (Huyghebaert et al., 2016). Therefore, in the present research, we explored how workload may interact with overcommitment to predict sleeping problems.

Indeed, overcommitted employees have difficulties withdrawing from work during non-work time, an exorbitant ambition, and a high need for approval and esteem (van Vegchel et al., 2005). Therefore, for highly overcommitted teachers, workload may be more detrimental in terms of sleeping problems since these employees have difficulties withdrawing from work in the first place and tend to exaggerate their efforts beyond the levels that are usually considered appropriate. Therefore, their opportunities to recover from high job demands diminish (Sonnetag & Fritz, 2015). Indeed, since they place unrealistic demands upon themselves, they are confronted with sustained strain reactions and frequently

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experience disappointment and frustration (Feuerhahn et al., 2012). In other words, their inability to psychologically withdraw from work obligations does not allow their taxed psychobiological systems to return to baseline levels, which makes them more exposed to sleeping problems (Meijman & Mulder, 1998) than those who are less overcommitted.

Hypothesis 3: Overcommitment moderates the relationship between workload and sleeping problems, such that the positive effect will be stronger for highly overcommitted teachers.

As overcommitted teachers are thought to react more negatively to workload, and as sleeping problems are predicted to mediate the relationships of workload to emotional exhaustion, presenteeism, job satisfaction, and performance, it appears that overcommitment should moderate the indirect relationships between workload and outcomes. In other words, we tested a moderated mediation model, as the aforementioned rationale led to the following hypotheses.

Hypothesis 4: The indirect positive relationships of workload to emotional exhaustion and presenteeism through sleeping problems are stronger when overcommitment is high.

Hypothesis 5: The indirect negative relationships of workload to job satisfaction and performance through sleeping problems are stronger when overcommitment is high.

Finally, past studies suggest that overcommitment may be directly related to individual and organizational outcomes. Precisely, it may be positively associated with emotional exhaustion and presenteeism, and negatively with job satisfaction and performance. Indeed, previous research found that overcommitment was associated with increased emotional exhaustion and presenteeism, and decreased job satisfaction and performance (e.g., Avanzi, Zaniboni, Balducci, & Fraccaroli, 2014). As a matter of fact, overcommitted workers commit themselves to continuously high achievement and find it difficult to disengage from their work activities. This may make them prone to energy depletion (Siegrist, 2001) and to maladaptive outcomes such as emotional exhaustion and presenteeism. Moreover, overcommitted employees are not intrinsically motivated by their work and may not experience high levels of job satisfaction as job satisfaction largely stems from pursuing autonomous goals (see Deci & Ryan, 2000). Finally, overcommitted workers often create busy work for themselves and make simple projects more complicated, which may lead to poorer job performance. In sum, overcommitment represents a dysfunctional motivational pattern of overdoing, is a possible source of strain, and may magnify stressful experience.

Method

Participants and Procedure

This research used a cross-sectional questionnaire survey design. According to local regulations, no formal ethical scrutiny was required as no ethics committee existed in the institution at the time of the study. However, after being explained the purpose of the study, each participant signed an informed consent form stressing the anonymous and voluntary nature of the study. No incentive was offered to take part in the study. Teachers were reached through a post on diverse teaching community groups on social media that invited them to complete an online questionnaire survey. A total of 884 teachers (71 men and 813 women) working with children and teenagers from different school levels completed the survey. Because we do not know how many teachers originally saw the post, no response rate can be inferred. Participants were between 21 and 61 years old, with a mean age of 32.75 years ($SD = 9.26$). Seven hundred and ninety-three participants were employed in the public sector (89.7%) and 91 worked in the private sector (10.3%). Seven hundred and eighty-five participants were permanent teachers (88.8%) and 99 were temporary workers (11.2%). Seven hundred and twenty-one teachers were full-time workers (81.6%) and 163 were part-time workers (18.4%).

Measures

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Workload. Spector and Jex's (1998) five-item scale (i.e., Quantitative Workload Inventory) was used to measure workload (e.g., "*How often does your job require you to work very hard?*"; $\alpha = .75$). Responses were provided on a five-point Likert-type scale, with anchors ranging from 1 (less than once per month or never) to 5 (several times per day).

Overcommitment. We used the six items (e.g., "*I get easily overwhelmed by time pressures at work.*"; $\alpha = .78$) from the Effort-Reward Imbalance Questionnaire (Siegrist, 1996) to assess teachers' overcommitment. The format is summated rating with five response choices scored from 1 (disagree) to 5 (agree).

Sleeping problems. We used the four items ($\alpha = .84$) developed by Jenkins, Stanton, Niemcryk, and Rose (1988) to measure sleeping problems during the past four weeks. Each item (i.e., "*difficulty falling asleep*", "*difficulty staying asleep*", "*waking up several times per night*", and "*waking up feeling tired and worn out after the usual amount of sleep*") was rated on a six-point scale: not at all (1), 1 to 3 days (2), 4 to 7 days (3), 8 to 14 days (4), 15 to 21 days (5), and 22 to 28 days (6).

Emotional exhaustion. We used five high-loading items from Schaufeli, Leiter, Maslach, and Jackson's (1996) MBI-GS (Maslach Burnout Inventory – General Survey) to assess emotional exhaustion (e.g., "*I feel emotionally drained by my work*"; $\alpha = .89$). Responses were anchored on a five-point Likert ranging from 1 (strongly disagree) to 5 (strongly agree).

Presenteeism. The six-item Stanford Presenteeism Scale (Koopman et al., 2002) was employed to measure presenteeism during the past month (e.g., "*Because of my health problems, the stresses of my job were much harder to handle*"; $\alpha = .94$). Participants responded to items on a five-point Likert-scale anchored by 1 (strongly disagree) and 5 (strongly agree). Mean scores were reversed so that a high score on this scale indicates a high level of what Koopman et al. (2002) refer to as decreased presenteeism, that is a lesser ability to concentrate on and accomplish work because of health problems.

Job satisfaction. Job satisfaction was assessed with one item used by Shimazu, Schaufeli, Kamiyama, and Kawakami (2015) (i.e., "*Are you satisfied with your job?*"). Responses were indicated on a scale ranging from 1 (dissatisfied) to 4 (satisfied).

Performance. Work performance was assessed with one item (i.e., "*How would you rate your overall job performance on the days you worked during the past four weeks*") from the World Health Organization Health and Work Performance Questionnaire (Kessler et al., 2003). Responses were indicated on a scale from 0 (worst performance) to 10 (best performance).

Results

Preliminary Analyses

A measurement model was first estimated using Mplus 7.4 robust maximum likelihood estimator (MLR). Each latent variable had between four and six indicators: four for sleeping problems, five for workload and emotional exhaustion, and six for overcommitment and presenteeism. The model presented satisfactory fit indices, χ^2 ($df = 260$, $N = 884$) = 646.32, $p < .001$, CFI = .97, TLI = .96, and RMSEA = .04. Moreover, all indicators were significantly related to their corresponding latent variable (β s ranging from .50 to .91, $p < .001$). We compared this hypothesized five-factor model to alternative four-factor, three-factor, two-factor, and one-factor models. Results indicated that the hypothesized five-factor model showed better fit to the data than the alternative ones (see Table 1).

Please insert Table 1 around here

We followed Podsakoff, MacKenzie, Lee, and Podsakoff's (2003) recommendations to address the issue of common method variance. First, we examined a single-factor model for the present data (i.e., Harman's single-factor test). This test revealed a poor fit to the data χ^2 ($df = 270$, $N = 884$) = 3219.17, $p < .001$, CFI = .77, TLI = .73, and RMSEA = .11. Second, we

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included an orthogonal latent common method factor in the theoretical model in order to assess the potential increase in model fit that would be gained from accounting for this unmeasured method factor. This model indicated good fit to the data χ^2 ($df = 234$, $N = 884$) = 461.75, $p < .001$, CFI = .98, TLI = .98, and RMSEA = .03. Although the method factor accounted for 43% of the total variance, it is commonly accepted that if the total variance for a single factor is less than 50% (i.e., less than the majority of the covariance among the measures), it suggests that common method bias (i.e., bias introduced by the use of a single instrument) does not seriously affect the data (Podsakoff et al., 2003). Correlations and descriptive statistics for the study variables are presented in Table 2.

Additionally, to rule out alternative explanations, we controlled for potentially predictive demographic variables. Indeed, results from preliminary analyses showed that some of the variables of interest were significantly correlated to socio-demographic variables (see Table 2). For instance, results showed that teachers in public schools had significantly higher scores in emotional exhaustion ($M_{\text{public}} = 3.58$, $M_{\text{private}} = 3.31$; $p < .05$) and significantly lower job satisfaction scores ($M_{\text{public}} = 2.78$, $M_{\text{private}} = 2.92$; $p < .05$) than did private schools teachers. Consequently, we controlled for socio-demographic variables (gender, age, sector, contract, and working time) in all the models we tested. Specifically, each of these control variables were related, through direct paths to sleeping problems, emotional exhaustion, presenteeism, job satisfaction, and performance. These links were specified in all subsequent analyses.

Main Analyses

We expected that the indirect relations between workload and emotional exhaustion, presenteeism, job satisfaction, and performance, through sleeping problems, would be moderated by overcommitment. To test these hypotheses, a moderated mediation regression was conducted using a path analysis with Mplus 7.4 MLR. Paths were specified according to the hypotheses mentioned above (see Figure 1). Results indicated that this model presented a satisfactory fit to the data, χ^2 ($df = 19$, $N = 884$) = 61.75, $p < .001$, CFI = .97, TLI = .93, and RMSEA = .05. An alternative model was also tested using a saturated path analysis (i.e., $df = 0$). It included unidirectional paths between the workload and overcommitment product term and respectively emotional exhaustion, presenteeism, job satisfaction, and performance. None of these links were significant.

Additionally, we tested alternative models to provide more rigorous information regarding the underlying mechanisms of the examined relationships. First, we tested a full mediation model, χ^2 ($df = 27$, $N = 884$) = 297.12, $p < .001$, CFI = .84, TLI = .70, and RMSEA = .11, which indicated significantly worse fit to the data than our proposed model ($\Delta \chi^2 = 235.37$, $\Delta df = 8$, $p < .001$). Second, we tested a model without the direct effects from workload to the outcome variables. Results from this model were as follow χ^2 ($df = 23$, $N = 884$) = 129.35, $p < .001$, CFI = .94, TLI = .86, and RMSEA = .07; and showed significantly worse fit to the data than our proposed model ($\Delta \chi^2 = 67.60$, $\Delta df = 4$, $p < .001$). Third, because the literature suggests that psychological health (e.g., emotional exhaustion) and job attitudes (e.g., job satisfaction) are antecedents of job-related behaviors like performance and presenteeism (e.g., Miraglia & Johns, 2016), we tested consecutive mediating effects. Precisely, we tested how sleeping problems may mediate the effects of workload on emotional exhaustion and job satisfaction respectively (moderated by overcommitment), which in turn related to job-related behaviors (i.e., performance and presenteeism). Results from this double mediation model were as follow: χ^2 ($df = 20$, $N = 884$) = 236.20, $p < .001$, CFI = .87, TLI = .67, and RMSEA = .11, and indicated significantly worse fit to the data than our proposed model ($\Delta \chi^2 = 174.45$, $\Delta df = 1$, $p < .001$). Finally, we tested an alternative model to get more insight into the ordering of our variables. In this model, sleeping problems was the outcome variable and exhaustion, job satisfaction, job performance, and presenteeism

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mediated the relationship between workload and sleeping problems. This alternative model provided worse fit to the data, χ^2 ($df = 18, N = 884$) = 115.46, $p < .001$, CFI = .94, TLI = .84, and RMSEA = .08, than our proposed model ($\Delta \chi^2 = 53.71, \Delta df = 1, p < .001$). Altogether, results from these alternative models indicated worse fit to the data than our hypothesized partial mediation model, as indicated by the significance of the χ^2 difference test between our proposed model and each of the alternative models. The hypothesized model was thus judged the most plausible model (see Figure 2).

Workload ($\beta = .075, p < .05$), overcommitment ($\beta = .458, p < .001$), and their interaction ($\beta = .071, p < .05$) had positive effects on sleeping problems. The regression line for sleeping problems on workload was significantly positive when overcommitment was high ($\beta = .139, p = .025$) but not significant when overcommitment was low ($\beta = -.001, p = .985$) (see Figure 3). Additionally, as shown in Figure 2, workload ($\beta = .252, p < .001$), overcommitment ($\beta = .301, p < .001$), and sleeping problems ($\beta = .258, p < .001$) were positively related to emotional exhaustion. Workload ($\beta = .148, p < .001$), overcommitment ($\beta = .133, p < .001$), and sleeping problems ($\beta = .228, p < .001$) had positive relationships with presenteeism. Furthermore, workload ($\beta = -.173, p < .001$), overcommitment ($\beta = -.117, p < .001$), and sleeping problems ($\beta = -.194, p < .001$) negatively related to job satisfaction. Finally, workload ($\beta = -.166, p < .001$), overcommitment ($\beta = -.075, p < .05$), and sleeping problems ($\beta = -.208, p < .001$) had negative effects on performance.

To confirm the moderated mediation relationship, the magnitude of the conditional indirect effects of workload on emotional exhaustion, presenteeism, job satisfaction, and performance, via sleeping problems, across high and low levels of overcommitment was examined. Furthermore, bootstrapped confidence interval estimates of the indirect effect were calculated to confirm the significance of mediations. In the present study, the 95 % confidence interval of the indirect effects was obtained with 5,000 bootstrap resamples. Results revealed that the conditional indirect effects of workload on emotional exhaustion and presenteeism were positive and significant in the high overcommitment condition (respectively $\beta = .051, CI = .024$ to $.082$; and $\beta = .045, CI = .021$ to $.076$) but not significant in the low overcommitment condition (respectively $\beta = -.012, CI = -.037$ to $.013$; and $\beta = -.011, CI = -.034$ to $.011$). In addition, the conditional indirect effects of workload on job satisfaction and performance were negative and significant in the high overcommitment condition (respectively $\beta = -.038, CI = -.066$ to $-.017$; and $\beta = -.041, CI = -.070$ to $-.020$) but not significant in the low overcommitment condition (respectively $\beta = .009, CI = -.010$ to $.029$; and $\beta = .010, CI = -.010$ to $.032$). More importantly, results from the above-mentioned analyses showed that the conditional indirect effects of workload on emotional exhaustion (Δ indirect effect = $.063, CI = .022$ to $.108$), presenteeism (Δ indirect effect = $.056, CI = .018$ to $.099$), job satisfaction (Δ indirect effect = $-.047, CI = -.088$ to $-.017$), and performance (Δ indirect effect = $-.051, CI = -.092$ to $-.018$) were significantly stronger in the high overcommitment condition than in the low overcommitment condition.

Discussion

This study aimed to explore the respective effect of workload on emotional exhaustion, presenteeism, performance, and job satisfaction, and to analyze the mediating role of sleeping problems in these relationships. Additionally, we sought to observe the moderating role of overcommitment in these indirect relationships.

First, workload—conceptualized as a hindering demand—had a positive linear effect on maladaptive outcomes (i.e., emotional exhaustion and presenteeism) and a negative linear effect on adaptive outcomes (i.e., job satisfaction and performance), which parallels results found in other occupations such as physicians (Shirom, Nirel, & Vinokur, 2010), nurses (Van Bogaert, Clarke, Willems, & Mondelaers, 2013), or social workers (Yürür & Sarikaya, 2012). This also extends prior investigations that found workload to be positively associated with

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teachers' work-family conflict, mental fatigue, and physical and psychological symptoms (e.g., Hakanen et al., 2006). By thus showing workload to relate to a wider variety of outcomes among teachers, we contribute to theory by extending the knowledge associated with the consequences of excessive workload in teachers. Indeed, our results show that teachers' excessive workload not only affects their psychological health (i.e., emotional exhaustion) but it also negatively impacts their attitudes (i.e., job satisfaction) and behaviors (i.e., performance and presenteeism). Our findings therefore confirm workload to be a serious issue to be taken into consideration to protect and promote teachers' general functioning.

Second, the relationships between workload and the four outcomes studied in the present research were partially mediated by sleeping problems. These findings are in line with Pereira and Elfering's results (2014) that showed that sleep disturbances mediated the relationship between work stressors and psychosomatic health impairment. These results thus indicate that sleeping problems relate to a variety of outcomes: not only do they associate with psychological health impairment (i.e., emotional exhaustion), but also with deleterious attitudes (i.e., lower job satisfaction) and behaviors (i.e., lower job performance, presenteeism). These results provide support for the effort-recovery theory (Meijman & Mulder 1998) and the conceptual approach of incomplete recovery (Geurts & Sonnentag, 2006). Specifically, our results shed light on a possible mechanism (i.e., sleeping problems) to explain the adverse consequences of excessive workload on teachers' functioning. Given the adverse consequences associated with incomplete recovery, our findings thus encourage to identify the conditions to prevent sleeping problems in teachers.

Third, overcommitment moderated the workload-sleeping problems relationship. Specifically, our results showed that workload was associated with more frequent sleeping problems among overcommitted teachers. A possible explanation for this result is that overcommitted teachers have a harder time psychologically detaching from work during non-work hours (Sonnentag & Krueger, 2006), therefore they have more trouble falling or staying asleep as they are caught up in work-related thoughts. Our findings therefore extend prior research on the moderating role of overcommitment. Indeed, to the best of our knowledge, our study is the first to demonstrate the moderating role of overcommitment in the relationship between workload and individual and organizational outcomes through incomplete recovery in teachers. Our results therefore corroborate the effort-reward imbalance model (Siegrist, 1996) by confirming overcommitment to accentuate the perceived imbalance between efforts and rewards and to be a dysfunctional coping pattern leading to a wide range of adverse consequences in teachers.

Fourth, high overcommitment resulted in stronger indirect positive relationships (through sleeping problems) between workload and respectively emotional exhaustion and presenteeism, and indirect negative associations between workload and job satisfaction and performance, but this mediation was not significant for those low in overcommitment. A possible interpretation is that because highly overcommitted teachers experience more sleeping problems as a result of workload, they do not allow their taxed psychobiological system to return to its baseline level (Meijman & Mulder, 1998) and their resources to regenerate. Therefore, our results show that they do not perform as well (i.e., low job performance) and go to work without being fully able to attend to it (i.e., presenteeism). Our results also indicate that because their resource restoration process is obstructed, teachers who are high in overcommitment may also reach a generalized state of energy depletion (i.e., emotional exhaustion). Overall, this adverse experience gives them a negative feeling about their job (i.e., low job satisfaction). Although prior research has directed efforts towards examining the consequences of overcommitment (Avanzi et al., 2014), it did not address its implications in the relationships between workload and individual and organizational outcomes through incomplete recovery, even less so in teachers. Our results allow to get some

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insight into how high overcommitment interacts with workload to explain individual and organizational consequences.

Finally, results also revealed that overcommitment positively related to emotional exhaustion and presenteeism, and negatively to job satisfaction and performance. A possible explanation is that overcommitted teachers exaggerate their efforts (van Vegchel et al., 2005), which may take the form of presenteeism, and they put unrealistic demands upon themselves which may result in lower perceived performance. Additionally, it can be interpreted that because overcommitted teachers strive excessively, they may tap into their resources until depletion of the latter (i.e., emotional exhaustion). Overcommitted workers are also known to frequently experience disappointment and frustration (Feuerhahn et al., 2012), which may take the form of low job satisfaction in overcommitted teachers. In sum, results confirm overcommitment to be a dysfunctional coping pattern leading to maladaptive outcomes (Siegrist, 2001).

Practical Implications

This research offers some guidance to enhance teachers' job satisfaction and performance, and reduce their sleeping problems, emotional exhaustion, and presenteeism. Essentially, it appears fundamental to consider the conditions under which teachers' workload could be reduced or more adequately distributed, especially for overcommitted teachers, in order to offer them the possibility to psychologically detach from work and increase their opportunities for recovery and recuperation (Sonnetag & Fritz, 2015). Because there is not always leverage to act on teachers' workload or because it requires time and resources to do so, practical implications could also focus on the possibility to increase recovery by offering teachers recovery training programs. Prior research indeed indicated approaches that successfully train psychological detachment (Hahn, Binnewies, Sonnetag, & Mojza, 2011). In their quasi-experimental study, researchers demonstrated that participants of a recovery training program (e.g., self-reflection, identification of barriers and strategies, time management techniques) showed higher recovery experiences (e.g., psychological detachment, relaxation) and had better sleep quality after the training, compared with participants of a control group. Finally, it would also be necessary to identify those teachers with high levels of overcommitment and develop preventative interventions to reduce levels of overcommitment.

As far as organizational practices are concerned, our results suggest that teachers dysfunctionally involved in their jobs may exaggerate their efforts when they are confronted with heavy workload, which makes them more exposed to incomplete recovery, psychological health impairment, and maladaptive job attitudes and behaviors. To avoid these negative outcomes, group seminars led by psychologists (Feuerhahn et al., 2012) could raise teachers' awareness on the risks of overcommitment, which is a motivational pattern that jeopardize their health and performance, especially under stressful working conditions (e.g., high workload). Stress management interventions based on psychodynamic, relaxation, as well as cognitive behavioral techniques have also proven to help to better deal with factors contributing to high efforts and low rewards at work, such as overcommitment (Aust, Peter, & Siegrist, 1996; Limm et al., 2010).

In addition, school managers should avoid positively reinforcing attitudes characterized by excessive efforts and an inability to detach oneself from work obligations. They should also support a fair system of rewards and provide organizational resources (e.g., information, communication, participation) which may limit the detrimental influence of overcommitment by promoting job satisfaction and well-being (Avanzi et al., 2014). Overcommitment may also be prevented by promoting healthy forms of commitment and encouraging efficient work based on productive time management strategies (Holland, 2008).

Limitations and Perspectives

On one hand, the present research has several limitations. First, the data collection was cross-sectional and the data are correlational in nature. Conclusions about causality are therefore unwarranted. To get more insight into the ordering of our study variables, we tested several alternative models which provided significantly worse fit to the data than our proposed model. Nonetheless, future research should attempt to replicate the present findings through the use of longitudinal designs in order to confirm the causal order of our study variables. Second, we only relied on self-report measures. Although the common-method bias does not constitute a serious issue underlying our data (see Podsakoff et al., 2003), we encourage researchers to conduct future studies with objective assessments to extend our results (e.g., actigraphy to monitor sleep; Pereira & Elfering, 2014). Third, the present sample only comprised teachers from one country (i.e., France). In order to strengthen confidence in the structural model, it is thus necessary to replicate our results in other samples of teachers from France but also from different cultures. Fourth and finally, in our study, workload was the only job demand of interest, yet the consideration of other job demands and resources may offer a more complete understanding of how teachers' work environment may affect their functioning. Additionally, we apprehended workload as a hindrance stressor, yet research showed that workload may be perceived as a challenge stressor (LePine, Podsakoff, & LePine, 2005), or that it may have curvilinear effects on individual functioning and may not have adverse effects up to a certain level (Germeys & De Gieter, 2017). Future research could further explore how workload may have counterintuitive effects on individual functioning.

On the other hand, this paper offers perspectives for research. Future research could further explore the workload-recovery relationship among overcommitted teachers. For instance, we know that pleasurable leisure experiences relate to a decrease in fatigue and an increase in vigor (van Hooff, Geurts, Beckers, & Kompier, 2011) as well as to positive affective states (Sonnentag & Zijlstra, 2006). In addition, exhaustion predicts a decrease in psychological detachment from work especially for employees who do not engage in pleasurable leisure experiences (Sonnentag, Arbeus, Mahn, & Fritz, 2014). This suggests that pleasurable leisure experiences could be an important boundary condition for the workload x overcommitment interaction on sleeping problems. In other words, the interaction effect would be boosted when teachers do not have pleasurable experiences during leisure time. Future research is encouraged to test this potential three-term interaction of workload, overcommitment, and leisure experiences in the prediction of incomplete recovery. Finally, an interesting avenue for future research would be to focus on another way to operationalize recovery. In the present study, we assessed sleeping problems but we encourage researchers to use other measures such as psychological detachment (Sonnentag & Fritz, 2015). More generally, because sleeping problems only partially mediated the relations of workload to individual and organizational outcomes in our study, additional research is needed to look into other mechanisms (e.g., work motivation, team cohesiveness) that may contribute to explain how job demands have significant effects on emotional exhaustion, presenteeism, job satisfaction, and performance.

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Table 1

Confirmatory Factor Analyses Comparing Alternative Measurement Models

Model	χ^2	<i>df</i>	χ^2/df	TLI	CFI	RMSEA and 90% CI	AIC	Model comparison	$\Delta \chi^2$	Δdf
M1: Hypothesized five-factor model	646.32	260	2.49	.96	.97	.041 (.037–.045)	828.32	–	–	–
M2: Four-factor model by combining workload and overcommitment into one factor	734.79	264	2.78	.96	.96	.045 (.041–.049)	908.79	M1 vs. M2	88.47*	4
M3: Four-factor model by combining overcommitment and emotional exhaustion into one factor	876.50	264	3.32	.94	.95	.051 (.048–.055)	2518.46	M3 vs. M4	1923.19*	3
M4: Three-factor model by combining sleeping problems, emotional exhaustion, and presenteeism into one factor	2799.69	267	10.49	.76	.81	.104 (.100–.107)	2967.69	M5 vs. M6	236.26*	1
M5: Two-factor model by combining overcommitment, sleeping problems, emotional exhaustion, and presenteeism into one factor	2982.91	269	11.09	.75	.79	.107 (.103–.110)	3146.91	M1 vs. M3	230.18*	4
M6: One-factor model	3219.17	270	11.92	.73	.77	.111(.108–.115)	3381.17	M1 vs. M5	2336.59*	9

Note. χ^2 = Chi-square; *df* = degree of freedom; TLI = Tucker-Lewis Fit Index; CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation; CI = Confidence Interval; AIC = Akaike Information Criteria; $\Delta \chi^2$ = Chi-square difference; Δdf = degree of freedom difference; * $p < .001$.

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Table 2
Means, Standard Deviations, and Correlations between Variables

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11
1. Workload	4.06	.59											
2. Overcommitment	3.91	.77	.53***										
3. Sleeping problems	3.44	1.32	.30***	.48***									
4. Emotional exhaustion	3.55	1.00	.48***	.56***	.48***								
5. Presenteeism	2.13	1.17	.28***	.33***	.34***	.48***							
6. Job satisfaction	2.79	.65	-.28***	-.30***	-.30***	-.56***	-.37***						
7. Performance	6.39	1.60	-.29***	-.28***	-.29***	-.45***	-.41***	.44***					
8. Age	32.75	9.26	-.12***	-.04	.01	.05	.05	-.10**	.17***				
9. Gender	–	–	.06	.16***	.10**	.10**	.08*	.02	-.08*	-.11**			
10. Sector	–	–	-.05	-.09**	-.01	-.08*	-.04	.07*	.10**	.14***	-.02		
11. Contract	–	–	-.04	-.06	-.02	-.05	-.04	.05	-.00	-.11**	.04	.10**	
12. Time worked	–	–	.02	.01	.06	-.03	.04	.03	-.05	-.12***	.09*	-.06*	.19***

Note. *** $p < .001$, ** $p < .01$, * $p < .05$; workload, overcommitment, emotional exhaustion, and presenteeism were measured on a 5-point scale; sleeping problems were measured on a 6-point scale; job satisfaction was measured on a 4-point scale; performance was measured on an 11-point scale; socio-demographic variables were coded as follow: Gender (1 = Men; 2 = Women), sector (1 = Public; 2 = Private), contract (1 = Permanent; 2 = Temporary), and time worked (1 = Full time; 2 = Part time)

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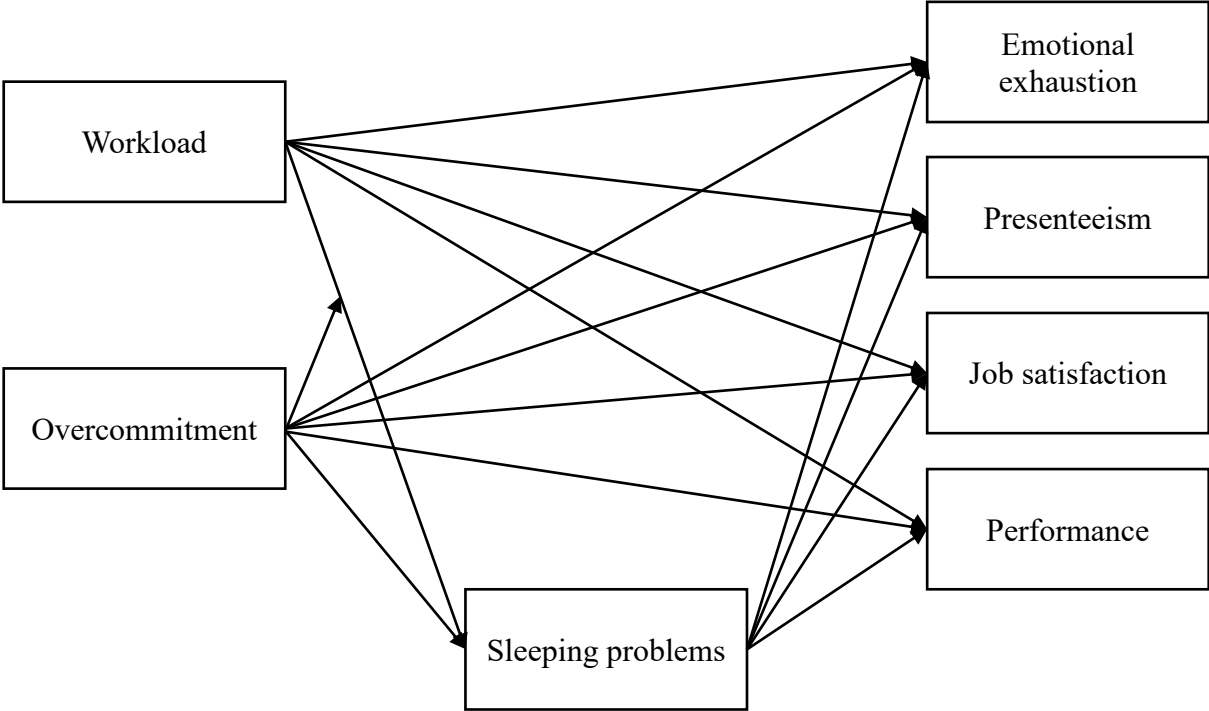


Figure 1. Theoretical model

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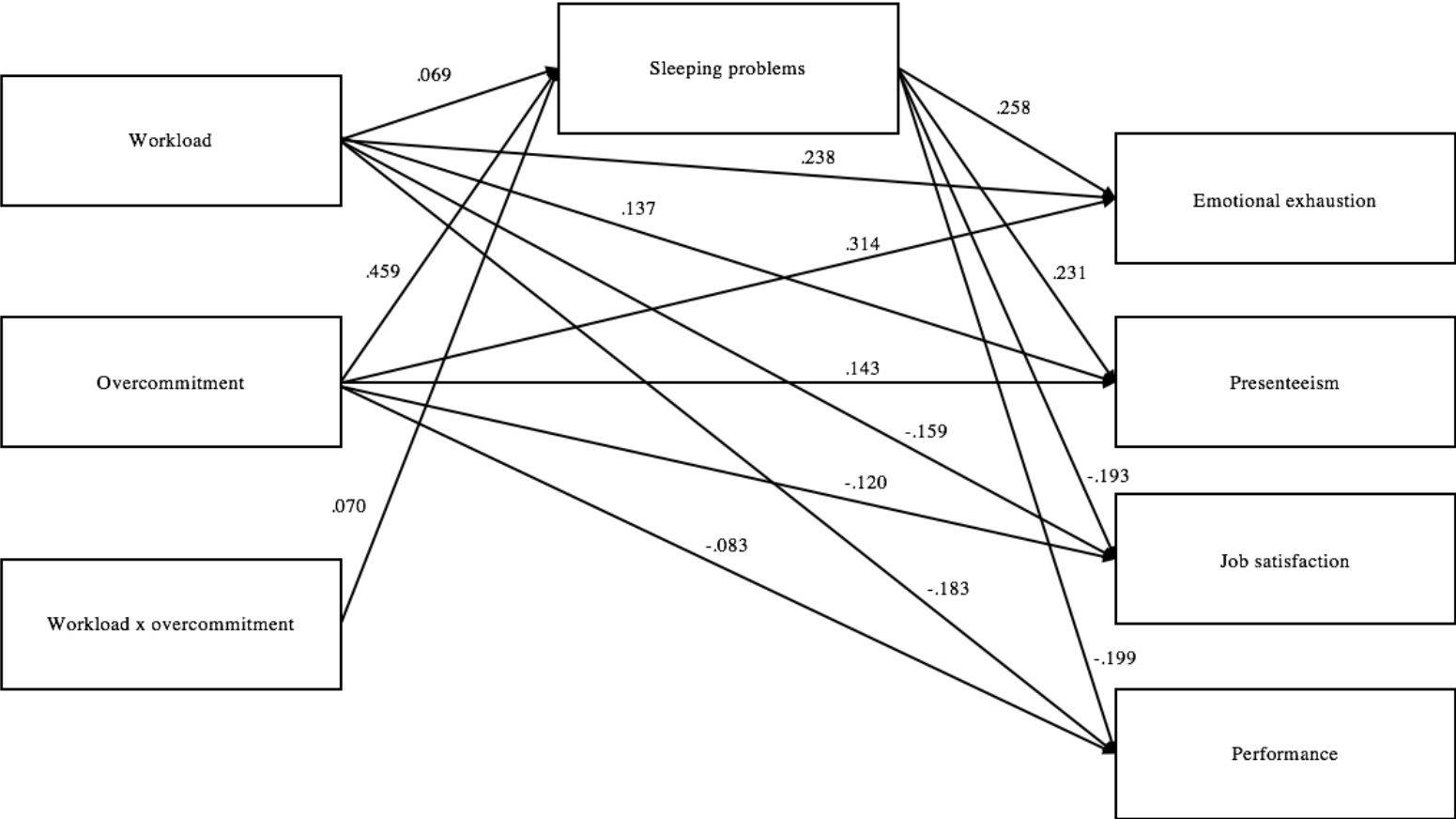


Figure 2. Results from the moderated mediation model

Note. Standardized coefficients are reported. For clarity purposes, covariances and links with controlled variables are not presented. All paths are significant ($p < .05$).

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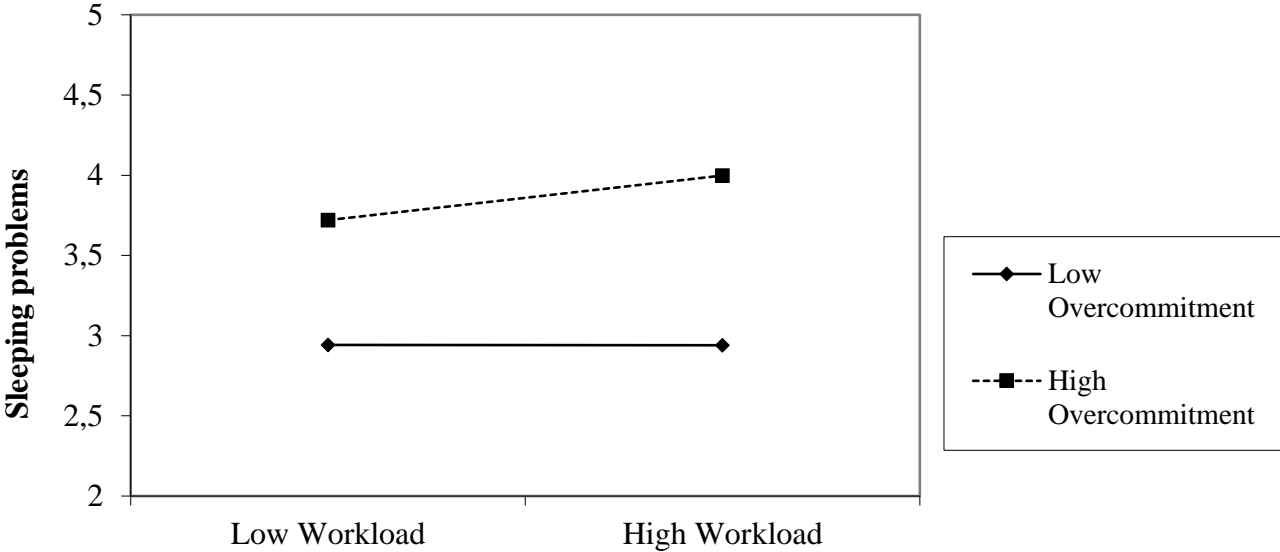


Figure 3. Interaction between workload and overcommitment in predicting sleeping problems