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To cite this article: Maja Tadić Vujčić, Wido G. M. Oerlemans & Arnold B. Bakker (2017) How challenging was your work today? The role of autonomous work motivation, European Journal of Work and Organizational Psychology, 26:1, 81-93, DOI: 10.1080/1359432X.2016.1208653

To link to this article: http://dx.doi.org/10.1080/1359432X.2016.1208653

Published online: 28 Jul 2016.

Article views: 136

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How challenging was your work today? The role of autonomous work motivation

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ABSTRACT

The main aim of this study was to investigate whether autonomous motivation for work can explain the distinctive associations between hindrance and challenge demands and work-related well-being (i.e., positive affect and work engagement) on a within-person level. Autonomous work motivation represents the degree to which motivation for putting effort in work is intrinsic (i.e., with a sense of volition and personal choice) or has been internalized (i.e., without feelings of internal or external pressure). In order to test our hypotheses, we employed a diary methodology and followed 153 secondary school teachers throughout five consecutive working days. The results of multilevel modelling provided support for the hypothesized research model. On days when teachers experienced more challenges, they also experienced more positive affect and more engagement in their work on the same day, and this relationship could be explained by (higher) autonomous work motivation on that day. In contrast, on days when teachers experienced more hindrance demands, they experienced less positive affect and less work engagement, and this process was explained by (reduced) autonomous work motivation that day. Our findings add to the literature by showing that daily autonomous motivation as a motivational process can explain why daily challenge and hindrance demands are differentially related to positive well-being at work.

Although many studies showed that high job demands—aspects of the job that require sustained effort or skills, and are associated with certain costs—cost energy and undermine work-related well-being (Bakker, Demerouti, & Verbeke, 2004; Hakanen, Schaufeli, & Ahola, 2008); some studies found non-significant (Schaufeli & Bakker, 2004; Simbula, 2010; Sonnentag, 2003), or even positive associations (Schaufeli, Taris, & Van Rhenen, 2008) between job demands and work-related well-being (Schaufeli & Taris, 2014; Van den Broeck, Van Ruyssseveldt, Vanbelle, & De Witte, 2013). These inconsistent associations have been attributed to differences in types of job demands, as outlined within the challenge–hindrance stressor framework (Crawford, LePine, & Rich, 2010; LePine, Podsakoff, & LePine, 2005), a theoretical basis for distinguishing between challenge and hindrance job demands. Challenge demands, such as workload and complex tasks, are stressful and straining, because they cost considerable effort and energy (Widmer, Semmer, Kälin, Jacobshagen, & Meier, 2012). However, unlike hindrance demands, challenge demands also have positive features as they can be motivating and help to perform well. Examples of challenge demands are high workload, job complexity, and responsibility (Widmer et al., 2012). Conversely, hindrance demands, such as contradictory assignments, or job and task insecurity, are not associated with these gains and have the potential to harm and interfere with important work outcomes, including work-related well-being and performance (Cavanaugh, Boswell, Roehling, & Boudreau, 2000).

Nonetheless, two important issues require further research: How exactly can daily challenge demands foster daily work-related well-being, and how can daily hindrance demands thwart it? Can job demands be distinguished on a within-person level? In order to gain more insight into these matters, the present study examined whether autonomous motivation for work—as outlined within the self-determination theory (SDT) (Deci & Ryan, 2008; Gagné & Deci, 2005)—can explain the distinctive associations between hindrance and challenge demands and work-related well-being on a within-person level. Autonomous work motivation represents the degree to which putting effort in work is performed out of genuine interest and choice rather than out of external pressure (Gagné et al., 2010; Meyer & Gagné, 2008; Sheldon & Elliot, 1999). The existing literature shows that employees who perceive their work as aligned with their interests and values are happier and more satisfied than those who put effort in work mostly for external reasons, such as getting paid or achieving high status (Bono & Judge, 2003; Judge, Bono, Erez, & Locke, 2005).

We argue that daily challenge demands foster daily autonomous work motivation because challenge demands can enhance employees’ felt sense that the work they do is fun, interesting, and meaningful. This, in turn, can boost their work engagement and positive affect at work on a daily basis. For example, teachers may see the value of putting effort into effectively dealing with large number of projects on a certain day, because that may help their pupils learn better. In this

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way, teachers’ may feel more positive affect at work and their work engagement on that particular day. This is important because maintaining high levels of employee well-being has proven to be beneficial not only for employees themselves, but also for the people they work and live with (Bakker, Demerouti, & Burke, 2009; Ilies, Wilson, & Wagner, 2009; Roorda, Koomen, Spilt, & Oort, 2011).

Conversely, employees might have difficulties finding the sense of satisfaction, meaning, and value (i.e., autonomous work motivation) on days when they have to deal with high hindrance job demands. For instance, when teachers have a large amount of daily bureaucratic tasks, they may not only lose their valuable energy, but they may have difficulties to find fun, interest, and meaning in them. This, in turn, can lead to lower work engagement and reduced positive affect on days like that. This means that daily hindrance demands reduce the opportunities for engagement and positive affect by lowering employees’ autonomous work motivation. Hindrance demands may be difficult to internalize because it is hard for employees to see their meaning or value.

This study adds to the literature in several ways. First, one of the main assumptions of the job demands–resources (JD-R) theory (Bakker & Demerouti, 2014) is that work motivation is highly relevant for work-related well-being. However, within JD-R theory research, work motivation is mostly studied on a “trait”–level through work engagement as a motivational state, but without direct examination of specific types of work motivation on the daily level (Berg, Bakker, & Cate, 2013; Fernet, Austin, & Vallerand, 2012). Hence, the present study emphasizes the importance of direct examination of work motivation as a highly relevant aspect of employees’ everyday work life that fluctuates substantially between working days.

Second, the study examines differential relationships of hindrance versus challenge demands with positive outcomes on a daily level. Challenge and hindrance demands are likely to fluctuate substantially on a day-to-day basis, and are likely to predict daily consequences such as fluctuations in daily work-related well-being (Ilies, Schwind, & Heller, 2007; Tadić, Bakker, & Oerlemans, 2013; Xanthopoulou, Bakker, & Ilies, 2012). These subjective experiences close to real time cannot be captured by global indicators. Yet, only three previous studies examined the within-person fluctuations in challenge and hindrance demands (Bakker & Sanz-Vergel, 2013; Rodell & Judge, 2009; Tadić, Bakker, & Oerlemans, 2014).

Third, the study provides an explanation for why hindrance demands have a negative relationship with positive outcomes on a daily basis, and why challenge demands have a positive link with positive outcomes on a daily basis (i.e., because of their differential associations with daily autonomous work motivation). Although several previous studies examined the associations between job demands and autonomous motivation (e.g., Fernet, Guay, & Senecal, 2004; Parker, Jimmieson, & Amiot, 2010; Trépanier, Fernet, & Austin, 2013), to our knowledge, this is the first study to examine the role of autonomous work motivation in the relationship between challenge and hindrance demands and work-related well-being on a within-person level. This is important because it increases our understanding of why job demands promote versus thwart work-related well-being in our everyday work life.

Finally, the current study examines the above daily processes among teachers. Work-related well-being of teachers is highly important not for only the individual teachers, but also for performing well in the classroom (Bakker, 2005; Hakanen, Bakker, & Schaufeli, 2006; Jennings & Greenberg, 2009; Konu & Rimpelä, 2002; Roorda et al., 2011). Also, most of the previous studies on work-related well-being of teachers focused on strain and negative indicators, such as exhaustion and burnout (Spilt, Koomen, & Thijs, 2011). The present study adds to this knowledge by examining positive indicators of work-related well-being among teachers. In the present study, we followed 153 secondary school teachers in Croatian across five consecutive working days.

Theoretical background

Daily work-related well-being

The present study focuses on the affective experiences of well-being, namely, positive affect and work engagement that employees actually experience while working on a day-to-day basis. Positive affect at work refers to transient positive emotions and moods (e.g., inspired, happy, satisfied) that are felt by employees in different degrees during different working days (Amabile, Barsade, Mueller, & Staw, 2005), whilst work engagement refers to a stimulating, energetic and meaningful work-related experience characterized by vigour, dedication, and absorption (Breevaart, Bakker, & Demerouti, 2014).

Positive affect and work engagement have been shown to fluctuate substantially on a within-person level (Xanthopoulou et al., 2012) and to predict optimal employee functioning (Fredrickson, 2003). Work engagement has been studied most often (Bakker & Oerlemans, 2012); however, the JD-R model is a broad model that has been able to predict a range of well-being and attitudinal indicators, including burnout, work engagement, and commitment (Bakker & Demerouti, 2014).

The challenge-hindrance stressor framework

According to the LePine et al.’s (2005) challenge stressorhindrance stressor framework, hindrance demands are only negative (for everyone), and challenge demands cost energy and can be straining (for everyone), but also offer potential of gains and accomplishment (for everyone) (Widmer et al., 2012). For instance, workload, job complexity, and time urgency present work tasks and conditions that require effort and energy, but efficiently dealing with them can result in growth, learning, and goal attainment. Similarly, highly complex work tasks may require high levels of energy investment, but can also promote mastery and competence. Thus, challenge demands can be rewarding and worth the effort because they signify the potential realization of desired outcomes through overcoming difficulties. As such, challenge demands can stimulate motivation and a proactive approach in dealing with them (Crawford et al., 2010; Pearsall, Ellis, & Stein, 2009).

In contrast, hindrance demands present work tasks and conditions that are unnecessary, constraining, and require
effort and energy, but do not offer potential for growth and development (LePine et al., 2005; Van den Broeck, De Cuyper, De Witte, & Vansteenkiste, 2010). As such, hindrance demands are typically viewed as obstacles that thwart gains and accomplishment because they encompass the assumption that the available resources and efforts will not be adequate to meet the demands, and because they are dependent on external and uncontrollable factors, which can result in a sense of being overwhelmed (Cavanaugh et al., 2000; Hakanen et al., 2006; Van den Broeck et al., 2010). Typical hindrance demands are redundant formal rules and bureaucracy, role ambiguity, role conflict, and hassles (Rodell & Judge, 2009).

The results of two meta-analyses (Crawford et al., 2010; LePine et al., 2005) provided support for the differential effects of challenge and hindrance demands on some work-related outcomes. For instance, both challenge and hindrance job demands have been found to exert employees’ energy and resources; however, challenge demands have been positively related to job satisfaction, work engagement, and motivation, and negatively to turnover. In contrast, hindrance demands have been positively related to exhaustion, anxiety, and physical symptoms, and negatively to work engagement (Crawford et al., 2010; LePine et al., 2005; Podsakoff, LePine, & LePine, 2007; Van den Broeck et al., 2010).

Thus, challenge demands, as particular job characteristics, can be distinguished from hindrance demands and they are not only a matter of subjective interpretation. However, to the best of our knowledge, no previous studies examined the underlying mechanism that can account for differential relations of challenge and hindrance demands to within-person fluctuations in work-related well-being.

**Autonomous work motivation**

Employees can put effort at work not only for functional purposes (e.g., getting paid), but also as one of the ways to fulfil their basic psychological needs (Fernet, Gagné, & Austin, 2010). The SDT details a multidimensional model of autonomous motivation that allows the assessment of the level as well as the type of motivation by emphasizing the individual’s proactive behaviour (Bono & Judge, 2003; Judge et al., 2005; Sheldon, 2002; Sheldon & Elliot, 1999; Sheldon, Ryan, Deci, & Kasser, 2004). High autonomous work motivation reflects working with a sense of volition, meaning and congruence between employees’ work-related activities and their own identity, personal interests and values, and working out of a sense of choice, even when there is no particular inherent interest (Gagné & Deci, 2005). More specifically, employees with high autonomous work motivation may have fun while putting effort in their work and have genuine interest in the work activities (i.e., intrinsic work motivation). However, sometimes employees may not like to go to work each day, but may acknowledge the importance of getting to work (i.e., identified work motivation) and they may find personal significance and meaning in their work activities, even when they are uninteresting (i.e., integrated work motivation). For example, teachers may not particularly enjoy organizing meetings with parents, but they can acknowledge the importance of developing positive collaboration with parents.

Autonomous work motivation is considered to lead to well-being because it fosters putting effort (Sheldon, 2002; Sheldon & Elliot, 1999; Sheldon et al., 2004), and fulfilment of basic psychological needs, particularly competence and autonomy (Meyer & Gagné, 2008). Between-person studies demonstrated that employees with generally high (vs. low) levels of autonomous work motivation are more committed to their work organizations (Otis & Pelletier, 2005; Richer, Blanchard, & Vallerand, 2002), and also report less hassles at work (Otis & Pelletier, 2005). Their profession is more central to their identity, which helps them to find the meaning and value in the demands that are challenging.

According to SDT, within-person changes in motivation from either moment-to-moment (within the day) or day-to-day (between days) should impact momentary and daily well-being, respectively. However, previous studies did not address the extent to which variations in employees’ affective states at work are dependent on variations in their motivational states. Bearing in mind that employees are likely to have different motivation and happiness levels during different work activities on different working days (Ashkanasy & Daus, 2002; Ilies et al., 2007; Reis, Sheldon, Gable, Roscoe, & Ryan, 2000; Tadić et al., 2013), we need a better understanding on how momentary motivational states impact affective experiences during work days and work activities.

**The present study**

The present study aims to add to our knowledge by investigating autonomous work motivation as a potential mediator in the relationship between different types of job demands and work-related well-being on a daily basis (i.e., daily work-related positive affect and work engagement). This study is among the first to directly examine autonomous work motivation as a psychological mechanism that may explain the somewhat inconsistent findings on the relationship between daily job demands and daily work-related well-being, while accounting for different types of job demands.

The overall research model is presented in Figure 1. Based on the above literature, we expected that challenge and hindrance demands, autonomous motivation, work engagement, and positive affect fluctuate substantially on a within-person level. Moreover, we predicted that daily fluctuations in challenge demands are related to daily autonomous motivation, as these demands point out to possibilities of positive outcomes. For instance, having a lot of work to do may result in getting a lot of work done—to have a high output. The same cannot be said about having a low workload. In contrast, high daily hindrance demands obstruct goal attainment, and thus are distracting. The effort needed to cope with hindrance demands cannot be invested in the work itself—hence the work engagement is likely to suffer.

When perceiving demands as challenges, individuals are likely to find the demands meaningful and important (i.e., autonomous), and subsequently invest autonomous effort to deal with the demands. When dealing with high daily challenge demands, such as high responsibilities and high job complexity, employees may acknowledge the potential positive outcomes of putting effort in these demands, even
though they might not find it particularly interesting or enjoyable. For instance, teachers could value organizing meetings with parents or doing workshops with pupils because this may help pupils to gain more knowledge and acquire new skills. In turn, this may help teachers experience work engagement and positive affect at work because it resonates with their core values, interests, and the reasons why they became teachers in the first place. Stated in a more formal way:

**Hypothesis 1:** Daily autonomous motivation at work mediates the direct positive relationship between daily challenge demands and (a) daily positive affect at work, and (b) daily work engagement. On days when teachers experience more challenges demands, they also experience more autonomous motivation and, in turn, they experience higher positive affect and work engagement during that day.

Finally, when employees encounter hindrance demands, they are likely to perceive these demands as hassles that will block or aggravate the achievement of personal desired work and personal goals. For instance, contradictory work obligations, or role conflict are likely to drain teachers’ resources that could have otherwise been used for attaining desired and meaningful outcomes. Under such conditions, employees are likely to adopt a more passive style of coping, feel bad at work, and invest less effort in dealing with hindrance demands (Crawford et al., 2010). Based on the above reasoning, we formulate our second hypothesis:

**Hypothesis 2:** Daily autonomous motivation at work mediates the direct negative relationship between daily hindrance demands and (a) daily positive affect at work, and (b) daily work engagement. On days when teachers experience more hindrance demands, their motivation for work is less autonomous, and, in turn, they experience less positive affect and less work engagement during that day.

In addition, we also examined the possibility that the relationship between challenge demands and autonomous motivation and work related well-being is curvilinear in nature. Specifically, we posited that high levels of challenge demands might be worse than moderate levels of these demands. Thus, increases in challenge demands might be associated with higher autonomous work motivation and work-related well-being, but only to a certain degree, after which further increases in challenge demands become negatively associated with autonomous motivation and work-related well-being (Janssen, 2001). This is in line with the notion that challenge demands act as a “double-edged sword” (Zapf, Semmer, & Johnson, 2014). We formulate this in our third and final hypothesis:

**Hypothesis 3:** Daily challenge demands have a curvilinear relationship with (a) daily autonomous work motivation, (b) daily positive affect at work, and (c) daily work engagement.

**Method**

**Participants**

Participants were 153 secondary school teachers working throughout Croatia. The majority of participants were female ($N = 123$), and their age ranged from 26 to 64 ($M = 43$, $SD = 10.16$). The teachers in our study worked in different types of secondary schools: gymnasiums (secondary schools focused on preparing students to enter a university for advanced academic study) (33%), economic schools (8.5%), medical schools (5.4%), engineering schools (13.7%), art schools (1%), and vocational schools (31.1%). A small number of teachers did not indicate the type of school they worked for (7.3%). On average, participants worked as teachers for 14 years ($SD = 10.01$), and worked 27 hours per week ($SD = 13.28$). All participants had either a bachelors or a master’s degree. This distribution of age, gender, and types of schools in our sample fairly represents the sociodemographic structure of secondary teachers’ population in Croatia, namely, national statistic show that majority of teachers in Croatia are female, and most of them work in technical and vocational schools (48%), followed by gymnasiums (44%), and, finally, art schools (8%) (Avilov, 2012).

Altogether, 153 teachers filled out the initial background questionnaire. Among them, 89 teachers joined the diary study and filled out the diary at least two times, 88 teachers filled out the diary three times, 78 four times, and 65 teachers filled out the diary five times. We excluded teachers who filled out the diary only once. Although we did not examine across-

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**Figure 1.** Hypothesized mediation model: the effects of daily work challenge and hindrance demands on daily work engagement and daily positive affect via daily autonomous work motivation.
day associations, we used data from participants who provided their responses on more than one day because autonomous work motivation, work-related well-being and job demands can exhibit substantial within-person variations from one day to another (Xanthopoulou et al., 2012). For instance, a daily diary study among primary school by Tadić, Bakker, and Oerlemans (2015) showed that, at day level, the intraclass correlation (ICC) in positive affect was .47 (.67 /[.67 + .75]), and the ICC in work engagement was .45 (.88/ [1.09 + .88]), which is consistent with previous studies (Breevaart, Bakker, demerouti, & Hetland, 2012; Sonnentag, Dorman, & Demerouti, 2010). Thus, data from only one day could not provide us with information on daily fluctuations within teachers. Examining data from the same participants from more than one occasion enabled us to better understand employees’ individual experiences from a micro-perspective and to understand how and why employees who may experience high work-related well-being most of the time, may not experience the same level of well-being every day (Sonnentag et al., 2010). In this way we were also able to minimize retrospective bias in recollecting previous experiences (Cranford et al., 2006).

This sample size of 153 is satisfactory for a diary study (Ilić, Johnson, Judge, & Keeney, 2011; Ilies et al., 2007; Zapf, Niessen, Sonnentag, & Ohly, 2010). Bearing in mind that the majority of the participants completed the diary study twice, we performed a drop out analyses in order to check whether these participants differ from those who provided full data. The results revealed no significant differences in age (t (499) = 2.23, ns) and in tenure (t (499) = 2.23, ns). The results showed a small, but significant differences in the number of weekly work hours (M2 = 22.18, SD = 12.70; M1 or more = 27.20, SD = 13.22; t (499) = −3.51, p = .001). However, we believe that this could not alter our results. This finding might reveal that those teachers who work somewhat more were more inclined to share their experiences within this survey. The teachers who filled out the diary twice and those who filled it out more often also did not differ in daily self-concordance (t (436) = −1.46, ns); daily positive affect (t (445) = −0.09, ns); daily work engagement (t (456) = −1.59, ns), daily challenge demands (t (432) = −1.02, ns), and daily hindrance demands (t (432) = 1.89, ns).

**Procedure**

We contacted a sample of 84 secondary school principals by telephone, explained the main aims of the study, and kindly asked the principals to e-mail the invitation for participation in a study on “well-being at work” to teachers in their school. Almost all contacted principals (91%) agreed to forward the study invitation to all of their teachers in their schools. However, we could not establish the number of teachers who received the invitation for participation; hence, we could not determine the exact response rate.

Data collection took place over 6 months. The data collection was somewhat prolonged in order to recruit the adequate number of participants. Bearing in mind the specifics of teachers’ occupational setting, it is indeed possible that the level of their job demands is somewhat higher at the end of the school year. We would expect both challenge and hindrance demands to be higher (teaching, working on many projects, helping pupils finish their grades successfully versus bureaucratic demands and maybe some conflicting tasks etc.). However, this paper focused on the associations between different types of job demands, autonomous work motivation, work engagement, and positive affect within the same day and we did not model the growth and change with respect to the time of the school year. Regardless of the level of challenge and hindrance demands (low vs. high), we expect that our model works the same way. Moreover, this study focused on within-person, and not on between-person differences.

Participation in this research was voluntary, and respondents were ensured anonymity. The study did not involve any form of deception or risk to the participants beyond that encountered in everyday life, and was approved by the official research ethics committee of The Ministry of Science, Education and Sports and the Education and Teacher Training Agency of the Republic of Croatia.

In the study, we used a self-developed online diary, named the Teachers’ happiness diary. Teachers were first asked to fill out a background questionnaire. After that, teachers were asked to complete a short diary survey every day at the end of the workday, for five consecutive workdays. On the first screen of diary survey, teachers reported the current day of the week, and rated the reasons for investing effort at work today (daily work self-concordance). Thereafter, on the next screen, teachers rated challenging and hindering demands they had encountered at work during that specific day. Next, teachers responded to how much positive affect at work and work engagement they experienced at work at the end of each workday.

**Measures**

All of the questionnaires were translated into Croatian. The scales—originally in English—were back translated by two independent bilingual researchers, and the items of the scales remained similar after the translation process. The items and instructions were adapted for daily assessment, which is a common procedure in daily diary studies (Ohly, Sonnentag, Niessen, & Zapf, 2010; Xanthopoulou et al., 2012). As can be seen in detailed descriptions later, these modifications did not reduce the reliability and validity of the scales.

**Daily positive affect**

Participants rated their positive affect at the end of a specific work day by using a list of seven emotion-related adjectives on a scale ranging from 1 (very slightly) to 7 (extremely). Five items were taken from a short form of the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988), namely inspired, alert, excited, attentive and determined. We added two additional items: happy and satisfied to include less active forms of positive affect as well. Altogether, these seven items demonstrated good internal consistency. Cronbach α varied over the 5 days between α = .92 and α = .98 (M = .94).
Daily work engagement

Daily work engagement was assessed at the end of each workday using the daily nine-item version of the Utrecht Work Engagement Scale (UWES; Schaufeli, Bakker, & Van Rhenen, 2009), which has been validated in previous research (Breevaart et al., 2012). Example items are: “I got carried away when I was working today” and “Today, I felt strong and vigorous in my job.” All items were scored on a 7-point rating scale ranging from 1 (strongly disagree) to 7 (strongly agree). Cronbach α varied over the 5 days between α = .93 and α = .96 (M = .95).

Daily autonomous work motivation

In order to assess daily autonomous motivation at work, we used the Motivation at Work Scale (MAWS, Gagné et al., 2010), which we modified so it could be used on a day level. At the end of each working day, participants rated the extent to which they made effort/got involved in their work for six different reasons, which combines two sub dimensions reflecting autonomous motivation (identified and integrated motivation) for engaging in work activities (Gagné & Deci, 2005; Gagné et al., 2010), using a scale ranging from 1 (not at all for this reason) to 7 (completely for this reason). Example items included: “Because I personally considered it important to put effort in this job today,” “Because putting effort in this job had personal significance to me today,” and “Because the work I did today was interesting.” Cronbach α of this scale varied between α = .89 and α = .94 (M = .91) across five days. We obtained a score on autonomous work motivation for each day by averaging the scores reported on the six items.

To test whether these three aspects of daily work life—positive affect, work engagement, and autonomous work motivation—represented empirically different constructs, we ran a set of multilevel confirmatory factor analyses (CFA) on a within-person matrix of items from MAWS, UWES, and PANAS (with two additional items happy and satisfied) using Mplus (Muthén & Muthén, 1998–2011). A three-factor model constructed by assigning the MAWS items to a first latent factor, the UWES items to a second latent factor, and the PANAS items to a third latent factor, was compared to one-factor model. Goodness of fit indices indicated that the three-factor model fit much better to the data (CFI = .92; TLI = .91; RMSEA = .08; SRMR = .05) than a one-factor model (CFI = .70; TLI = .67; RMSEA = .15; SRMR = .09), supporting the three-factor solution (Kline, 1998; Schermelleh-Engel, Moosbrugger, & Müller, 2003).

Daily challenge and daily hindrance demands

In order to assess challenge and hindrance demands on a daily basis, we used two eight-item measures created by Rodell and Judge (2009) and adapted this measure for daily use. Participants were asked to indicate how much they agreed with the 16 items, using a 7-point scale ranging from 1 (strongly disagree) to 7 (strongly agree) at the end of each workday. The challenge demands items represented perceived levels of workload, time urgency, job responsibility, and job complexity. Example items included “Today, my job has required me to work very hard”; and “Today, I have experienced severe time pressures in my work.” Cronbach α for the scale varied between α = .91 and α = .98 (M = .94) across five days. Example items of the hindrance demands included “Today, I have not fully understood what is expected of me” and “Today, I have had many hassles to go through to get projects/assignments done.” Cronbach α for this scale varied between α = .72 and α = .94 (M = .85) across five days.

Analytical approach

The data in this study has a two-level hierarchical structure with repeated measures collected at five working days (Level 1) nested within teachers (Level 2). In the present study, all of the variables in the analyses were Level 1 (day level) variables, including challenge and hindrance demands, autonomous work motivation, positive affect at work and work engagement. In order to appropriately test and interpret intra-individual relationships, we centered the Level 1 predictor variables—variables that fluctuate on a within-person level—at the respective person mean. This is a typical centring strategy with multilevel data (e.g., Peugh & Enders, 2005). Centring on the person-level focuses specifically on the within-person changes whilst excluding between-person variations.

Taking the multilevel structure of our data into account and in line with Preacher, Zyphur, and Zhang (2010), we used multilevel structural equation modelling (MSEM) to test our mediation hypotheses. This strategy is recommended to overcome the limitations of traditional multilevel mediation analysis (Preacher, Zhang, & Zyphur, 2011; Preacher et al., 2010; Selig & Preacher, 2009). For the analysis in this study, we used the Mplus software package to estimate the multilevel structural equation model (Muthén & Muthén, 1998–2011).

We tested our hypotheses simultaneously in one MSEM model. Bearing in mind that our hypotheses assume daily (within-person level) associations between challenge and hindrance demands, autonomous work motivation, positive affect at work and work engagement, these relationships were modelled at the day level (Level 1), and this model could be described as a 1-1-1 model with one mediator (see Figure 1). MSEM model enables us to estimate all random intercepts and random slopes; however, Preacher et al. (2010) noted that this type of a model adds unnecessary complications and can reduce the probability of convergence. Thus, we specified random intercepts and fixed slopes. Maximum-likelihood estimation was used in all analyses.

In order to test the mediation effects, we calculated Indirect Effects in Mplus using the procedure proposed by Bauer, Preacher, and Gil (2006), which is valid for multilevel data. Four additional parameters were added in Mplus in which we calculated four indirect effects from challenge and hindrance demands to either positive affect or work engagement, via autonomous motivation. Note that the additional parameters produce unstandardized estimates and standard errors for the four indirect effects which can be tested by dividing the estimate by the standard error, which produces a p-value. In these cases, the effects of the original predictors (challenge and hindrance demands) are transmitted—at least partially—through an intervening variable (autonomous motivation).
Results

Descriptive analyses

Table 1 presents the overall means, standard deviations, and zero-order correlations among the variables included in the study. Note that the correlations below the diagonal represent person-level correlations and correlations above the diagonal represent within-person correlations. As can be seen, challenge and hindrance demands correlated significantly and positively. Whereas challenge demands were significantly and positively correlated with autonomous motivation for work, positive affect and work engagement on a within-person level; hindrance demands were significantly and negatively correlated with these outcomes.

Before testing the hypotheses, we investigated whether multilevel analyses are appropriate by examining intraclass correlations (ICC) of the outcome variables. The proportion of variability or the ICC at Level 1 (within-teachers, day level) in positive affect variance was .50 (.72/(.72 + .71)), and for work engagement the ICC was .36 (.82/(1.47 + .82)), which is consistent with previous studies (Sonnentag, 2003; Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2012). The proportion of variability at the within-teachers day level for challenge demands was .46 (.83/(.99 + .83)), and it was .43 (.46/(.61 + .46)) for hindrance demands. These ICC values confirm that these variables fluctuate substantially on a within-person level, and suggest that there is adequate variability at each level of the analysis for multilevel modelling (Heck, Thomas & Tabata, 2010; Snijders & Bosker, 1999), and that we need to take into account the multilevel nature of our data in the analyses to avoid inflated type I error rates (Peugh, 2010; Snijders & Bosker, 1999).

Hypotheses testing

The main aim of our study was to investigate whether daily autonomous work motivation mediated the relationship between daily challenge and daily hindrance demands on the one hand, and daily positive affect and daily work engagement on the other hand. The overall hypothesized research model is presented in Figure 1. The results of our MSEM are shown in the Table 2. The MSEM model displayed an excellent fit to the data, namely, the fit indices were as follows: χ² = 343.02, df = 12, p < .01; CFI = .99; TLI = .99; RMSEA = .01, SRMR = .01 (within-level) and .01 (between-level). We calculated indirect effects using a two-level random model in Mplus. In particular, we added a model constraints section, where indirect effects were calculated by setting up new variables which combined two pathways, resulting in four indirect effect measures (i.e., from either challenge or hindrance demands to autonomous work motivation, and from autonomous work motivation to either work-engagement or positive affect).

Daily challenge and hindrance demands (predictors) significantly predicted autonomous work motivation (mediator). In line with our expectations, on days teachers were confronted with more challenge demands, they experienced more autonomous work motivation (γ = .17, SE = .09, p = .05). In contrast, on days teachers were confronted with more hindrance demands, they experienced lower autonomous work motivation (γ = −.24, SE = .09, p = .01). Moreover, we tested the associations between daily challenge and hindrance demands and two indicators of daily work-related well-being: positive affect and work engagement. The results in Table 2 (Model 2) showed that the associations between daily challenge job demands and daily work-related well-being indicators was positive, but not significant, for daily positive affect at work (γ = .06, SE = .08, p = .48) and work engagement (γ = .11, SE = .09, p = .20). Similarly, the results revealed that the relationships between daily hindrance job demands and daily positive affect (γ = −.08, SE = .07, p = .21) on the one hand, and work engagement (γ = −.08, SE = .05, p = .10) on the other hand were negative, but not significant. We also examined the association between daily autonomous work motivation (mediator) and daily work-related well-being indicators (outcomes). The results in Table 2 showed that on days when teachers experienced high levels of self-concordance in their work, they also felt high positive affect (γ = .60, SE = .05, p < .01), and were highly engaged in their work (γ = .66, SE = .08, p < .01).

Furthermore, we analysed the hypothesized mediation of daily autonomous work motivation. The within indirect link from daily challenge job demands through daily autonomous work motivation on both positive affect (γ = .10, SE = .06, p = .058) and work engagement (γ = .11, SE = .06, p = .059) was in the hypothesized direction and marginally significant. The within indirect link from daily hindrance job demands through daily autonomous work motivation on both positive affect (γ = −.14, SE = .06, p = .01) and work engagement (γ = −.16, SE = .06, p = .02) was in the hypothesized direction and significant.

Finally, we also tested for curvilinear relationships between daily challenge demands and the mediator and outcomes using multilevel modelling. More specifically, we first calculated the squared relationships of challenge demands in addition to the linear relationships of challenge demands on each of the outcomes at a within-person, day level. As stated in our third hypothesis, multilevel modelling showed that the
squared effects of daily challenge demands—in addition to the linear effects on the outcome variables—were significant for both daily work engagement ($\gamma = -0.07, SE = .04, t = -2.09, p < .05$) and daily positive affect ($\gamma = -0.09, SE = .03, t = -3.00, p < .05$), as can be seen in Figures 2 and 3. The squared effect of daily challenge demands also related significantly to daily autonomous work motivation ($\gamma = -0.08, SE = .04, t = -2.00, p < .05$), as presented in Figure 4. This confirms our third hypothesis for daily work-related well-being as well as for the autonomous motivation.

In addition, we examined whether the direct curvilinear relationships between challenge demands and the two outcomes of daily positive affect and work engagement would be mediated by daily self-concordance in the MLSEM model. Results showed that this was not the case. After adding two additional indirect effect variables to the model constraints section, results indicated that neither the indirect path from curvilinear challenge demands to positive affect via self-concordance ($\gamma = -0.03, SE = .04, t = -0.74, \text{ns}$), nor the indirect path from curvilinear challenge demands to work engagement via self-concordance ($\gamma = -0.03, SE = .04, t = -0.73, \text{ns}$) were significant.

**Discussion**

The main goal of this study was to examine whether daily autonomous work motivation functions as an underlying mechanism that may explain differential associations between
daily challenge and hindrance job demands and daily positive work-related well-being (i.e., daily positive affect and daily work engagement). In this way, the study aimed to bring novel insights into the roles of work motivation and on more proximal factors that foster (vs. thwart) work-related well-being in everyday work life. The results of our diary study among 153 secondary school teachers provided support for the hypothesized model. On days when teachers experienced more challenges, they also experienced more autonomous work motivation, and, in turn, they reported higher positive affect and more engagement in their work on the same day. In contrast, on days when teachers experienced more hindrance demands, they also experienced lower autonomous motivation, which, in turn, was linked to less daily positive affect and less daily work engagement.

**Theoretical contributions**

The current study makes several important contributions to the existing literature. First, the study demonstrates that employees have different experiences of job demands, motivation and well-being on different work days, and that these experiences are significantly interrelated. These findings are in line with previous research and theoretical notions (Crawford et al., 2010; LePine et al., 2005; Podsakoff et al., 2007). However, our findings provide further insights into the sometimes contradictory findings of the associations between job demands and well-being. More specifically, our study shows that it is important to differentiate between challenge and hindrance job demands, because they have differential associations with autonomous motivation. Although the indirect link of challenge demands on work-related well-being through autonomous work motivation was only marginally significant, the results still imply that, whereas challenge demands motivate teachers, and thus contribute to their vigour, dedication, and absorption; hindrance job demands undermine teachers’ motivation, and reduce teachers’ levels of vigour, dedication, and absorption. Moreover, our study reveals that the squared effect of daily challenge demands on daily work engagement and daily positive affect is negative. One interpretation could be that, although challenge demands are in essence positively related to positive outcomes, extremely high challenge demands may also reduce positive emotional experiences as such challenges may not be in balance with the persons’ skillset, or perhaps individuals may lack the time, resources, or autonomy to tackle these extremely challenging demands.

Second, our study extends the existing literature on hindrance and challenge demands by showing that autonomous work motivation, as a specific type of motivation (Gagné & Deci, 2005; Meyer & Gagné, 2008), is a mediator in the daily relationship between challenge and hindrance demands and work-related well-being. This important outcome can be explained as follows. When teachers encounter daily challenge demands, they tend to perceive them as effortful, potentially rewarding and meaningful, which aligns with their personal values and interests and stimulates daily autonomous work motivation, and, subsequently, higher daily well-being (i.e., daily positive affect at work and daily work engagement). Although the indirect link was only marginally significant (at $p < .057$), these findings are interesting as they indicate that challenge demands can stimulate curiosity, interest, and an active approach (e.g., finding value and meaning) which, in turn, leads to higher work-related well-being on a day-to-day basis.

In contrast, our findings suggest that daily hindrance demands are detrimental for daily work engagement and daily positive affect at work because they lead to a sense that daily work is not meaningful, i.e., hindrance job demands lower daily autonomous work motivation. When teachers encounter hindrance demands, such as receiving assignments without adequate resources and materials, or having to go through many hassles (e.g., high administrative workload), they see these demands as potential threats and obstacles that are not aligned with their interests and values. This translates into low levels of autonomous work motivation, meaning that teachers do not feel autonomously motivated to do their work, which, in turn, lowers their daily work-related well-being.

In other words, the negative relationship between daily hindrance demands and daily work-related well-being can be explained, at least in part, by mediation of daily autonomous work motivation. These notions are in line with the self-determination theory, which posits that people put effort in work not only for functional purposes (e.g., monthly pay cheque), but also because this enables them to satisfy their basic psychological needs-needs for autonomy, competence, and relatedness (Parker, Bindl, & Strauss, 2010; Van den Broeck, Vansteenkiste, De Witte, & Lens, 2008).

Third, the study integrates and explains somewhat contradictory findings on teachers’ work stress and well-being. Specifically, teaching has been shown to be one of the most demanding jobs along with ambulance workers, social services, prison and police officers (Brotheridge & Grandey, 2002; Montgomery & Rupp, 2005; Roorda et al., 2011), and these high job demands often lead to burnout, which can have detrimental effects on teachers’ work performance (Brackett, Palomera, Mojsa-Kaja, Reyes, & Salovey, 2010; Feuerhahn, Stamov-Roßnagel, Wolfram, Bellingrath, & Kudielka, 2013). However, previous studies also showed that many teachers experience high work engagement (Bakker & Bal, 2010; Hakanen et al., 2006), job satisfaction (Bishay, 1996), and enthusiasm regarding work despite the high daily job demands (Duckworth, Quinn, & Seligman, 2009; Roth, Assor, Kanat-Maymon, & Kaplan, 2007; Simbula, 2010). Our study provides a deeper understanding of these findings because it shows that high demands are not always negative. Indeed, some demands, when perceived as challenges (e.g., a large number of projects and/or assignments), can be experienced as valuable and meaningful (e.g., because they promote pupils’ well-being). This, in turn, can foster teachers’ work motivation and work-related well-being, which is important because maintaining high levels of teachers’ well-being has proven to be beneficial not only for teachers themselves, but also for pupils they work with (Roorda et al., 2011).

Finally, our study also provides novel and important insights on the curvilinear relationships between challenge job demands, autonomous work motivation, and work-related well-being on a daily basis. The results showed that, when
daily challenge demands are very high (i.e., +1SD above the mean), they are negatively associated with autonomous work motivation, daily work engagement and daily positive affect as dealing with the challenges is overwhelming. These findings are in line with previous studies. For instance, in a cross-sectional study among low-level and midlevel management employees Janssen (2001) demonstrated a curvilinear effects of job demands on work and supervisory satisfaction. More concretely, the study showed that managers who are fairly rewarded for their efforts seem to feel most satisfied in response to intermediate levels of job demands. However, at high levels of job demands, the regression curve significantly declined for both work satisfaction and supervisory satisfaction.

Nonetheless, our study expands previous insights by differentiating between challenge and hindrance demands on a daily level, and by providing better understanding of the mechanisms underlying the relationship between challenge demands and work-related well-being. More concretely, in the context of JD-R theory (Bakker & Demerouti, 2014), it seems that autonomous work motivation reflects not only the motivational process, but also the energy depleting process proposed by the theory. In other words, autonomous work motivation seems to explain why the challenge demands lead to lower work-related well-being after a certain point.

In addition, our study provides further confirmation that both challenge and hindrance demands indeed fluctuate substantially on a within-person level, which is important because the scientific evidence for these within-person fluctuations is still limited. We show that almost half of the variance in both challenge (46%) and hindrance demands (43%) can be attributed to these day-to-day fluctuations. This suggests that examination of the within-person fluctuations of work-related well-being and work conditions is necessary in order to acquire more insight into how and why teachers show different levels of engagement and positive affect, depending on proximal, daily factors such as different types of job demands and autonomous work motivation (Xanthopoulou et al., 2012). This can add to our understanding of the circumstances that foster employees to feel and function better at work in their everyday work life.

**Limitations and future research**

The current study has a few limitations that should be acknowledged. First, although self-reports are valid and useful method of well-being assessment (Sandvik, Diener, & Seidlitz, 2009), a multi-methodological approach that combines self-reports and objective data may be useful. Also, by using more sources of information (e.g., colleagues’, pupils’ and/or school principals’ reports), additional aspects of the teachers’ motivation, well-being and their impact could be examined. Still, this study demonstrates that daily hindrance and challenge demands, autonomous work motivation and daily well-being show meaningful intra-individual fluctuations on the day level. Second, the variables under study refer to rather subtle intrapersonal processes. Thus, it is possible that sole involvement in this study made teachers think more and evaluate the reasons why they put effort in their work, which they perhaps may not normally do in their everyday work life in terms of appraisal. However, as our study shows, it seems that these processes indeed occur within teachers and that they can be captured using diary methodology. Importantly, the daily fluctuations in the levels of job demands are related to well-being in a theoretically meaningful way.

Third, in this study we focused solely on autonomous motivation for work, without assessing the role of non-autonomous (i.e., controlled) work motivation. We justify this approach because previous studies showed that, whilst autonomous motivation typically has positive and significant associations with goal attainment, job satisfaction, and life satisfaction (Gagné & Deci, 2005; Judge et al., 2005; Sheldon & Kasser, 2001), non-autonomous (i.e., controlled) motivation typically shows nonsignificant correlations with these variables (Bono & Judge, 2003; Judge et al., 2005). Also, Judge et al. (2005) concluded that researchers should investigate the autonomous and non-autonomous motives for work separately as they anchor the extremes of the autonomy continuum.

We think that the role of non-autonomous work motivation in the association between different types of job demands and work-related well-being is an interesting research question. Based on the existing research and theoretical notions, we hypothesize that, on the one hand, challenge demands have the potential to enhance non-autonomous motivation in terms of rational, self-enhancing actions. For instance, a high workload (e.g., several demanding projects with pupils) could foster teacher’s introjected (or external) motivation for work. A teacher might want to finish these tasks in order to avoid feeling guilty because of not doing them (or in order to fulfil his job requirements and get his pay check). However, we hypothesize that this would not be positively associated with work-related well-being because the teacher did not personally embrace the value of these activities. We also hypothesize that hindrance demands reduce all types of work motivation, and that non-autonomous motivation for work would not mediate the relations between challenge and hindrance demands and work-related well-being. Nonetheless, these notions require further research.

Fourth, the study solely focused on positive work-related well-being indicators because examining these positive indicators is important for theoretical and practical reasons. Specifically, bearing in mind that previous studies on the distinction between challenge and hindrance demands mostly focused on negative work-related well-being indicators, such as burnout and strain (Crawford et al., 2010), examination of positive indicators contributes to a more comprehensive understanding of everyday work life. However, future studies could benefit from testing our research model using negative indicators of work-related well-being.

Finally, the study did neither track long-term effects nor distinguish cause and effect relationships; rather, it was based on an analysis of associations. Future studies could orient more on modelling the long-term causal processes between motivation, job demands, resources, and work-related well-being, and investigate which other process may come at play in the association between hindrance
and challenge job demands and work-related well-being. For instance, studies may focus on the role of psychological needs satisfaction in the relationship between different types of job demands and work-related well-being (Van den Broeck et al., 2013). It is conceivable that the appraisal of job demands as challenging (as positive and stimulating) changes as a result of an overwhelming amount of demands, which, in turn, could change the relationships between the demands and work-related well-being, because of loss of energy and negative impact on basic psychological needs satisfaction. For instance, teachers may start to experience complex tasks such as dealing with challenging pupils more as a hindrance than a challenge (i.e., if the demands cannot be resolved they may thwart accomplishing a sense of competence and relatedness), which, in turn may lead to a lower level of work-related well-being. Hence, it could be investigated how high challenge demands combined with high job resources and high autonomous work motivation at Time 1 affect job resources, autonomous work motivation and work-related well-being at Time 2. In this way, future research could provide additional knowledge on how work-related well-being can be sustained in everyday life, as well as in the longer term, and may reveal long-term curvilinear effects of challenge demands.

**Practical implications and conclusions of the study**

The present study shows that teachers’ daily work-related well-being partially depends on the differential associations between daily challenge and hindrance job demands on daily autonomous work motivation. Challenge job demands stimulate teachers’ work-related well-being through strengthening their autonomous motivation for work, whereas hindrance demands weaken it. These findings are important because they can be used to provide more evidence-based strategies aimed at fostering school well-being and creating more supportive school contexts (Spilt et al., 2011).

They imply that principals could promote teachers’ well-being in their everyday work life by limiting the amount of hindrance demands, such as unclear and contradictory work tasks the teachers have to cope with. However, when situations at school cannot be changed easily and do not allow for demands reduction, such as pupils’ misbehaviour or uncooperative parents, the negative effects of coping with those demands may be weakened by strengthening teachers’ autonomous work motivation by giving them more challenges than hindrances, and enabling them to find meaning and value in their work. Therefore, it seems necessary for teachers to sustain interest, sense of meaning and relevance in their work in order to thrive in their work on a daily basis.

**Disclosure statement**

No potential conflict of interest was reported by the authors.

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