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Dave Stynen

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How job characteristics relate to need satisfaction and autonomous motivation: implications for work effort

Rein De Cooman¹, Dave Stynen^{2,3}, Anja Van den Broeck⁴, Luc Sels², Hans De Witte⁵

¹Research Center for Organization Studies, HRM, KU Leuven/Thomas More, Antwerp, Belgium

²Research Center for Organization Studies, KU Leuven, Leuven, Belgium

³Department of Epidemiology, Maastricht University, Maastricht, The Netherlands

⁴Human Relations Research Group, KU Leuven/HUB, Brussels, Belgium

⁵Research Group Work, Organizational, and Personnel Psychology, KU Leuven, Leuven, Belgium

Correspondence concerning this article should be addressed to Rein De Cooman, KU Leuven/Thomas More, Korte Nieuwstraat 33, 2000 Antwerpen, Belgium.
E-mail: rein.decooman@kuleuven.be

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Abstract

To explore the motivational potential of job design, we linked job demands and job resources, as defined in the job demands–resources model, to the motivational process defined in self-determination theory. Specifically, we introduced basic need satisfaction and autonomous motivation as consecutive process variables mediating the relationship between job design and work effort. We tested this model by means of structural equation modeling in a sample of 689 employees. The comparison of several competing models provided support for the hypothesized model. We conclude that job demands thwart and job resources promote the fulfillment of 3 psychological needs. High levels of need satisfaction, in turn, are associated with autonomous motivation and, therefore, with high levels of effort.

Employees' optimal functioning and positive experiences at work are key interests in organizational behavior and human resource management (Warr, 2007). To attract and retain employees and to enhance their well-being and performance in the workplace, employers must design jobs and work environments in line with people's needs (Grant, Fried, Parker, & Frese, 2010; Morgeson & Campion, 2002).

This empirical study contributes to the field by exploring the processes that underlie the motivating potential of job characteristics. Specifically, we supplement the assumptions of the job demands–resources model (JDR; Bakker & Demerouti, 2007; Demerouti, Bakker, Nachreiner, & Schaufeli, 2001) with new insights from the strategic human resource management (SHRM) literature (Schuler & Jackson, 1987) in order to describe how job characteristics such as job demands and job resources relate to work effort. We detail the motivational process underlying these relationships by relying on self-determination theory (SDT; Deci & Ryan, 2000; Gagné & Deci, 2005). We introduce basic psychological need satisfaction and autonomous work motivation as process variables mediating the relationship between job characteristics and the effort employees put into their

jobs, which represents the behavioral manifestation of work motivation.

This study contributes to the literature in three distinctive ways. First, relying on SDT, we clarify the process through which job demands and resources relate to motivational outcomes. In detailing this motivational process, we extend a number of recent studies linking JDR and SDT (Van den Broeck, Vansteenkiste, De Witte, & Lens, 2008) by modeling both basic need satisfaction and autonomous work motivation and by focusing on a behavioral outcome (i.e., work effort), rather than on work-related well-being. As such, the proposed research model tests a critical mechanism that is rarely tested within SDT (Gagné, Senécal, & Koestner, 1997; Richer, Blanchard, & Vallerand, 2002), which is the second contribution of this study. Finally, following the recommendations of Becker and Huselid (2010), we extend JDR with a strategic aspect of job design. Specifically, in addition to the job characteristics often included in the JDR literature, we consider strategic impact, adapted from the SHRM literature, as an additional resource. In this study, we develop an integrated theoretical model on work effort by successively discussing job characteristics as antecedents and need satisfaction and autonomous motivation as mediating variables.

Job characteristics

Job design refers to “how jobs, tasks, and roles are structured, enacted, and modified, as well as the impact of these structures, enactments, and modifications on individual, group, and organizational outcomes” (Grant & Parker, 2009, p. 319). An extensive literature provides evidence that structural job characteristics (e.g., decision authority, autonomy, skill utilization, role conflict, work pressure) have an important impact on work outcomes (e.g., Fried & Ferris, 1987; Humphrey, Nahrgang, & Morgeson, 2007).

In the job demands–resources (JDR) model (Bakker & Demerouti, 2007), relevant job characteristics are divided into two dimensions. First, unfavorable job characteristics, categorized as *job demands*, are those “aspects of the job that require sustained physical and/or psychological (cognitive and emotional) effort. They are associated with certain physiological and/or psychological costs” (Bakker, Demerouti, & Verbeke, 2004, p. 86). Job demands include time and work pressure, the interference between work and family, and organizational changes (e.g., Bakker, Demerouti, Taris, Schaufeli, & Schreurs, 2003). Second, favorable job characteristics, labeled *job resources*, are the “physical, psychological, social, or organizational aspects of the job that are (1) functional in achieving work goals; (2) reduce job demands and the associated physiological and psychological costs; or (3) stimulate personal growth and development” (Bakker et al., 2004, p. 86). Job resources may concern employees’ level of autonomy, variety, and decision authority; the social support they receive; and whether they feel they can use their knowledge, skills, and abilities (e.g., Bakker et al., 2003). Resources can be situated at the organizational level (i.e., the interpersonal or social level) or at the task level (i.e., the organization of work). Task-related resources may, for instance, include the core job dimensions included in Hackman and Oldham’s (1976) job characteristics model.

The present study aims to contribute to the JDR literature by relying on recent arguments from SHRM. Specifically, we are interested in the role of strategic impact. Because of changes in the nature of work, emphasis is shifting from short-term, day-to-day concerns to long-term, strategic organizational goals and individual needs. The concept of *strategic impact* thus refers to the effect of someone’s personal work activities on the achievement of general organizational objectives.

According to Cohen (2008) and Grant (2007, 2008), strategic impact may be considered an important job resource: Jobs may include dull, routine tasks, which do not seem challenging, but if a rationale can be provided for the focused effort that tasks or roles require, this may motivate employees to achieve their work goals. According to Stone, Deci, and Ryan (2009), the provision of a rationale is one of the routes by which core psychological needs are fulfilled in

the workplace. Nonetheless, scholars have not yet established a clear link between the perception of strategic impact and employee outcomes (Grant, 2008). There is, however, some evidence that people who experience the strategic impact of their work expend greater effort on achieving performance goals and are more satisfied, committed, involved, and inclined to stay (Brown & Yoshioka, 2003; Locke & Latham, 1990; Thomas & Velthouse, 1990). With regard to the proposed link with outcome variables, having strategic impact is likely to serve as an important job resource for employees. Therefore, we examine this job characteristic, along with job characteristics traditionally included in the JDR (Vough & Parker, 2008). In all, we investigate the associations between job demands (e.g., work pressure, work–home interference) and job resources (e.g., strategic impact, skill utilization), on the one hand, and the effort employees put into their jobs, on the other hand.

Theoretical development

Considerable empirical evidence confirms the relationship between job demands and job resources and aspects related to employee well-being, such as job and organization engagement and burnout (Bakker, Demerouti, & Schaufeli, 2003; Saks, 2006; Schaufeli & Bakker, 2004) and behavior such as turnover, absenteeism, organizational citizenship behaviors, and employee performance (Bakker et al., 2004; Bakker, Demerouti, & Schaufeli, 2003; de Lange, De Witte, & Notelaers, 2008; Demerouti, 2006). However, none of these studies have included work motivation and effort as outcome variables. As Gagné and Deci (2005) and Parker and Ohly (2008) argued, further empirical research should examine the relationship between work motivation and characteristics of tasks and contexts. By integrating work effort in the research model, we associate job design not only with individuals’ well-being, but also with the proficiency with which they carry out their job duties (i.e., behavior), one of the key objectives of SHRM.

The existing literature has not only paid little attention to the association between job characteristics and motivational outcomes, but has also overlooked the processes affected by job characteristics. Empirical studies explaining the connection between job characteristics and outcomes are scarce (Van den Broeck et al., 2008). To fill this void, the present study explores the associations between job characteristics and motivational and behavioral work outcomes, and examines the processes underlying these associations. To this end, SDT may be particularly useful.

Combining the JDR and SDT literatures, we posit that job resources are positively related to need satisfaction, while job demands are negatively related to need satisfaction. Need satisfaction, in turn, is positively associated with autonomous motivation, which influences work effort. As such, need

satisfaction may play the role of a critical psychological state linking employee functioning to environmental aspects, as suggested by [Hackman and Oldham \(1976\)](#). We do not suggest that this model represents the only approach to explaining work effort, but it seeks to explain the effect of job design on work effort through basic needs and autonomous work motivation. In the following sections, we will elaborate on each of the proposed links.

The association between job characteristics and need satisfaction

The central proposition of SDT is that optimal functioning in terms of, for instance, well-being and behavior depends on the satisfaction of three basic, universal psychological needs ([Ryan & Deci, 2000](#)). These needs (i.e., autonomy, relatedness, competence) are defined as “nutrients that must be procured by a living entity to maintain its growth, integrity, and health” ([Deci & Ryan, 2000, p. 229](#)). *Need for autonomy* refers to the need to experience ownership of behavior and a sense of volition. *Need for relatedness* refers to the need to feel connected to others. Finally, *need for competence* refers to the need to be effective and to manage various challenges ([Deci & Ryan, 2000](#)). All of these needs are positively related, which suggests that they may be grouped into one concept of general need satisfaction (e.g., [Deci et al., 2001](#); [Vansteenkiste et al., 2007](#)).

According to SDT, individuals can only function optimally if their needs are satisfied ([Gagné & Deci, 2005](#)). The degree of need satisfaction mainly depends on structural or social aspects of the environment. In the context of work, several studies within the SDT framework have focused on how managers and the work climate contribute to need satisfaction ([Baard, Deci, & Ryan, 2004](#); [Deci et al., 2001](#)). Recently, the role of job characteristics as defined in the JDR was also examined ([Van den Broeck et al., 2008](#)). Job demands require considerable physiological and psychological energy, thus distracting employees from the satisfaction of their needs. Job resources, in contrast, may establish conditions of growth and goal achievement, and thereby facilitate need satisfaction ([Bakker & Demerouti, 2007](#)). [Van den Broeck and colleagues \(2008\)](#) empirically confirmed that job demands are generally negatively related to need satisfaction, whereas job resources are positively related to need satisfaction. Moreover, they concluded that need satisfaction serves as a mediator in the relationships advanced in JDR: Need satisfaction fully accounted for the relationship between job resources and exhaustion (i.e., the main component of burnout) and partially explained the relationship between job demands and exhaustion and between job resources and vigor (i.e., a key component of work engagement).

Building on this stream of literature, we predict that job demands will tend to frustrate basic needs, whereas job

resources will satisfy these needs. Furthermore, we extend this line of research by examining whether need satisfaction can explain the relationship between job characteristics, on the one hand, and work motivation and effort, on the other hand, building on [Hackman and Oldham's \(1976\)](#) discourse on psychological states as mediators.

The association between need satisfaction and autonomous motivation

According to SDT, individuals can only function optimally if their needs are satisfied ([Gagné & Deci, 2005](#)). Such optimal functioning may take the form of autonomous motivation, which is evident when employees engage in work because they want to and choose to do so ([Deci & Ryan, 2000](#)). Autonomously motivated employees are interested in their jobs; they enjoy performing their tasks or identify with the value of the activity ([Gagné & Deci, 2005](#)). Autonomous motivation may, in turn, promote well-being and performance ([Deci, Eghrari, Patrick, & Leone, 1994](#); [Gagné & Deci, 2005](#)). SDT considers autonomous motivation to be a strong predictor of effective performance and psychological health ([Deci & Ryan, 2000](#)). This has been confirmed in empirical studies in various work settings (e.g., [Baard et al., 2004](#); [Deci et al., 2001](#)) and will be explicitly tested in the current study.

The association between autonomous motivation and work effort

In SDT, autonomous motivation is not only regarded as a valuable outcome, but is also considered to result in other positive consequences ([Gagné & Deci, 2005](#)). Findings have indicated that autonomously motivated employees feel more committed to their organizations ([Gagné & Deci, 2005](#)), report fewer turnover intentions ([Richer et al., 2002](#)), and display greater levels of job satisfaction ([Lam & Gurland, 2008](#)). In the current study, we are particularly interested in the relationship between autonomous motivation and work effort, an association that has been underexplored in the organizational behavior literature.

Autonomous motivation implies that individuals engage in a task because they enjoy it or acknowledge its relevance. Autonomous motivation may thus constitute a solid basis for persistent and strong effort ([Deci & Ryan, 2000](#)). Although some scholars have found support for this assumption in a work setting ([De Cooman, De Gieter, Pepermans, Jegers, & Van Acker, 2009](#); [Sheldon & Elliot, 1998](#)), more extensive evidence has been found in other domains. For instance, in the context of education and sports, empirical studies have reported that autonomous motivation is related to concentration and self-reported efforts ([Pelletier et al., 1995](#); [Vallerand et al., 1993](#)).

The operationalization of work effort, however, has been widely debated. Scholars often use idiosyncratic measures that do not tap into all dimensions of work effort proposed in the generally accepted conceptual definitions (e.g., [Campbell & Pritchard, 1976](#); [Kanfer, 1991](#)). Rather than merely including the work intensity dimension, De Cooman and colleagues (2009) defined *work effort* as the behavioral manifestation of work motivation, referring to the intensity (force), persistence (duration), and direction (relevance) of the effort expended at work. The hypothesized model thus posits that autonomous motivation is positively related to all dimensions of work effort. To our knowledge, no previous studies have assessed the full path structure of relationships proposed by SDT, linking need satisfaction, autonomous motivation, and behavioral effectiveness in a work setting.

Method

Data collection and participants

The current study was conducted in January 2008. Because it is recommended to include a variety of jobs when exploring relationships between job characteristics and outcomes ([Warr, 1990](#)), we recruited a heterogeneous sample of 12 service organizations representing a wide range of employees in terms of gender, age, and sector. The sample contained two organizations in the field of education, three in the cultural sector, three in business support, one in healthcare, and three in developmental aid. The sample thus mirrors the heterogeneity of Belgian service-delivering employees.

Participation was anonymous on an unpaid, voluntary basis. The survey was formulated in Dutch (the official language in the northern part of Belgium). Depending on the organization's preference, participants received an online version or a paper-and-pencil version of the questionnaire (no differences were found between the instruments). In each organization, the general manager or the human resource manager encouraged employees to participate by sending an e-mail or letter to all employees, stating that the organization had agreed to take part in a survey and including the link to the online questionnaire or the paper questionnaire. Upon the conclusion of the study, each organization received general feedback on the research results.

We obtained a total sample of 689 respondents (response rate = 63%; 222 males, 449 females, 18 did not indicate gender). The sample was mainly female (65%), employed full time (64%), highly tenured (32% had worked at the same organization for over 15 years), and highly educated (73% had completed higher education). Most workers were employed as white-collar workers (91%). Participants' ages ranged from 21 to 71 years ($M = 41.2$ years). The sample thus reflects the composition of Belgian service organizations where women, highly educated, and highly tenured workers

are traditionally overrepresented. In Belgium, the highest number of female employees (i.e., about 80% in 2010) is found in the educational and healthcare sectors (FPS Economy, 2010). Concerning tenure, Belgians tend to prefer traditional psychological contracts where employer loyalty is offered in exchange for job security ([Janssens, Sels, & Van den Brande, 2003](#)). The Belgian rate of organizational tenure is among the highest in Europe, with 1 in 3 employees having more than 15 years' service at the same organization ([Accountemps, 2006](#)), which is similar to the 32% included in our sample.

Measures

Job demands were operationalized by work pressure and negative work-home interference. Work pressure mainly requires physical and cognitive effort, while work-home interference mainly requires psychological effort. Work pressure was measured by three items, such as "Do you have to work at a high pace?" ([De Witte, Verhofstadt, & Omev, 2007](#)). The items were rated on a 4-point Likert-type scale ranging from 1 (*hardly ever*) to 4 (*very often*), and they showed good internal consistency ($\alpha = .89$). Negative work-home interference was measured on the same 4-point scale with four items (e.g., "Do job demands prevent you from feeling relaxed at home?"; [Geurts et al., 2005](#)). The items showed good internal consistency ($\alpha = .87$).

Job resources were operationalized by skill utilization and strategic impact. Both aspects are functional in achieving work goals, reducing job demands, and stimulating development. Skill utilization was measured by three items including "Are you given the opportunity to show what you are capable of?" These items were also rated on a 4-point scale ($\alpha = .73$). Finally, strategic impact was measured by the item "To what degree do you feel that your job directly contributes to the objectives (mission) of your organization?" This item is similar to the item used by [Brown and Yoshioka \(2003\)](#) and was rated on a 7-point scale ranging from 1 (*very little*) to 7 (*very much*).

Need satisfaction was measured by the Work-Related Basic Need Satisfaction Scale ([Van den Broeck, Vansteenkiste, De Witte, Soenens, & Lens, 2010](#)). Respondents rated 18 items on a five-point scale ranging from 1 (*totally disagree*) to 5 (*totally agree*). Three items measured autonomy satisfaction (e.g., "I feel like I can be myself at my job"). Three items measured relatedness satisfaction (e.g., "At work, I feel part of a group"). Finally, four items measured competence satisfaction (e.g., "I am good at the things that I do in my job"). Cronbach's alpha of the 18-item scale was .84.

Autonomous motivation was measured using the intrinsic motivation subscales (e.g., "Because I have fun doing my job") and identified regulation (e.g., "Because this job fits my personal values") of the Motivation at Work Scale ([Gagné](#)

et al., 2010). Respondents rated the degree to which the items reflect the reasons for which they are doing this specific job on a 7-point scale ranging from 1 (*does not fit at all*) to 7 (*fits completely*). Cronbach's alpha of the six-item scale was .91.

Work effort was measured using the 10-item Work Effort Scale (De Cooman et al., 2009). Responses were rated on a 7-point scale ranging from 1 (*fully disagree*) to 7 (*fully agree*). Three items measure the persistence of the effort (e.g., "When I start an assignment, I pursue it to the end"). Three items measure the direction of the effort (e.g., "I really do my best to achieve the objectives of the organization"). Finally, four items measure the intensity of the effort (e.g., "I put a lot of energy into the tasks that I commence"). This general scale for work effort thus includes all subcomponents and had good internal consistency ($\alpha = .92$).

Finally, we included a number of relevant control variables. We asked participants to indicate their age (in years), gender (1 = male, 2 = female), organizational tenure (in years), job level (un/semi-skilled blue collar worker, skilled blue collar worker, clerical white-collar worker, professional, line management, and higher management), and work regime (full time or part time).

Results

Preliminary analyses

Before testing the hypotheses, we examined our measurement model comprising the expected latent variables of work pressure and work-home interference (both job demands); skill utilization and impact awareness (both job resources); the three manifestations of work effort (i.e., intensity, persistence, direction); the three basic needs (i.e., competence, autonomy, relatedness); and the two types of autonomous motivation (i.e., intrinsic motivation, identification). All latent variables were operationalized by their items. In line

with their definitions, we used a higher-order structure to model need satisfaction, autonomous motivation, and work effort.

We used the following three fit indexes to evaluate model fit: comparative fit index (CFI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR; Hu & Bentler, 1999). Indications of good model fit are CFI values larger than .90 (Bentler, 1990), and RMSEA and SRMR values below .08 and .10, respectively (Byrne, 2001; Hu & Bentler, 1999). We used maximum likelihood estimation. The hypothesized measurement model fit the data well, $\chi^2(602) = 1751.77$, $p < .001$ (CFI = .91; RMSEA = .06; SRMR = .07). All items had significant loadings on their latent factor (estimated factor loadings ranged between .47 and 1.00, all $ps < .001$). In addition, the loadings of first-order factors on their second-order factors (i.e., need satisfaction, autonomous motivation, work effort) ranged between .34 and 1.00 (all $ps < .001$). As noted in Table 1, this measurement model (M0) yielded better fit to the data than several other models, that is, (a) a one-factor model (M1); (b) a model that allowed all job demands and resources to load on the second-order factor of need satisfaction (M2); (c) a model where basic need satisfaction was additionally allowed to load on the second-order factor of autonomous motivation (M3); and (d) a model in which autonomous motivation was allowed to load on the second-order factor of work effort (M4).

As depicted in Table 2, the results show that the two job demands (i.e., work pressure, negative work-home interference) were positively related ($r = .41$). Work pressure was positively related to need satisfaction ($r = .17$), autonomous motivation ($r = .14$), and work effort ($r = .23$). Negative work-home interference was negatively related to need satisfaction ($r = -.11$), but unrelated to autonomous motivation and work effort. Both job resources (i.e., skill utilization, strategic impact) were positively related with each other ($r = .42$) and with need satisfaction ($rs = .46$ and $.33$), autonomous

Table 1 Means and Correlations for Study Variables

| Variable | <i>M</i> | <i>SD</i> | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|--|----------|-----------|--------|--------|--------|-------|-------|-------|-------|-------|
| 1. Gender | 0.33 | 0.47 | — | | | | | | | |
| 2. Job level | 3.86 | 1.23 | .23** | — | | | | | | |
| 3. Job demands: Work-home interference | 2.06 | 0.80 | .10* | .24** | — | | | | | |
| 4. Job demands: Work pressure | 3.02 | 0.75 | .03 | .26** | .41** | — | | | | |
| 5. Job resources: Skill utilization | 2.96 | 0.66 | .06 | .26** | .12** | .32** | — | | | |
| 6. Job resources: Strategic impact | 5.50 | 1.26 | .05 | .30** | .09* | .19** | .42** | — | | |
| 7. Need satisfaction | 3.85 | 0.45 | -.05 | .06 | -.11** | .17** | .46** | .33** | — | |
| 8. Autonomous motivation | 5.33 | 0.93 | -.04 | .20** | .01 | .14** | .49** | .45** | .50** | — |
| 9. Work effort | 6.02 | 0.74 | -.16** | -.10** | .02 | .24** | .22** | .23** | .39** | .42** |

Note. Job level: 1 = unskilled/semiskilled blue-collar worker; 2 = skilled blue-collar worker; 3 = clerical white-collar worker; 4 = professional; 5 = line management; 6 = higher management.

* $p < .05$. ** $p < .01$.

Table 2 Goodness of Fit Indexes of the Various Measurement Models

| Model | χ^2 | df | CFI | RMSEA | SRMR | Model comparison | $\Delta\chi^2$ | Δdf |
|---|----------|-----|-----|-------|------|------------------|----------------|-------------|
| M0: Hypothesized measurement model | 1751.77 | 602 | .91 | .06 | .07 | — | — | — |
| M1: One-factor model | 7717.69 | 629 | .42 | .13 | .13 | M1/M0 | 5965.92*** | 27 |
| M2: Job demands/job resources/basic need satisfaction | 1980.05 | 616 | .89 | .06 | .08 | M2/M0 | 228.28*** | 14 |
| M3: Basic need satisfaction/autonomous motivation | 1824.39 | 607 | .90 | .06 | .07 | M3/M0 | 72.62*** | 5 |
| M4: Autonomous motivation/work effort | 2000.20 | 607 | .89 | .06 | .09 | M4/M0 | 248.43*** | 5 |

Note. CFI = comparative fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual.

*** $p < .001$.

motivation ($r_s = .49$ and $.45$), and work effort ($r_s = .22$ and $.23$; all $p_s < .01$).

Next, we tested whether the endogenous variables in our model (i.e., need satisfaction, autonomous motivation, work effort) differed in function of the control variables. Independent-sample t testing, $t(667) = -4.24$, $p < .001$, reveals that women ($M = 6.11$, $SD = 0.71$) reported higher levels of work effort than did men ($M = 5.86$, $SD = 0.73$).¹ One-way ANOVAs show that employees occupying different positions differed in both autonomous motivation, $F(5, 656) = 7.74$, $p < .001$; and work effort, $F(5, 658) = 2.96$, $p < .05$. Employees in lower level jobs reported less autonomous work motivation, but higher levels of work effort, as compared to individuals in higher job levels. Age, organizational tenure, and work regime were unrelated to need satisfaction, autonomous motivation, and work effort. Based on these preliminary analyses, we decided to add a path between gender (1 dummy, reference category = female) and work effort, and two paths between job level (5 dummies, reference category = higher management) and autonomous motivation and work effort, respectively.

Primary analyses

Following the two-step approach proposed by McDonald and Ho (2002), McDonald (2010), and O'Boyle and Williams (2011), we examined the fit of our hypothesized path model separately from our measurement model. Since we are proposing a model with two sequential mediators (i.e., three-path mediated), we followed the recommendations of James, Mulaik, and Brett (2006) and Taylor, MacKinnon, and Tein (2008). Again, we used maximum likelihood estimation. First, we tested our hypothesized full mediation model with both mediators specified in the hypothesized sequence. This model provided an unsatisfactory fit, $\chi^2(16) = 210.55$, $p < .001$ (CFI = .74; RMSEA = .14; SRMR = .05). Subsequently, we compared this model with partial mediation models that allowed additional direct paths between the

exogenous and endogenous variables; that is, a direct path for the job resources skill utilization, $\chi^2(15) = 207.53$, $p < .001$ (CFI = .74; RMSEA = .14; SRMR = .05) and strategic impact, $\chi^2(15) = 203.14$, $p < .001$ (CFI = .74; RMSEA = .14; SRMR = .05); and for the job demands work-home interference ($\chi^2(15) = 208.52$, $p < .001$; CFI = .74; RMSEA = .14; SRMR = .05) and work pressure, $\chi^2(15) = 166.92$, $p < .001$ (CFI = .79; RMSEA = .13; SRMR = .05). Only direct paths for strategic impact, $\Delta\chi^2(1) = 7.41$, $p < .01$; and work pressure improved model fit significantly, $\Delta\chi^2(1) = 43.63$, $p < .001$.

Additionally, we tested the two-path mediated relationships nested within our hypothesized model. First, we compared our full mediation model with a series of partial mediation models in which direct paths between job design characteristics and autonomous motivation were allowed; that is, a direct path for skill utilization, $\chi^2(15) = 149.05$, $p < .001$ (CFI = .82; RMSEA = .12; SRMR = .04); strategic impact, $\chi^2(15) = 143.97$, $p < .001$ (CFI = .83; RMSEA = .12; SRMR = .04); work-home interference, $\chi^2(15) = 209.41$, $p < .001$ (CFI = .74; RMSEA = .14; SRMR = .05); and work pressure, $\chi^2(15) = 210.30$, $p < .001$ (CFI = .73; RMSEA = .14; SRMR = .05). Adding direct paths for skill utilization, $\Delta\chi^2(1) = 61.50$, $p < .001$; and strategic impact, $\Delta\chi^2(1) = 66.59$, $p < .001$, improved model fit significantly. Second, we compared our full mediation model with a partial mediation model in which a direct path between need satisfaction and work effort was allowed. Adding this direct path also improved model fit significantly, $\chi^2(15) = 169.02$, $p < .001$ (CFI = .79; RMSEA = .13; SRMR = .05), $\Delta\chi^2(1) = 41.53$, $p < .001$.

Fit indexes of a final model allowing for all significant direct paths indicates satisfactory model fit, $\chi^2(11) = 28.85$, $p < .001$ (CFI = .98; RMSEA = .05; SRMR = .02). Figure 1 gives an overview of the standardized path coefficients of this final model. Path coefficients rendered support for our hypothesized model. As expected, resources skill utilization and strategic impact were positively related to need satisfaction, whereas work-home interference was negatively related to need satisfaction. Yet, contrary to expectations, work pressure was positively related to need satisfaction. Need satisfaction, in turn, was positively related to autonomous motivation, and autonomous motivation was positively

¹Other studies also found a gender difference for work effort, implying that the level of perceived work effort is greater for women than for men (Bielby & Bielby, 1988; Green, 2004; McIntosh, 1997).

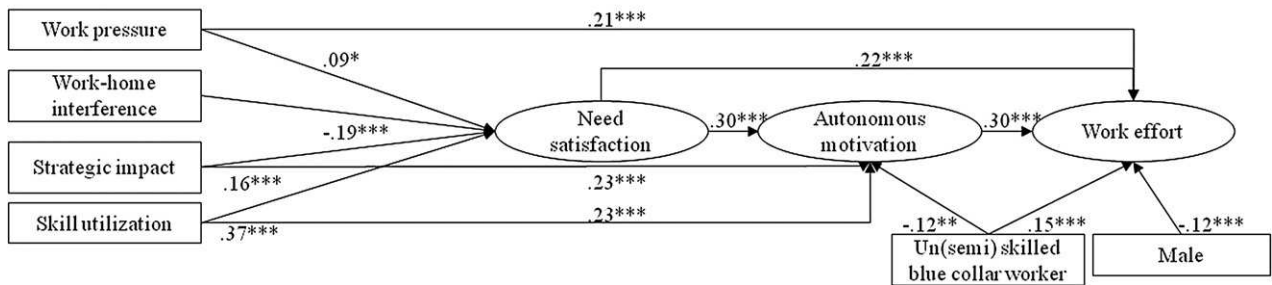


Figure 1 Results of the path model. * $p < .05$. ** $p < .01$. *** $p < .001$.

related to work effort. In addition, skill utilization and impact awareness were positively related to autonomous motivation. Both need satisfaction and work pressure were positively related with work effort. In this model, the direct path between strategic impact and work effort proved insignificant and was, therefore, left out of the model. Regarding the control variables, only unskilled/semi-skilled blue-collar workers differed from higher managers. The former group reported significantly less autonomous motivation, but significantly higher work effort. In addition, males reported lower levels of work effort than did females. These three paths were added to the model.

Overall, following Holmbeck (1997), we conclude that the relationships between three work characteristics (i.e., skill utilization, strategic impact, work-home interference) and work effort can be fully explained by need satisfaction and autonomous motivation. For work pressure, we found partial mediation, indicating that work pressure has a unique relationship with work effort after its relationships with need satisfaction and autonomous motivation are taken into account.

Finally, we tested the robustness of our model by comparing it with plausible alternative models. In all these models, all direct (i.e., partial mediation) significant paths were allowed; that is, $\Delta\chi^2(1)$ equal to or larger than 3.84, as indicated by modification indexes. First, we specified the mediators in an alternative sequence, but this model provided poorer fit, $\chi^2(18) = 47.14$, $p < .001$ (CFI = .96; RMSEA = .05; SRMR = .02). Subsequently, we fitted a model in which need satisfaction leads to perceptions of job demands and resources, which, in turn, relate to autonomous motivation and work effort. This model showed poorer fit, $\chi^2(33) = 410.68$, $p < .001$ (CFI = .67; RMSEA = .13; SRMR = .08). When autonomous motivation and need satisfaction were switched, model fit remained poor, $\chi^2(36) = 349.84$, $p < .001$ (CFI = .72; RMSEA = .12; SRMR = .07). Finally, we tested our hypothesized model in reverse order. Again, model fit was worse, $\chi^2(29) = 131.22$, $p < .001$ (CFI = .91; RMSEA = .07; SRMR = .04), compared to our hypothesized model.

Discussion

The present study was designed to contribute to the job design literature by providing empirical support for the connection between job characteristics and work effort. Specifically, it focused on the motivational process underlying this relationship. In a survey among 689 employees from 12 service organizations, we tested the basic assumptions of JDR and SDT. In line with calls from SDT researchers (e.g., Gagné & Deci, 2005), as well as job design scholars (e.g., Parker & Ohly, 2008), we linked relevant aspects of tasks and contexts with motivation. Furthermore, we built on empirical evidence by Van den Broeck and colleagues (2008) on need satisfaction as a mediator in the association between job characteristics and outcomes. Finally, we included an additional job resource; that is, a job's strategic role within the entire organization, as studied in the SHRM literature.

The results provide support for our hypothesized full mediation model. As expected from JDR (e.g., Bakker & Demerouti, 2007), work-home interference (a job demand) was negatively related to satisfaction of the basic psychological needs as defined in SDT, whereas job resources (e.g., strategic impact, skill utilization) were positively related to satisfaction of those needs. Next, need satisfaction was positively related to autonomous motivation, which, in line with SDT (Deci & Ryan, 2000), was positively related to work effort. Both job resources also showed a direct positive relationship with autonomous motivation. Need satisfaction was also directly linked to work effort. Contrary to our expectations, work pressure (also a job demand) was slightly positively related to basic psychological needs and moderately positively related to work effort. In general, these findings support earlier findings by Van den Broeck et al. (2008), suggesting that job demands thwart and job resources promote the fulfillment of universal, psychological needs. Combining the different theoretical frameworks permits us to draw a few remarkable conclusions.

First, a thorough study of the results indicates that job resources are more strongly related to the mediating as well as

the dependent variables than are job demands. Second, although our results provide evidence of the risks of job demands, they indicate that only negative work–home interference thwarts need satisfaction. Work pressure, in contrast, seems to promote need satisfaction. Other studies have concluded that particular job demands (e.g., work load, cognitive demands) are positively related to work engagement (Bakker, Demerouti, & Schaufeli, 2005; Mauno, Kinnunen, & Ruokolainen, 2007; Van den Broeck, De Cuyper, De Witte, & Vansteenkiste, 2010). Based on these findings, it is suggested that some job demands may impair health and can, therefore, be considered job hindrances. Other job demands, in contrast, may require energy, but are nonetheless stimulating (i.e., job challenges; Crawford, LePine, & Rich, 2010; Van den Broeck, De Cuyper et al., 2010). The current study indicates that negative work–home interference may operate as a job hindrance, whereas work pressure functions as a job challenge.

Third, complementing earlier findings, the current study strongly emphasizes the importance of employees' perception of their strategic impact on the organization. By including strategic impact as a job resource, the current study validates the recent trend in industrial/organizational psychology and HRM to highlight the importance of strategic jobs (Becker & Huselid, 2010), in addition to active jobs (de Jonge, Bosma, Peter, & Siegrist, 2000). We encourage future studies to include this issue, in addition to the job resources traditionally explored in JDR studies (e.g., autonomy, skill utilization).

A fourth conclusion builds on Ryan and Deci's (2008) claim that enhancing autonomous motivation is important in its own right. This argument is supported by the strong association found between the autonomous motivation to perform a job and the actual effort that is put into the job. Job design is thus not only important for individuals' well-being, but also for the proficiency with which they perform their duties within the organization. The inclusion of work effort in the research model can be considered an important contribution to the literature on job design, work motivation, and strategic HR management.

Finally, the comparison of the hypothesized model with alternative models supports the motivational process proposed in SDT. As such, this study clarifies the relationship between job design and work effort. For the first time, the full path structure of SDT—linking need satisfaction, autonomous motivation, and behavioral effectiveness—has been confirmed in a work setting.

Limitations and directions for future research

In interpreting the results of the present study, a number of limitations must be considered. First, we purposively used a

heterogeneous sample in which readily accessible subgroups may be overrepresented. Nevertheless, this sample meets multiple interests and needs. In selecting service organizations that provide various types of services in a broad range of fields, we attempted to ensure that the sample accurately (though not proportionally) represented the Belgian service sector. Furthermore, the high response rate indicates that a substantial part of the employees in the selected organizations took part in this study, which may reduce selection effects.

Second, because of the cross-sectional nature of the design, we must be cautious about making causal inferences. Nevertheless, our model is central to SDT theorizing. Moreover, the model in which mediators were specified in reverse order provided a significantly worse fit to the data.

Third, the use of self-reports may artificially inflate the strength of the observed relationships (i.e., common method bias). However, our CFA results show that our hypothesized measurement model fits the data better than a one-factor model or other sensible models, suggesting that the effect of common method variance is limited (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

Fourth, the independent variable of strategic impact was measured in a rather rudimentary way, using only one item. Although other scholars used a similar methodology (e.g., Brown & Yoshioka, 2003), in future research, it would be preferable to measure this variable with a larger number of items. All in all, multiple-item scales are considered to be better and more robust measures of theoretical constructs (Nunnally, 1978). Although long-term, strategic organizational goals are becoming increasingly important for individuals as well as for organizations, as stated in the SHRM literature, some employees may be more familiar with and more concerned about specific departmental, rather than organizational objectives. It may be interesting, therefore, to acknowledge this difference and to include this relevant distinction in a multi-item scale on the concept of strategic impact.

Next, we acknowledge that the operationalization of job characteristics was limited, though defensible in a service context with a large number of frontline employees. Several other job characteristics are likely to influence employees' work effort. Therefore, it would be valuable for future research to examine the impact of other job characteristics (e.g., autonomy, cognitive demands) on work effort. Moreover, three categories of job characteristics (i.e., job resources, job challenges, job hindrances) should be differentiated.

Finally, notwithstanding the dominant unidirectional model proposed by JDR, we call for future research to examine potentially reversed relationships. De Lange and colleagues (2008), for example, suggested that a positive gain spiral may occur because employees may invest current resources (i.e., exert effort) in a strong desire to actively gain

resources (i.e., further skill development), an argument that has also been proposed in the conservation of resources theory (Hobfoll, 1989, 2001).

Practical implications

Our findings offer interesting implications for practice. Knowledge of the motivational and behavioral consequences of the demands and resources involved in an activity is especially relevant in a work setting. The current study indicates that employees can become more autonomously motivated in their job if the job design meets the need for autonomy, relatedness, and competence. Autonomous motivation may lead

to behavioral effectiveness, which is noticed in the exertion of strong work effort. To motivate one's personnel and encourage them to work at their full potential, therefore, it is not only important to decrease job demands, but also—and perhaps most important—to provide a positive and resource-filled work environment. In this regard, the strategic component of a job must be carefully considered. Through aligning individual jobs with the general mission and objectives, organizations may improve their employees' work motivation and efforts, which benefits overall organizational effectiveness. Therefore, we agree with other scholars that this strategic component of HRM is an integral part of job design, which will become increasingly relevant in future years.

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