

How do job characteristics contribute to burnout? Exploring the distinct mediating roles of perceived autonomy, competence, and relatedness

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This study aimed to better understand the psychological mechanisms, referred to in the job demands–resources model as the energetic and motivational processes, that can explain relationships between job demands (role overload and ambiguity), job resources (job control and social support), and burnout (emotional exhaustion, depersonalization, and personal accomplishment). Drawing on self-determination theory, we examined whether psychological resources (perceived autonomy, competence, and relatedness) act as specific mediators between particular job demands and burnout as well as between job resources and burnout. Participants were 356 school board employees. Results of the structural equation analyses provide support for our hypothesized model, which proposes that certain job demands and resources are involved in both the energetic and motivational processes—given their relationships with psychological resources—and that they distinctively predict burnout components. Implications for burnout research and management practices are discussed.

Keywords: Burnout; Job demands; Job resources; Psychological resources; Self-determination theory.

Burnout is one of the most common psychological manifestations of job-related health problems (Schaufeli, Leiter, & Maslach, 2009). It is an important concern for practitioners and managers, given the magnitude of the resultant costs to individuals (e.g., low satisfaction and engagement) and organizations (e.g., higher turnover and absenteeism; see Halbesleben & Buckley, 2004). In the past decade, the job demands–resources (JD-R) model (Bakker & Demerouti, 2007; Demerouti, Bakker, Nachreiner, & Schaufeli, 2001) has become an influential theoretical framework to explain the processes that lead to burnout. This model proposes two separate but related psychological processes—energetic and motivational—that independently predict burnout components (i.e., emotional exhaustion, depersonalization, and reduced personal accomplishment).

However, despite growing evidence, research on the JD-R model has been relatively silent about the psychological mechanisms that could explain how job demands and resources contribute to burnout. More importantly, because the JD-R model assumes independent processes, researchers have overlooked

potential psychological mechanisms that are concurrently related to both processes. Based on self-determination theory (SDT; Deci & Ryan, 1985; Ryan & Deci, 2000), we propose that perceived autonomy, competence, and relatedness are psychological resources that simultaneously explain the two processes in the JD-R model and separately predict the components of burnout. We now present the multidimensional nature of burnout, the JD-R model, self-determination theory, and our hypothesized model.

THE MULTIDIMENSIONAL NATURE OF BURNOUT

Burnout stems from an unhealthy relationship between the job and the individual who performs it. It is characterized by three main components: emotional exhaustion, depersonalization, and reduced personal accomplishment (Maslach, 1982). *Emotional exhaustion* refers to the feeling of being emotionally overextended and exhausted at work. *Depersonalization* refers to negative, cynical, or excessively detached

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responses to other people at work (also termed cynicism and disengagement). *Reduced personal accomplishment* refers to the feeling of loss of efficiency and productivity at work (also termed loss of professional efficacy). Although emotional exhaustion is considered the primary feature of burnout, the two other components capture critical aspects of this syndrome (Maslach & Leiter, 2008; Schaufeli & Taris, 2005). Thus, in addition to reduced emotional energy, burnout implies interpersonal detachment as well as personal detachment from the job.

THE JD-R MODEL

The JD-R model (Bakker & Demerouti, 2007; Demerouti et al., 2001) posits that the two central characteristics of any workplace environment are job demands and job resources. *Job demands* comprise the physical, psychological, social, and organizational aspects of the job that require sustained physical and/or psychological effort and are associated with certain physiological and/or psychological costs (Demerouti et al., 2001). *Job resources* encompass the various physical, psychological, social, and organizational aspects that support individuals in the accomplishment of their tasks. By facilitating task accomplishment, these resources can reduce job demands and contribute to employee well-being (Demerouti et al., 2001).

The JD-R model assumes two separate but related psychological processes that explain burnout components. In the energetic process (considered to impair health), job demands drain employees' mental and physical energy and therefore contribute to emotional exhaustion. In the motivational process, the absence of job resources impacts employees' motivation and therefore contributes to disengagement and withdrawal (Bakker & Demerouti, 2007). Because lack of resources prevents employees from goal attainment and personal development, they tend to detach themselves from the job through depersonalization and view their work negatively (Bakker, Demerouti, Taris, Schaufeli, & Schreurs, 2003). Many studies support the JD-R model and its underlying processes.¹ In the burnout process, job demands have been related primarily to exhaustion, whereas job

resources have been linked mainly to depersonalization and personal accomplishment (see Table 1 for a summary). Although these findings are fairly consistent with the larger literature on burnout (see Maslach, Schaufeli, & Leiter, 2001), some studies also suggest that job resources are involved in the energetic process and job demands in the motivational process (Lee & Ashforth, 1996). For example, in a subsample of health care employees, Bakker et al. (2003) found that job resources were related to emotional exhaustion in addition to depersonalization and personal accomplishment. Results also showed that job demands were related to personal accomplishment. Similarly, Martijnussen et al. (2007) showed that certain job demands (work-family pressures) and resources (social support) were related to all three burnout components.

An explanation for these findings is that emotional energy may be depleted not only by the presence of job demands, but also by the absence of job resources, which can hinder employees from achieving significant work goals. This reasoning is consistent with the conservation of resources theory (Hobfoll & Freedy, 1993), which posits that when significant resources are lost or threatened, job strain and burnout result. Self-determination theory (Deci & Ryan, 1985) supports this because the work environment entails conditions that may facilitate or thwart the satisfaction of basic psychological needs, which are critical psychological resources for energizing behaviours (Gagné & Deci, 2005). As employees' psychological needs are hindered either by the presence of demanding conditions or the absence of resourceful conditions, they would become vulnerable to burnout.

Although the JD-R model provides a useful framework to summarize the relationships between job characteristics and burnout, the research to date has not fully addressed the role of psychological mechanisms to explain how different job demands and resources separately predict the different components of burnout. However, some studies have indicated that psychological resources (also called personal resources) such as self-efficacy, optimism, and organization-based self-esteem (e.g., Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2007) mediate the relationships between job resources and the emotional component of burnout. Despite these findings, little is known about the systematic relationships between (1) job characteristics (job demands and resources), (2) psychological resources, and (3) burnout components. Self-determination theory provides a useful theoretical framework to address this gap (Deci & Ryan, 2000).

SELF-DETERMINATION THEORY

Self-Determination Theory (SDT) takes as a premise that individuals have basic psychological needs for

¹Although the JD-R model was initially conceptualized to address the underlying processes of burnout (originally called the JD-R model of burnout), recent studies have incorporated work engagement into this framework. Engagement, considered as the antipode of burnout, refers to a positive motivational state characterized by vigour, dedication, and absorption (Schaufeli, Salanova, González-Romá, & Bakker, 2002). In the expanded JD-R model, engagement is embedded in the motivational process, whereas burnout (which usually combines emotional exhaustion and depersonalization) is situated in the energetic process. The research conducted to date indicates that both versions of the JD-R model are well suited to examine the processes that underlie burnout and/or engagement (see Hakanen & Roodt, 2010, for an extensive review).

TABLE 1
Summary of studies based on the JD-R model of burnout

<i>Study</i>	<i>Sample</i>	<i>Design</i>	<i>Job demands</i>	<i>Job resources</i>	<i>Relevant results</i>
Bakker, Demerouti, & Euwema (2005)	1012 employees of a higher education institute	Cross-sectional study	Workload, emotional demands, physical demands, work-home interference	Job control, social support, quality of relationships with the supervisor, performance feedback	Job demands are the most important predictors of exhaustion. Job resources are the most important predictors of cynicism (depersonalization) and professional efficacy (personal accomplishment).
Bakker, Demerouti, Taris, Schaufeli, & Schreurs (2003)	3092 home care employees	Multisample (4) and cross-sectional study	Workload, physical and emotional, problems with planning, sexual harassment, patient harassment	Job control, support from colleagues, supervisory support, possibility of professional development, performance feedback, financial rewards	Demands are mainly related to exhaustion and resources are primary related to cynicism (depersonalization) and professional efficacy (personal accomplishment).
Bakker, Demerouti, & Verbeke (2004)	146 employees from different sectors and organizations	Cross-sectional study	Workload, emotional demands, work-home conflict	Job control, professional development, social support	Job demands and job resources are related to in-role performance through exhaustion, and job resources are related to extra-role performance through disengagement (depersonalization).
Bakker, van Emmerik, & van Riet (2008)	290 employees of a temporary employment agency	Cross-sectional study	Work pressure, emotional demands, work-home interference	Colleague resources (support, harmony, team cohesion) and supervisor resources (job control, coaching, supervisor support)	Cynicism (depersonalization) mediates the relationship between colleague resources and objective financial team performance. Emotional exhaustion does not mediate the link between job demands and team performance.
Demerouti, Bakker, Nachreiner, & Schaufeli (2001)	374 employees in various occupational fields	Multisample (3) and cross-sectional study	Physical workload, time pressure, recipient contact, physical, shift work, environment	Feedback, rewards, job control, participation, job security, supervisor support	Job demands are primarily and positively related to exhaustion; job resources are negatively related to disengagement (depersonalization).
Houkes, Winants, & Twellaar (2008)	700 general practitioners	Longitudinal study (two waves)	Workload, work-family interference	Job control, social support	Job demands are related mainly to exhaustion, whereas job resources are linked to depersonalization and personal accomplishment.
Jourdain & Chênevert (2010)	1636 hospital nurses	Cross-sectional study	Quantitative overload, role stress, work-family interference, hostility from	Psychological empowerment (competence and meaning), job control, recognition by	Job demands are the most important predictors of emotional exhaustion and job resources mainly predict depersonalization.

(continued overleaf)

TABLE 1
(Continued)

<i>Study</i>	<i>Sample</i>	<i>Design</i>	<i>Job demands</i>	<i>Job resources</i>	<i>Relevant results</i>
			physicians and patients	physicians and patients, support from supervisor and colleagues	
Lee, Lovell, & Brotheridge (2010)	278 physicians	Cross-sectional study	Workload, work-life conflict	Job control, understanding, predictability	Job demands are related mainly to emotional exhaustion. Job resources are related mainly to depersonalization and personal accomplishment.
Martinussen & Richardsen (2006)	209 air traffic controllers	Cross-sectional study	Overtime work, work conflict, work-family pressures	Organizational support (job control, social support from coworkers and supervisors)	Job demands (especially work conflict) are related to all three burnout components, whereas job resources (especially support) are linked to depersonalization and professional efficacy.
Martinussen, Richardsen, & Burke (2007)	223 police officers	Cross-sectional study	Overtime work, work conflict, work-family pressures	Social support from colleagues and supervisors, job control, organizational support	Job demands (especially work-family pressures) and resources (social support) are related to all three burnout components.
Peterson et al. (2008)	3719 health care workers	Cross-sectional study	Quantitative, decisional, learning demands	Job control, positive challenges, social support from superior, fairness, empowering leadership, social climate	Job demands are related mainly to emotional exhaustion, whereas lack of resources is related to disengagement (depersonalization).

The literature search was conducted using the PsychInfo database (studies published in or after 2001). Two searches were executed using the following keywords: (1) "job demands-resources model" and (2) "burnout", "job demands", and/or "job resources". Only empirical studies that pertained to the initial version of the JD-R model (Demerouti et al., 2001) of burnout were included. Studies examining work engagement, as proposed in the expanded JD-R model, were not included, nor were studies that evaluated the interactive relationships between job demands/ resources and burnout based on the Job Demand-Control model (Karasek, 1979). Finally, the studies had to be published in English in order to be included.

autonomy, competence, and relatedness. *Autonomy* refers to the experience of volition and self-endorsement of one's actions (deCharms, 1968), *competence* refers to the judgement of one's abilities to produce given attainments (White, 1959), and *relatedness* refers to the degree to which one feels connected to others (Baumeister & Leary, 1995). The satisfaction of these psychological needs may be understood as psychological resources that energize, direct, and sustain human behaviours (Gagné & Deci, 2005). Thus, these resources are assumed to directly enhance psychological and physical well-being (Deci & Ryan, 2008). In the workplace, it has been shown that needs satisfaction is associated with work motivation (Gagné, Senécal, & Koestner, 1997; Richer, Blanchard, & Vallerand, 2002), job performance,

psychological well-being (Baard, Deci, & Ryan, 2004; Deci et al., 2001), and employee commitment (Gagné, Chemolli, Forest, & Koestner, 2008). In a more recent study, Van den Broeck, Vansteenkiste, de Witte, and Lens (2008) found that needs satisfaction is linked to emotional exhaustion and vigour, which constitute the energetic components of burnout and engagement, respectively (see Bakker, Schaufeli, Leiter, & Taris, 2008). More specifically, their results showed that employees' basic psychological needs play a mediating role not only between job resources and exhaustion (and engagement), but also between job demands and emotional exhaustion. However, the authors investigated neither the specific role of job demands and resources nor the separate contribution of each psychological need to explain

burnout components. Nonetheless, their findings underscore that psychological resources are involved in both the energetic and motivational processes, and that further examination of these variables are needed to better understand the different pathways that link job characteristics to burnout components.

It is important to mention that the main divergence between the JD-R model and SDT concerns the role played by psychological resources. According to SDT, the work environment—whether controlling (i.e., constrains or pressures how employees think, feel, and behave) or supportive (i.e., encourages self-initiative, minimizes pressure, provides feedback, and acknowledges feelings and views)—impacts employees' psychological functioning through the extent to which their basic needs are met. In connection with burnout, it is plausible that when job demands such as workload exceed employees' capacities, they will perceive that their autonomy is suppressed and become more vulnerable to emotional exhaustion. In other words, the feeling of being trapped in a situation is liable to drain employees' emotional resources. Although the JD-R model recognizes the importance of psychological resources, these resources are limited to the motivational process. To this effect, recent studies based on the expanded JD-R model indicate that job resources promote psychological resources such as self-efficacy and impact employee engagement (Llorens, Schaufeli, Bakker, & Salanova, 2007; Simbula, Guglielmi, & Schaufeli, 2011; Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2009). However, except for the previously mentioned study by Van den Broeck et al. (2008), these studies did not directly test the potential role of psychological resources in explaining the energetic process, even though these resources have been negatively associated with emotional exhaustion (Xanthopoulou et al., 2007). In addition, the JD-R-based research has largely assumed that job demands are not relevant in explaining employees' detachment from their work. However, recent studies have shown that job demands that employees perceive as hindrances are negatively related to engagement (Crawford, LePine, & Rich, 2010; Van den Broeck, de Cuyper, de Witte, & Vansteenkiste, 2010). Because job demands also have the potential to thwart needs satisfaction and hinder the achievement of work goals, we contend that they are liable to predict interpersonal and personal forms of withdrawal, such as depersonalization and reduced personal accomplishment.

Briefly, we propose that perceived autonomy, competence, and relatedness are psychological resources that simultaneously explain the two processes in the JD-R model and distinctly predict burnout components. Accordingly, we propose that both job demands and job resources have the potential to

predict emotional exhaustion (the energetic process) as well as depersonalization and personal accomplishment (the motivational process), given that these job characteristics can either facilitate or thwart the satisfaction of employees' needs.

THE PRESENT STUDY

The present study aimed to deepen our understanding of the psychological mechanisms that can explain how job characteristics contribute to burnout. To extend previous research, we assessed the three components of burnout. We also assessed the separate role of two job demands (role overload and ambiguity) and job resources (job control and social support) as well as the three psychological needs proposed by SDT (perceived autonomy, competence, and relatedness). We focused on these particular demands and resources for three reasons. First, they have been identified as major determinants of burnout (Lee & Ashforth, 1996; Maslach et al., 2001). Second, although the research based on the JD-R model has not focused exclusively on these workplace aspects, they are included in most studies (see Table 1). Third, because the present study was conducted in a sample of school board employees that held different jobs (e.g., teachers, support staff), it was essential to assess generic job characteristics.

In contrast to most studies based on the JD-R model, which regroup the variables under general headings (e.g., job demands and resources), we considered specific relationships between different job characteristics, psychological resources, and burnout components. This approach seems justified because the burnout research has shown that burnout components are differentially related to job demands and resources. Lee and Ashforth (1996) show in their meta-analysis that different aspects of job demands (e.g., workload, role ambiguity) are not exclusively associated with emotional exhaustion. For example, although workload is more strongly associated with emotional exhaustion ($r^c = .65$) than with depersonalization ($r^c = .34$), role ambiguity is more closely related to depersonalization ($r^c = .34$) than to emotional exhaustion ($r^c = .21$). Similar results were reported in a recent meta-analysis by Örtqvist and Wincent (2006). This reasoning is consistent with Warr's (1990) assumption that certain job characteristics are more or less salient in relation to different facets of employee functioning (see also Crawford, LePine, & Rich, 2010).

Based on SDT premises, we propose that perceived autonomy, competence, and relatedness are relevant psychological resources for predicting the three components of burnout. Specifically, we propose the central hypothesis that psychological

resources mediate the relationships between job demands (role overload and ambiguity) and burnout (emotional exhaustion, depersonalization, and reduced personal accomplishment) as well as between job resources (job control and social support) and burnout.

Although all three psychological resources should be related to job characteristics and burnout—because workplace factors either facilitate or thwart needs satisfaction and either foster or impede psychological functioning—it is plausible to assume differences in their impact because certain demands and resources are more liable to be associated with specific psychological resources, and because specific resources might better predict particular burnout components. Although this proposition has been insufficiently tested empirically, some research supports its claim. For example, Van den Broeck, Vansteenkiste, de Witte, Soenens, and Lens (2010) showed that psychological needs yield different relationships with job characteristics (e.g., job control, social support) and indicators of psychological functioning (e.g., exhaustion, vigour). More specifically, they found that job control was consistently related to perceived autonomy and competence, whereas social support was closely linked to relatedness and also—albeit to a lesser extent—to perceived autonomy. Moreover, Ryan and Solky (1996) presented a conceptual argument for the effect of social support on psychological needs: The positive effect of a social support system derives mainly from its capacity to satisfy the need for relatedness and autonomy. With respect to job demands, role overload was expected to have a greater impact on employees' perception of autonomy than on other psychological needs. According to Pines, Aronson, and Kafry (1981), overwhelming demands should be accompanied not only by the experience of exhaustion, but also a sense of helplessness and entrapment. Put differently, role overload can impede employees' sense of autonomy at work (Fernet, Guay, Sénécal, & Austin, in press; Ryan & Deci, 2000), because it would hinder them from seeking to perform tasks that are coherent with their values, thereby achieving autonomy. Role ambiguity, for its part, was expected to have a greater impact on employees' perceptions of competence, because lack of clarity interferes with work goal achievement (Beauchamp, Bray, Eys, & Carron, 2002; see also Gist & Mitchell, 1992.). As argued by Cherniss (1980), employees would find it hard to develop a strong sense of competence when they feel unsure of what is expected from them in terms of performance. Although no study to date has tested all these relationships simultaneously, we formulated the following hypotheses (see Figure 1):

Hypothesis 1: Role overload is negatively related to perceived autonomy.

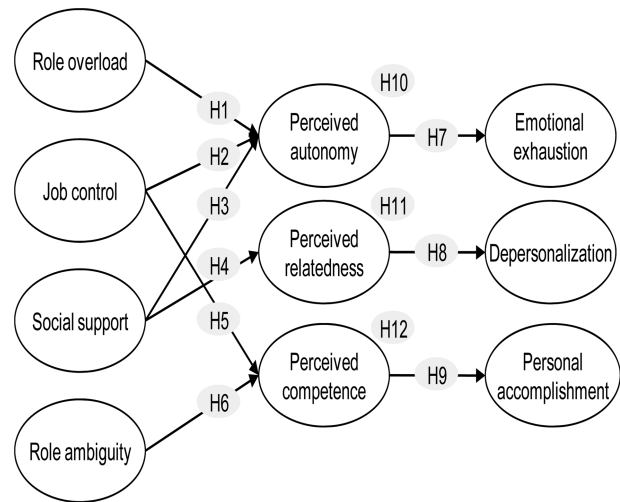


Figure 1. Hypothesized model.

Hypothesis 2: Job control is positively related to perceived autonomy.

Hypothesis 3: Social support is positively related to perceived autonomy.

Hypothesis 4: Job control is positively related to perceived competence.

Hypothesis 5: Role ambiguity is negatively related to perceived competence.

Hypothesis 6: Social support is positively related to perceived relatedness.

Our model also proposes specific relationships between psychological resources and burnout components. Although no studies to our knowledge have systematically linked psychological needs to burnout in the workplace, there are conceptual reasons to expect such relationships. For instance, Burisch (1993) argued that lack of autonomy is a critical factor in exhaustion reaction, and there is some support for this contention. Perceived autonomy was expected to be closely tied to emotional exhaustion because lack of volition and psychological freedom when performing an activity has been associated with the feeling of being depleted of emotional resources (Adie, Duda, & Ntoumanis, 2008; Blais, Brière, Lachance, Riddle, & Vallerand, 1993; Lévesque, Blais, & Hess, 2004; Van den Broeck et al., 2010). In addition, perceived relatedness should have a greater impact on depersonalization, because depersonalization is the interpersonal component of burnout that implies an unfeeling response towards others (Leiter, 1991; Maslach & Leiter, 2008). Finally, in agreement with several authors (e.g., Cordes & Dougherty, 1993; Lee & Ashforth, 1996), perceived competence should be more closely related to personal accomplishment, because personal accomplishment represents a decline in feelings of effectiveness and goal achievement at work. Based

on these assumptions, we formulated the following hypotheses (see Figure 1):

- Hypothesis 7:* Perceived autonomy is negatively related to emotional exhaustion.
- Hypothesis 8:* Perceived relatedness is negatively related to depersonalization.
- Hypothesis 9:* Perceived competence is positively related to personal accomplishment.

The present study aimed not only to test the direct links involving psychological needs, but more importantly to examine whether they are salient mediators in the relationships between the different job characteristics and burnout components. Based on the proposed set of relationships (Hypotheses 1–9), we formulated the following mediation hypotheses:

- Hypothesis 10:* Perceived autonomy mediates the relationships between role overload and emotional exhaustion, between job control and emotional exhaustion, and between social support and emotional exhaustion.
- Hypothesis 11:* Perceived relatedness mediates the relationship between social support and depersonalization.
- Hypothesis 12:* Perceived competence mediates the relationships between role ambiguity and personal accomplishment and between job control and personal accomplishment.

METHOD

Procedure and participants

Data were collected as part of a research project on occupational stress conducted in a school board located in the province of Québec, Canada. All 768

employees were approached and asked to complete a consent form and a questionnaire and return them in a prepaid envelope. A sample of 356 employees participated in this study for a response rate of 46%. Participants (76% women and 24% men; *M* age = 41.8, *SD* = 10.4) represented all employment levels: 58% were teachers, 27% were support staff, 8% were education professionals, and 7% were administrative staff. Of the participants, 76% held a permanent position and 84% worked full-time. The sample fairly represented the demographic distribution of the entire school board staff, with the exception of gender, with women slightly overrepresented (76% of respondents vs. 68% of all school board employees).

Measures

All measures were administered in French. Instruments originally written in English were translated into French and then translated back into English. English-speaking judges verified the semantic correspondence between back-translated and original items (Vallerand & Halliwell, 1983). Properties (means, standard deviations, correlations, and internal consistencies) of all measures are presented in Table 2.

Job demands. Two job demands were assessed. Role overload was assessed with eight items in French, adapted from the Occupational Stress Inventory–Revised Edition (Osipow, 1998). The questions addressed qualitative (i.e., the complexity of tasks to be accomplished) and quantitative (i.e., excessive work and insufficient time) aspects of job demands. A sample item is, “I work under tight time deadlines”. Items were scored on a 5-point scale ranging from 1 (“rarely or never”) to 5 (“constantly or always”). Role ambiguity was measured with the

TABLE 2
Fit indices for the tested models

<i>Model description</i>	χ^2	<i>df</i>	<i>CFI</i>	<i>NNFI</i>	<i>RMSEA</i>	<i>Model comparison</i>	$\Delta\chi^2$	Δdf
Measurement model								
M1a: Initial	2442.817	1229	.87	.86	.053			
M1b: Modified	1789.219	989	.91	.90	.048			
M1c: Single-factor	9460.263	1034	.34	.31	.152			
M1d: Final	669.038	360	.95	.94	.049			
MIMIC model								
M2: Gender and age effects	765.215	401	.94	.93	.051			
Hypothesized model								
M3: Full mediation	1000.612	440	.91	.90	.060			
M4: Partial mediation	871.278	434	.93	.92	.053	M4 vs. M3	129.33**	6
M5: Partial mediation (with 2 significant direct paths)	879.635	438	.93	.92	.053	M5 vs. M4	8.36 <i>ns</i>	4
M6: Final	823.204	436	.94	.93	.050	M6 vs. M5	56.43**	2
M7: Alternative model	871.961	439	.93	.92	.053	M7 vs. M6	48.76**	3

Results were controlled for gender and age (M3–M7); CFI=comparative fit index; NNFI=non-normed fit index; RMSEA=root mean square error of approximation; MIMIC=multiple indicator multiple indicator cause. **p* < .05, ***p* < .01.

six-item French Canadian adaptation (Lachance, Tétreau, & Pépin, 1997) of Rizzo, House, and Lirtzman's (1970) scale. Role ambiguity refers to a lack of adequate information to perform the job properly (e.g., "I know exactly what is expected of me" (reverse scoring). Items were scored on a 7-point scale ranging from 1 ("definitely false") to 7 ("definitely true").

Job resources. Two job resources were assessed. Job control was measured with the three-item French Canadian version (Brisson et al., 1998) of the Job Content Questionnaire (JCQ; Karasek, 1985). This scale covers opportunities for control and decision making, for example, "My job allows me to make a lot of decisions on my own". Items were scored on a 4-point scale ranging from 1 ("strongly disagree") to 4 ("strongly agree"). Social support was also assessed with three items adapted from Cohen and Hoberman's (1983) questionnaire. This questionnaire measures the perceived availability of support in the workplace and includes the following items: "I know an employee at work that I can ask for advice", "I don't know any employees who could help me understand or resolve my problems", and "There is one employee that I can count on if I need advice to make a decision or cope with a problem". Items were scored on a 5-point scale ranging from 1 ("strongly disagree") to 5 ("strongly agree").

Psychological resources. The three instruments used to assess the satisfaction of psychological needs were adapted for the specific field of work. Perceived competence was measured using the Perceived Competence Toward Life Domains Scale (Losier, Vallerand, & Blais, 1993) and contained four items (e.g., "I feel that I perform my tasks effectively"). Perceived autonomy was measured with the Autonomy Perceptions in Life Contexts Scale (Blais & Vallerand, 1992) and contained three items (e.g., "I do this job out of personal preference"). Items in both scales were scored on a 7-point scale ranging from 1 ("not at all in agreement") to 7 ("completely in agreement"). Perceived relatedness was assessed with the four-item Quality of Interpersonal Relationships Scale (QIRS; Sénécal, Vallerand, & Vallières, 1992). Participants indicated the extent to which each of the items (e.g., harmonious, enriching, satisfying, and trusting) corresponded to their current relationships with their coworkers on a scale from 0 ("not at all") to 4 ("extremely").

Job burnout. The French Canadian version (Dion & Tessier, 1994) of the Maslach Burnout Inventory (MBI; Maslach & Jackson, 1986) was used to assess the three burnout components (emotional exhaustion, depersonalization, and personal accomplishment) on

a scale from 0 ("never") to 6 ("every day"). Given the situation of school board employees, items related to "recipients" were replaced by the term "people with whom I work". Emotional exhaustion comprised nine items (e.g., "I feel emotionally drained by my work"). Five items assessed depersonalization (e.g., "I've become more callous toward people since I took this job"). Personal accomplishment was assessed by eight items (e.g., "I have accomplished many worthwhile things at this job"). Based on preliminary analyses (see Results section), we eliminated two items for emotional exhaustion and three items for personal accomplishment that addressed working with other people.

Statistical analyses

Model adequacy was assessed by structural equation modelling (SEM) using EQS (Bentler, 2004). All models were tested with standardized coefficients obtained using maximum likelihood estimation. To ascertain model fit, we used the comparative fit index (CFI), the non-normed fit index (NNFI), and the root mean square error of approximation (RMSEA). CFI and NNFI vary along a zero-to-one continuum, where values greater than .90 typically indicate an acceptable fit (Schumacker & Lomax, 1996). Values below .05 for RMSEA indicate a close fit, whereas values up to .08 indicate acceptable errors of approximation (Browne & Cudeck, 1993).

RESULTS

Preliminary analyses

Measurement model. An initial measurement model (M1a) provided an unsatisfactory fit to the data (see Table 2): Two items for emotional exhaustion and three for personal accomplishment showed poor factor loadings. These items (4, 6, 7, 16, and 21) assessed feelings of exhaustion and personal accomplishment due to working with people. These items were eliminated from a subsequent model (M1b), which provided an acceptable data fit (see Table 2). In a next step, because all data were self-reported, we ran a single-factor model (M1c) to test for common method variance bias. This model provided a poor data fit (see Table 2). Although this does not unequivocally rule out the possibility of common method variance, the results suggest that it would be unlikely to confound the interpretations of relationships among variables.

The last step was to construct item parcels to reduce the number of estimated parameters and facilitate model testing. Single items were used as indicators of job control (three items), social support (three items), perceived autonomy (three items),

competence (four items), and relatedness (four items). Given the length of the remaining scales, we created three parcels as indicators of role overload, role ambiguity, and exhaustion and two parcels as indicators of depersonalization and personal accomplishment by averaging sets of items from the respective scales. In each case, we computed balanced parcels based on factor loadings by pairing higher-with lower-loading items (see Little, Cunningham, Shahar, & Widaman, 2002). Item parceling was deemed suitable because we focused more on structural paths than on the measurement model, and because the parceled constructs are unidimensional (Bandalos & Finney, 2001). The final measurement model (M1d) provided a good data fit (see Table 2). All factor loadings were significant, ranging from .62 to .92. Correlations between latent variables were in the expected direction (see Table 3), with the exception of two nonsignificant relationships (between role overload and personal accomplishment and between role overload and perceived relatedness).

Gender and age effects. Although studies have found inconsistent results on gender and age effects on burnout dimensions (Maslach et al., 2001), some have reported these demographic differences in job characteristics and psychological resources. We therefore built an MIMIC model (multiple-indicator-multiple-indicator-cause; Jöreskog & Goldberger, 1975; Kaplan, 1999), in which each latent variable is predicted by gender and age (see Table 2, M2) to more stringently test the potential effects of the demographic variables. This is a stronger test than a traditional MANOVA or a correlational analysis based on measured variables (i.e., scale scores), which are assumed to be measured without error, instead of latent variables. Results revealed five significant paths. Gender was negatively associated with social support, $\beta = -.17, p < .01$, but positively with depersonalization, $\beta = .13, p < .05$, indicating that women reported greater social

support and lower depersonalization than men. In addition, age was positively associated with role overload, $\beta = .13, p < .05$, but negatively with social support, $\beta = -.17, p < .01$, and perceived relatedness, $\beta = -.11, p < .05$. Thus, younger employees reported lower role overload than their older counterparts, but greater support and higher-quality relationships with coworkers. We therefore controlled for these effects in subsequent analyses by including only the significant paths in the structural models.

Testing the hypothesized model

In order to test the adequacy of the hypothesized model, we first ran two contrasting models: a fully mediated model (M3) and a partially mediated model (M4). M3 included only indirect paths from role overload, job control, and social support to emotional exhaustion through perceived autonomy; from role ambiguity and job control to personal accomplishment through perceived competence; and from social support to depersonalization through perceived relatedness. M4 consisted of the hypothesized model with the addition of the six previously mentioned direct paths connecting job characteristics to burnout components. SEM analysis results indicated that M4 provided a better fit to the data (see Table 2) and that two direct paths were significant (role overload to exhaustion and role ambiguity to personal accomplishment). Based on these results, the hypothesized model was modified (M5) to include these two direct paths. Although the fit of M5 did not differ significantly from that of M4, it provided a more parsimonious solution.

Although these results provide support for the hypothesized model, we could not verify whether job characteristics were exclusively related to particular psychological resources or whether these resources contribute independently to each burnout dimension. To examine this more closely, we tested a model including all direct and indirect paths and systematically removed insignificant paths. Results indicated

TABLE 3
Means, standard deviations, and correlations between latent variables

	Range	M	SD	1	2	3	4	5	6	7	8	9	10
1. Role overload	1-5	2.48	0.80	(.87)									
2. Role ambiguity	1-7	1.79	0.83	.28**	(.87)								
3. Job control	1-4	3.19	0.53	-.24**	-.46**	(.77)							
4. Social support	1-5	4.34	0.90	-.20**	-.22**	.17*	(.80)						
5. Perceived autonomy	1-7	5.90	1.14	-.25**	-.30**	.38**	.31**	(.88)					
6. Perceived competence	1-7	6.02	0.79	-.15*	-.34**	.33**	.14*	.58**	(.85)				
7. Perceived relatedness	0-4	2.89	0.80	-.12	-.21**	.24**	.38**	.39**	.13*	(.94)			
8. Emotional exhaustion	0-6	2.28	1.31	.63**	.32**	-.26**	-.13*	-.43**	-.29**	-.16**	(.90)		
9. Depersonalization	0-6	1.06	0.99	.17*	.22**	-.13*	-.26**	-.46**	-.17*	-.61**	.30**	(.65)	
10. Personal accomplishment	0-6	4.43	1.02	-.12	-.37**	.34**	.29**	.44**	.42**	.48**	-.30*	-.45**	(.72)

Reliabilities (Cronbach's alphas) are shown in the diagonal. * $p < .05$, ** $p < .01$

that the inclusion of two additional paths (perceived autonomy to depersonalization; and perceived relatedness to personal accomplishment) significantly improved M5 (see Table 2). Because these paths were not inconsistent with our conceptual model, we included them to more adequately represent the data. The final model (M6) with coefficient paths is depicted in Figure 2 (for simplicity, covariances are not shown). In addition to the direct paths connecting role overload to emotional exhaustion and role ambiguity to personal accomplishment, results indicated that role overload, job control, and social support were associated with perceived autonomy, which in turn predicted emotional exhaustion and depersonalization. They also indicated that social support was associated with perceived relatedness, which predicted depersonalization and personal accomplishment. Finally, they showed that role ambiguity and job control were associated with perceived competence, which in turn predicted personal accomplishment. In summary, these results provide support for the hypothesized model, although they further indicate that the needs for autonomy and relatedness also contributed to predict depersonalization and personal accomplishment, respectively.

To more thoroughly test the mediating role of psychological resources, we conducted a series of Sobel tests (Sobel, 1982). Results confirm the partial mediating role of perceived autonomy in the relationship between role overload and exhaustion, $z = -1.98$, $p < .05$, and between role overload and depersonalization, $z = -1.97$, $p < .05$. In addition, results reveal the full mediating role of autonomy between job control and exhaustion, $z = -2.72$, $p < .01$, between job control and depersonalization, $z = -2.72$, $p < .01$, between social support and exhaustion, $z = -2.56$, $p = .01$, and between social

support and depersonalization, $z = -2.54$, $p = .01$. With respect to the mediating role of relatedness, results indicate that it fully mediates the relationships between social support and depersonalization, $z = -4.63$, $p < .01$, and between social support and personal accomplishment, $z = 4.52$, $p < .01$. Results also support the partial mediating role of perceived competence in the relationship between role ambiguity and personal accomplishment, $z = -2.60$, $p < .01$, and its full mediating role between job control and personal accomplishment, $z = 2.70$, $p < .01$.

Alternative model

To rule out possible alternative explanations, we compared the final model (M6) with an alternative model (M7) based on JD-R assumptions. This model included direct paths from job demands to emotional exhaustion as well as direct and indirect paths (through psychological resources) from job resources to depersonalization and personal accomplishment. Compared to M6, this model excluded four paths (role overload to perceived autonomy, perceived autonomy to emotional exhaustion, role ambiguity to perceived competence and role ambiguity to personal accomplishment) and included one additional path (role ambiguity to emotional exhaustion). This alternative model yielded a significantly poorer fit than M6 (see Table 2), suggesting that perceived autonomy, competence, and relatedness are relevant psychological mechanisms in both the motivational and energetic processes. Hence, it was concluded that the final model (M6) best captures the relationships between job characteristics, psychological resources, and burnout dimensions.

DISCUSSION

This study aimed to deepen our understanding of the psychological mechanisms liable to explain how job characteristics contribute to burnout components. Drawing on SDT, we proposed a model in which perceived autonomy, competence, and relatedness act as specific mediators between specific job demands and burnout components on the one hand, and between specific job resources and burnout on the other. The results support this model, indicating that employees' perceptions of relatedness and competence explain interpersonal and personal forms of withdrawal (depersonalization and reduced personal accomplishment), as described by the motivational process of the JD-R model of burnout, whereas perceptions of autonomy contribute to emotional exhaustion and depersonalization, as described by both the energetic and motivational processes. First, the results show that job resources are involved in the energetic process, given that job control and social

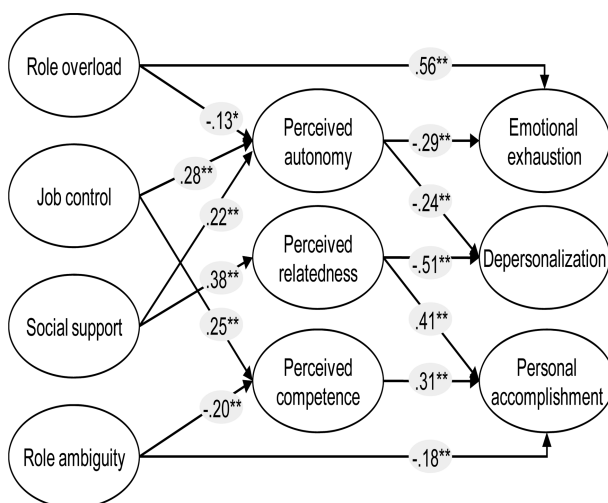


Figure 2. Final model (M6) with significant standardized path coefficients. * $p < .05$, ** $p < .01$.

support impact employees' emotional exhaustion through perceptions of autonomy. These resources are also linked to the motivational process, as they predict employees' feelings of depersonalization through perceived autonomy and relatedness as well as personal accomplishment through perceived relatedness and competence. Second, the results indicate that job demands are associated with both the energetic and motivational processes. Specifically, role overload predicts employees' emotional exhaustion and depersonalization through perceived autonomy, whereas role ambiguity explains feelings of personal accomplishment through perceived competence. However, it is important to mention that, despite the inclusion of psychological resources, role overload is positively and directly linked to emotional exhaustion, whereas role ambiguity is negatively and directly related to personal accomplishment.

Research implications

A contribution of this study is the recognition of the importance of each of the psychological needs proposed by SDT to explain burnout. To date, the satisfaction of employees' psychological needs has been considered more as part of an independent process and not a psychological mechanism liable to explain burnout components. Our results clearly show that the basic needs for autonomy, competence, and relatedness play an active role in the relationships between job characteristics and burnout components. These results corroborate those of other studies that have linked motivational factors to emotional exhaustion (Lévesque et al., 2004; Richer et al., 2002), depersonalization (Lorente, Salanova, Martinez, & Schaufeli, 2008), personal accomplishment (Rubino, Luksyte, Perry, & Volpone, 2009), or to all three components of burnout (Fernet, Gagné, & Austin, 2010; Fernet, Guay, & Senécal, 2004). Moreover, these findings extend previous research by specifying the separate roles of the psychological needs in connection with burnout components. However, contrary to expectation, the satisfaction of each psychological need did not predict a single component of burnout. Perceived autonomy appears to be particularly important in explaining emotional exhaustion and depersonalization, whereas perceived relatedness appears to be a predictor of depersonalization and personal accomplishment, and perceived competence a predictor of personal accomplishment. Although further research is needed on the differential effects of psychological needs on burnout components, our results suggest that the deprivation of any need could lead to burnout. Furthermore, our findings indicate that these psychological resources would be determined by not only protection factors (job resources), but also risk factors (job demands) in

the workplace. This study therefore contributes to a better understanding of *how* and *why* job characteristics predict burnout.

Moreover, this study underscores the need to consider the components of burnout separately. In fact, the results suggest that different burnout components are not necessarily predicted by the same job characteristics or psychological resources. Our results corroborate those of other studies showing that workload is particularly associated with emotional exhaustion (e.g., Lee & Ashforth, 1996; Örtqvist & Wincent, 2006). However, our results also reveal that job resources, such as job control and social support, exert an indirect effect on exhaustion, which is the central component of burnout. These resources would also be salient for fostering employees' feelings of personal accomplishment and minimizing depersonalization, with particular relevance for the burnout sequence. Leiter and Maslach (1988) suggest that emotional exhaustion is the key manifestation of burnout, and that it can trigger other components (depersonalization and reduced feelings of personal accomplishment). Accordingly, if job control and social support can buttress personal energy, they might consequently delay the burnout process. However, it is worth noting that, regardless of the burnout sequence, our findings suggest that job control and social support may be valuable resources to prevent burnout.

The specific relationship patterns observed in this study pose somewhat of a challenge to the JD-R model of burnout, because both job demands and resources are linked to burnout components through psychological resources. Whereas the framework does not expect relationships between job demands and withdrawal reactions or between job resources and exhaustion (Bakker & Demerouti, 2007), we found not only that they are significantly related, but also that psychological resources are involved in both the energetic and motivational processes. Although these findings suggest that both processes are unlikely to act independently, one could argue that the energetic route proposed by the model still stands. Indeed, despite the role played by psychological resources in both processes, role overload appears to operate directly on emotional exhaustion. Thus, overload is liable to drain employees' emotional energy, even if this particular demand translates into the deprivation of psychological needs (i.e., autonomy). However, role ambiguity poses another challenge, because it exclusively predicts personal accomplishment. In order to gain more insight into the role of psychological resources in both processes, a useful research avenue would be to investigate the role of needs frustration versus needs satisfaction. According to Ryan and Deci (2000), needs frustration is more likely to lead to maladaptive behaviours and

ill-being, because people use self-protective and other nonoptimal strategies when facing needs frustration. A recent study in the sport context (Bartholomew, Ntoumanis, Ryan, & Thøgersen-Ntoumani, 2011) supports this contention by revealing that needs frustration predicts athletes' exhaustion over and above needs satisfaction. Notwithstanding, the present study illustrates that more research is needed to delineate the psychological processes underlying burnout. Although the JD-R model clearly has its merits for parsimoniously organizing the research on burnout, we believe that its simplicity may obscure the presence of important relationships between specific job characteristics and burnout components. More importantly, in its current state, it may fail to completely account for how job demands and resources predict burnout. Perhaps the JD-R model could be expanded to incorporate psychological resources in order to better capture the complexity of burnout, which, according to Maslach et al. (2001), would benefit from considering the person within the job context.

Finally, our results increase the relevance of SDT research for organizations (see Gagné & Deci, 2005). Specifically, SDT proposes that psychological adaptation to the job stems from the individual's relationship to the job. However, the SDT-based research to date has mainly supported the importance of interpersonal resources present in the workplace, such as the work environment and management styles (Baard et al., 2004; Deci et al., 2001), to explain employee functioning. Our results add to previous studies by underscoring the roles of not only social resources such as social support, but also job characteristics (role overload, role ambiguity, and job control).

Limitations of the present study

Some limitations of this study should be noted. First, the use of a cross-sectional design does not allow establishing causal relations between variables. Although many studies support the proposed motivational sequence of antecedents–psychological resources–consequences in diverse life domains (see Vallerand, 1997), we should not exclude the possibility of reciprocal or inverse relationships between certain variables. In fact, in a temporal perspective, it is plausible that employees' perceptions of needs satisfaction would influence their perceptions of the workplace environment. For instance, employees who feel oppressed or inadequate in their job would be more liable to view their work environment negatively. Future studies could use longitudinal designs to examine these relationships. Second, the common variance bias could have influenced the results by increasing or decreasing the strength of correlations, as all data were gathered by the same method. We attempted to minimize this problem by

selecting self-report measures formulated in different terms and by using different scale ranges (see Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). The results of the single-factor measurement model provided some evidence that our findings were not unduly affected by this bias. Nevertheless, future research would benefit from obtaining information from other sources, such as perceptions of job characteristics reported by coworkers and supervisors. Third, the results cannot be generalized to all employees in the labour market because our participants comprised school board employees only. Although the present study suggests that certain job demands and resources are more salient than others for understanding the psychological resources of school board employees in relation to burnout, other aspects of the working environment could be more crucial for certain subgroups of school board employees. For instance, emotional demands are particularly threatening for teachers because of their frequent contact with students, whereas they could be a minor source of stress for support staff (van Vegchel, de Jonge, Söderfeldt, Dorman, & Schaufeli, 2004). Thus, future research on school boards should investigate the role of additional demands and resources in employee subgroups. In addition, the specificity issue could be further explored in other occupational groups. For example, it would be useful to determine whether perceived relatedness is also a salient mechanism linking social resources to cynicism or disengagement, as these constructs are part of a more general process of job detachment.

Implications for practice

The hypothesized model needs to be further validated by additional studies. Nevertheless, it has practical implications for preventing burnout. From an organizational standpoint, interventions that aim to reduce job demands and increase job resources are recommended. Organizations concerned with alleviating job demands can assess employee workloads to ensure that they are appropriate for their skills and capacities. Managers could also attempt to clarify employee roles and responsibilities. When it is difficult to eliminate or reduce job demands, increasing job resources appears to be a promising approach. A workplace that offers employees more decision latitude and provides more support would reduce emotional exhaustion and depersonalization while contributing to a feeling of personal accomplishment. To complement this support, interventions could aim to more fully meet employees' psychological needs. In addition to the workplace factors documented in this study, psychological resources could be reinforced through task enrichment (job design) and by management's leadership behaviours.

With respect to task enrichment, the research suggests that workplaces that provide favourable job characteristics (e.g., task significance, autonomy, and feedback from the job) foster employees' psychological resources (Gagné et al., 1997). Moreover, managers who adopt an autonomy-supportive style towards their employees (i.e., acknowledge their subordinates' perspective, provide meaningful information, offer opportunities for choice, and encourage self-initiative) facilitate the satisfaction of employee needs (Baard et al., 2004). To obtain similar outcomes, managers could also use transformational leadership behaviours, as other studies (e.g., Bono & Judge, 2003) have linked transformational behaviours to autonomous motivation in employees, which entails the satisfaction of psychological needs. Such behaviours occur when managers provide employees with constructive feedback, encourage them to think creatively, and convince them to put extra effort into their job (Bass, 1985).

CONCLUSIONS

This study sheds new light on the importance of psychological resources and the link between these resources and workplace characteristics in explaining burnout. Results suggest that employees' perceptions of autonomy, competence, and relatedness can prevent burnout, given that they are linked to central characteristics of the workplace environment. Future studies could attempt to better identify the role of psychological resources in connection with employees' adaptation to the work environment and other work-related outcomes. This would provide not only a better understanding of the psychological mechanisms linked to employees' psychological functioning, but above all, it could contribute to better intervention strategies to prevent burnout and lessen the associated costs.

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