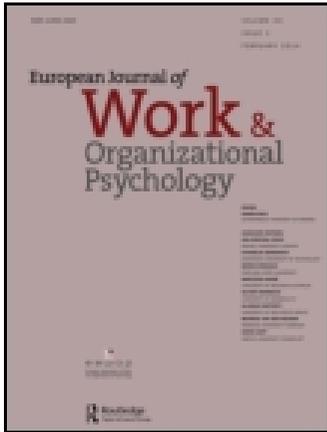


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## How psychological stress in the workplace influences presenteeism propensity: A test of the Demand–Control–Support model

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The aim of this study is to examine the influence of the sources of psychological stress at work assumed by the Demand–Control–Support (DCS) model on presenteeism propensity. Research propositions are derived from the dynamic version of the Demand–Control model, to which we added the dimension of social support, which is part of the DCS model. Data were obtained from a large representative sample consisting of 1609 public and private sector workers living in the Canadian province of Québec, who responded to a questionnaire, administered using computer-assisted interviewing over a 3-month period in 2007–2008. The results indicate that the combination of low decision authority and high supervisor’s support attenuates the positive relationship between job demands and presenteeism propensity within a 10-year time frame of exposure to a new job.

**Keywords:** Control; Demands; Presenteeism; Stress; Support.

One prevalent idea respecting employee well-being is the notion that absenteeism is a common behavioural response to a stressful work environment (Johns, 2009). Yet, in their meta-analysis, Darr and Johns (2008) report a positive but weak connection between job strain and absence, while finding support for the contention that illness mediates the job strain–absence association. One of the explanations provided for why the job strain–absence association is not stronger was proffered by Johns (2009), who points to research showing that some of the very conditions that can be characterized as job stressors can also necessitate attendance. Such work conditions would explain why employees choose to attend work despite symptoms of illness that should prompt them to take sick leave, a phenomenon known as presenteeism (Aronsson & Gustafsson, 2005; Johns, 2010). Considered to be the alternative behaviour to sickness absenteeism, presenteeism is defined as the act of showing up at work although sick (Aronsson & Gustafsson, 2005; Johns, 2010).

Some scholars (e.g., Demerouti, Le Blanc, Bakker, Schaufeli, & Hox, 2009; Johns, 2010) suggest that presenteeism could be viewed as a sign of high commitment and as a type of organizational citizenship behaviour. A research study conducted on a representative sample in the Canadian province of Québec, where the current study was carried out, reveals that 53% of participants declared they have been present at work while sick during the previous 12 months (Vézina, Stock, St.-Arnaud, & Funes, 2010). Other studies estimate the prevalence of presenteeism (twice or more) to three to five cases per 10 workers (Aronsson & Gustafsson, 2005; Böckerman & Laukkanen, 2010). Again, in Québec, Biron, Brun, Ivers, and Cooper (2006) observed that workers are absent from work because of sickness 7.5 days per year, and attend work while sick 11.9 days per year. The ratio of days worked while sick to the total number of sick days reported is similar to the ratio reported for other regions in Canada. For instance, Caverley, Cunningham, and MacGregor

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(2007) observe that presenteeism days represent almost 58% of all sick days (sick days present plus absent days) in a Canadian public service organization.

Presenteeism might seem attractive to organizations facing challenging goals, strategic change or improper staffing, but leaders ought to be concerned about the negative impact of presenteeism on job performance, and, ultimately, on speed, quality, and service. In the health care sector, for instance, deciding to show up at work despite health problems that might adversely affect performance could have serious implications for quality of care and patient safety, as some studies on burnout have shown (e.g., Argentero, Dell’Olivo, & Ferretti, 2008; Halbesleben, Wakefield, Wakefield, & Cooper, 2008). Moreover, working while ill has been shown to increase the incidence of serious coronary events (Kivimäki et al., 2005) and the rate of long-term sickness absence (Grinyer & Singleton, 2000).

Considering the potentially significant negative consequences of presenteeism, both for organizations and employees, it appears critical to examine how stressful work conditions might prompt presenteeism rather than sickness absenteeism. One conceptual framework has been particularly successful in guiding research on psychological stress in the workplace: the Demand–Control (DC) model (Karasek, 1979) and its extended version, the Demand–Control–Support (DCS) model (Johnson & Hall, 1988). However, we note the absence of studies testing the joint effect of demands, control, and social support on presenteeism propensity. Therefore, the aim of this study is to examine the impact of the sources of psychological stress at work assumed by the DCS model on presenteeism propensity. Moreover, the dynamic version of the DC model (Karasek & Theorell, 1990; Theorell & Karasek, 1996), to which we added the dimension of social support, will serve as a theoretical basis for investigating the influence of the length of exposure to specific work conditions on presenteeism propensity. In the next section of the article, we begin with the presentation of the core concepts of the DCS model and the postulates of the dynamic version of the DC model. Then, we proceed with a discussion of the theoretical implications of a dynamic version of the DCS model for organizational attendance.

## THEORETICAL FRAMEWORK

### The Demand–Control model and its extended version

According to the DC model (Karasek, 1979), demands and control are crucial aspects in the development of health problems and skills. Demands

refer to workload, constraints on task completion, and role conflict. Control, which is sometimes called decision latitude, comprises two components: the degree of influence on the way the work must be done and on the work environment (decision authority), and the degree to which the job consists of various tasks, requires a high level of skills, and continuous learning (skill discretion). The DC model distinguishes four types of jobs resulting from the different combinations of high and low levels of demands and control. Developed based on stress and learning theories, most notably Seyle’s (1956) general adaptation syndrome and White’s (1959) effectance motivation theories, the model predicts the joint effect of different combinations of demands and control on adverse stress reactions (i.e., strain) and learning. The extended version of the DC model, the DCS model (Johnson & Hall, 1988), includes a third dimension, social support, which refers to instrumental and emotional support, both from the supervisor and from coworkers.

### The dynamic Demand–Control model and a redefined version

By contrast with the original DC model (Karasek, 1979), the dynamic version of the DC model (Karasek & Theorell, 1990; Theorell & Karasek, 1996) takes into account the length of exposure to specific work conditions, and posits that strain and learning are linked to the evolution of personality. The first main hypothesis states that lacking control when demands are high (i.e., being in high-strain jobs) produces daily residual strain and, over a significant period of time, leads to feelings of exhaustion and health problems (i.e., physical and mental illnesses). Moreover, prolonged exposure to these job characteristics contributes to the development of trait anxiety, a permanent and broad personal-response orientation to the work environment that diminishes the level of active engagement in the work role, and thus, the likelihood of learning. Trait anxiety is considered to be a personality dimension similar to neuroticism (Eysenck & Eysenck, 1985). A corollary of the first hypothesis is that jobs with high control and low demands (i.e., low-strain jobs) produce little daily residual strain because control allows workers to respond to each challenge optimally. However, low-strain jobs provide few opportunities to learn, as there are few challenges to be met. Karasek (1979) shows that workers in these jobs, although they may be healthier, experience a feeling of dissatisfaction. Indeed, given that they have access to a high level of control, their jobs might seem boring to them. According to White (1959), people have a basic need to interact with their environment, as novelty and variety seem to be

enjoyed for their own sake. Moreover, according to the dynamic DC model, experimenting with new behaviour patterns that produce effective changes in the environment increases one's feeling of mastery, which serves as an intrinsic reward.

The second main hypothesis of the dynamic DC model states that having control when demands are high (i.e., being in active jobs) increases motivation to develop new behaviour patterns. Prolonged exposure to these job characteristics gives workers access to a larger reservoir of skills that contributes to the development of a feeling of mastery, a permanent and broad personal-response orientation to the work environment that inhibits the perception of strain during periods of high demands. Karasek and Theorell (1990) assert that the feeling of mastery over situations is a personality trait similar to other measures such as locus of control (Rotter, 1966) and hardiness (Kobasa, 1979). Moreover, because much of the energy aroused by high demands is translated into action through effective problem solving, the model predicts little daily residual strain. A corollary of the second hypothesis is that jobs with low levels of control and demands (i.e., passive jobs) lead to skills atrophy and apathetic behaviour. Although these jobs are characterized by few demands and are presumed to produce little daily residual strain, the model predicts that each new episode of high demands will result in a substantial increase of residual strain (just as in isostrain jobs).

Even though social support is part of the extended version of the DC model, it is not included in the dynamic DC model, although a case could, however, be made for including it. In fact, Karasek and Theorell (1990, pp. 69–70) maintain that social support increases motivation to develop new behaviour patterns in challenging situations because it fosters a positive sense of identity, based on the socially confirmed value of the individual's contribution to collective goals. In other words, they suggest that workers who feel supported by their supervisor and coworkers are likely to be more predisposed to learn solutions to new problems, a coping strategy that is expected to increase their feeling of mastery, according to the dynamic DC model. Hence, on the basis of Karasek and Theorell's contention, we propose a redefined version of the dynamic DC model, including social support.

Although the DCS model proposes eight possible combinations of high and low levels of demands, control, and social support, Karasek and Theorell (1990, p. 69) assert that, in practice, when the model is applied to job design, changes in control and in social relations are almost inseparable strategies. They even provide support for this assertion based on US data, but note that fundamental national differences in social relations at work may exist.

Consequently, in this study, we will develop theoretical arguments for four types of jobs characterized by similar levels of control and support. These jobs are (1) high in demands and low in control and support (i.e., iso-strain jobs), (2) high in demands and high in control and support (i.e., active collective jobs), (3) low in demands and high in control and support (i.e., low-strain collective jobs), and (4) low in demands and low in control and support (i.e., passive isolated jobs).

### The determinants of presenteeism propensity

The DCS model focuses on *chronic* sources of stress that are likely to lead to *chronic* health problems (e.g., cardiovascular disease, burnout, depression) (Theorell & Karasek, 1996; Van der Doef & Maes, 1999), which, in turn, increase the likelihood of episodic illnesses. Because individuals exposed to the most adverse work conditions assumed by this model are likely to experience chronic stress-related and episodic health problems to a greater extent than those who are exposed to less stressful jobs, they will necessarily show a greater propensity to presenteeism. In fact, the results of a 2007–2008 Québec study on working, employment, and occupational health and safety conditions (EQCOTESST; Vézina et al., 2010) supports this presumption. In other words, in general, they will report that they showed up at work although sick more frequently during a definite period of time than those exposed to less pathogenic jobs. Thus, as shown in Figure 1, health problems may be seen as a mediator (Arrow 1) in the relationship between sources of psychological stress and the act of presenteeism, and as an independent predictor (Arrow 2), when the illnesses experienced are unrelated to work environment factors.

As shown in Figure 1, our research model proposes that the causes of presenteeism are both contextual and individual (Johansson & Lundberg, 2004). The contextual determinants considered here are the primary sources of psychological stress in the workplace assumed by the DCS model, which could be categorized as either demands or resources (i.e., control and social support). The individual determinants of interest are the employee's health problems, which are depicted as both an independent (Arrow 2) and a mediating (Arrow 1) variable. Because the goal of this study is to clarify how stressful work conditions per se increase presenteeism propensity, we are primarily interested in the *unmediated* links between sources of psychological stress and presenteeism propensity. In other words, we wish to examine the influence of sources of psychological stress on presenteeism propensity (Arrow 3) *over and above* the impact of health problems.

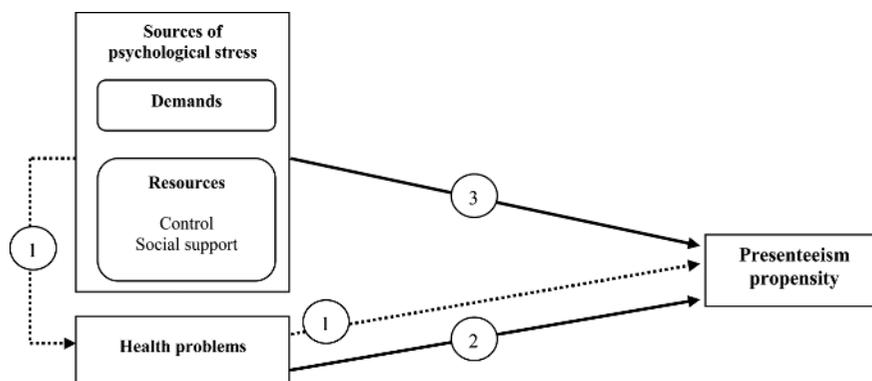


Figure 1. The research model.

### The influence of sources of psychological stress on presenteeism propensity

With respect to the decision to assume a particular sick role, the question arises as to whether an employee experiencing a particular or multiple health problems, given the presence of specific work conditions, will be more inclined to attend work. Considering the lack of empirical evidence respecting the joint effect between demands, control, and social support and the influence of the length of exposure to specific work conditions on presenteeism propensity, our predictions are based mainly on the postulates of the dynamic DC model, which we have redefined by adding social support. Thus, because the empirical part of this study is exploratory in nature, research propositions, rather than hypotheses, will be formulated. We first discuss the impact of demands on presenteeism propensity, and then consider their joint effect with control and social support. Then, we present the arguments surrounding our research propositions when the length of exposure to the different job conditions depicted by the dynamic DCS model is taken into account.

Johansson and Lundberg (2004) have proposed a model of illness flexibility in which attendance requirements originating from work, a concept similar to demands, are associated with higher presenteeism propensity. The concept of attendance requirements is defined as the negative consequences of absence for the individual and others (e.g., coworkers, clients) and, thus, are considered attendance pressure factors. Therefore, the high demands that characterize isostrain and active collective jobs should exert a pressure to attend work on individuals afflicted by health problems. In fact, several studies report a robust positive association between high demands and presenteeism propensity (e.g., Biron et al., 2006; Demerouti et al., 2009; Hansen & Andersen, 2008; Johansson & Lundberg, 2004; Kivimäki et al., 2005). Moreover, the low resources that characterize isostrain jobs (i.e., low control and

low social support) in particular should exert an additional pressure to attend work on individuals afflicted by health problems simply because demands are likely to be perceived as greater. Although a few studies have examined the predictive value of either control or social support on presenteeism propensity (e.g., Biron et al., 2006; Caverley et al., 2007; Hansen & Andersen, 2008; Johansson & Lundberg, 2004; Kivimäki et al., 2005), they are inconclusive in terms of the main effect of the two components of control and of each type of social support. In the current study, however, we propose to test their joint effect with demands, and we expect that workers exposed to active collective jobs characterized by high demands and high control and social support will show a lower presenteeism propensity than workers exposed to isostrain jobs characterized by high demands and low control and social support. The corollary of this main prediction is that workers exposed to low-strain collective jobs characterized by low demands and high control and social support will show a lesser presenteeism propensity than workers exposed to passive isolated jobs characterized by low demands and low control and social support. Nevertheless, workers in passive isolated jobs are not likely to be as inclined as those in isostrain jobs to choose presenteeism over sickness absenteeism: Although a lack of resources may increase perceived demands, demands are actually low. To summarize our argument, resources are expected to attenuate the positive relationship between demands and presenteeism propensity. However, this proposition does not take into account the length of exposure to the different job conditions depicted by the dynamic DCS model. Next, we discuss the influence of exposure time to specific work conditions in the organizational attendance decision-making process.

According to the dynamic DCS model, isostrain jobs are presumed to produce daily residual strain and increase the risk of physical illness, and to decrease the likelihood of learning by contributing to the development of trait anxiety, a personality

characteristic that tends to diminish the level of active engagement in that environment. Prolonged exposure to these jobs should decrease workers' participation in organizational activities and, thus, increase sickness absenteeism. Therefore, taking into account what has been argued previously, we expect that workers exposed to isostrain jobs will show, at first, a high presenteeism propensity that will tend to decrease as the number of years of exposure to high demands and low control and social support increases. The corollary of this prediction is that workers exposed to low-strain collective jobs will show, at first, a low presenteeism propensity that will tend to increase as the number of years of exposure to low demands and high control and social support increases. Low-strain collective jobs are presumed to provide few opportunities to learn by taking up challenges. Workers in these jobs are expected to be more willing to embrace challenges over time, as their feeling of mastery grows and serves as an intrinsic reward. Although their learning process is likely to be slower than workers in active collective jobs, a feeling of mastery will develop and tend to inhibit the perception of strain when health problems occur and they are scheduled to work, with the consequence that they will eventually be more inclined to choose presenteeism over sickness absenteeism.

By contrast, the dynamic DCS model presumes that active collective jobs provide many learning opportunities and contribute to the development of a stable feeling of mastery that inhibits the perception of strain during periods of high demands. Therefore, taking into account what has been argued previously, we expect that workers exposed to active collective jobs will show, at first, a low presenteeism propensity that will tend to increase as the number of years of exposure to high demands and high control and social support increases. The corollary of this prediction is that workers exposed to passive isolated jobs will show, at first, a high presenteeism propensity that will tend to decrease as the number of years of exposure to low demands and high control and social support increases. Passive isolated jobs are presumed to lead to skills atrophy. Each new challenge will appear more and more beyond their control and generate greater residual strain. Over time, the model posits that these work conditions tend to encourage apathetic behaviour. Therefore, workers exposed to passive isolated jobs will eventually be more inclined to choose sickness absenteeism over presenteeism because they are more likely to consider that they do not possess the skills needed to face the challenge of attending work while sick. To summarize our argument, resources are expected to exacerbate the positive relationship between demands and presenteeism propensity over a significant period of time. Accordingly, taking the length of exposure into

consideration, we formulate the following two propositions:

*Proposition 1:* Control and social support attenuate the positive relationship between demands and presenteeism propensity among workers who have had a shorter exposure to the different job conditions depicted by the dynamic DCS model.

*Proposition 2:* Control and social support exacerbate the positive relationship between demands and presenteeism propensity among workers who have had a longer exposure to the different job conditions depicted by the dynamic DCS model.

## METHODOLOGY

### Participants

Participants were part of a large job risk assessment project and occupational health survey in the Canadian province of Québec, and were selected through a stratified random sampling method, in order to ensure representativeness. A questionnaire was administered using computer-assisted interviewing (25 minutes on average) over a 3-month period in 2007–2008. The survey had a response rate of 62% ( $N = 5071$ ), which is slightly lower than the 70% response rate obtained in a recent similar Finnish survey conducted on the determinants of presenteeism (Böckerman & Laukkanen, 2010). Only salaried workers who had been actively engaged in their job during the past 12 months were retained for this study ( $n = 4173$ , 82%).

Presenteeism propensity ranges from 1 to 9 days in the current study. This choice is based on the rationale that contextual determinants of presenteeism propensity are expected to explain only a small amount of variance of chronic presenteeism. Rather, as the results from the Québec EQCOTESST study (Vézina et al., 2010) suggest, chronic presenteeism should be largely a function of chronic health problems experienced by employees. Therefore, in order to determine the real predictive value of sources of psychological stress and avoid making a Type II error, it is important to consider the different types of presenteeism and their underlying main cause. In fact, supplementary analyses showed that the joint effect of the predictors on chronic presenteeism (i.e., 10–365 sickness attendance days) yield nonsignificant results. In the Canadian province of Québec, most workers entitled to pay for sick leave can enjoy less than 10 paid sick days per year during periods of temporary or episodic sickness (ADP, 2009). Following our reasoning and using this reference point, individuals who reported more than 9 presenteeism days ( $n = 578$ , 26%) were excluded from the population under study.

Moreover, individuals who reported no presenteeism days ( $n = 1986$ , 48%) were excluded from the population under study. The reason behind this decision is that our dependent variable is presenteeism propensity, which implies—by definition—that workers must have experienced episodes of illnesses in the past 12 months to be included in our sample. Because we did not have access to absenteeism data, it was preferable to exclude those who declared they never came to work while sick as we were not certain that they had experienced episodes of illnesses over the past 12 months and made a rational choice between two alternative sick roles (Biron et al., 2006; Johansson & Lundberg, 2004); that is, they might also be “healthy” individuals. In fact, supplementary analyses conducted on a sample including individuals who reported between 0 and 9 presenteeism days showed that the joint effect of the predictors on presenteeism propensity yield nonsignificant results. Thus, the current study sample consists of 1609 individuals having reported 1 to 9 sickness attendance days over the 12-month period preceding the administration of the survey.

A breakdown of the demographic characteristics of the study sample showed that 52% of the respondents were female and that the average age was 37 years old. Most had a permanent job status (88%), were full-time employees (85%), worked in the private sector (71%), and were not unionized (60%). As many as 44% had no more than a secondary-level education, and 30% held a university level diploma. In terms of job category, 40% were blue-collar workers, 14% clerical workers, 21% professional workers, and 25% executive workers.

## Measures

Because of operational constraints (i.e., the length of telephone interviews), we had to use short versions of validated instruments. Participants were asked to express their level of agreement with each statement on a continuum ranging from “strongly disagree” (1) to “strongly agree” (4).

*Independent variables.* Demands were measured using the five-item scale taken from the Core Job Content Questionnaire (JCQ) scale (Karasek et al., 1998), to which we added one item (i.e., tasks interrupted) included in the full JCQ version (Karasek et al., 1998). The control scale comprised five items taken from a shorter and validated version of Karasek et al.’s (1998) instrument (Brisson & Larocque, 2001), and was composed of two subscales: decision authority (two items) and skill discretion (three items). The social support scale included seven items related to instrumental and emotional support, and was composed of two subscales: support from the

supervisor (four items) and from coworkers (three items). Six of the seven items were taken from Karasek et al.’s instrument; these six items are used in the Canadian Community Health Survey conducted every 2 years by Statistics Canada (2004), and were selected to allow data comparisons. One item from the coworkers’ support scale came from the Copenhagen Psychosocial Questionnaire (Kristensen, Hannerz, Høgh, & Borg, 2005), and was combined to two items from Karasek et al.’s instrument in order to better balance the number of items used to measure the two types of support.

The results of a confirmatory factor analysis,  $\chi^2(94) = 732.60$ ,  $p < .001$ , RMSEA = .066, NFI = .92, CFI = .93, provided a basis for the creation of five summated scales labelled “demands”, “decision authority”, “skill discretion”, “supervisor’s support”, and “coworkers’ support”. However, one item from the supervisor’s support scale (i.e., good organizer) and one from the coworkers’ support scale (i.e., hostile) were excluded in order to obtain an adequate level of reliability. We compared our proposed five-factor model with a simpler model, i.e., a three-factor model, in which items related to decision authority and skill discretion are specified to load on the same factor (i.e., control) and in which items related to supervisor’s support and coworkers’ support are specified to load on the same factor (i.e., social support). This three-factor model provided a less satisfactory fit,  $\chi^2(101) = 1376.52$ ,  $p < .001$ , RMSEA = .09, NFI = .84, CFI = .85, than the proposed five-factor model. A comparison of these two nested models indicated a deterioration in the quality of fit both from the perspective of the chi-square ( $\chi^2$ ) statistic,  $\Delta\chi^2(7) = 643.92$ ,  $p < .001$ , and from a practical standpoint.

*Dependent variable.* Presenteeism was assessed using two questions. First, we addressed a filter question, formulated by Aronsson, Gustafsson, and Dallner (2000) and typically used to measure the prevalence of presenteeism (Johns, 2010), to determine if respondents could be included in the sample under study; that is, “During the past 12 months, did you ever go in to work in spite of feeling that you should stay home because you were sick?”. Respondents who provided a positive answer to the filter question were asked a second question to measure their propensity to presenteeism, using an open-ended, fill-in-the-blank response format, as recommended by Johns (2010); that is, “During the past 12 months, how many days did you go to work in this condition?” Focusing on “episodic” presenteeism propensity in this study, the dependent variable ranged from 1 to 9 days, with no regard to the length of each spell of presenteeism (i.e., total number of days of presenteeism per 1-year period).

*Control variables.* Being an extraneous variable, health problems are considered to constitute a confounding factor in this study. As we argued, they are presumed to correlate with both the main explanatory variables and the dependent variable (see Figure 1, Arrows 1 and 2). Therefore, to avoid making a Type I error, the influence of health problems is controlled for in all analyses by using three indicators: chronic musculoskeletal disorders (four items), depressive symptoms (two items), and self-reported general health (one item). A remark needs to be made regarding this last indicator. In absenteeism research, previous sickness absenteeism is considered to be the best predictor of prospective sickness absenteeism (Martocchio & Harrison, 1993). However, not having access to absenteeism data, we considered the individual's general health status, which studies have found to be related to presenteeism (Bergström et al., 2009; Demerouti et al., 2009), as a proxy for previous sickness absenteeism. Moreover, the influence of two types of variables on presenteeism propensity was explored through bivariate analyses. First, we investigated the impact of three structural conditions that may lead disadvantaged workers to accept pathogenous job conditions and discard sickness absenteeism. Thus, information was collected on economic sectors and occupations in order to control for the lack of alternative choice in the labour market, on education degrees to control for a low level of skills, and on job precarity (permanent/temporary position) to control for the confinement to short-term contracts. Second, based on previous presenteeism studies (e.g., Aronsson & Gustafsson, 2005; Johansson & Lundberg, 2004; cf. Johns, 2008), the influence of the following sociodemographic and occupational characteristics was also examined: gender, age, type of employer (public/private sector), type of employment (full-time/part-time), union jobs, annual personal income, presence of organizational practices facilitating work–personal life balance (measured using seven items, including flexible schedule, paid sickness absence days, and possibility of working from home), and the number of hours per week dedicated to domestic tasks or family responsibilities.

## Analyses

Analyses were performed using the Statistical Analysis System (SAS 9.1) and the SAS survey procedures that enabled us to make more statistically valid inferences for a population by incorporating our complex sample design (stratified by region) into analyses. Multiple regression analyses were conducted to verify our propositions, suggesting an interaction effect between demands, control, and

social support. For this purpose, we built models including the control variables, the independent variables that were mean-centred to avoid multicollinearity (Cohen, Cohen, West, & Aiken, 2003; Jaccard, Turrisi, & Wan, 1990), and the two- and three-way multiplicative interaction terms, formed with mean-centred scores.

Finally, to verify our propositions, which were formulated by taking into account the length of exposure to different job conditions depicted by the dynamic DCS model, we formed four subsamples of workers according to the number of years they had held their current main job. However, because the empirical part of this study is exploratory in nature, we had no reference to established cutoff points. Nevertheless, we reasoned that a breakdown at work generally occurs after 5 to 10 years of ignoring symptoms of growing stress problems (Anschuetz, 1999). Consequently, a significant change in presenteeism propensity is more likely to be observed within a 10-year time frame of exposure to new job conditions. Our reasoning is in line with Laufersweiler-Dwyer and Dwyer's (2000) observation that police officers with experience levels of 6 to 10 years (called the disenchantment phase) report higher stressor scores. In addition, Garcia, Nesbary, and Gu (2004) report data suggesting a similar curvilinear relationship between job tenure and stress. Their study, also conducted among police officers, reveals that respondents with 5 to 10 years of job tenure report higher stressor scores. For our part, we did conduct sensitivity analyses using shorter time frames, like 3 or 5 years, and we observed marginally significant relationships between work conditions and presenteeism propensity between 5 to 9 years of exposure and a significant relationship between these variables after 10 years. In this study, current job tenure ranges from 0.1 to 52 years ( $M = 13$ ). Therefore, we chose to group workers as follows: (1) less than 10 years ( $n = 1078$ , 67%), (2) 10 to 19 years ( $n = 225$ , 14%), (3) 20 to 29 years ( $n = 209$ , 13%), and (4) 30 years and more ( $n = 97$ , 6%).

## RESULTS

### Preliminary data analysis

Table 1 presents the descriptive statistics and correlations between the main variables of the study, along with reliability coefficients. Respondents showed a moderately low propensity to presenteeism over a 1-year period, and the scale scores proved to be normally distributed. Also, of all the main explanatory variables, only control and its two components were not significantly associated with presenteeism, although the relationship with decision authority approached significance. Polynomial

TABLE 1  
Descriptive statistics, correlations, and reliability coefficients

Main variables	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8
1. Demands	2.49	0.50	(.72)							
2. Control	2.95	0.46	.08***	(.61)						
3. Decision authority	2.94	0.63	-.08***	.73***	(.62)					
4. Skill discretion	2.95	0.54	.18***	.85***	.25***	(.58)				
5. Support	3.15	0.47	-.25***	.33***	.33***	.20***	(.78)			
6. Supervisor's support	3.15	0.55	-.25***	.30***	.32***	.17***	.91***	(.77)		
7. Coworkers' support	3.15	0.57	-.17***	.25***	.23***	.18***	.79***	.46***	(.71)	
8. Presenteeism	3.56	1.71	.17***	.00	-.04 <sup>†</sup>	.03	-.10***	-.10***	-.07**	-

Pearson's correlation coefficients (*r*) are reported below the diagonal; coefficients alpha ( $\alpha$ ) are reported on the diagonal. <sup>†</sup> $p < .10$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

regression was used to model potential nonlinear relationships between the independent and dependent variables. All relationships proved to be linear. The level of reliability of internal consistency for some of the main variables measured with multiple reflective indicators was under the generally recommended minimum threshold of .70 (Hair, Anderson, Tatham, & Black, 1998). This was the case for control and its two components. However, a closer examination of the correlations involving the two components of control and demands revealed important differences between decision authority and skill discretion. Theoretically, resources are presumed to be negatively associated with demands (Bakker & Demerouti, 2007). Table 1 indicates that decision authority is indeed negatively related to demands, but we note that the correlation between skill discretion and demands is positive (for similar findings, cf. Brisson et al., 1998; Karasek et al., 1998). Furthermore, the (nonsignificant) correlations with presenteeism show the same pattern of association (for similar findings, see Biron et al., 2006), and the fact that the two components of control are positively related suggests that skill discretion could have a suppressor effect in our analyses (MacKinnon, Krull, & Lockwood, 2000). In fact, the operationalization of skill discretion is ambiguous because it could be interpreted as a demand instead of a resource. Skill discretion was measured with items such as "My job *requires* a high level of skill", which do not measure the presence of a resource per se. Indeed, under some work conditions (e.g., workload, continued technological changes, financial restrictions), individuals may not have the opportunity to learn and develop their skills. For purposes of construct validity, we decided to exclude skill discretion from our analyses.

Before testing our propositions, we conducted bivariate analyses to examine the influence of the control variables specified in the Methodology section on presenteeism propensity. Overall, 10 factors had a significant influence on the dependent variable, and were, therefore, included as control

variables in all multiple regression analyses. These factors are: health problems (three indicators), job precariousness (permanent/temporary position), gender, age, type of employer (public/private sector), type of employment (full-time/part-time), union jobs, and annual personal income. However, because the impact of these control variables is not the focus of the study, only the results pertaining to the influence of the main explanatory variables are discussed in the following section.

### Propositions testing

Because confirmatory factor analysis revealed the presence of two different factors in terms of support, we examined the first and second propositions by using each source of support (i.e., from supervisor or coworkers) as a separate predictor. Beginning with the model including supervisor's support, Table 2 presents the results of the analyses conducted on the four subsamples of workers that we formed according to the number of years they have held their current main job. We can see that the main effect of demands on presenteeism propensity is significant for workers having between 0 and 29 years of current job tenure. More importantly, we note that only one interaction term is significant, that is, the joint effect of demands, decision authority, and supervisor's support on presenteeism propensity for the group of workers having less than 10 years of exposure to their current job,  $B = 0.47$ ,  $p < .05$ .

To understand the form of this interaction, we followed the procedure outlined in Aiken and West (1991). First, we selected values from the decision authority and supervisor's support scales using one standard deviation below and above the mean, and used all combinations of these values to generate regression equations. Then, we entered selected values from the demands scale (one standard deviation below and above the mean) in these equations and plotted the lines shown in Figure 2. A visual inspection of the regression lines suggests that access

TABLE 2  
Results of the multiple regression analyses with supervisor's support

	Current job tenure			
	Less than 10 years ( <i>n</i> = 1078) ( <i>B</i> )	10 to 19 years ( <i>n</i> = 225) ( <i>B</i> )	20 to 29 years ( <i>n</i> = 209) ( <i>B</i> )	30 years and more ( <i>n</i> = 97) ( <i>B</i> )
Step 1				
Self-reported health	0.31***	0.25*	0.22 <sup>†</sup>	0.12
Chronic musculoskeletal disorders	0.28*	0.28	-0.03	-0.18
Depressive symptoms	0.45*	0.40	0.59	0.55
Gender	-0.15	-0.07	0.21	0.04
Age	-0.09	0.13	0.16	0.00
Type of employer (public/private sector)	-0.12	-0.07	0.28	0.31
Job precariousness (permanent/temporary position)	-0.28 <sup>†</sup>	0.37	1.24	0.00
Type of employment (full-time/part-time)	-0.06	-0.14	0.44	-0.14
Union jobs	-0.13	-0.04	0.07	0.46
Annual personal income	0.09*	-0.04	0.11	0.13
Step 2				
Demands	0.54***	0.62**	0.60*	0.44
Decision authority	0.01	0.06	0.01	-0.08
Supervisor's support	-0.00	-0.21	-0.31	-0.05
Step 3				
Demands × Decision authority	0.03	-0.49	-0.73 <sup>†</sup>	-1.40
Demands × Supervisor's support	-0.22	0.26	0.07	0.15
Decision authority × Supervisor's support	-0.04	-0.12	-0.61*	-1.20
Step 4				
Demands × Decision authority × Supervisor's support	0.47*	0.47	0.34	0.76
<i>R</i> <sup>2</sup>	.13	.12	.14	.28

For categorical variables, the unstandardized regression coefficient reported represents the overall effect of the control variable. <sup>†</sup>*p* < .10, \**p* < .05, \*\**p* < .01, \*\*\**p* < .001.

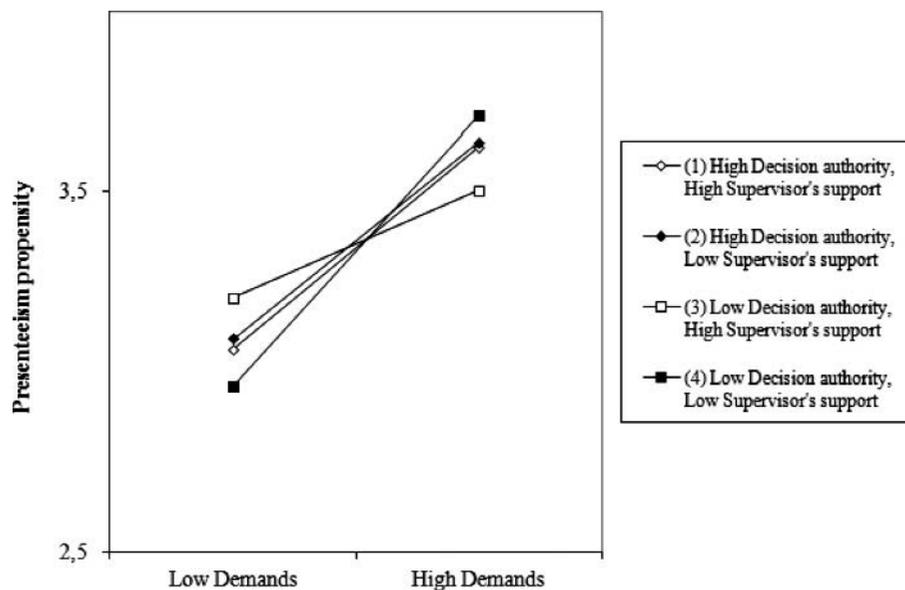


Figure 2. Multiplicative interaction effect between demands, decision authority, and supervisor's support on presenteeism propensity for workers having less than 10 years of exposure to their current job (*n* = 1078).

to either or both decision authority and supervisor's support attenuates the positive relationship between demands and presenteeism propensity. However, a significance test for slope differences (see Dawson & Richter, 2006) revealed that only two slopes differ

significantly from each other,  $t(985) = -1.99$ ,  $p < .05$ . As shown in Table 3, these slopes concern workers having access to low decision authority and low supervisor's support, and those having access to low decision authority and high supervisor's support.

Taking into account this last finding, we would be inclined to conclude that decision authority does not play an important role in the relationship between demands and presenteeism propensity, and that supervisor's support is the only resource that matters. This conclusion would be erroneous because Table 2 indicates that none of the two-way interaction terms formed by demands and supervisor's support is significant.

Looking next at Table 4, which presents the results of the analyses conducted with the model including coworkers' support, it can be observed that no interaction term is significant. Nevertheless, we can see that the main effect of demands on presenteeism propensity is again significant, but for all four

subsamples of workers. Overall, these findings partly support Proposition 1, which states that resources attenuate the positive relationship between demands and presenteeism propensity among workers who have had a shorter exposure to the different job conditions depicted by the dynamic DCS model. However, they refute Proposition 2, which states that resources exacerbate the positive relationship between demands and presenteeism propensity among workers having a longer exposure to the different job conditions depicted by the dynamic DCS model.

### Supplementary analysis

When combined, Propositions 1 and 2 suggest that the positive relationship between demands and presenteeism propensity is moderated by resources in a curvilinear way. However, the results show that resources (i.e., low decision authority and high supervisor's support) only have a moderating effect among workers who have had a shorter exposure to the different job conditions depicted by the dynamic DCS model. This finding means that, in the context of high demands, resources decrease presenteeism propensity and that exposure time moderates, i.e., attenuates, the influence of resources on presenteeism propensity. Thus, a supplementary analysis was performed on the whole sample to test if time

TABLE 3  
Slope difference tests for the multiplicative interaction effect shown in Figure 2

Pair of slopes	<i>t</i> -value for slope difference	<i>p</i> -value for slope difference
(1) and (2)	0.07	.948
(1) and (3)	1.29	.199
(1) and (4)	-0.85	.396
(2) and (3)	0.83	.405
(2) and (4)	-0.99	.320
(3) and (4)	-1.99	.047

TABLE 4  
Results of the multiple regression analyses with coworkers' support

	<i>Current job tenure</i>			
	<i>Less than 10 years</i> ( <i>n</i> = 1078) ( <i>B</i> )	<i>10 to 19 years</i> ( <i>n</i> = 225) ( <i>B</i> )	<i>20 to 29 years</i> ( <i>n</i> = 209) ( <i>B</i> )	<i>30 years and more</i> ( <i>n</i> = 97) ( <i>B</i> )
Step 1				
Self-reported health	0.31***	0.26**	0.22 <sup>†</sup>	0.03
Chronic musculoskeletal disorders	0.27*	0.27	-0.02	-0.03
Depressive symptoms	0.48*	0.40	0.55	0.60 <sup>†</sup>
Gender	-0.16	-0.07	0.21	0.10
Age	-0.10	0.12	0.13	0.00
Type of employer (public/private sector)	-0.12	-0.09	0.31	0.71
Job precarity (permanent/temporary position)	-0.25	0.35	10.34	0.00
Type of employment (full-time/part-time)	-0.04	-0.10	0.38	-0.03
Union jobs	-0.14	-0.06	0.06	0.39
Annual personal income	0.10**	-0.04	0.09	0.14
Step 2				
Demands	0.58***	0.60***	0.69**	0.53*
Decision authority	-0.02	0.01	0.00	-0.53***
Coworkers' support	0.00	-0.06	-0.21	0.49 <sup>†</sup>
Step 3				
Demands × Decision authority	-0.06	-0.32	-0.60 <sup>†</sup>	-0.80**
Demands × Coworkers' support	-0.08	-0.16	0.19	0.29
Decision authority × Coworkers' support	-0.04	-0.30	-0.38	-0.12
Step 4				
Demands × Decision authority × Coworkers' support	0.36	0.72	0.54	0.74
<i>R</i> <sup>2</sup>	.13	.12	.14	.29

For categorical variables, the unstandardized regression coefficient reported represents the overall effect of the control variable. <sup>†</sup>*p* < .10, \**p* < .05, \*\**p* < .01, \*\*\**p* < .001.

exposure attenuates, when demands are high, the relationship between resources (i.e., decision authority and supervisor's support) and presenteeism. The results indicated a significant interaction effect of decision authority, supervisor's support and time exposure on presenteeism propensity,  $B = -0.04$ ,  $p < .05$ .

## DISCUSSION

In our view, this is the first study to examine the impact of the primary sources of psychological stress in the workplace, assumed by the DCS model, on presenteeism propensity from a theoretical and an empirical perspective. Research propositions were derived from the dynamic version of the DC model (Karasek & Theorell, 1990; Theorell & Karasek, 1996), to which we added the dimension of social support, which is part of the DCS model (Johnson & Hall, 1988). In particular, we attempted to explain why studies generally report a weak association between job strain and absence (Darr & Johns, 2008).

The results are consistent with the explanation provided by Johns (2009), as the study shows that some of the very conditions that can be typified as job stressors and cause absence via sickness can also motivate attendance. Indeed, in concordance with the results of past studies (e.g., Biron et al., 2006; Demerouti et al., 2009; Kivimäki et al., 2005), we found that workers confronted with high demands are generally more prone to attend work while sick over a considerable period of time, working in the same job. Moreover, this study reveals that workers who are exposed to jobs high in demands and low in resources (in terms of decision authority and supervisor's support)—these job conditions being the most stressful according to the DCS model—tend to be more inclined to choose presenteeism over sickness absenteeism within the first 10 years of exposure to the same job conditions. However, our results indicate that, within this 10-year time frame, having low decision authority but access to one particular resource, that is, supervisor's support, attenuates the positive relationship between demands and presenteeism propensity.

In regard to the influence of job resources on presenteeism propensity, studies having investigated the main effects of control or social support and their underlying dimensions (e.g., Biron et al., 2006; Caverley et al., 2007; Hansen & Andersen, 2008; Johansson & Lundberg, 2004; Kivimäki et al., 2005) have provided contradictory findings. However, these studies have some important limitations: first, "healthy" individuals were not always excluded from their analyses; second, results were not always obtained after controlling for health problems; third,

although the effect of one predictor on presenteeism propensity has sometimes been examined in the presence of the others, none of these studies tested the multiplicative interaction effect between the three predictors; and fourth, the analyses were performed without taking into account the length of exposure to specific job conditions. Nevertheless, an unexpected finding in our study is that low decision authority—not high—in combination with high supervisor's support have an attenuating effect on the positive relationship between demands and presenteeism propensity. We have argued that low resources in general should exert an additional pressure to attend work on individuals afflicted by health problems simply because demands are likely to be perceived as greater. However, Johansson and Lundberg (2004) provide another perspective on the decision authority–presenteeism propensity relationship. According to their model of illness flexibility, sickness attendance (i.e., presenteeism) is determined by both attendance requirements and work ability. In turn, work ability is determined by both a loss of function due to illness and adjustment latitude, a concept similar to decision authority. Johansson and Lundberg argue that adjustment latitude offers people the opportunity to alter their work effort when feeling ill and, thus, the likelihood of retaining the ability to work should be greater when this work condition is present. In their study conducted among unhealthy individuals, Johansson and Lundberg find that, when controlling for attendance requirements and health problems, low adjustment latitude increases sickness attendance, but only among women. However, it should be noted that their study only examines main effects.

By contrast, we observed that decision authority and social support, when combined with demands, have *no* significant influence on presenteeism propensity among workers who have held the same job for more than 10 years. Contrary to our prediction, resources do not appear to have an exacerbating effect on the positive relationship between demands and presenteeism propensity among workers having the greatest exposure to the same job conditions. Two plausible explanations may account for the refutation of our proposition.

For one thing, our research model may be misspecified because of the omission of relevant variables posited by the dynamic DC model. As mentioned earlier, this model presumes that access to resources when demands are high, over a significant period of time, leads to the development of a stable feeling of mastery over situations, which inhibits the perception of strain during periods of high demands. Therefore, feeling of mastery may have a greater exacerbating effect on the positive relationship between demands and presenteeism propensity than

resources per se, with the former being a more proximal determinant of perceived strain.

A second explanation is provided by the effort–reward imbalance (ERI) model (Siegrist, 1996), which offers an alternative approach to understanding psychological stress in the workplace. While the DCS and ERI models both focus on the demanding aspects of the task, these two conceptual frameworks differ in terms of the type of resources they emphasize (Xie & Schaubroeck, 2001). With respect to the DCS model, control and support are resources that workers can invest in demanding tasks on a day-to-day basis in order to develop new behaviour patterns. By contrast, the ERI model is more concerned with reciprocity in work contracts and with workers' success in gaining resources that are distributed in the form of rewards, namely, good salary, job security, career opportunities, and esteem from supervisor and coworkers. These resources are generally granted upon making a notable contribution to the collective goals. As we will explain next, the ERI model suggests that another condition, the obtention of rewards, along with personality traits, may be *necessary* to explain presenteeism propensity after long-term exposure to specific job conditions.

Siegrist (1996) argues that, in early stages of employment, individuals may accept for a certain time job conditions that are considered unfair for strategic reasons, as they tend to improve their chances for promotion and related rewards at a later stage. Therefore, we reasoned that workers exposed to high demands and low resources may show a high presenteeism propensity within the first 10 years of exposure to their job conditions because they hope, thereby, to gain respect and be rewarded for their unwavering commitment to the organization. Indeed, in the context of high demands, the lack of resources makes attendance almost a heroic behaviour, and could increase expectations of obtaining rewards. This proposition may help explain why supervisor's support was found to have a far more critical influence on presenteeism propensity within a 10-year time frame of exposure to a new job than coworkers' support. In other words, when workers perceive low support from their supervisor, they may be more inclined to choose presenteeism over sickness absenteeism in order to impress their hierarchical superior, who has the power to give access to rewards. However, after a while, workers may realize that they have failed to obtain rewards for their exemplary attendance and for their considerable efforts to meet demands. Therefore, after an employee experiences and perceives nonreciprocity at work as a psychological contract violation (Siegrist, 1996), factors such as job demands that exert pressure on the individual may then become a stronger predictor of the decision to attend work while sick than factors

such as job resources that increase extrinsic motivation. The same would be true for workers who have been exposed to jobs high in demands and high in resources, and have putatively developed a stable sense of mastery, but failed to obtain rewards for their efforts and success in meeting demands.

### Study limitations

The first limitation of this study lies in its design. Specifically, we used cross-sectional data to examine presumed causal relationships. However, research on presenteeism is still largely exploratory and atheoretical, and we provided readers with theoretical arguments supporting the temporal order of our variables, although we acknowledge the possibility of reciprocal relationships between work conditions and presenteeism. Moreover, we consider that the results of this study, obtained from a large representative sample, and controlling for numerous confounding factors, can provide significant insight into the determinants of this potentially costly organizational behaviour. Nevertheless, the fact that we did not have access to absenteeism data can be considered as a second limitation of this study. Although we did control for the influence of health problems in all analyses, the use of self-reported health as a proxy for previous sickness absenteeism remains an imperfect measure. Future studies should include absenteeism data to control for the influence of previous sickness absenteeism on presenteeism propensity because it is considered to be the best predictor of prospective sickness absenteeism (Martocchio & Harrison, 1993). Finally, a third limitation of this study lies in the data collection method and the measures used. Specifically, we collected subjective data from a single source, a method likely to introduce common method bias. However, it is hard to conceive of a measure of presenteeism that would not use self-report, at least in the case of presenteeism related to episodic illnesses. Recall bias could also have contaminated our results, as respondents may have had difficulty remembering the exact number of days they attended work while sick during the past 12 months. In future studies, to avoid the problem of faulty reconstruction of the phenomena of interest, an alternative would be to ask respondents to fill out a ledger diary when a "health event" occurs (Burman, 1995).

### Practical implications

People in contemporary organizations are often subjected to increasing demands, while resources are left unchanged or even diminished. Yet, this study provides evidence that within a 10-year time frame of exposure to a job high in demands and low in resources, people may be more prone to choose to

attend work while sick. However, it also demonstrates that increasing the level of resources available to workers, especially supervisor's support, can help prevent presenteeism. Access to resources may indirectly decrease presenteeism propensity by reducing perceived high demands. For workers who have held their job for more than 10 years, the results suggest that a far more effective strategy for preventing presenteeism would be to reduce the level of demands to which they are exposed. Although this could be a challenging goal for most organizations, examples of possible interventions include the prioritization of demands, implementation of job rotation, and redistribution of workloads. Finally, organizations should communicate clear expectations concerning attendance during episodes of illness, and implement policies and practices that allow workers to choose an alternative behaviour to presenteeism and transform sickness absenteeism into an attractive option.

### Research avenues

Further to our discussion, more research is needed to examine the influence of the length of exposure to the different job conditions delineated by the DCS model on presenteeism propensity. Future studies should therefore include the two personality traits posited by the dynamic version of the DC model and the rewards component of the ERI model. Moreover, our study reveals that demands generally increase presenteeism propensity. This finding raises an intriguing question: Do the *consequences* of presenteeism for the sick attendee depend, however, *precisely*, on the level of resources available? It would thus be worthwhile to examine the actual costs and benefits associated with the choice of presenteeism when demands are high, in the context of both high and low resources. In cases when the ailment of the sick attendee is episodic and psychological, it is plausible that jobs characterized by high resources could have a beneficial impact on the health of the worker that chooses presenteeism, pressured by high demands, whereas jobs characterized by low resources would impair the sick attendee's health. Moreover, besides health, other outcomes, such as workload, teamwork conflict, support from coworkers, organizational-based self-esteem, or pride in oneself, could be explored in the future. Choosing presenteeism over sickness absenteeism may increase or decrease specific demands and resources, some linked to the work environment, and others to the individual. Last, future studies should also consider the potential heterogeneity in the estimated relationships. As the results obtained from this study suggest, the influence of the sources of psychological stress at work assumed by the DCS model on presenteeism

propensity is likely to vary according, notably, to gender, type of employer (public/private sector), and annual personal income.

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