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**Job demands, job control, psychological climate, and job satisfaction: A cognitive dissonance perspective**



### Abstract

*Purpose:* Research into job design and employee outcomes has tended to examine job design in isolation of the wider organizational context, leading to calls to attend to the context in which work is embedded. This study examines the effects of the interaction between job design and psychological climate on job satisfaction.

*Design/approach:* Cognitive Dissonance Theory was used to explore the nature of this relationship and its effect on job satisfaction. We hypothesized that psychological climate (autonomy, competence, relatedness dimensions) augments favourable perceptions of job demands and control when there is consistency between them (augmentation effect) and compensates for unfavourable perceptions when they are inconsistent (compensation effect).

*Findings:* Analysis of data from 3,587 individuals partially supported the hypotheses. Compensation effects were observed for job demands under a high autonomy and competence climate and for job control under a low competence climate. Augmentation effects were observed for job demands under a high relatedness climate.

*Research implications:* Psychological climate has the power to enhance or reduce the effects of job design and this may extend to other outcomes such as performance and commitment.

*Practical implications:* Well-designed and high-quality jobs should take into account the effects of psychological climate on employee outcomes.

*Originality/value:* This study has offered a way to bridge the job design and psychological climate fields and demonstrated that the call for more attention to the context in which jobs are embedded is worth heeding.

*Keywords:* job control, job demands, psychological climate, job satisfaction, workplace characteristics model, cognitive dissonance theory

### **Job demands, job control, psychological climate, and job satisfaction: A cognitive dissonance perspective**

A range of perspectives have been used to explore and explain how job design can affect important employee outcomes such as job satisfaction. The consensus among researchers and practitioners is that well-designed jobs, in terms of providing opportunities for control and an acceptable level of job demands, can lead to increased well-being and job satisfaction. However, research on job design and employee outcomes has tended to look at job design in isolation of the organizational context, ignoring the fact that behaviour is a product of the person *and* the wider environment (Field Theory, Lewin, 1939; Mesquita, Feldman Barrett and Smith, 2010). As Lewin (1939) suggested “to explain social behaviour it is necessary to represent the structure of the total situation and the distribution of the forces in it” (p. 868). Although the interactionist approach was first articulated over 70 years ago (Lewin, 1939; also see Magnusson and Magnusson, 2013), attention on the importance of the broader environment or context has only re-emerged relatively recently in the field of organizational behaviour (Johns, 2006, 2010; Rousseau and Fried, 2001).

Specifically, job design has been at the centre of discussion on the neglect of the broader context in organizational behaviour as it is an example *par excellence* of a phenomenon treated in isolation from its surrounding context (Grant, 2010; Johns, 2010; Rousseau and Fried, 2001). As the interactionist perspective reminds us, we should not be treating attitudes and behavior attitudes behavior in isolation from the psychosocial and cultural milieu in which they are situated. It is argued, that the way jobs are designed “is embedded in a larger work context” (Johns, 2010, p. 361), which may influence individuals’ attitudes and behaviour. Morgeson and Humphrey (2006) in particular acknowledge that the effectiveness of job redesign will depend on the organizational context, whereas Morgeson, Dierdorff and Hmurovic (2010) highlight psychological climate (or the perceptions that people have of their work organization; Schneider, 1975) as a dimension of context to consider in relation to job design and employee outcomes.

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3 The question then becomes how do job design and psychological climate work together to  
4 produce employee outcomes such as job satisfaction? The interactionist paradigm (Lewin, 1939;  
5 Magnusson and Magnusson, 2013) can be supplemented by a more detailed examination, offered by  
6 Cognitive Dissonance Theory (CDT; Festinger, 1957), to understand the nature of this interaction  
7 and supplement analysis of the job design–job satisfaction relationship. CDT suggests that  
8 individuals have a preference for cognitions (attitudes, beliefs, or knowledge of one’s behaviours) to  
9 be aligned with each other and that a discrepancy between two cognitions will create an  
10 uncomfortable negative affective state and, consequently a motivation to reduce that discrepancy.  
11 We operationalize negative affective state as job satisfaction, or “an evaluative judgment one makes  
12 about one’s job or job situation” (Weiss, 2002), as a key outcome variable that has been reliably  
13 linked to cognitive dissonance (see Pugh, Groth and Hennig-Thurau, 2010).

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27 In this paper we take an interactionist approach to job design and psychological climate  
28 within which employee outcomes are situated. We supplement past analysis of the job design–job  
29 satisfaction relationship by drawing from CDT to understand the nature of this interaction. We firstly  
30 outline the concepts of job design and psychological climate and their impact on job satisfaction, and  
31 then apply CDT to explore how the job and climate might jointly determine job satisfaction, before  
32 reporting the results of the study.

### 33 34 35 36 37 38 39 40 ***Job Control, Job Demands, and Job Satisfaction***

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42 One of the most influential models for explaining the influence of the job on well-being and  
43 employee outcomes is Karasek and Theorell’s (1990) job demands–control model (DCM). It  
44 proposes job control or decision latitude and psychological demands as the characteristics of the job  
45 that most influence strain and has since been applied to a range of affective and behavioural work  
46 outcomes. It has been examined in relation to a range of indices of psychological well-being,  
47 including job satisfaction, burnout, and stress, with the evidence supporting a positive effects of job  
48 control and negative effects of job demands (Van der Doef and Maes, 1999). Job demands are  
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3 defined as “those physical, psychological, social, or organizational aspects of the job that require  
4 sustained physical and/or psychological (cognitive and emotional) effort or skills and are therefore  
5 associated with certain physiological and/or psychological costs” (Bakker and Demerouti, 2007, p.  
6 312). Furthermore, DCM proposes that high strain jobs, characterized by a combination of high  
7 demands and reduced control, are most likely to lead to adverse well-being outcomes (Van der Doef  
8 and Maes, 1999). Although empirical evidence concurs that “high levels of perceived control [is]  
9 associated with high levels of job satisfaction” and a broad range of desirable affective, motivational  
10 and behavioural outcomes (Spector, 1986, p. 1005), tests to see whether job control buffers the  
11 impact of job demands on well-being is inconsistent (Bakker and Demerouti, 2007). Therefore, we  
12 only focus on direct rather than interaction effects of job demands and job control on job satisfaction.  
13 On the basis of consistent evidence for strong links between job demands and control and job  
14 satisfaction (Dwyer and Ganster, 1991; Loher, Noe, Moeller, and Fitzgerald, 1985), we state the first  
15 hypotheses, which form the bases of subsequent hypotheses thus:

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32 *Hypothesis 1a: Job control is positively associated with job satisfaction*

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34 *Hypothesis 1b: Job demands are negatively associated with job satisfaction*

### 35 36 ***Psychological Climate and Job Satisfaction***

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38 Field Theory posits that “to understand or to predict behaviour, the person and his environment have  
39 to be considered as one constellation of interdependent factors” (Lewin, 1946, p. 338). In the  
40 organizational behaviour literature the interactionist approach is evident in calls for research to  
41 attend to the context in which job design and organizational behavior are situated (e.g., Grant, 2010;  
42 Johns, 2006; Johns, 2010; Morgeson et al., 2010; Rousseau and Fried, 2001), as well as with  
43 advances in multilevel theory and resolutions of levels of analysis issues (Klein and Kozlowski,  
44 2000). What may constitute context, however, is broad and open to debate. Morgeson, Dierdorff and  
45 Hmurovic (2010) proposed three aspects of context as relevant to job design, including psychological  
46 climate, technical systems, and organizational structure; here we focus on the psychosocial climate  
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3 because it is one of the most permeating influences on employee outcomes besides the job (Karasek,  
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5 2004; Schneider, González-Romá, Ostroff and West, 2017; Schyns, van Veldhoven and Wood,  
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7 2009). For clarity, it should be noted that a distinction is made between psychological and  
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9 organizational climate, the former referring to individual's perception of the climate and the latter to  
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11 shared perceptions of climate (James and Jones, 1974).

14 Following Schneider (1975) psychological climate is widely taken to refer to perceptions  
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16 people have of their work organization. Psychological climate can refer to an employee's perceptions  
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18 of the organization in general or to aspects of the organization, particularly its policies, practices and  
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20 procedures, or the behaviours that are rewarded, supported or expected (James *et al.*, 2008). When  
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22 individuals perceive their workplace environment positively, they are more likely to invest more  
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24 effort and yield more positive outcomes (Brown and Leigh, 1996). Positive perceptions of climate  
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26 for group relationships, leadership, and supervision, for example, are linked to positive mental health  
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28 outcomes (e.g., lower burnout, depression, anxiety) (Bronkhorst, Tummers, Steijn and Vijverberg,  
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30 2015; Parker *et al.*, 2003). Schneider (1975) also argued that for the concept of climate to be useful it  
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32 ought to be conceptualized as a climate for something or be domain-specific, for example, climate  
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34 for justice (Naumann and Bennett, 2000), safety climate (Zohar, 2002), risk-taking climate (O'Reilly,  
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36 Chatman, and Caldwell, 1991) service climate (Liao and Chuang, 2004), (Sowinski, Fortmann, and  
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38 Lezotte, 2008), and creativity climate (Ekvall, 1996). In essence, the effectiveness of climate to  
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40 positively influence employee outcomes depends on the congruence and specificity of the said  
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42 climate in relation to these target outcomes. A climate for safety will be more strongly linked to  
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44 safety than a positive but not domain-specific climate.

49 For the purposes of understanding individuals' broader well-being and affective states, an  
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51 "operational definition of psychological climate that is based on the extent to which employees  
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53 perceive the organization to be a psychologically safe and meaningful work environment" (Brown  
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55 and Leigh, 1996; p. 358) is appropriate. In line with this, the Workplace Characteristics Model  
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(WCM; Karanika-Murray and Michaelides, 2015) was developed to describe the characteristics of the workplace that have the potential to support adaptation, meaning, self-regulation, and optimal functioning. It is based on the premise that happiness and a meaningful life as the purpose of human activity and a frame of reference in one's life (self-determination theory, SDT; Deci and Ryan, 1985, 2000). Drawing from the climate, job design, and self-determination perspectives, the WCM differentiates three dimensions of workplace climate: the degree of freedom of action in the workplace (autonomy-supportive climate), of the availability of resources that support the fulfilment of job requirements (competence-supportive climate), and of the degree to which the social context fosters meaningful relationships in the workplace (relatedness-supportive climate). These three dimensions of climate correspond to the three fundamental human needs in SDT, of autonomy, competence and relatedness, the fulfilment of which fosters purpose and self-regulation (Deci and Ryan, 1985, 2000). Gagne and Deci (2005) argue that "climates that promote satisfaction of the three basic psychological needs will enhance employees' intrinsic motivation and promote full internalization of extrinsic motivation and that this will in turn yield the important work outcomes" (p. 337), including, among others, performance, job satisfaction, psychological adjustment, and well-being. Concurring with this, the WCM posits that perceptions of the workplace as promoting self-regulation (and specifically through prominence of the autonomy, competence, and relatedness dimensions) will constitute a workplace climatic context that can lead to positive affective outcomes. The WCM differs from other domain-specific climates in that it focuses on higher-order concepts of meaning and self-regulation, rather than on specific outcome behaviours, and as such it has the potential to be linked to a range of specific behavioural and attitudinal outcomes. Therefore, we propose the following:

*Hypothesis 1c: Psychological climate is positively associated with job satisfaction*

***Effects of Job Control, Job Design, and Psychological Climate on Job Satisfaction***

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3 If we accept that the interaction between the job (control and demands) and psychological climate  
4 impacts upon employee outcomes and specifically job satisfaction, what form does this interaction  
5 take? And which is the moderator?  
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10 In relation to the latter, Johns (2010) suggests that both the job and the climate constitute two  
11 levels of individual's context. The way jobs are designed "is embedded in a larger work context" and  
12 how jobs are designed "constitutes a context for their incumbents" (Johns, 2010, p. 361) that may  
13 influence employee outcomes. However, the job, being more proximal and more actively shaped by  
14 the individual (Wrzesniewski and Dutton, 2001), has a more immediate influence on attitudes and  
15 cognitions than the climatic context. Therefore, we view psychological climate as the moderator of  
16 the job control and job demands–job satisfaction relationship.  
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25 In relation to the former, we draw from Cognitive Dissonance Theory (CDT; Festinger, 1957;  
26 Fiske and Taylor, 2013) to explain the nature of the interaction between the job (control and  
27 demands) and job satisfaction. Imported from social psychology, CDT has been used in  
28 management, work psychology, and organizational behaviour research to explain human behaviour  
29 in the work context, including performance (Schleicher, Watt and Greguras, 2004; Visser and  
30 Coetzee, 2005), organizational commitment (Dal Santo et al., 2013), reactions toward bullying  
31 (Samnani, 2013), proactivity and organizational citizenship behaviour (Liao, 2015), and reduced  
32 well-being and job dissatisfaction (e.g., Grandey, Chi and Diamond, 2013; Bhawe and Glomb, 2016).  
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43 CDT suggests that individuals have a preference for cognitions (attitudes, beliefs, and  
44 knowledge of one's behaviour) to be aligned and in agreement. Cognitions have instrumental and  
45 adaptive functions; they help us to make sense of the evidence and our affective responses (Simon et  
46 al., 2004) and to avoid taxing affective outcomes (Fiske and Taylor, 2013). They are also closely  
47 interconnected (Scott, 1996). Cognitions "broadly dispose people to respond positively or  
48 negatively" (Fiske and Taylor, 2013, p. 254–255) but their influence may depend on how consistent  
49 they are. Consistent attitudes help people to create a feeling of contentment with their surroundings  
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3 and a sense of stability in their life (Festinger, 1957; Fiske and Taylor, 2013, p. 137). Discrepancy or  
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5 conflict between two or more cognitions will lead to dissonance and a negative affective state,  
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7 which, in turn, will create a motivation to reduce the dissonance (Harmon-Jones and Harmon-Jones,  
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9 2007). Strategies for reducing dissonance include, for example, attitude or behaviour change,  
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11 adjusting relevant cognitions, trivializing the importance of the behaviour, or selective information  
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13 processing (Hinojosa, Gardner, Walker, Coglisier and Gullifor, 2016).  
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17 More specifically, when people experience inconsistencies in their perceptions of the job and  
18  
19 the psychological climate, they will also experience dissonance and an uncomfortable negative  
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21 affective state, operationalized here as job dissatisfaction. This may lead them to adjust their attitudes  
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23 as a coping process, a means of reducing the discrepancy between cognitions of the job and of the  
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25 psychological climate, perhaps a particularly efficient form of 'cognitive miserliness' (Fiske and  
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27 Taylor, 2013, p. 15). A positively experienced psychological climate will compensate for poor job  
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29 design.  
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33 On the other hand, it is possible to expect that consistency between perceptions of job  
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35 demands and control and psychological climate will have independent and combined effects on job  
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37 satisfaction. Employees with high job control who also perceive the psychological climate for  
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39 autonomy as high may have a higher level of satisfaction than those who perceive it as low.  
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41 Psychological climate will augment job design as people will feel more secure and that they can  
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43 achieve more.  
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46 If psychological climate augments the negative relationship between job demands and job  
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48 satisfaction, then it strengthens that relationship and intensifies the effects of high demands on job  
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50 dissatisfaction. It thus has a negative impact. However, if climate plays a compensatory role, then it  
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52 reduces the negative effects of demands on job satisfaction. In contrast, if climate augments the  
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54 positive relationship between job control and job satisfaction, then it intensifies the effect of job  
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control and thus has a positive impact on employees. On the other hand, if psychological climate compensates for low job control, then it weakens the positive impact of control on job satisfaction.

We therefore propose that psychological climate moderates the effects of job control and job demands on job satisfaction and test the following competing effects (augmentation or compensation) and corresponding hypotheses:

*Hypothesis 2a: Psychological climate augments the effects of job control on job satisfaction (augmentation effect).*

*Hypothesis 2b: Psychological climate compensates for the effects of job control on job satisfaction (compensation effect).*

*Hypothesis 3a: Psychological climate augments the effects of job demands on job satisfaction (augmentation effect).*

*Hypothesis 3b: Psychological climate compensates for the effects of job demands on job satisfaction (compensation effect).*

It is important to note that the signs of the interaction effects, if significant, will indicate support for one of the two competing propositions but the interpretation of the signs will differ for job control and job demands. If job demands are negatively related to job satisfaction, a negative sign for the job demands–psychological climate interaction would support an augmentation effect, whereas a positive sign would indicate a compensation effect. Assuming a positive relationship between job control and job satisfaction, a positive sign for the job control–psychological climate interaction would be consistent with an augmentation effect, whereas a negative sign would be consistent with a compensation effect.

## Method

### *Participants*

Data were collected from 17 organizations in England from various sectors, including education, advertising, finance, manufacturing, and local government. The timeline for data collection was

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3 different for each organization, between mid-2010 and end of 2011. Longitudinal data were collected  
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5 by administering the same questionnaire in each organization four times, with 3-month intervals  
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7 between data collection waves. In total, 10,506 questionnaires were completed by 5039 participants  
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9 from 267 workplaces. Response rates varied among the 17 organizations and data collection waves  
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11 and ranged between 5% and 21%. This is consistent with reported response rates for online  
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13 questionnaires (e.g., Kaplowitz, Hadlock, and Levine, 2004).  
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17 Questionnaires with missing values in any of the variables used were excluded from the  
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19 analysis. This yielded a usable sample of 8220 questionnaires from 3761 participants. From this  
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21 sample, 36 workplaces have less than 5 responses, considered to be potentially non-representative of  
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23 their workplace. These responses and workplaces were excluded from the data analysis reducing the  
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25 sample to 7403 questionnaires from 3587 participants from 231 workplaces. From the total of 3587  
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27 participants 1491 (41.57%) completed the questionnaire only once, 880 (24.53%) completed it twice,  
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29 712 (19.85%) completed it three times, and 504 (14.05%) completed it all four times.  
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33 The final sample consisted of 65.5% women and the mean age of participants was 42.69  
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35 years (range: 18–69 years). Nearly half of the participants, 47.5%, had received secondary education,  
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37 37.1% had an undergraduate degree and the remaining 15.4% had a postgraduate degree. The mean  
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39 tenure of the participants in their organizations was 10.7 years (range: < 1–47.9 years).  
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#### 41 *Measures*

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43 *Job demands* were measured with eight items from the Copenhagen Psychosocial Questionnaire  
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45 (Kristensen, Hannerz, Høgh, and Borg, 2003). Respondents were asked to indicate how often they  
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47 experienced certain workload problems (e.g., “My workload is unevenly distributed so it piles up”,  
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49 “My work requires that I remember a lot of things”) on a 5-point Likert scale (from 1 = *never/hardly*  
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51 ever to 5 = *always*). The scores were grand mean centred and Cronbach’s  $\alpha$  for this scale was .78.  
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55 *Job control* was measured with nine items from Morgeson and Humphrey (2006), which  
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57 together capture a range of aspects of job control such as work-scheduling, decision-making, and  
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3 work methods. Respondents were asked to indicate the extent to which they agreed with a number of  
4 statements (e.g., “The job allows me to make my own decisions about how to schedule my work”,  
5 “The job provides me with significant autonomy in making decisions”) on a 5-point Likert scale  
6 (from 1 = *strongly disagree* to 5 = *strongly agree*). The scores were grand mean centered.  
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12 Cronbach’s  $\alpha$  for this scale was .95.

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14 *Psychological climate* was measured using the autonomy, competence, and relatedness  
15 supportive dimensions of the Workplace Design Questionnaire (Karanika-Murray and Michaelides,  
16 2015). Respondents were asked to indicate how true a range of statements were on the working  
17 conditions in their workplace (e.g., “We can make a lot of decisions without requiring approval”,  
18 “We are always aware of how well we are doing the job”, “There are opportunities to develop  
19 friendships”) on a 7-point Likert response scale (1 = *strongly disagree* to 7 = *strongly agree*) and  
20 with a 3-month time window. Each dimension was group-mean centred. Cronbach’s  $\alpha$  values were  
21 .92, .96 and .93, respectively. The WDQ structure and psychometric properties are detailed in  
22 Karanika-Murray and Michaelides (2015).  
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34 In order to evaluate interactions between job demands and job control on one hand, and  
35 psychological climate, on the other, we standardized these variables before the analyses. In addition,  
36 the discriminant validity of the autonomy climate and job control was tested via a CFA model across  
37 the four waves. The chi-square statistics showed that the two were significantly different.  
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43 Discriminant validity is also confirmed by their correlation which was  $< .85$ .  
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45 *Job satisfaction* was measured with three items, two taken from the Michigan Organizational  
46 Assessment Questionnaire (Cammann, Fichman, Jenkins and Klesh, 1983; i.e., “In general I like  
47 working here” and “All in all I am satisfied with my job”) and one from Quinn and Shepard’s (1974)  
48 job satisfaction index (i.e., “Knowing what I know now, if I had to decide all over again whether to  
49 take my job, I would”). Respondents were asked to indicate how true the statements were for them  
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3 on a 7-point Likert response scale (1 = *strongly disagree* to 7 = *strongly agree*). Cronbach's  $\alpha$  for  
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5 this scale was .89.

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7 *Time* was measured as a discrete variable to signify the data collection wave. The variable  
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9 ranged from 0 to 3 (i.e., the first data collection wave is 0) to allow the regression line between time  
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11 and job satisfaction to cross the y-axis at the first wave. Thus, the random intercept reflects job  
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13 satisfaction for each individual at the first data collection wave.

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16 *Control variables* included were participants' gender, age, organizational tenure, and job  
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18 tenure. Past research has demonstrated that job satisfaction differs between men and women (Bender,  
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20 Donohue and Heywood, 2005; Clark, 1997) and can vary with age (Clark, Oswald and Warr, 1996)  
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22 and tenure (Bedeian, Ferris and Kacmar, 1992). Although age, organizational tenure and job tenure  
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24 are highly correlated ( $r$  between .32 and .47), they all had distinct effects on job satisfaction. Because  
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26 perceptions of psychological climate and perceptions of job demands and control may differ between  
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28 respondents who do and those who do not manage other employees, we also controlled for whether  
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30 participants had managerial responsibilities, measured as a single item with a binary response format.  
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32 Finally, we controlled for whether participants had experienced any major negative event over the  
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34 last three months, measured with a single item and a yes/no response format (i.e., "Has any major  
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36 negative event happened to you in the last 3 months?"). Negative events could interfere with work  
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38 and normal functioning negatively affecting individuals' well-being or mood and can have therefore  
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40 a direct effect on job satisfaction. The control variables were included in the first step and remained  
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42 significant at all steps of the analysis.

### 43 44 45 46 47 **Analyses**

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49 The data were analysed using multilevel models with R 3.1.2 (R Core team, 2014), *lme4* (Bates,  
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51 Maechler, Bolken and Walker, 2015) and *ggplot2* (Wickham, 2009). The dataset involved four  
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53 different levels: observations (repeated measures), individuals, workplaces, and organizations, and  
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55 potentially serial correlation (autoregressive) between consecutive data collection waves. Prior to  
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3 evaluating the hypotheses we examined the ICC1 values for job satisfaction, autonomy, competence,  
4 relatedness, demands and control at different levels. Table 1 shows the ICC1 values are the  
5 individual (i.e., repeated measures), workplace and organizational levels.  
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10 [Table 1 here]

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12 We also compared a series of models to determine whether it was necessary to account for all  
13 of the levels of analysis or to allow for an autoregressive effect. We first fitted a two-level model  
14 with a random intercept for individuals (which accounts for the repeated measures nested in  
15 individuals) and compared it to a three-level model with random intercepts for individuals and  
16 workplaces. The two models were significantly different ( $\Delta\chi^2(df=1) = 374.75, p < .001$ ) indicating  
17 that there is substantial variability between workplaces in job satisfaction. Then, we compared the  
18 three-level model to a four-level one with random intercepts for individuals, workplaces, and  
19 organizations. The comparison was not significant ( $\Delta\chi^2(df=1) = 2.94, p > .05$ ) indicating that  
20 overall job satisfaction does not vary significantly between organizations. Building on the three-level  
21 model we then added a fixed effect for time, which showed a significant negative effect of time on  
22 job satisfaction ( $\beta = -.07, t = -7.03, p < .001$ ). We then compared this to a model with time as a  
23 random effect to determine whether allowing for a different growth curve for every participant  
24 improves the model fit, and found that a random slope for time allowed for job satisfaction changes  
25 over time ( $\Delta\chi^2(df=4) = 35.25, p < .001$ ). Finally, we also tested if there was serial correlation by  
26 allowing for an AR1 (autoregressive lag 1) correlation structure but the results revealed that this was  
27 not the case ( $\Delta\chi^2(df=1) = 2.67, p > .05$ ). We therefore did not use an AR1 structure in the main  
28 analysis.  
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50 Consequently, the baseline model was a three-level growth curve model of observations  
51 nested in individuals, which in turn is nested in workplaces. The random effects of the model  
52 consisted of two random intercepts (individual level and workplace level) and one random slope for  
53 the effect of time at the individual level. Starting with this baseline model, we added predictors in  
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3 stage and compared the model to the previous step. The control variables were added at the first step  
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5 (Model 1), the effect of job demands and job control at the second step (Model 2), the three  
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7 psychological climate dimensions at the third step (Model 3), and finally the interactions were  
8  
9 simultaneously added at the fourth step (Model 4). Six interactions were included to reflect the three  
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11 dimensions of psychological climate (autonomy, competence, relatedness) and the two main effects  
12  
13 (job control and job demands). Each step was compared to its preceding step using  $-2 \text{ Log}$   
14  
15 Likelihood ( $\Delta\chi^2$ ) maximum likelihood estimates.  
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19 To ensure that there was no multicollinearity between different interaction terms, we  
20  
21 evaluated the multilevel variance inflation factor. This was below the recommended maximum value  
22  
23 of ten for all predictors and interactions and thus there is no multicollinearity problem. The highest  
24  
25 value was for the interaction between control and competence ( $\text{VIF} = 1.88$ ). Finally, because we  
26  
27 found no interactions between job control and job demands (Van der Doef and Maes, 1999) we did  
28  
29 not include this interaction term in the analyses.  
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### 32 Results

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34 Table 2 shows the descriptive statistics and correlations between all the continuous variables. The  
35  
36 core variables are significantly correlated and in the expected directions.  
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39 The first regression model, Model 1 (see Table 3) revealed that all the control variables were  
40  
41 significant related to job satisfaction. Specifically, job satisfaction was higher for those with  
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43 managerial responsibility ( $\beta = .19, SE = .04, p < .001$ ), women ( $\beta = .20, SE = .05, p < .001$ ), and those  
44  
45 who reported not having experienced a negative event in the previous three months ( $\beta = .17, SE =$   
46  
47  $.03, p < .001$ ). Job satisfaction increased with age ( $\beta = .01, SE = .00, p < .01$ ) but decreased with  
48  
49 organizational tenure ( $\beta = -.01, SE = .00, p < .05$ ) and job tenure ( $\beta = -.01, SE = .00, p < .001$ ).  
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52 [Tables 2 and 3 here]

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54 The addition of job demands and job control (Model 2) resulted in an overall better fit  
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56 compared to Model 1 ( $\Delta\chi^2 = 851.25, df = 2, p < .001$ ). In addition, there was a negative significant  
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3 effect for job demands ( $\beta = -.18, SE = .02, p < .001$ ) and a positive significant effect for job control  
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5 ( $\beta = .42, SE = .02, p < .001$ ), providing support for Hypotheses 1a and 1b.  
6

7 The third step (Model 3), which involved the inclusion of the three psychological climate  
8  
9 variables, further improved the fit of the model ( $\Delta\chi^2 = 1279.77, df = 3, p < .001$ ). All three climate  
10  
11 dimensions had a significant positive effect on job satisfaction, providing support for Hypothesis 1c.  
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13 Competence climate had the strongest effect ( $\beta = .43, SE = .02, p < .001$ ), followed by relatedness ( $\beta$   
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15 = .22,  $SE = .02, p < .001$ ) and autonomy climate ( $\beta = .14, SE = .02, p < .001$ ).  
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18 The addition of the six interaction terms in Model 4 further improved the model fit ( $\Delta\chi^2 =$   
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20 33.54,  $df = 6, p < .001$ ). The main effects (of the two job characteristics and three climate variables)  
21  
22 remained significant, and of the six interaction effects four were significant.  
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25 Of the interactions involving psychological climate and job control, only the interaction  
26  
27 between job control and competence climate was significant ( $\beta = -.04, SE = .02, p < .05$ ) with a  
28  
29 significant simple slope ( $ss = .12, SE = .01, p < .001$ ). As Figure 2 shows, the positive effects of job  
30  
31 control on job satisfaction were stronger under a low competence climate, which is consistent with  
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33 the compensation hypothesis (see Figure 2; Hypothesis 2b). These findings offer partial support for  
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35 the moderating effects of psychological climate on the relationship between job control and job  
36  
37 satisfaction.  
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40 The interaction between job demands and autonomy climate was positive ( $\beta = .03, SE = .01,$   
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42  $p < .05$ ) and the simple slope test showed a significant negative effect ( $ss = -.08, SE = .01, p < .001$ ),  
43  
44 supporting a compensation effect: autonomy climate compensates, to some extent, for the negative  
45  
46 effect of job demands on job satisfaction such that under a high autonomy climate the effects of job  
47  
48 demands are less pronounced (see Figure 1a; Hypothesis 3a). The interaction between job demands  
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50 and competence climate was also positive ( $\beta = .05, SE = .02, p < .001$ ) with a negative simple slope  
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52 ( $ss = -.06, SE = .01, p < .001$ ), suggesting a compensation effect: competence climate reduces the  
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54 negative effect of job demands on job satisfaction (see Figure 1b; Hypothesis 3b). Finally, the  
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3 interaction between job demands and relatedness climate was negative ( $\beta = -.04$ ,  $SE = .01$ ,  $p < .05$ )  
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5 with a negative simple slope ( $ss = -.15$ ,  $SE = .00$ ,  $p < .001$ ). As Figure 1c shows, the negative effect  
6  
7 of job demands on job satisfaction is further amplified under a high relatedness climate but less  
8  
9 pronounced under a low relatedness climate, which is consistent with an augmentation effect  
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11 (Hypothesis 3c).  
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14 [Figures 1 and 2 here]  
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### 16 Discussion

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18 This study examined the joint impact of job control and demands, on one hand, and psychological  
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20 climate, on the other, on job satisfaction. Using the interactionist paradigm to define our focus and  
21  
22 highlight the importance of understanding the situational or contextual forces shaping behaviour  
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24 (Lewin, 1939; Mesquita *et al.*, 2010) and Cognitive Dissonance Theory to explain their impact and  
25  
26 ground our hypotheses, we presented an empirical test of the proposition that the analysis of job  
27  
28 demands and control as antecedents of job satisfaction can be usefully complemented by a  
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30 consideration of the wider context in which the job resides (Johns, 2010; Morgeson *et al.*, 2010). The  
31  
32 context we have focused on is the psychological climate and how it impacts on affective evaluations  
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34 of one's job which we examined through the lens of the Workplace Characteristics Model (Karanika-  
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36 Murray and Michaelides, 2015) with its three dimensions of autonomy, competence, and relatedness  
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38 -supportive climate dimensions. We proposed that the form of the moderation effect of psychological  
39  
40 climate on the relationship between job characteristics and job satisfaction would reflect one of two  
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42 competing effects: augmentation or compensation.  
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47 The results of our study revealed interaction effects between psychological climate  
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49 (autonomy, competence, and dimensions) and job demands/job control on job satisfaction, in four of  
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51 the six interactions tested. Three of these supported the compensation effect and one the  
52  
53 augmentation effect. The results thus show that the effects of psychological climate may vary across  
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55 its different dimensions and different aspects of the job. Discrepancies between job-related  
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3 cognitions and climate-related cognitions seem to be the most prominent driver for job satisfaction,  
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5 as the compensation effect fits two of the interactions involving job demands and the one involving  
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7 job control. The remaining interaction involving job demands and relatedness climate suggested an  
8  
9 augmentation effect and two of the interactions involving job control were not significant.  
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12 The compensation effect implies that job demands increase dissatisfaction less when the  
13  
14 individual perceives that the psychological climate encourages the use of discretion in their work  
15  
16 (and conveys a sense that skills are valued and their use is encouraged and actively supported.  
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18 Similarly, low job control has a weaker effect on feelings of dissatisfaction when the psychological  
19  
20 climate is supportive of competence.  
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23 The finding that a psychological climate that is high in relatedness amplifies the negative  
24  
25 effects of job demands on job satisfaction may reflect the role of peer pressure. It may be that in  
26  
27 workplaces where people are more closely connected and work in teams there is more pressure to  
28  
29 fulfil job demands. Alternatively, or in addition, grievances about high demands may be amplified by  
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31 being shared and communicated among colleagues.  
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34 The lack of interactions between job control and the autonomy and relatedness climate  
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36 dimensions reflects the strong main effect that control has and also the way that its effect is  
37  
38 moderated by competence climate. It is a feeling that the organization provides resources to promote  
39  
40 individual competence, for example, through training, constructive feedback and support, that  
41  
42 enhance the effect of job autonomy and meaningful personal relationships on job satisfaction; it is  
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44 less a feeling that it encourages the exercise of autonomy or sense of community.  
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#### 47 **Implications for theory and research**

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49 Promoting the climatic context from a background to a foreground variable in the relationship  
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51 between job characteristics and work outcomes offers a range of possibilities for understanding its  
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53 role in shaping work attitudes and behaviour. This study has a number of implications for developing  
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55 theory and future research.  
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3 First, by responding to calls for attention to context in organizational behavior and job design  
4 theory (Grant, 2010; Johns, 2006; Johns, 2010; Kozlowski and Doherty, 1989; Morgeson et al.,  
5 2010; Rousseau and Fried, 2001), it offers the first empirical study on the relationships amongst  
6 context, operationalized as psychological climate, job design, and job satisfaction. Affective  
7 processes need to be studied within the psychosocial and cultural milieu in which they are situated.  
8 This is an essential principle in Field Theory – as Lewin (1939) asserted, “analysis starts with the  
9 situation as a whole”. Essentially, job satisfaction is constructed through a combination of  
10 perceptions of climate and job characteristics. The results confirm that the manner of this will vary as  
11 climate can either augment or compensate the effects of job design and this will depend on the job  
12 characteristic. Further studies are required to ascertain the robustness of the specific results and the  
13 more general principle underlying these processes, rooted as it is in cognitive dissonance. This could  
14 be enhanced by theoretical and empirical exploration of how cognitions or perceptions of both the  
15 job and the context are formed and they jointly impact upon affective and motivational states.  
16 Further research on other aspects of the context, structural and technological characteristics, might  
17 also be valuable, not least to assess the relative significance of the climate.  
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36 Second, in addition to psychological climate, it may be useful to examine how organizational  
37 climate moderates the effects of job design on work outcomes. This would allow to see whether  
38 organizational climate has the same effects as psychological climate, or any effect over and above  
39 those of psychological climate, or even moderate the interactions effects involving psychological  
40 climate. In this case, however, the conceptual foundations would be different from what we have  
41 presented here, since CDT is an individual level theory and does not account for shared constructs  
42 such as organizational climate.  
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52 Third, the complex interaction between the person and the environment (Mesquita et al.,  
53 2010) may involve “reciprocal causations between persons and environments” (Magnusson and  
54 Magnusson, 2013, p. 280), such that “satisfaction with job/tasks (job satisfaction) and perceptions of  
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3 challenge, autonomy, and importance are reciprocal causes of each other” (James and Jones, 1979; in  
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5 Magnusson and Magnusson, 2013, p. 289). A longitudinal study would be required to explore this  
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7 possibility more fully.  
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10 Fourth, we have suggested a way to integrate and expand current knowledge of psychological  
11  
12 climate and job design with insights from social psychology. By explaining how individuals react  
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14 when experiencing attitude-cognition inconsistencies and how such inconsistencies can influence a  
15  
16 range of outcomes (e.g., Liao, 2015; Lopez, 1992; Schleicher et al., 2004; Visser and Coetzee, 2005),  
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18 CDT has offered a useful lens for understanding how job design and job control, on one hand, and  
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20 the psychological climate on the other, together shape job satisfaction. As such, this study is a  
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22 reminder that there is scope in the field of organizational behaviour for further refining our  
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24 understanding of organizational and work behavior by applying models from cognate fields.  
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28 Fifth, we used the DCM (Karasek and Theorell, 1990) to examine job characteristics in the  
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30 form of job control and job demands and provide initial support for our hypotheses. It would be  
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32 useful to broaden the examination to other job characteristics, perhaps using the Job Characteristics  
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34 Model (Hackman and Oldham, 1976). Further conceptual and empirical work using a broader range  
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36 of job characteristics would help to develop more nuanced examination of the joint contribution of  
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38 climate and the job on employee outcomes. We are at very early stages of this exploration.  
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#### 41 **Implications for practice**

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43 Three implications of our study for practice and policy can be highlighted. First, supporting  
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45 well-designed and high-quality jobs remains a significant objective for governments, employers, and  
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47 employee representatives, especially in the face of empirical evidence showing that only a minority  
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49 of jobs could be described as well-designed jobs (e.g., in the UK, see Van Wanrooy *et al.*, 2013).  
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51 The fact that differences exist between countries within the same sector (e.g., in call centre jobs)  
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53 suggests there is scope for improvement in the way that jobs are designed (Holman, Frenkel,  
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55 Sørensen and Wood, 2009). However our research shows that we should also encourage employers  
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3 and management to invest resources in creating and supporting climates that encourage employees to  
4 use their autonomy, develop their competencies and are support their relationships. It may in fact be  
5 that managers are currently more appreciative of this need than they are of the need for conscious job  
6 design but highlighting the interdependencies between the two may reinforce the significance of  
7 both. The fact that job control and autonomy climate are independent suggests that just designing  
8 jobs in certain ways or more generally instituting high-involvement practices (Lawler, 1986) or what  
9 is often termed 'high performance work systems' (Appelbaum, Bailey, Berg and Kalleberg, 2000)  
10 may not be sufficient. The emphasis in human resource management practice is often very  
11 concentrated on processes and ensuring procedures are followed rather than on content and what is  
12 actually happening in their enactment (Bowen and Ostroff, 2004). Management should aim to create  
13 positive climates that help employees to perceive work environments as psychologically safe and  
14 meaningful and feel that the workplace is being supportive of their competencies, relationships, and  
15 autonomy. This can be achieved through entrusting employees and teams to make decisions within  
16 their locus of control, by providing the resources to ensure staff can competently perform their jobs,  
17 providing fair and helpful feedback and displaying recognition of effort and appreciation for their  
18 contribution to the organization.  
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38 The third implication of the study derives from the interaction results as these indicate more  
39 precisely what needs targeting. The results that conform to compensation effect suggest that  
40 psychological climates supportive of autonomy and competence are especially important. The  
41 interaction between demands and relatedness climate suggests that managers might investigate  
42 whether peer pressure is too strong.  
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### 49 **Strengths and limitations**

50 The main strength of the present study was that it was based on a substantial sample size of  
51 employees across a range of organizations, allowing us to assess the stability of the hypothesized  
52 relationships across organizations and enhance the robustness of our results. Collecting the data over  
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3 four time periods and modelling changes over time as a growth model also allowed to control for  
4 changes in job satisfaction for each participant and model the moderation relationships independently  
5 of within-individual fluctuations.  
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10 A weakness of the study was that all the data were collected using questionnaires which can  
11 potentially result in common method variance or social desirability biases (Podsakoff, MacKenzie  
12 and Podsakoff, 2012). However, the detection of strong interaction effects suggests that neither is a  
13 significant problem (Siemsen, Roth and Oliveira, 2010).  
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### 18 **Conclusions**

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20 This research is a response to the call for more nuanced consideration of the interaction between job  
21 design and psychological climate and the context of work. On the basis of CDT, we hypothesized  
22 that psychological climate (conceptualized via the WCM) is more likely to augment perceptions of  
23 job characteristics when there is consistency between them, and to compensate for job design  
24 perceptions when they are inconsistent. Our empirical study has confirmed such conjectures and that  
25 psychological climate may be a significant contextual factor that influences the way job  
26 characteristics affect job satisfaction. The climatic context is not then just an additional variable to  
27 take into account or control for when considering employees' attitudes or well-being; the findings  
28 demonstrate it is a significant moderator of the job demands/control–job satisfaction relationship,  
29 and it is likely – or at least worth hypothesizing – that its influence may extend to other employee  
30 outcomes such as job strain and organizational commitment. Even more importantly, the results  
31 show that the moderating effects of psychological climate vary across its dimensions. Overall, our  
32 findings suggest that the call for more attention to be paid to the context in which jobs are embedded  
33 is worth heeding. Psychological climate not only impacts upon job satisfaction but also shapes how  
34 perceptions of the job influence job satisfaction.  
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Table 1. ICC1 Values for individual, workplace and organizational levels

	<b>Individual level</b>	<b>Workplace level</b>	<b>Organizational level</b>
Job demands	.74	.10	.02
Job control	.69	.09	.01
Autonomy climate	.66	.09	.02
Competence climate	.78	.09	.02
Relatedness climate	.69	.07	.02
Job satisfaction	.73	.07	.02



Table 2. Means, standard deviations and correlations between continuous variables

	<i>M(SD)</i>	1	2	3	4	5	6	7	8
1. Age	43.11 (10.45)								
2. Organizational tenure	10.96 (9.22)	.46***							
3. Job tenure	4.94 (5.27)	.32***	.47***						
4. Job demands	3.24 (0.8)	.13***	.11***	.04***					
5. Job control	3.89 (0.77)	.04***	.04***	-.03**	-.04**				
6. Autonomy climate	5.45 (1.04)	.04**	.04***	-.03*	-.07***	.76***			
7. Competence climate	4.36 (1.47)	-.02*	-.05***	-.12***	-.20***	.42***	.48***		
8. Relatedness climate	5.42 (1.04)	.00	-.01	-.03**	-.12***	.39***	.43***	.59***	
9. Job satisfaction	5.12 (1.44)	.03*	-.03**	-.07***	-.19***	.40***	.45***	.58***	.51***

Note. N=7403. \*  $p \leq .05$ , \*\*  $p \leq .01$ , \*\*\*  $p \leq .001$ .

Table 3. Direct and interaction effects of job design and psychological climate on job satisfaction

	Model 1			Model 2			Model 3			Model 4		
Fixed effects	<i>B</i>	<i>SE</i>		<i>B</i>	<i>SE</i>		<i>B</i>	<i>SE</i>		<i>B</i>	<i>SE</i>	
Intercept	5.12	0.11	***	5.04	0.10	***	5.02	0.08	***	5.05	0.08	***
Time	-0.07	0.01	***	-0.07	0.01	***	-0.06	0.01	***	-0.06	0.01	***
Manager (No)	0.19	0.04	***	0.14	0.04	***	0.09	0.03	**	0.09	0.03	**
Age	0.01	0.00	**	0.01	0.00	***	0.01	0.00	***	0.01	0.00	***
Gender (Male)	0.20	0.05	***	0.16	0.04	***	0.14	0.04	***	0.14	0.04	***
Negative event (No)	0.17	0.03	***	0.15	0.03	***	0.09	0.03	***	0.09	0.03	***
Organizational tenure	-0.01	0.00	*	-0.01	0.00	**	-0.01	0.00	**	-0.01	0.00	**
Job tenure	-0.01	0.00	***	-0.01	0.00	***	-0.01	0.00	*	-0.01	0.00	*
Job demands				-0.18	0.02	***	-0.12	0.01	***	-0.11	0.01	***
Job control				0.42	0.02	***	0.17	0.02	***	0.16	0.02	***
Autonomy climate							0.14	0.02	***	0.13	0.02	***
Competence climate							0.43	0.02	***	0.43	0.02	***
Relatedness climate							0.22	0.02	***	0.22	0.02	***

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Job demands * Autonomy climate										0.03	0.01	*
Job control * Autonomy climate										0.00	0.01	
Job demands * Competence climate										0.05	0.02	***
Job control * Competence climate										-0.04	0.02	*
Job demands * Relatedness climate										-0.04	0.01	*
Job control * Relatedness climate										0.00	0.01	

Random effects	Var	SD	r	Var	SD	r	Var	SD	r	Var	SD	r
Individuals – Intercept	1.42	1.19		1.05	1.02		0.71	0.84		0.71	0.84	
Individuals – Time	0.04	0.19	-.09	0.03	0.19	-.05	0.03	0.18	-.15	0.03	0.18	-.14
Workplaces – Intercept	0.02	0.16		0.03	0.18		0.09	0.30		0.09	0.29	
Residual	0.51	0.71		0.50	0.71		0.48	0.69		0.47	0.69	
Log likelihood (REML)	-11509.84 (df= 13)			-11091.24 (df= 15)			-10461.55 (df= 18)			-10465.32 (df= 24)		
Log likelihood (ML)	-11481			-11056			-10416			-10399		
$\Delta\chi^2$				851.25*** (df= 2)			1279.77*** (df= 3)			33.54*** (df= 6)		
AIC	22989			22142			20868			20846		

Note.  $N_{\text{observations}} = 7403$ ,  $N_{\text{individuals}} = 3587$ ,  $N_{\text{workplaces}} = 231$ ; \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p \leq .001$ .

Figure 1. Effects of demands on job satisfaction for high, medium and low values of autonomy, competence and relatedness climate (-2, 0, and 2 SD from 0)

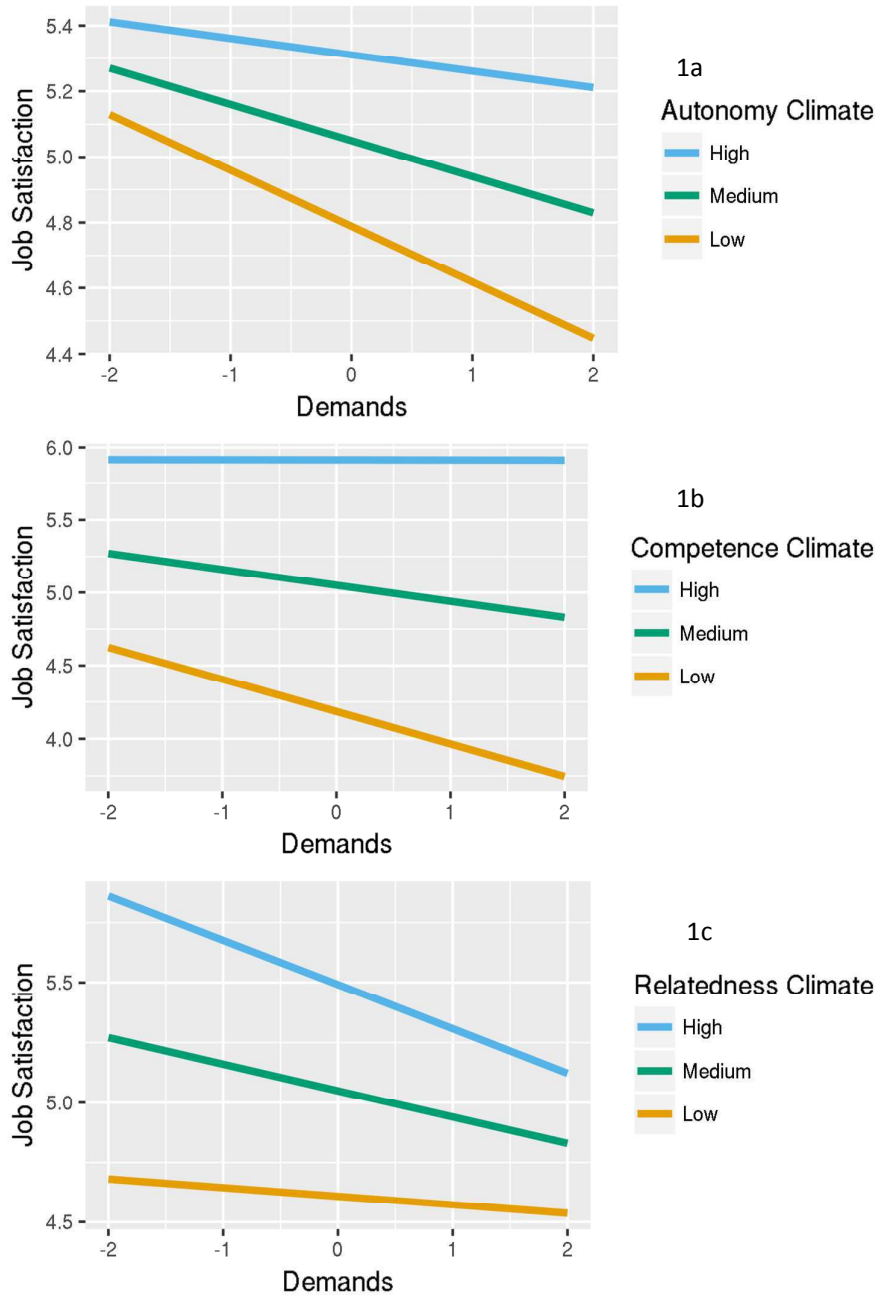
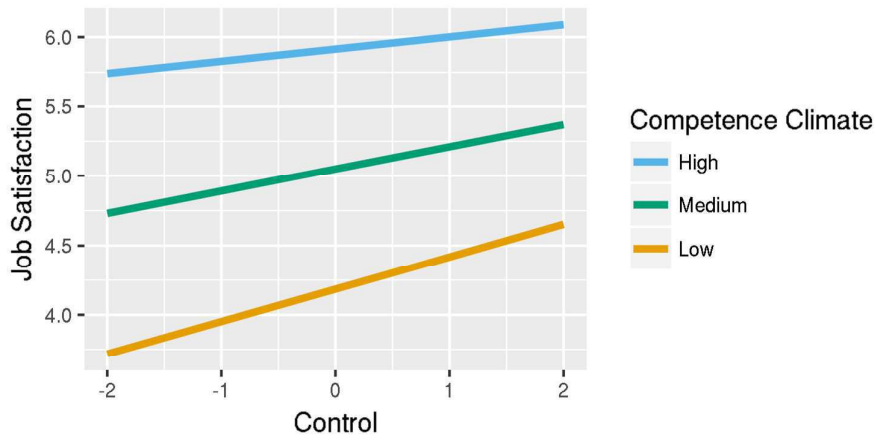


Figure 2. Effects of control on job satisfaction for high, medium and low values of competence climate (-2, 0, and 2 SD from 0)



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