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

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Abstract

Purpose: Research into job design and employee outcomes has tended to examine job design in isolation, ignoring the fact that behaviour is a product of the person and their environment and calls to focus on 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: We take an interactionist approach to understanding the effects of job design and psychological climate on employee outcomes and use Cognitive Dissonance Theory to explore the nature of this relationship and its effect on job satisfaction. We hypothesize that psychological climate (autonomy, competence, relatedness) will augment favourable perceptions of job demands and control when there is consistency between them (augmentation effect) and compensate for unfavourable perceptions when they are inconsistent (compensation effect).

Findings: Analysis of data from 3587 individuals partially supported the hypotheses. Job demands is associated with lower satisfaction under a high autonomy climate. Control is associated with lower satisfaction under a high competence climate. The effects of demands on satisfaction are augmented under a high relatedness climate.

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

Practical implications: Integrating job design and psychological climate can help to support employee outcomes.

Originality/value: This study has presented a case for the interactionist perspective in understanding employee outcomes and bridging the job design and psychological climate fields. 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; cognitive dissonance theory
Job demands, job control, psychological climate, and job satisfaction: A cognitive dissonance perspective

A range of perspectives have been used to understand how job design can impact important employee outcomes such as job satisfaction. The consensus 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, ignoring the fact that behaviour is a product of the person and their environment (Field Theory, Lewin, 1939). 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 Lewin proposed field theory over 70 years ago, attention on the importance of the broader environment or context has 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 discussions 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). It is argued, that the way jobs are designed “is embedded in a larger work context” (Johns, 2010, p. 361) that may influence individuals’ attitudes and behaviour. It is not possible to isolate employee outcomes from the psychosocial and cultural milieu in which they are situated, nor is it possible to understand jobs and their outcomes in isolation from their surroundings (Johns, 2010).

This ‘return’ of the interactionist approach in the field of organizational behaviour is warranted by a range of forces such as interdependence of job roles, the social dimension of jobs, and organizational structures and processes. For example, Parker, Wall and Cordery (2001) suggest that job design needs to take place at the group rather than at the individual level, whereas Morgeson and Humphrey (2006) acknowledge that the effectiveness of job redesign will depend on the organizational context, and Morgeson, Dierdorff and Hmurovic (2010) and Truss et al. (2014)
highlight psychological climate (or the perceptions that people have of their work organization; Schneider, 1975) as a dimension of context especially relevant to consider in relation to job design and employee outcomes. Of the broad range of factors beyond the job to consider in relation to job design and employee outcomes (see Truss et al., 2014), the psychological environment, as opposed to technology and structure, is most prominent in the literature and one of the most permeating factors in one’s work experience. In the study of work, separating the nature and experience of the job from the nature and experience of the workplace is difficult.

The question then becomes how does job design and psychological climate work together to produce employee outcomes such as job satisfaction? An overall perspective such as the interactionist assumption can be supplemented by a more detailed examination, offered by Cognitive Dissonance Theory (CDT; Festinger, 1957), to understand the nature of this interaction and supplement analysis of the job design–job satisfaction relationship. CDT suggests that individuals have a preference for cognitions (attitudes, beliefs, or knowledge of one’s behaviours) to be aligned with each other and that a discrepancy between two different cognitions will create an uncomfortable negative affective state and, subsequently, motivation to reduce that discrepancy. We operationalize negative affective state as job satisfaction, or “an evaluative judgment one makes about one’s job or job situation” (Weiss, 2002), as a key outcome variable that has been reliably linked to cognitive dissonance (see Pugh et al., 2010).

In the management and work psychology literatures, CDT has been evoked to demonstrate how cognitive dissonance can explain negative employee outcomes such as reduced well-being and job dissatisfaction (e.g., Bhave and Glomb, 2016; Dal Santo, Pohl and Battistelli, 2013; Lewig and Dollard, 2003; Pugh, Groth and Hennig-Thurau, 2010). There are, however, still ‘missed opportunities’ related to the application of CDT to explain phenomena in the field (Hinojosa, Gardner, Walker, Cogliser and Gullifor, 2017). Within an interactionist approach, the use of CDT to
explore the nature and impact of job design and psychological climate on job satisfaction can offer potentially insightful contributions for developing both theory and practice.

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

**Job Control, Job Demands, and Job Satisfaction**

One of the most influential models for explaining the influence of the job on well-being and employee outcomes is Karasek and Theorell’s (1990) job demands–control model (DCM). It proposes job control or decision latitude and psychological demands as the essential characteristics of the job that influence a range of affective and behavioural work outcomes (van Veldhoven et al., 2005). This has been examined in relation to a range of indices of psychological well-being, including job satisfaction, burnout, and stress, with the evidence supporting a positive effects of job control and negative effects of job demands (Van der Doef and Maes, 1999). Job demands are defined as “those physical, psychological, social, or organizational aspects of the job that require sustained physical and/or psychological (cognitive and emotional) effort or skills and are therefore associated with certain physiological and/or psychological costs” (Bakker and Demerouti, 2007, p. 312). Furthermore, high strain jobs characterized by a combination of high demands and reduced control are most likely to lead to adverse well-being outcomes (Van der Doef and Maes, 1999). Although empirical evidence concurs that “high levels of perceived control [is] associated with high levels of job satisfaction” and a broad range of desirable affective, motivational and behavioural outcomes (Spector, 1986, p. 1005), evidence that job control is able to buffer the impact of job demands on well-being is less consistent (Bakker and Demerouti, 2007) and therefore we only focus
on direct rather than interaction effects of job demands and job control on job satisfaction. On the basis of consistent evidence for strong links between job demands and control and job satisfaction (Dwyer and Ganster, 1991; Loher, Noe, Moeller, and Fitzgerald, 1985), we state the first hypotheses, which will form the bases of subsequent hypotheses:

Hypothesis 1a: Job demands are negatively associated with job satisfaction

Hypothesis 1b: Job control is positively associated with job satisfaction

**Psychological Climate and Job Satisfaction**

Following Schneider (1975) psychological climate is widely taken to refer to perceptions people have of their work organization. When individuals perceive their workplace environment positively, they are more likely to invest more effort and yield more positive outcomes (Brown and Leigh, 1996). Psychological climate can refer to an employee’s perceptions of the organization in general or to aspects of the organization, particularly its policies, practices and procedures, or the behaviours that are rewarded, supported or expected (James et al., 2008). Accordingly, Schneider (1975) argued that for the concept of climate to be useful it ought to be conceptualized as a climate for something or domain-specific (for example, climate for justice, Naumann and Bennett, 2000; safety climate, Zohar, 2002; risk-taking climate, O’Reilly, Chatman, and Caldwell, 1991; service climate, Liao and Chuang, 2004, Sowinski, Fortmann, and Lezotte, 2008; or creativity climate, Ekvall, 1996).

Although the effectiveness of climate to positively impact employee outcomes depends on the congruence and specificity of the said climate to the target outcomes, the general consensus is that support at the level of the workplace is important for enhanced work outcomes, independently and in addition to the characteristics of the job (e.g., Dollard and Bakker, 2010). Positive perceptions of climate, such as group relationships, leadership, and supervision are linked to positive mental health outcomes (e.g., lower burnout, depression, anxiety) (Bronkhorst, Tummers, Steijn and Vijverberg, 2015; Parker et al., 2003).
For the purposes of understanding individuals’ broader well-being and affective states, an “operational definition of psychological climate that is based on the extent to which employees perceive the organization to be a psychologically safe and meaningful work environment” (Brown and Leigh, 1996; p. 358) is appropriate. The Workplace Characteristics Model (WCM) developed by Karanika-Murray and Michaelides (2015) to describe the characteristics of the climate that can support adaptation and intrinsic motivation fulfills this purpose. WCM views the value of climate in whether individuals feel that the workplace is being supportive of competencies, relationships, and autonomy, what they are permitted to do, and whether climate reflects the norm and is legitimated.

The WCM (Karanika-Murray and Michaelides, 2015) is a domain-specific climate that describes the attributes of the workplace that have the potential to foster adaptation, meaning, self-regulation, and optimal functioning. Drawing from the climate, job design, and self-determination perspectives it groups workplace characteristics into perceptions of the degree of freedom of action in the workplace (autonomy climate), perceptions of the availability of resources that support the fulfilment of job requirements (competence climate), and perceptions of the degree to which the social context fosters meaningful relationships in the workplace (relatedness climate). 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 autonomy, competence, and relatedness dimensions will constitute a workplace climatic context that can lead to positive affective outcomes. The model has so far been tested on motivation, but since it is based on self-regulation, it has the potential to cover a range of related outcomes including job satisfaction as an immediate affective state and indicator of well-being.
Therefore, on the basis of existing research supporting strong links between psychological climate and job satisfaction, we propose the following:

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

**Job Control, Job Design, and Psychological Climate Combined**

As mentioned earlier, the interactionist perspective is as fundamental as it has been neglected in job design and organizational behaviour research. Instead, researchers have tended to view the effects of job design on employee outcomes in isolation. Although this approach has led to a highly specific and detailed understanding of an array of job characteristics and types of relationships, it has missed the fundamental influence of the broader context. Field Theory mentions that “to understand or to predict behaviour, the person and his environment have to be considered as one constellation of interdependent factors” (Lewin, 1946, p. 338).

Recently, in the organizational behaviour literature the interactionist approach has emerged as calls for research to attend to the context in which job design and organizational behavior are situated (e.g., Grant, 2010; Johns, 2006; Johns, 2010; Morgeson et al., 2010; Rousseau and Fried, 2001). What may constitute context is broad and open to debate. Although Morgeson, Diederoff and Hmurovic (2010) proposed three aspects of context as relevant to job design, including psychological climate, technical systems, and organizational structure, we focus on the psychosocial environment because of its prominence in the literature, because it is one of the most permeating influences on employee outcomes besides the job, and because in the study of work separating the nature and experience of the job from the nature and experience of the workplace as an entity is difficult. In other words, the work experience consists of one’s experience of the job and his or her experience of the workplace in equal measures.

Taking a broader lens, Johns (2010) suggests that both the job and the climate constitute two levels of context. The way jobs are designed “is embedded in a larger work context” and how jobs are designed “constitutes a context for their incumbents” (Johns, 2010, p. 361) that may influence
employee outcomes. The job is more proximal, dealt with on a daily basis, more actively shaped by
the individual (through job crafting, for example), and therefore has a more immediate influence on
private cognitions and attitudes than the climatic context.

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

If we accept that the interaction between the job (control and demands) and psychological climate
impacts employee outcomes and specifically job satisfaction, what form does this interaction take?

Cognitive Dissonance Theory (CDT; Festinger, 1957; Fiske and Taylor, 2013) suggests that
individuals have a preference for cognitions (attitudes, beliefs, and knowledge of one’s behaviour) to
be aligned and in agreement. Cognitions (attitudes, beliefs, and knowledge of one’s behaviour)
“broadly dispose people to respond positively or negatively” (Fiske and Taylor, 2013, p. 254-255)
but their influence may depend on how consistent they are with each other. Consistent attitudes help
people to create a feeling of contentment with their surroundings and a sense of stability in their life
(Festinger, 1957; Fiske and Taylor, 2013, p. 137). Discrepancy or conflict between two or more
cognitions will lead to dissonance and a negative affective state, which, in turn, will lead to
motivation to reduce the dissonance, and discrepancy reduction through adjusting the relevant
cognitions (Harmon-Jones and Harmon-Jones, 2007). Cognitions have instrumental and adaptive
functions; they help us to make sense of the evidence and our affective responses (Simon *et al.*, 
2004) and to avoid taxing affective outcomes (Fiske and Taylor, 2013). They are also closely
interconnected (Scott, 1996). Strategies for reducing dissonance include, for example, attitude or
behaviour change, trivializing the importance of the behaviour, or selective information processing
(Hinojosa *et al.*, 2017).

Although CDT was first introduced in the field of social psychology, it has been widely used
in work psychology and organizational behaviour to understand human behaviour in the work
context (e.g., Harmon-Jones and Harmon-Jones, 2007; Simon, Snow and Read, 2004) and explain a
range of phenomena (Hinojosa *et al.*, 2017) including the relationship between job satisfaction and
performance (Schleicher, Watt and Greguras, 2004; also see Lopez, 1992; Visser and Coetzee, 2005), organizational commitment and job satisfaction (Dal Santo et al., 2013), reactions toward bullying (Samnani, 2013) and the relationship between proactivity and employee outcomes such as performance, organizational citizenship behaviours, job satisfaction, and organizational commitment (Liao, 2015). Hinojosa and colleagues (2017) note that while social psychology has focused on the type of discrepancy reduction, management studies have mainly focused on the negative affective state that results from unresolved dissonance, including job dissatisfaction (e.g., Erdogan, Kraimer and Liden, 2004; Grandey, Chi and Diamond, 2013).

CDT adds a useful lens to the interactionist perspective for understanding how job design and job control, on one hand, and the psychological climate on the other, together shape negative employee outcomes such as job (dis)satisfaction. The broad expectation is that discrepancy in cognitions between job demands/job control and psychological climate will lead to lower job satisfaction.

More specifically, when people experience inconsistencies in their perceptions of the job and the psychological climate, they will also experience dissonance and an uncomfortable negative affective state, operationalized here as job dissatisfaction. This may lead them to adjust their attitudes as a coping process, a means of reducing the discrepancy between cognitions of the job and of the psychological climate, perhaps a particularly efficient form of ‘cognitive miserliness’ (Fiske and Taylor, 2013, p. 15). Psychological climate will compensate for poor job design.

On the other hand, and although CDT focuses on discrepancies between cognitions, it is possible to expect that consistency between perceptions of job demands and control and psychological climate will have independent and combined effects on job satisfaction. Employees with high job control who also perceive the psychological climate for autonomy as high may have a higher level of satisfaction than those who perceive it as low. Psychological climate will augment job design as people will feel more secure and that they can achieve more.
But how do augmentation and compensation apply on job control and job demands when one is desirable and the other less so? If psychological climate augments the negative relationship between job demands and job satisfaction, then it strengthens that relationship and intensifies the effects of high demands on job dissatisfaction. It thus has a negative impact. However, if climate plays a compensatory role, then it reduces the negative effects of demands on job satisfaction. In contrast, if climate augments the positive relationship between job control and job satisfaction, then it intensifies the effect of job 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.

Taking an interactionist approach and based on CDT, we thus test the following purposefully broad hypotheses:

*Hypothesis 2a: Psychological climate moderates the effects of job control on job satisfaction*

*Hypothesis 2b: Psychological climate moderates the effects of job demands on job satisfaction*

It is important to note that the signs of the interaction effects will indicate support for the two propositions but the interpretation of the signs will differ for job demands and job control. Assuming job demands is negatively related to job satisfaction, a negative sign for the job demands-psychological climate interaction would support the augmentation effect, whereas a positive sign would indicate a compensation effect. Therefore, favourable perceptions of psychological climate will compensate for taxing job demands and augment the effects of manageable job demands.

Assuming a positive relationship between job control and job satisfaction, a positive sign for the job control-psychological climate interaction would be consistent with the augmentation effect, whereas a negative sign would be consistent with compensation effect. Therefore, favourable perceptions of psychological climate will augment the effects of positive perceptions of job control and compensate for poor job control.
Method

Participants

Data were collected from 17 organizations in England from various sectors, including education, advertising, finance, manufacturing, and local government. The organizations were recruited via direct contacts. The timeline for data collection was different for each organization, between mid 2010 and end of 2011. Longitudinal data were collected by administrating the same questionnaire to the same organizations four times with 3-month intervals between data collection waves. In total, 10506 questionnaires were completed by 5039 participants from 267 workplaces. Response rates varied among the 17 organizations and different data collection waves and ranged between 5% and 21%. This is consistent with reported response rates for online questionnaires (e.g., Kaplowitz, Hadlock, and Levine, 2004).

Questionnaires with missing values in any of the variables used were excluded from the analysis. This yielded a usable sample of 8220 questionnaires from 3761 participants. From this sample, 36 workplaces have less than 5 responses which were considered to be non-representative of their populations. These responses and workplaces were excluded from the data analysis reducing the sample to 7403 questionnaires from 3587 participants from 231 workplaces. From the total of 3587 participants 1491 (41.57%) completed the questionnaire only once, 880 twice (24.53%), 712 (19.85%) completed it three times and 504 (14.05%) completed it all for times.

The final sample consisted of 65.5% women and the average age of participants was $M_{age} = 42.69$ years (age range: 18 – 69 years). Nearly half of the participants, 47.5%, had received secondary education, 37.1% had an undergraduate degree and the remaining 15.4 % had a postgraduate degree. The average tenure of the participants in their organizations was $M_{tenure} = 10.7$ years (tenure range: < 1 – 47.9 years).

Measures
Job demands was measured with eight items from the Copenhagen Psychosocial Questionnaire (Kristensen, Hannerz, Høgh, and Borg, 2003). Respondents were asked to indicate how often they experienced certain workload problems (e.g., “My workload is unevenly distributed so it piles up”, “My work requires that I remember a lot of things”) on a 5-point Likert scale (from 1 = never/hardly ever to 5 = always). The scores were grand mean centred and Cronbach’s alpha for this scale was .78.

Job control was measured with nine items from Morgeson and Humphrey (2006), which together capture a range of aspects of job control such as work-scheduling, decision-making, and work methods. Respondents were asked to indicate the extent to which they agreed with a number of statements (e.g., “The job allows me to make my own decisions about how to schedule my work”, “The job provides me with significant autonomy in making decisions”) on a 5-point Likert scale (from 1 = strongly disagree to 5 = strongly agree). The scores were grand mean centered. Cronbach’s alpha for this scale was .95.

Psychological climate was measured using the autonomy, competence, and relatedness supportive dimensions of the Workplace Design Questionnaire (Karanika-Murray and Michaelides, 2015). Respondents were asked to indicate how true a range of statements were on the working conditions in their workplace (e.g., “We can make a lot of decisions without requiring approval”, “We are always aware of how well we are doing the job”, “There are opportunities to develop friendships”) on a 7-point Likert response scale (1 = strongly disagree to 7 = strongly agree) and with a 3-month time window. Each dimension was group-mean centred. Cronbach’s alpha values were .92, .96 and .93, respectively. Although the WCM and WDQ can be used to measure both psychosocial and organizational climate, we apply CDT on the former in order to understand the individual’s attitudes and cognitions rather than those of the workgroup. The alternative would necessitate assessing agreement among individuals working in the same workplace and not be appropriate to examine using CDT. The examination of the WDQ’s structure and psychometric
properties is detailed in Karanika-Murray and Michaelides (2015). Because psychological climate refers to a “direct perception of the work or organizational situation” (Schneider, 1975, p. 461) and represents what is “out there” rather than the individual’s internal state (Schneider, 1975, p. 466), it is conceptually distinct from job satisfaction.

In order to evaluate interactions between job demands and job control on one hand, and psychological climate, on the other, we standardized these variables before the analyses. In addition, the discriminant validity of the autonomy climate and job control was tested via a CFA model across the four waves. The chi-square statistics showed that the two were significantly different. Discriminant validity is also supported by their correlation which was < .85. The results are available on request.

Job satisfaction was measured with three items, two taken from the Michigan Organizational Assessment Questionnaire (Cammann, Fichman, Jenkins and Klesh, 1983; i.e., “In general I like working here” and “All in all I am satisfied with my job”) and one from Quinn and Shepard’s (1974) job satisfaction index (i.e., “Knowing what I know now, if I had to decide all over again whether to take my job, I would”), to provide a more rounded assessment of job satisfaction. Respondents were asked to indicate how true the three statements were for them on a 7-point Likert response scale (1 = strongly disagree to 7 = strongly agree). Cronbach’s alpha for this scale was .89.

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

Control variables included were participants’ gender, age, organizational tenure, and job tenure. Gender can potentially influence the results as job satisfaction may systematically vary between men and women (Bender, Donohue and Heywood, 2005; Clark, 1997). Similarly, past research has demonstrated that job satisfaction can vary with age (Clark, Oswald and Warr, 1996).
and tenure (Bedeian, Ferris and Kacmar, 1992). Although age, organizational tenure and job tenure are highly correlated (r between .32 and .47), they all had distinct effects on the dependent variables. Because perceptions of psychological climate and perceptions of job demands/control may differ between respondents who do and those who do not manage other employees, we also controlled for whether participants had managerial responsibilities, measured as a single item with a binary response format. Finally, we controlled for whether participants had experienced any major negative event over the last three months, measured with a single item and a yes/no response format. Negative events, even if isolated, could have a direct effect on job satisfaction, if they are work-related or they are family issues that interfere with work, but also exert an indirect influence by negatively affecting individuals’ well-being or mood and by extension their appraisal of job satisfaction. The control variables were included in the first step and remained significant at all steps of the analysis (see Results section).

Analyses

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

Prior to the analysis we also compared a series of models to determine whether it was necessary to account for all of these levels of analysis or to allow for an autoregressive effect. We first fitted a two-level model with a random intercept for individuals (which accounts for the repeated measures nested in individuals) and compared it to a three-level model with random
intercepts for individuals and workplaces. The two models were significantly different ($\Delta \chi^2 (df = 1) = 374.75, p < .001$) indicating that there is substantial variability between workplaces in job satisfaction. Then, we compared the three-level model to a four-level one with random intercepts for individuals, workplaces and organizations. The comparison was not significant ($\Delta \chi^2 (df = 1) = 2.94, p > .05$) indicating that overall job satisfaction does not vary significantly between organizations.

Building on the three-level model we then added a fixed effect for time, which showed a significant negative effect of time on job satisfaction ($\beta = –.07, t = –7.03, p < .001$). This was then compared to a model with time as a random effect to determine whether allowing for a different growth curve for every participant improves the model fit. Indeed, a random slope for time provided a better model for how job satisfaction changes over time ($\Delta \chi^2 (df = 4) = 35.25, p < .001$). Finally, we also tested if there was serial correlation by allowing for an AR1 (autoregressive lag 1) correlation structure but the results revealed that this was not the case ($\Delta \chi^2 (df = 1) = 2.67, p > .05$). We therefore did not use an AR1 structure in the main analysis.

Consequently, the baseline model was a three-level model of observations nested in individuals, in turn nested in workplaces. The random effects of the model consisted of two random intercepts (individual level and workplace level) and one random slope for the effect of time at the individual level, and is therefore a growth curve model. Starting with this baseline model, we added predictors, evaluated their effect and compared the model to the previous step. The control variables were added at the first step (Model 1), the effect of job demands and job control at the second step (Model 2), the three psychological climate dimensions at the third step (Model 3), and finally all the interactions were added at the fourth step (Model 4). Six potential interactions were included: psychological climate (autonomy, competence, relatedness) by job control and job demands. Each step was compared to its preceding step using $-2$ Log Likelihood ($\Delta \chi^2$) maximum likelihood estimates.
To ensure that there was no multicollinearity between different interaction terms, we evaluated the multilevel variance inflation factor. This was below the recommended value of ten for all predictors and interactions. The highest value was for the interaction between control and competence (VIF = 1.88). Finally, because we found no interactions between job control and job demands (Van der Doef and Maes, 1999) we did not include this interaction term in the analyses.

Results

Table 2 shows the descriptive statistics and correlations between all the continuous variables. The core variables are significantly correlated and in the expected directions.

The first regression model, Model 1 (see Table 3) revealed that all the control variables were significant related to job satisfaction. Specifically, job satisfaction was higher for those with managerial responsibility ($\beta = .19$, $SE = .04$, $p < .001$), women ($\beta = .20$, $SE = .05$, $p < .001$), and those who reported not having experienced a negative event in the previous three months ($\beta = .17$, $SE = .03$, $p < .001$). Job satisfaction increased with age ($\beta = .01$, $SE = .00$, $p < .01$) but decreased with organizational tenure ($\beta = -.01$, $SE = .00$, $p < .05$) and job tenure ($\beta = -.01$, $SE = .00$, $p < .001$).

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

The third step (Model 3), which involved the inclusion of the three psychological climate variables, further improved the fit of the model ($\Delta \chi^2 = 1279.77$, $df = 3$, $p < .001$). All three predictors had a significant positive effect on job satisfaction, providing support for Hypothesis 1c. Competence climate had the strongest effect ($\beta = .43$, $SE = .02$, $p < .001$), followed by relatedness ($\beta = .22$, $SE = .02$, $p < .001$) and autonomy climate ($\beta = .14$, $SE = .02$, $p < .001$).
The addition of the six interaction terms in Model 4 further improved model fit ($\Delta \chi^2 = 33.54$, $df = 6, p < .001$). The main effects (of the two job characteristics and three climate variables) remained significant, and of the six interaction effects four were significant and two were not. All the interactions involving job demands were significant. Thus, Hypothesis 2b for the moderating effects of psychological climate on the effects of job demands on job satisfaction is supported for all three dimensions of climate. The interaction between job demands and autonomy climate was also positive ($\beta = .03, SE = .01, p < .05$) and the simple slope test also showed a significant negative effect ($ss = - .08, SE = .01, p < .001$). These results support a compensation effect: autonomy climate compensates, to some extent, for the negative effects of demands on job satisfaction such that under a high autonomy climate the effects of job demands are less pronounced (see Figure 1a). The interaction between job demands and competence climate was positive ($\beta = .05, SE = .02, p < .001$) with a negative simple slope ($ss = -.06, SE = .01, p < .001$) which also supports a compensation effect: competence climate neutralizes the negative effects of job demands on job satisfaction (see Figure 1b). The interaction between job demands and relatedness climate was negative ($\beta = -.04, SE = .01, p < .05$) with a negative simple slope ($ss = .15, SE = .00, p < .001$) implying that the effect of job demands on job satisfaction is amplified in high relatedness climate and less pronounced in low relatedness climate (see Figure 1c).

The interactions involving job control were less decisive. Only the interaction between job control and competence climate was significant ($\beta = -.04, SE = .02, p < .05$) with a significant simple slope ($ss = .12, SE = .01, p < .001$), but did not support the augmentation hypothesis: the positive effects of job control on job satisfaction were stronger under a low competence climate (see Figure 2). Hypothesis 2a offers partial support for the moderating effects of psychological climate on the effects of job control on job satisfaction.

[Figures 1 and 2 near here]

Discussion
This study examined the joint impact of job demands and control, on one hand, and psychological climate, on the other, on job satisfaction. Taking an interactionist perspective and grounding arguments on Cognitive Dissonance Theory, it presented an empirical test of the proposition that the analysis of job demands and control as an antecedent of job satisfaction can be complemented by a consideration of the wider context in which the job resides (Johns, 2010; Morgeson et al., 2010) and the importance of understanding situational forces shaping behaviour (Lewin, 1939; Mesquita, Feldman Barrett and Smith, 2010). In this case, context was viewed as psychological climate and job characteristics, impacting on affective evaluations of one’s job and examined through the lens of the Workplace Characteristics Model (Karanika-Murray and Michaelides, 2015) which describes autonomy, competence, and relatedness supportive climates as aspects of the psychological climate that can support meaning, adaptation and intrinsic motivation.

As expected, the analyses offered support for interaction effects between psychological climate (autonomy, competence, relatedness) and job demands/control on job satisfaction, in four of the six interactions tested. Three of these supported the compensation effect and one the augmentation effect. The results showed that the effects of psychological climate may vary across its different dimensions and different aspects of the job. Specifically, discrepancies between job-related cognitions and climate-related cognitions seem to be the most prominent driver for job satisfaction, as the compensation effect fit two of the interactions involving job demands and the one involving job control. The remaining interaction involving job demands supported the augmentation effect and two of the interactions involving job control were not significant.

The compensation effect implies that job demands are perceived as less unpleasant when the individual also perceives that psychological climate encourages the use of discretion in the way that work is carried out (specifically, autonomy climate) and conveys a sense that skills are valued and their use is encouraged and actively supported (specifically, competence climate). Similarly, low job control or autonomy is perceived as less unpleasant when the psychological climate is supportive of
competence. Alternatively, autonomy may be more important when it is perceived to come from internal sources such as the immediate job that an individual has more control of rather than external sources such as the psychological climate that is independent and has a more indirect effect on private evaluations of one’s job. It may be useful to examine the role of locus of control in this relationship (Rotter, 1990).

The finding that a psychological climate that is high in relatedness amplifies the negative effects of job demands on job satisfaction was not anticipated. However, it echoes evidence that social support can be too high and deleterious after a certain point (e.g., Karanika-Murray, Antoniou, Michaelides and Cox, 2009). Perhaps in a workplace where people are more closely connected or where there is more teamwork there is more pressure to fulfil job demands – this can be tested in future research. Alternatively, grievances about high demands may be amplified by being be shared and communicated among colleagues. Similarly, social comparison mechanisms may lead to one’s own job demands being experienced as higher than colleagues’.

The lack of interactions between job control and the autonomy and relatedness climate dimensions may suggest that individuals’ sense that they can exercise their discretion is unaffected by the degree to which the context is seen as supportive on these dimensions. The fact that autonomy climate buffers the effect of job demands is especially significant as we found no interaction effect between job demands and job control. Therefore, the feeling of support for autonomy at the climate level may be more important than feeling control over the job; a possibility to be examined in future research.

Future research

Our application of the interactionist approach (Lewin, 1939) and use of CDT (Festinger, 1957) to underpin understanding of how job design and psychological climate together impact employee outcomes with job satisfaction as the indicator, has thus been partially justified. However, in addition to the future research directions mentioned earlier, further exploration of this and especially reactions
to inconsistencies would be useful. Such exploration might also consider how climatic and job context spark mechanisms for discrepancy reduction, which have not been largely omitted from the organizational behaviour literature. It would also be useful to expand on CDT to provide modifications specific to its application in the field – for example, examining behavioural changes that amount to changing job, what is known as job crafting (Wrzesniewski and Dutton, 2001). Promoting the climatic context from a background to a foreground variable in the relationship between job characteristics and work outcomes, opens up a range of possibilities for understanding its active role in shaping work attitudes and well-being.

The present study builds on (author reference, undisclosed) by suggesting alternative possibilities for representing context as psychological climate, whereas using CDT theory adds plausible explanations of how aspects of that context may interact to impact employee outcomes and affective states such as job satisfaction. Although we are at very early stages of this exploration and have hypothesized on the overall (compensation and augmentation) effects of job demands/control and psychological climate and job satisfaction, more fine-grained hypotheses on specific aspects of climate and job design would be extremely useful.

Strengths and limitations

The main strength of the present study was that it was based on a substantial sample of employees across a range of organizations, allowing to establish stability of these relationships across organizations. Collecting the data over four time periods and modelling changes over time as a growth model also allowed to control for changes in job satisfaction for each participant and model the moderation relationships independently of within-individual fluctuations.

A weakness of the study was that all the data were collected using questionnaires which can potentially result in method variance or social desirability biases (Podsakoff, MacKenzie and Podsakoff, 2012). Nevertheless, it should be noted that because interaction effects are typically deflated in the presence of common method variance and become more difficult to detect (Siemsen,
Roth and Oliveira, 2010), the results of the moderation hypotheses are unlikely to be affected by artefacts of common method variance.

**Implications for theory**

This study addresses calls for attention to context in organizational behavior (e.g., Grant, 2010; Johns, 2006; Johns, 2010; Morgeson et al., 2010; Rousseau and Fried, 2001). Despite calls for job design studies to attend to the context in which jobs are embedded (e.g., Grant, 2010; Johns, 2010), to our knowledge there is currently no empirical research on the relationship between job design, climate, and job satisfaction. Context is important but neglected and this may partly be due to the difficulty in conceptualizing and, consequently, measuring it. As mentioned, it is not possible to isolate affective processes from the psychosocial and cultural milieu in which they are situated, nor is it possible to understand jobs in isolation from their surroundings (Johns, 2010). This is an essential principle in Field Theory – as Lewin (1939) asserted, “analysis starts with the situation as a whole”. The call for more attention to be paid to the organizational context in job design theory and more generally (e.g., Johns, 2010; Kozlowski and Doherty, 1989; Morgeson et al., 2010) has been shown to be aimed at a valid target.

We have therefore presented a case for the return of the interactionist perspective which allows for a broader lens in attempting to understand the effects of work on employee outcomes. CDT is a well-established theory but with promising refinements in the field of organizational behaviour (Hinojosa et al., 2017). Further conceptual explorations could integrate motivation or needs theory with job design theory to explain in more detail how climates that promote different psychological needs (Gagne and Deci, 2005; Karanika-Murray and Michaelides, 2015) interact with aspects of job design, perhaps using the Job Characteristics Model (Hackman and Oldham, 1975). This would help to promote full exploration of aspects of climate and aspects of job design relevant to important work outcomes.
We focused on psychological climate and on the application of CDT principles to explore how cognitions of climate and job design jointly affect a job satisfaction as an affective state. A focus, sole or combined, on organizational climate was not possible since CDT is an individual level theory. However, developing expectations on how discrepancies between perceptions of the shared climate, psychological climate, and perceived job design would be one avenue for extending the interactionist approach. This would allow to see whether organizational climate has the same effects as psychological climate, or any effect over and above those of psychological climate, or even moderate the interactions effects involving psychological climate. In this case, the conceptual foundations would be different. For example, one possibility would be to conceptualize different levels and dimensions of climate as resources to be conserved and protected (conservation of resources theory; Hobfoll, 1989) in order to maintain desirable work attitudes and behaviours.

Another would be to apply the Job Demands-Resources Model (Bakker & Demerouti, 2007), which incorporates a broader range of job demands and job resources and defines job resources as “those physical, psychological, social, or organizational aspects of the job that are either/or: functional in achieving work goals, reduce job demands and the associated physiological and psychological costs, stimulate personal growth, learning, and development” (Bakker and Demerouti, 2007, p. 312). These alternatives may also help to explore the relevance and impact of a different aspects of climate (e.g., technology and structure) in addition to the psychological environment.

When considering the importance of context in employee outcomes it is important to explore relationships among different aspects of the context. The job context is more proximal than the climatic context: a daily experience that is actively shaped by the individual and therefore a more immediate influence on more private attitudes and consequent behaviour than the climatic context. This is not to minimize the role of the individual’s experience of the psychological climate; as the results showed, the psychological climate has the power to neutralize or enhance the role of the
immediate job and how it is experienced. After all, attitudes and behaviour are a function of a complex interaction between person and environment (Mesquita, et al., 2010).

Finally, despite partial support for the hypotheses, the findings showed that it is possible to combine established bodies of research such as job characteristics and climate by considering the attitudinal and behavioural foundations of employee outcomes. CDT allowed to achieve this and, indeed, CDT has played a great role in explaining how individuals react in cases of attitude-cognitive inconsistencies and how such inconsistencies can influence a range of outcomes (e.g., Liao, 2015; Lopez, 1992; Schleicher et al., 2004; Visser and Coetzee, 2005). As the field of organizational behaviour is not shy of borrowing models from longer established fields, there is scope for further incorporation and refinements of social and cognitive theories for explaining work outcomes.

**Implications for practice**

The practical implications of the study are, first that encouraging the design of good quality jobs remains a significant objective for governments, management and trade unions, especially as the empirical evidence is that only a minority of jobs could be described thus (e.g., in the UK, see Van Wanrooy et al., 2013). The fact that differences exist between countries (e.g., in call centre jobs) suggests there is scope for choice in the way that jobs are designed (Holman, Frenkel, Sørensen and Wood, 2009).

The second implication for practice but also policy is that management can intentionally create and support climates that are conducive job satisfaction, well-being and even performance. The fact that job control and autonomy climate are independent suggests that just by designing jobs in certain ways or more generally instituting high-involvement practices (Lawler, 1986) or what is often termed ‘high performance work systems’ (Appelbaum, Bailey, Berg and Kalleberg, 2000) may not be sufficient. It is the messages that are conveyed by having such practices that may be important, and particularly those that are disseminated through them or in other ways. The emphasis in human resource management practice is often very concentrated on processes and ensuring
procedures are followed rather than monitoring what is actually happening in their enactment. To more directly create positive climates that help employees to perceive work environments as psychologically safe and meaningful and feel that the workplace is being supportive of competencies, relationships, and autonomy. Management should be seen to be entrusting employees and teams to make decisions within their locus of control, to be providing fair and helpful feedback, giving staff recognition for their work, or developing trust and a sense of community in the workplace.

The third implication of the study derives from the interaction results as these indicate more precisely what needs targeting. The results that conform to compensation effect suggest that psychological climates supportive of autonomy and competence are especially important. The interaction between demands and relatedness climate suggests that managers might investigate whether peer pressure is too strong.

Conclusions

This research is a response to the call for more nuanced consideration of the interaction between job design and psychological climate and the context of work. On the basis of CDT, we hypothesized that psychological climate is more likely to augment perceptions of job characteristics when there is consistency between them, and to compensate for job design perceptions when they are inconsistent. We have shown how psychological climate may be one such contextual factor that influences the way job characteristics affects job satisfaction. The climatic context is not then just an additional variable to take into account when considering employees’ attitudes or well-being; the findings demonstrate it is a significant moderator of the job demands/control–job satisfaction relationship, and it is likely – or at least worth hypothesizing – that its influence may extend to other employee outcomes such as job strain and organizational commitment. Even more importantly, the results show that the moderating effects of psychological climate vary.
Overall, the research suggests that the call for more attention to be paid to the context in which jobs are embedded is worth heeding. These findings also vindicate the argument for extending understanding of the effects of job design to include the psychological climate that forms part of the job context. Psychological climate not only influences job satisfaction but also shapes how perceptions of the job influence that. We have also illustrated the value of a comprehensive model of psychological climate and more specifically the virtue of treating it multi-dimensionally. Finally, the application of CDT to explain how psychological climate may either amplify or compensate for the effects of job design on employee outcomes may add to our appreciation of this theory.
References


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)
Table 1. ICC1 Values for individual, workplace and organizational levels

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<th>Workplace level</th>
<th>Organizational level</th>
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<td>.02</td>
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<tr>
<td>Job satisfaction</td>
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Table 1. Means, standard deviations and correlations between continuous variables

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<th>5</th>
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<td>.04***</td>
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<td>.04***</td>
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<td>6. Autonomy climate</td>
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<td>7. Competence climate</td>
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<td>-.03**</td>
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Note. N=7403. * p ≤ .05, ** p ≤ .01, *** p ≤ .001.
Table 2. Direct and interaction effects of job design and psychological climate on job satisfaction

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Note. N_observations = 7403, N_individuals = 3587, N_workplaces = 231; * p < .05, ** p < .01, *** p ≤ .001.