The effects of work control and job demands on employee adjustment and work performance

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The present study examined the effects of work control and job demands on employee adjustment and work performance using a multidimensional measure of work control (assessing levels of task control, decision control and work scheduling control). It was proposed that the negative effects of job demands and employee adjustment would be moderated by high levels of task control. It was also proposed that there would be evidence of main effects of both job demands and work control (particularly task-related levels of control) on employee adjustment. To test these predictions, a study of 135 university employees holding administrative positions was undertaken. Methodological improvements over previous research included the use of both self-reported adjustment measures and supervisor ratings of work performance as outcome variables, and the assessment of the predictor and outcome measures at different points in time (self-reported adjustment was assessed at both Times 1 and 2). The results revealed some support for the proposal that the effects of job demands would be buffered by high levels of task control, but not more peripheral aspects of work control. There were also significant main effects of task control on job satisfaction.

In a widely cited development in the work stress literature, Karasek (1979) proposed that the negative effects of work demand are mitigated if employees have high levels of decision latitude. More specifically, Karasek hypothesized that there are two elements of the work environment that impact on an individual's level of well-being and the quality of his or her work, namely, job demands and decision latitude. Job demands reflect the amount of work required from the employee, the extent to which he or she has to work under time pressure, and the degree to which the employee is expected to complete conflicting job demands. Decision latitude—later referred to as work control (Karasek & Theorell, 1991)—refers to the extent that employees can exert influence over tasks and conduct during a

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normal working day. The model postulates that psychological strain results not from either aspect of the work environment alone, but from the joint effects of the level of job demands and the degree of work control available to the employee. In other words, the model predicts that job strain results from the interaction of job demands and work control. Strain is hypothesized to exist when there are high levels of job demands and low levels of control over the demands. Alternatively, when high levels of work demands and control exist the job is described as being ‘active’, meaning that the demands act as a source of challenge and regeneration, rather than as a source of mental and physical stress.

The central tenet of Karasek’s (1979) demands–control model is that high levels of work control protect the employee from the harmful effects of a demanding job. To the extent that a demanding job is likely to be stressful, Karasek’s model is analogous to the stress-buffering hypothesis that is commonly used by researchers to describe the effects of a range of variables that may help protect people from the effects of stress (Ganster, 1989; see also Cohen & Wills, 1985; Terry, 1989). Karasek’s model, however, goes beyond the model adopted in the general stress literature, in that Karasek envisages that under conditions of high work control, a demanding job may actually foster feelings of well-being and enhance employee performance.

Empirical support for the demand–control model has been, at the best, only mixed. Karasek (1979) reported some support for the model in samples of employees in both Sweden and the United States, as have a number of more recent cross-sectional studies of job demands, work control and employee well-being (Dwyer & Ganster, 1991; Fox, Dwyer & Ganster, 1993; Parkes, Mendham & von Rabenau, 1994; Xie, in press). However, studies of this type have more often provided only limited support for the model (e.g. Ganster & Mayes, 1988; Hesketh & Shouksmith, 1986; Landsbergis, 1988; McLaney & Hurrell, 1988; Payne & Fletcher, 1983; Spector, 1988). The lack of consistent support for Karasek’s (1979) model in cross-sectional studies is also evident in methodologically more sophisticated studies. In one of the few longitudinal studies in the area, Bromet and his colleagues (Bromet, Dew, Parkinson & Schulberg, 1988) found support for the interactive model only in the prediction of the occurrence of alcohol problems, which was one of three outcomes assessed. Other longitudinal studies have similarly failed to find convincing evidence for the demands–control model (Carayon, 1993; Parkes et al., 1994). In a laboratory experiment, Perrewé & Ganster (1989) also found limited support for the model. They reported weak evidence that work control (experimentally manipulated) buffered the effects of work stress on anxiety, but not on task satisfaction or physiological arousal.

Although inconsistent support has been found for the interactive effects of job demands and work control, there is consistent evidence that a high level of work control has positive effects on levels of adjustment, independent of job demands. For example, there is evidence of beneficial effects of work control on job satisfaction (Dwyer & Ganster, 1991; Greenberger, Strasser, Cummings & Dunham, 1989; McLaney & Hurrell, 1988; Tetrick & LaRocco, 1987), work performance (Greenberger et al., 1989), psychological well-being (Perrewé & Ganster, 1989; Spector, 1987), pill consumption (Karasek, 1979) and indicators of

Overall, research testing the utility of Karasek's (1979) demands-control model has failed to find conclusive evidence of work control by job demand interactions on employee adjustment, although there is evidence of significant main effects of work control. As noted by Wall, Jackson, Mullarkey & Parker (1996), the lack of converging evidence in support of the stress-buffering role of work control may reflect problems in the operationalization of the notion of work control in previous research—a similar point has been made by other researchers (Ganster, 1988; Ganster & Fusilier, 1989; Kasl, 1989).

Wall et al. (1996) argued that, although the notion of decision latitude has been increasingly conceptualized in terms of work control (see Karasek & Theorell, 1991), most research has continued to use Karasek's (1979) measure of decision latitude to assess control. In addition to items assessing control, this scale assesses the skill requirements of the job, whether employees have to learn new things, whether they need to be creative, and whether the work is non-repetitious. As noted by Wall et al. (1996), this means that Karasek's measure of decision latitude is likely to tap both work control and job complexity. In support of this assertion, Wall et al. (1996) found stronger support for Karasek's (1979) model when a focused measure of work control (comprising items assessing the extent to which employees perceived that they had control over how and when they did their work—method and timing control) was used rather than when a broader measure of control—assessing a range of job characteristics including control, opportunity to use skills and job variety—was employed.

Wall et al. (1996) showed clearly that support for the demands-control model is greater when a focused measure of work control is used rather than Karasek's (1979) general measure of decision latitude. We extended this research by testing the proposal that, even when a focused measure of work control is used, different types of control should be distinguished. Ganster (1988) asserted that work control may be a multidimensional construct, given that it is likely that employees have varying levels of control over different aspects of their work and their work environment, Karasek (1979) himself, acknowledged the likely complexity of the notion of work control. He suggested that researchers should examine the effects of levels of control over a number of different dimensions of work, including task organization, work pacing and decision making.

By assessing a single construct of work control—even when the measure is focused on the construct of control—researchers may have masked the fact that some types of control have the potential to buffer the negative effects of job demands, whereas others do not. In this respect, it can be suggested that task-relevant sources of control (such as work pacing, task organization and scheduling control) will be more likely than peripheral sources of work control (such as mobility, resource allocation and organizational decision control) to moderate the effects of work demands. This proposal is consistent with Cohen & Wills’ (1985) stress-matching hypothesis. According to Cohen & Wills, there should be an adequate match between the demands of the situation and the type of buffer under consideration if stress-buffering effects are to be detected. Cohen & Wills’
(1985) stress-matching hypothesis has received some support (Terry, Nielsen & Perchard, 1993), although this specific hypothesis has yet to be systematically tested. The notion that task-relevant sources of work control will be more likely to buffer the negative effects of work stress is also consistent with Frese’s (1989) action sequence proposal, which hypothesizes that the control domains most central to an employee are likely to have immediate and strong effects on employee adjustment, whereas those control dimensions that are less proximal to daily work activities are likely to have less impact on adjustment. It should be noted that, although the latter proposal supports the view that task-relevant aspects of work control will be most likely to buffer the negative effects of work stress, it forms the basis more explicitly for the prediction that the main effects of work control should be strongest for those aspects of control that are of central importance to the performance of an employee’s daily work activities.

To date, little research has attempted to distinguish among different dimensions of work control. This is with McLaney & Hurrell’s (1988) exception which utilized a multidimensional measure of work control that assessed levels of task control, decisional control, physical environment control and resource control. McLaney & Hurrell failed to find support for Karasek’s (1979) interactive model, although they did find that levels of task, physical environment and resource control exerted (positive) main effects on job satisfaction. Jimmieson & Terry (1993) also failed to find strong support for the demands—control model in a study that distinguished two types of work control. However, it can be argued that further research should examine the effects of distinct dimensions of work control, given that McLaney & Hurrell’s (1988) only outcome variable was job satisfaction and the study conducted by Jimmieson & Terry (1993) was restricted in its focus (the participants were retail employees and only two aspects of work control were assessed).

In addition to problems with the conceptualization and operationalization of the notion of work control, the present study was designed to meet two methodological limitations of previous research on work control. In the first instance, the majority of studies on work control have employed cross-sectional designs. Such a design is likely to inflate the observed correlations between predictors and outcomes because of method variance, which is contributed to by response consistency effects that emanate from the influence of both stable dispositional factors (such as negative affectivity) and unstable occasion factors (such as mood; see Spector, 1992; Spector & Brannick, 1995; Zapf, Dormann & Frese, 1996). Because of their instability, the effects of occasion factors can be reduced by assessing the predictors and the outcomes at different points in time; however, to fully control for the potential biasing effects of both occasion factors and dispositional factors, the effects of prior adjustment should be controlled in the prediction of subsequent adjustment (Zapf et al., 1996).

Second, much of the research on work control has employed self-report measures of physical, mental health and/or affective aspects of employee adjustment. As well as adopting a longitudinal design, method variance can be controlled by obtaining, where possible, data from an external source. Thus, in addition to self-report measures of adjustment, supervisor reports of work performance could provide a useful outcome measure in research on job demands, work control and
employee adjustment. It is well documented that excessive work demands such as work overload lead to decreased work performance (see Sullivan & Bhagat, 1992, for a review). However, despite the clear assumption in Karasek's (1979) model that the joint effects of demands and control impact on work performance, there has been little research that has examined the moderating effects of control on the demand–work performance relationship. This is with the exception of a study of nurses that was conducted by Fox et al. (1993). The fact that Fox et al. did not find any evidence of demands by control interactions on an overall measure of work performance may be attributable to the fact that a general (unidimensional) measure of work control was utilized.

The present study

The aim of the present study was to examine further the effects of work control on employee adjustment and work performance. It was hypothesized that support for the demands–control model would be found if a multidimensional measure of control was employed. Specifically, on the basis of Cohen & Wills’ (1985) stress-matching hypothesis, it was proposed that high levels of control over task-related aspects of the job would protect the person against high levels of work demands. Buffering effects were not expected to be evident for more peripheral types of work control (see also Frese, 1989). In accord with previous research in the area, it was expected that levels of work control would also exert significant main effects on level of employee adjustment. On the basis of Frese’s (1989) action sequence proposal, it was hypothesized that these effects would be strongest for task-related levels of control. The present study was designed to incorporate methodological improvements over previous research in the area. These included the use of both self-reported adjustment measures and supervisor ratings of work performance as outcome variables, and the assessment of the predictor and outcome variables at different points in time (self-reported adjustment was assessed at Times 1 and 2).

Method

Design

Measures of work control, job demands and employee adjustment (low depressive symptoms and job satisfaction) were obtained at Time 1. Measures of low depressive symptoms and job satisfaction were also obtained at Time 2 (six weeks later). Supervisor ratings of work performance were obtained at Time 2.

Sample

Participants in the study were full-time administrative staff employed in a university. A total of 135 employees provided data at Time 1; 61 per cent of the Time 1 sample were followed up at Time 2 (N= 87). Of these participants, 75 per cent (N = 62) were willing to have their supervisor provide performance ratings. Participants who provided data at both points in time did not differ from those who failed to provide Time 2 data on the demographic variables, or on the measures of job demands or work control. However, there were differences between those participants who gave permission to
Table 1. Descriptive and psychometric data for measures of work control, work demands, employee adjustment and work performance

<table>
<thead>
<tr>
<th>Variable</th>
<th>No. of items</th>
<th>Response scale</th>
<th>Mean</th>
<th>SD</th>
<th>Cronbach’s alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task control (T1)</td>
<td>6</td>
<td>1–5</td>
<td>3.51</td>
<td>0.81</td>
<td>.84</td>
</tr>
<tr>
<td>Decision control (T1)</td>
<td>3</td>
<td>1–5</td>
<td>2.41</td>
<td>0.82</td>
<td>.76</td>
</tr>
<tr>
<td>Scheduling control (T1)</td>
<td>5</td>
<td>1–5</td>
<td>3.47</td>
<td>0.82</td>
<td>.80</td>
</tr>
<tr>
<td>Quantitative work overload (T1)</td>
<td>11</td>
<td>1–5</td>
<td>3.56</td>
<td>0.52</td>
<td>.81</td>
</tr>
<tr>
<td>Skill underutilization (T1)</td>
<td>5</td>
<td>1–5</td>
<td>2.75</td>
<td>0.82</td>
<td>.74</td>
</tr>
<tr>
<td>Role ambiguity (T1)</td>
<td>6</td>
<td>1–7</td>
<td>2.95</td>
<td>1.03</td>
<td>.73</td>
</tr>
<tr>
<td>Role conflict (T1)</td>
<td>8</td>
<td>1–7</td>
<td>3.64</td>
<td>1.13</td>
<td>.80</td>
</tr>
<tr>
<td>Work locus of control (T1)</td>
<td>16</td>
<td>1–6</td>
<td>2.78</td>
<td>0.67</td>
<td>.80</td>
</tr>
<tr>
<td>Low depressive symptoms (T1)</td>
<td>6</td>
<td>1–4</td>
<td>3.31</td>
<td>0.58</td>
<td>.89</td>
</tr>
<tr>
<td>Low depressive symptoms (T2)</td>
<td>6</td>
<td>1–4</td>
<td>3.3</td>
<td>0.64</td>
<td>.87</td>
</tr>
<tr>
<td>Job satisfaction (T1)</td>
<td>7</td>
<td>1–5</td>
<td>3.50</td>
<td>0.80</td>
<td>.89</td>
</tr>
<tr>
<td>Job satisfaction (T2)</td>
<td>7</td>
<td>1–5</td>
<td>3.50</td>
<td>0.80</td>
<td>.89</td>
</tr>
<tr>
<td>Work performance (T2)</td>
<td>8</td>
<td>1–7</td>
<td>5.80</td>
<td>0.86</td>
<td>.93</td>
</tr>
</tbody>
</table>

*Notes. Scale scores are mean item scores; N=135, except for work performance (N=62) and job satisfaction and low depressive symptoms (N=87). T1=Time 1; T2=Time 2 (six weeks after Time 1).*

have their work performance assessed (and provided data at Time 1) and those who did not. Participants who were not willing to have their work performance assessed reported lower levels of well-being (assessed with a measure of low depressive symptoms: t(130) = 3.47, p < .01), job satisfaction (t(132) = 3.18, p < .01), task control (t(133) = 2.77, p < .01), and scheduling control (t(132) = 2.27, p < .05), and higher levels of underutilization of skills (t(133) = 2.60, p < .01), and role ambiguity (t(133) = 3.76, p < .01) than participants who were willing to have their performance assessed.

Most participants were employed as administrative assistants (75 per cent), the remainder were administrative officers. The participants in the study ranged in age from 21 to 60 years (M = 33.4 years). There were more females (N = 115) than males (N = 20) in the Time 1 sample, which is consistent with the predominance of females employed in clerical occupations.

Measures

Multi-item measures were used to measure each of the variables. The reliability of the measures was assessed using Cronbach’s coefficient alpha (Cronbach, 1951). Descriptive and psychometric data for the measures are shown in Table 1.

Work control. Perceptions of work control were assessed with 16 items developed for use in the present study. The items were designed to examine perceived levels of control over a range of work domains, namely, task organization, decision making, work pacing and work scheduling control (see Ganster, 1989). Participants were asked to assess the degree of influence that they had over the various aspects of the job on a five-point response scale, ranging from not at all to a great deal. To assess the dimensionality of the measure, the responses to the 16 items were factor analysed. On the basis of a scree test, three factors were rotated, which accounted for 48.2 per cent of the variance. The first factor appeared to be assessing task control. It consisted of six items that related to the extent to which individuals perceived that they had control over how and when job tasks were undertaken (e.g. ‘How tasks are to be done’). Three items loaded on the second factor. The factor was labelled decision
control. It assessed the degree of involvement in work or organizational decisions (e.g. 'The decisions that are made concerning the medium range goals of the work unit'). The final factor was labelled work scheduling control. The five items loading on the scale assessed the extent to which people perceived that they had control over when to work (e.g. 'When you take a rostered day off from work').

**Job demands.** Role ambiguity (six items) and role conflict (eight items) were assessed using the measures of the two variables developed by Rizzo, House & Lirtzman (1970). Each item was responded to on a seven-point scale ranging from very false to very true. Quantitative work overload was measured using the 11-item scale developed by Caplan, Cobb, French, Harrison & Pinneau (1980). The scale assesses perceived pace and amount of work. Each item had a five-point response scale ranging from hardly any to a great deal. Skill underutilization was measured using Caplan et al.'s (1980) five-item scale. This scale assesses the extent to which participants perceive that their skills are utilized at work. A five-point response scale was used, ranging from rarely to very often.

**Low depressive symptoms.** To assess low depressive symptomatology, Caplan et al.'s (1980) six-item measure of depression (a = .90 and .88 at Times 1 and 2, respectively) was utilized. The participants rated on a four-point scale how much of the time they felt sad, unhappy, good, depressed, blue or cheerful when they currently thought about themselves and their job. This measure was considered appropriate, given that the design required that the dependent variable assess current state, rather than mental illness (see Frese & Zapf, 1988). The scale was scored so that high scores were indicative of low symptomatology.

**Job satisfaction.** Job satisfaction was assessed using Caplan et al.'s (1980) seven-item scale (e.g. 'If a friend of yours told you that they were interested in working in a job like yours, what would you tell them?'). The items assessed overall job satisfaction, as opposed to levels of satisfaction with specific facets of their job. This type of measure was chosen in order to prevent confounding between the measures of stress and ratings of job satisfaction.

**Work performance.** To assess work performance, an eight-item scale was derived from work by Greenberger et al. (1989). The questionnaire asked the supervisor to evaluate the subordinate's current performance on a range of different work facets (seven-point response scale: outstanding to very poor). A principal axis factor analysis of the items revealed a single factor structure, which accounted for 61 per cent of the variance. All items had factor loadings that exceeded .40; hence, they were averaged into a composite measure of work performance.

**Results**

**Preliminary analyses**

Intercorrelations among each of the scales are presented in Table 2. As shown in this table, the measures of task, decision and work scheduling control were moderately correlated, as were the measures of job satisfaction and low depressive symptoms. In all cases, however, the measures were intercorrelated at lower levels than their respective scale reliabilities, which suggests that empirically distinct, yet related, constructs were being assessed (see Campbell & Fiske, 1959). Preliminary analyses revealed that gender, education level and job classification did not influence any of the outcome variables. Moreover, there was no evidence of any significant predictor by demographic variable interactions when predicting the outcome variables (i.e. the effects of the predictors did not vary as a function of any of these demographic characteristics). Analyses were, therefore, performed on the complete sample. Other preliminary analyses revealed that none of the results at

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1Although underutilization of skills is better conceptualized as a work stressor than a work demand, for ease of exposition it was referred to as a work demand in the present research.
Table 2. Correlations among measures of work control, work demands, employee adjustment and work performance

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Task control (T1)</td>
<td>(.84)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Decision control (T1)</td>
<td>.50</td>
<td>(.76)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Scheduling control (T1)</td>
<td>.54</td>
<td>.45</td>
<td>(.80)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Role ambiguity (T1)</td>
<td>-.50</td>
<td>-.27</td>
<td>-.35</td>
<td>(.73)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Role conflict (T1)</td>
<td>-.31</td>
<td>-.02</td>
<td>-.36</td>
<td>.51</td>
<td>(.80)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Quantitative work overload (T1)</td>
<td>-.34</td>
<td>-.07</td>
<td>-.24</td>
<td>.14</td>
<td>.31</td>
<td>(.81)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Skill underutilization (T1)</td>
<td>-.35</td>
<td>-.28</td>
<td>-.12</td>
<td>.22</td>
<td>.10</td>
<td>-.10</td>
<td>(.74)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Job satisfaction (T1)</td>
<td>.50</td>
<td>.34</td>
<td>.23</td>
<td>-.41</td>
<td>-.32</td>
<td>-.06</td>
<td>-.63</td>
<td>(.89)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Job satisfaction (T2)</td>
<td>.43</td>
<td>.17</td>
<td>.10</td>
<td>-.28</td>
<td>-.11</td>
<td>-.05</td>
<td>-.64</td>
<td>.82</td>
<td>(.89)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Low depressive symptoms (T1)</td>
<td>.41</td>
<td>.29</td>
<td>.32</td>
<td>-.35</td>
<td>-.40</td>
<td>-.04</td>
<td>-.32</td>
<td>.65</td>
<td>.51</td>
<td>(.89)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Low depressive symptoms (T2)</td>
<td>.44</td>
<td>.28</td>
<td>.22</td>
<td>-.28</td>
<td>-.15</td>
<td>-.04</td>
<td>-.47</td>
<td>.54</td>
<td>.63</td>
<td>.64</td>
<td>(.87)</td>
<td></td>
</tr>
<tr>
<td>12. Work performance (T2)</td>
<td>-.16</td>
<td>.00</td>
<td>-.14</td>
<td>.07</td>
<td>.08</td>
<td>.16</td>
<td>-.24</td>
<td>.32</td>
<td>.21</td>
<td>.06</td>
<td>.06</td>
<td>(.93)</td>
</tr>
</tbody>
</table>

Notes: N=135 for Time 1 measures (critical value for r, p<.05, two-tailed = .17); N=87 for Time 2 measures (critical value for r, p<.05, two-tailed test = .21); N=62 for measure of work performance (critical value for r, p<.05, two-tailed test = .25). T1 = Time 1; T2 = Time 2 (six weeks after Time 1).
Time 1 changed when the Time 1 sample was reduced to only those participants who provided data at both Times 1 and 2.

Data analysis procedure

Two sets of hierarchical regression analyses were performed on each of the dependent variables (job satisfaction and low depressive symptoms at Times 1 and 2 and Time 2 work performance). The first set of analyses examined the main effects of work control and job demands. The second set of analyses tested Karasek’s (1979) demands–control model, which proposes that perceptions of work control moderate the effects of job demands on employee adjustment and work performance.

In the analyses predicting Time 2 (low) depressive symptoms, Time 1 scores on this variable were entered as a covariate in the first step of the hierarchical regressions. Because of the high correlation between the two measures of job satisfaction (r = .82), Time 1 job satisfaction was not controlled in the analyses predicting Time 2 job satisfaction. Thus, the prediction of Time 2 job satisfaction scores from the Time 1 predictor variables was similar to a cross-sectional analysis, although response consistency effects that occur as a consequence of occasion effects were at least partially controlled (see Zapf et al., 1996). It should be noted that control of Time 1 depressive symptoms in the analyses predicting Time 2 job satisfaction did not change any of the results reported in the present paper, thus the results cannot be attributed to the fact that both the predictors and the outcome measure tapped the tendency to experience negative distress and to evaluate one’s environment negatively (a tendency that is assessed by measures of distress; see Watson & Pennebaker, 1989).

Main effects of work control and job demands

As noted, hierarchical regression procedures were utilized to test for the main effects of job demands and work control on employee adjustment and work performance. The measures of task, decision and work scheduling control were entered in the first step of the analyses, and the measures of job demands were entered in the second step. This allowed for an examination of the extent to which job demands accounted for additional variance in the dependent variables, once the effects of the more enduring work control variables were controlled.

The results of the analyses predicting Time 1 job satisfaction and low depressive symptoms at Time 1 are presented in Table 3. The measures of work control accounted for 27 per cent of the variance in Time 1 job satisfaction (F(3,126) = 15.41, p < .001), and 18 per cent of the variance in Time 1 low depressive symptoms (F(3,126) = 9.19, p < .001). Entry of the measures of job demands into the second step of the regression equations accounted for an additional 27 per cent of the variance in Time 1 job satisfaction (F(7,122) = 17.33, p < .001) and an additional 14 per cent of variance in Time 1 low depressive symptoms (F(7,122) = 6.10, p < .001). When all the variables were in the equation,
Table 3. Hierarchical regression analyses predicting employee adjustment and work performance from measures of work control and work demands

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Low dep. symptoms (T1)</th>
<th>Job satisfaction (T1)</th>
<th>Low dep. symptoms (T2)</th>
<th>Job satisfaction (T2)</th>
<th>Work perform. (T2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task control</td>
<td>.16</td>
<td>.22*</td>
<td>.18</td>
<td>.30*</td>
<td>-.35</td>
</tr>
<tr>
<td>Decision control</td>
<td>.12</td>
<td>.10</td>
<td>-.05</td>
<td>-.13</td>
<td>.11</td>
</tr>
<tr>
<td>Scheduling control</td>
<td>.11</td>
<td>-.08</td>
<td>-.02</td>
<td>-.19</td>
<td>-.11</td>
</tr>
<tr>
<td>Skill underutilization</td>
<td>-.17*</td>
<td>-.49**</td>
<td>-.22*</td>
<td>-.57**</td>
<td>-.41*</td>
</tr>
<tr>
<td>Work overload</td>
<td>.15</td>
<td>.03</td>
<td>.05</td>
<td>.01</td>
<td>-.03</td>
</tr>
<tr>
<td>Role ambiguity</td>
<td>.00</td>
<td>-.07</td>
<td>-.04</td>
<td>-.14</td>
<td>.01</td>
</tr>
<tr>
<td>Role conflict</td>
<td>-.35**</td>
<td>-.19*</td>
<td>.12</td>
<td>.08</td>
<td>.00</td>
</tr>
<tr>
<td>$R^2$</td>
<td>.32</td>
<td>.53</td>
<td>.50</td>
<td>.21</td>
<td>.05</td>
</tr>
<tr>
<td>$R$</td>
<td>.56</td>
<td>.73</td>
<td>.72</td>
<td>.46</td>
<td>.22</td>
</tr>
</tbody>
</table>

*p<.05, **p<.01.
Note: Effects of predictor variables are presented as the standardized regression coefficients (betas) computed on the final step of each analysis. In analysis predicting Time 2 (low) depressive symptoms, Time 1 (low) depressive symptoms entered on Step 1 of the analysis, $\beta = .53$, at final step of analysis. T1=Time 1, T2=Time 2 (six weeks after Time 1).

role conflict and underutilization of skills were significant negative predictors of both job satisfaction and low depressive symptoms, whereas task control was a significant positive predictor of concurrent job satisfaction.

The results revealed that, after control of the effects of Time 1 (low) depressive symptoms, the work control variables (assessed at Time 1) did not account significantly for any additional variance in Time 2 (low) depressive symptoms, but they did in Time 2 job satisfaction ($R^2_{\text{change}} = .21$, $F(3,76) = 6.99$, $p < .001$). The Time 1 measures of job demands accounted for an additional 27 per cent of variance in the delayed measure of job satisfaction ($F(4,72) = 9.63$, $p < .001$), and, although not statistically significant, an additional 6 per cent in the delayed measure of low depressive symptoms ($F(4,70) = 2.14$, $p < .08$). When all the variables were in the equation (see Table 3), underutilization of skills was a significant negative predictor of both job satisfaction and low depressive symptoms, whereas task control was a significant positive predictor of Time 2 job satisfaction.

The measures of work control failed to account for a significant proportion of variance in supervisor ratings of work performance, as did the subsequent entry of the job demand variables. When all the variables were in the equation, there was, however, evidence that participants’ perception that their skills were being underutilized (at Time 1) was predictive of poor Time 2 supervisor ratings of work performance.

**Interactive effects of work control and job demands**

To test the hypothesized interactions between work control and job demands, four sets of multiplicative terms were computed, one for each of the job demand
variables (e.g. role conflict \times task control, role conflict \times work scheduling control, role conflict \times decision control). For each outcome variable, separate analyses were performed testing the significance of each of the sets of multiplicative terms. The main effect terms for demands and work control were entered into the equation first, followed by the respective sets of interaction terms (in the analyses predicting Time 2 low depressive symptoms, the Time 1 score on this variable was entered prior to the main effect terms). To avoid multicollinearity between the predictors and the interaction terms, the multiplicative functions were computed as the product of the standardized scores on the component variables (see Finney, Mitchell, Cronkite & Moos, 1984).

The analyses of the ratings of work performance (assessed at Time 2) provided no support for the buffering hypothesis. None of the demands by control interactions were significant. There were, however, significant demands by control interactions on the other outcome measures. For Time 1 (low) depressive symptoms, there was a significant work overload by task control interaction ($\beta = .30, p < .001$). There was also a significant work overload by task control interaction on Time 2 (low) depressive symptoms ($\beta = .30, p < .01$). Entry of the task control and work overload product term accounted for 8 per cent ($F(8,121) = 15.45, p < .001$) and 7 per cent ($F(8,71) = 8.32, p < .01$) of additional variance (after the main effects and, in the case of Time 2 depression, the Time 1 depression scores) in levels of Time 1 and Time 2 low depressive symptoms, respectively. The interaction between work overload by task control on Time 2 (low) depressive symptoms is presented graphically in Fig. 1; a similar pattern of results was evident when the comparable interaction on Time 1 (low) depressive symptoms was graphed. As shown in Fig. 1, the negative relationship between work overload and low depressive symptoms was most marked for participants who
perceived low task control—for those who perceived high task control, work overload and low depressive symptoms were positively related.

The analyses of Time 1 job satisfaction scores revealed a significant task control by role ambiguity interaction ($\beta = .14, p<.05$). This interaction was also evident when the Time 2 job satisfaction scores were analysed ($\beta = .28, p<.001$). The interaction effects explained an additional 2 per cent ($F(6,122) = 4.01, p<.05$), and 7 per cent ($F(8,70) = 10.93, p<.001$), of variance in Time 1 and Time 2 job satisfaction, respectively. As shown in Fig. 2, the task control by role ambiguity interaction on Time 2 job satisfaction interaction was consistent with the stress-buffering model (similar results were evident when the Time 1 interaction was graphed). The negative relationship between role ambiguity and job satisfaction was more marked for employees who perceived low levels of task control than for those who perceived high task control.

In addition to the significant task control by role ambiguity interaction on Time 2 job satisfaction, there was evidence that decision control moderated the effects of underutilization of skills ($\beta = .22, p<.01$) on Time 2 job satisfaction. The interaction explained an additional 4 per cent of the variance in Time 2 job satisfaction. Graphical representation of the decision control by underutilization of skill interaction revealed that it was not consistent with the buffering model. The negative relationship between underutilization of skills and Time 2 job satisfaction was more marked for employees who reported high rather than low decision control.

Subsequent analyses revealed much weaker evidence of demand by control interactions when a global measure of control—that is, computed as the sum of all the control items—was used in the analysis. Only two of the five interactions (involving work overload on Time 1 and 2 depressive symptoms) discussed above were significant, and these were considerably weaker than those observed when the specific measure of task control was used in the analyses.
Work control and employee adjustment

Discussion

The aim of the present study was to examine further the relationships among job demands, work control and both employee adjustment and work performance. The research assessed specific aspects of work control (task, decision and scheduling control). There was some support for the prediction that the effects of job demands would be buffered by task control, but not by the more peripheral aspects of work control. There was also consistent evidence of significant main effects of task control on job satisfaction.

As noted, the study provided some support for the proposal that stronger support for Karasek's (1979) demands–control model would be evident on task-relevant aspects of work control than on peripheral aspects of control. As predicted, each of the significant buffering effects involved task control. Moreover, when a composite measure of work control was used—responses to each item summed, irrespective of focus of control—only very weak support for the demands–control model was obtained. Task control buffered the negative relationship between role ambiguity and job satisfaction (at Times 1 and 2) and between work overload and (low) depressive symptomatology (at Times 1 and 2). Task control is likely to be particularly relevant to a person with ambiguous role demands—such stress should be responsive to the extent to which an employee has the capacity to control how, and in what sequence, task requests are handled. The fact that task control buffered the negative relationship between work overload and low depressive symptoms at both Times 1 and 2 is also interpretable in light of the stress-matching hypothesis, given that a person who has too much to do is likely to be able to handle this stress if the job has some flexibility in terms of its allocation of time and energy to tasks.

The present study extends the research conducted by Wall et al. (1996) by showing that focused measures of work control are more likely to show buffering effects if they assess task control rather than more peripheral aspects of work control. These results provide support for Frese's (1989) action sequence model of work control and for Cohen & Wills' (1985) stress-matching hypothesis (see also Breaugh, 1989). Clearly, the present results suggest that research testing Karasek's (1979) demands–control model requires not only the use of focused measures of work control (see Wall et al., 1996) but also attention to task-relevant aspects of control. In the latter respect, the present results suggest that future research might benefit from examining the match between specific work demands and specific aspects of task control. Nevertheless, it is acknowledged that the present results supporting the prediction that task control would be more likely to buffer work demands than peripheral types of work control need to be interpreted with some caution, given that not all the interactions involving task control were significant.

An interesting aspect of the significant (buffering effect) interactions concerns the fact that there was evidence that, under high levels of task control, work overload had a positive, rather than a negative, relationship with employee adjustment (Time 1 and Time 2 low depressive symptoms). Clearly, this result has to be replicated; however, it is noteworthy, to the extent that it is consistent with
Karasek's (1979) view that, under high levels of work control, job demands may enhance levels of well-being. Also noteworthy is the significant decision control by underutilization of skills interaction on Time 2 job satisfaction—this interaction did not reflect a buffering effect. In positions where people feel that they have high levels of decision control, the perception that one's skills are being underutilized is likely to relate particularly strongly to job dissatisfaction, possibly because of the expectation that jobs allowing control over decision making will be challenging, and hence more likely to utilize one's skills.

Consistent with the results of the interactive analyses, task control was the only aspect of work control to have significant main effects on employee adjustment. This pattern of results is consistent with the action sequence model of work control proposed by Frese (1989). As noted previously, Frese argued that the control domains proximal to an employee's daily work activities are likely to have the strongest impact on adjustment. It can be suggested that the relationships between employee adjustment and both scheduling and decision control were weak in comparison to the relationships involving task control, because the former sources of control are not directly related to attaining task-related goals. Frese's action sequence proposal clearly deserves attention in future research; however, the present results do need to be replicated in longer term longitudinal studies, given that levels of decision and work scheduling control may have delayed effects (beyond the six-week span of the present study) on adjustment. Moreover, such research should assess a wider range of outcome variables than assessed in the present study. It is possible, for instance, that scheduling control may be predictive of employees' levels of life satisfaction. The latter effect is likely to be particularly marked for employees with other demands on their time (for example, child care and study commitments).

It is noteworthy that the main and interactive effects of work control on levels of work performance were not significant. As noted previously, Fox et al. (1993) examined the effects of work control on work performance, and also failed to find any evidence of a work control–performance link. These findings may be attributed to the complex nature of work performance (Latham, 1986). In the present study, the fact that the work performance ratings were obtained on only a subsample of the participants (who perceived low levels of job demands and high levels of work control, and were rated, in general, as performing well in their jobs) could have also contributed to the weak findings linking work control to work performance. Future research on the effects of job demands and control on work performance should seek to obtain work performance ratings on a larger and more representative sample of employees. Such research would also benefit from using a range of other objective measures of work performance (e.g., measures of work output).

In relation to the main effects of job demands, there was strong evidence that underutilization of skills was related negatively to employee adjustment. This support was evident for both immediate and delayed levels of adjustment, and for ratings of work performance. Such results suggest that the perception that one's skills are being underutilized has implications not only for employees' self-report levels of adjustment, but also for the quality of their work performance. As a result, the effects of underutilization of skills are likely to be costly for both the individual
and the organization. Apart from skill underutilization, the only evidence of main effects of work demands involved role conflict. High levels of role conflict were related negatively to Time 1 levels of both low depressive symptoms and job satisfaction. However, these effects did not appear to endure across time, suggesting that the link between role conflict and Time 1 adjustment was due to the influence of occasion factors (such as mood), which may inflate correlations between predictors and outcomes when the two sets of variables are assessed contemporaneously. Inspection of the correlations between the measures of perceived role stress—role conflict and role ambiguity—and the Time 1 and Time 2 measures of employee adjustment (see Table 1) shows that the correlations were substantially higher at Time 1 than at Time 2, which is indicative of the biasing effect of method variance.

Theoretically, the results of the present study suggest that specific dimensions of control should be assessed in future research. The results provide some support for the proposal that the extent to which work control buffers the effects of demands experienced in the workplace may be dependent on the match between the type of control and demand under consideration. The stress-matching hypothesis has received some support in other research on work stress (Terry et al., 1993), and deserves further attention in future research. The present results also support Frese's (1989) contention that control dimensions central to daily work activities are likely to have stronger effects than dimensions of control more peripheral to the employee's task and work functions.

The present study incorporated a number of methodological improvements on previous research, including the use of a longitudinal-type research design, and the use of both self-report and external assessments of outcome variables. The importance of using a design where the biasing effects of occasion effects—such as mood—can be at least partially controlled was demonstrated by the fact that subjective ratings of role conflict emerged as a significant predictor of concurrent but not delayed adjustment. The present study, however, was not without limitations. First, future research should avoid contemporaneous measurements of independent variables (that is, job demands and work control). Additional waves of data collection (beyond the two obtained in the present study) would allow consideration of the interplay among work control, demands and adjustment across time. Second, to constitute a true longitudinal design, future research should obtain measures of both the predictors and the outcome variables at both points in time. Third, researchers investigating work performance should make every effort to obtain ratings of work performance from the total sample. Also, as noted, attempts should be made to assess other aspects of work performance.

The present findings have implications for the management of administrative employees, although such recommendations should be viewed as only speculative. The findings suggest that augmenting task control should relate positively to employees' job satisfaction and well-being. As such, the present study provides some evidence in support of the beneficial impact of empowerment—that is, providing employees with opportunities to have greater control and involvement in task processes and activities. In terms of job design, the results suggest that interventions which focus on matching specific aspects of work control with the
needs of the person experiencing excessive job demands may be more beneficial than generic stress-intervention programmes.

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References


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