

The Relative Merits of Lean, Enriched, and Empowered Offices: An Experimental Examination of the Impact of Workspace Management Strategies on Well-Being and Productivity

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Principles of lean management encourage managers to exert tight control over office space and the people within it. Alternative, design-led approaches promote the value of offices that are enriched, particularly by plants and art. On the basis of a social identity perspective, we argue that both of these approaches may compromise organizational outcomes by disempowering workers and failing to give them input into the design of their office space. This hypothesis is tested in two experiments ($n_s = 112, 47$). The first was conducted in an interior office in a psychology department, the second in a commercial city office. In 4 independent conditions we examine the impact of space management strategies in which the office is either (a) lean, (b) decorated by the experimenter (with plants and art), (c) self-decorated, or (d) self-decorated and then redecorated by the experimenter. We examine the impact of these conditions on organizational identification, well-being, and various forms of productivity (attention to detail, information processing, information management, and organizational citizenship). In both experiments, superior outcomes are observed when offices are decorated rather than lean. However, further improvements in well-being and productivity are observed when workers have input into office decoration. Moreover, these effects are attenuated if this input is overridden. Implications for theory and practice are discussed. In particular, findings point to the need to question assumptions about the merits of lean office space management that have been dominant throughout the last century.

Keywords: identity, space, office, productivity, well-being

Studies of psychological well-being at work were initiated at the turn of the last century (e.g., Mayo, 1933; Mead, 1913; Myers, 1925; Viteles, 1923; Wells, 1912) and continue to this day (e.g., Hansson, Vingard, Arnetz, & Anderzen, 2008; Messer & White, 2006; Mills, Tomkins, & Schlangen, 2007). However, the management of modern office space is typically influenced far less by psychologists than by architects, interior designers, facility managers, corporate real estate agents, and popular management theorists (Cohen, 2007; Stegmeier, 2008). Here the emphasis is generally on corporate return rather than psychological welfare (Bain & Taylor, 2000; Handy, 1990). Indeed it has been observed that when it comes to office management more generally, psychological factors tend to be considered only as an adjunct to business interests rather than exerting any influence over them (Furnham, 1990; Peters & Waterman, 2004; Statt, 2004).

In this paper we report research that explores some of the key concepts at the heart of workspace management. In this, we draw on insights from the social identity approach to organizational life,

as previously applied to the study of office space (e.g., Ashforth & Mael, 1989; Baldry, Bain, & Taylor, 1998; Haslam, 2004; Knight & Haslam, in press; Millward, Haslam, & Postmes, 2007; Postmes, Tanis, & de Wit, 2001). The key issues that we investigated are whether empowerment within office space impacts on (a) well-being (in particular, feelings of psychological comfort, organizational identification, physical comfort, and job satisfaction) and (b) productivity.

The Lean Approach: The Case for Managerial Control of Office Space

Key recommendations of the Taylorist approach to office space management (e.g., Pruijt, 2003; Tapping & Dunn, 2006) include (a) the removal from the workspace of everything except the materials required to do the job at hand, (b) tight managerial control of the workspace, and (c) standardization of managerial practice and workspace design (Boyer, 2003; Duffy, 1997; C. Harris & Harris, 2006). These ideas have been particularly influential in work that has promoted the lean office as the key to efficiency and productivity (Hirano, 1996; Hobson, 2006; Louis, 2007; Tapping & Shaker, 2002; Zalesny & Farace, 1987). This approach is exemplified by Bibby (1996) in his comparison of two adjacent offices in a modern bank:

The contrast between the old and new in office life is currently well reflected here. Part of one floor is temporarily being occupied by staff from the [old] operation: here there is the usual clutter of office paperwork to be seen, the pinned-up postcards and personal photo-

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graphs beside the desks. By contrast, the desks for [new] staff only a few feet away are spick-and-span, bare of all paper and, in line with company policy, free of any personal belongings. (para. 10)

The Taylorist literature sees lean, open space as efficient for a number of reasons. In the first instance, large, uncluttered space can accommodate more people and so lends itself to economies of scale (Durmusoglu & Kulak, 2008; Kelliher & Anderson, 2008). Desks (undecorated or personalized) can also easily be reconfigured for use by other workers (Hobson, 2006; Thompson, 2000). As a result, space occupancy can be centrally managed with minimal “disruptive” interference from workers (Keyte & Locher, 2004; Titman, 1991). Indeed, many businesses now adopt a clean or lean office policy because they have more employees than they have spaces at which they can work. These lean desks are either taken on a first-come-first-served basis (hot desking) or can be booked in advance (hotelling; Millward et al., 2007; Stegmeier, 2008). In the lean office, employee involvement in the running of the working space is purposefully de-emphasized (Wood & Wall, 2007; Zeisel, 2006). Low-status workers follow the system planned for them by management (George, Maxey, Rowlands, & Upton, 2004; Skinner, 2005), performing deskilled, repetitive tasks (J. A. H. Becker & O’Hair, 2007), reflecting Taylor’s injunction that “all possible brainwork should be removed from the shop and centered in the planning or laying out department” (Braverman, 1974, p. 447).

These low autonomy environments echo the demand—control model (Karasek, 1979), which argues that a combination of low-decision latitudes and high pressure job roles (e.g., as found in a classic telesales environment; Baldry et al., 1998), lead not just to psychologically uncomfortable working conditions and depression (Seligman, 1975; Sundbom, 1971), but also to greater incidence of cardio-vascular disease. Indeed since the early 1960s, research has pointed to the negative association between social class and coronary heart disease (Theorell & Karasek, 1996), despite the persistent belief that those at the top of the tree are under the most pressure (Martin, 1997; Peters, 1989).

The methodology based on low-worker autonomy has proved attractive to businesses since Taylor and his contemporaries began their work in the 1880s (Becker & Steele, 1995; Kanigel, 1999). Yet despite the enormous body of literature spawned (e.g., Bibby, 1996; Brill, Margulis, Konar, & BOSTI, 1984; George et al., 2004; Hirano, 1996; Hobson, 2006; Hyer & Wemmerlov, 2002; Louis, 2007; Pruijt, 2003) there is a surprising lack of empirical evidence to support the claims for greater efficiency. There would appear to be two main reasons for this oversight. First, the assumption that Taylorist methodology “just works” (Pyzdek, 2003, p. 664) and, second, the heavy reliance (particularly in fields of design, architecture, and space management) on evidence gleaned from case studies (e.g., Louis, 2007; Tapping & Shuker, 2002; Taylor, 1911).

The Green Approach: The Case for Design-Led Office Space

Space planning and design is frequently seen as an expression of managerial intent (Marmot & Ely, 2000), in which a building’s aesthetics are seen as an opportunity to reflect and project a particular corporate ethos and image (Myerson & Ross, 2003; see also Cornelissen, Haslam, & Balmer, 2007). We have seen how

this space is often deliberately stark (or lean; C. Harris & Harris, 2006; Hobson, 2006), but some organizations choose to avoid Taylorist prescriptions for a lean office and instead enrich the workspace by investing in “environmental comfort” (Vischer, 2005, p. 102). This strategy is typically informed by a belief that such enrichment may promote health. In particular, aesthetically uplifting art—particularly images from nature—is believed to reduce stress and anger in a working environment (Kweon, Ulrich, Walker, & Tassinari, 2008). The presence of living plants in a workspace is also thought to have the additional benefit of cleaning, or “conditioning” the air, thereby helping workers feel happier and healthier (Bringslimark, Hartig, & Patil, 2007; Dravigne, Waliczek, Lineberger, & Zajicek, 2008).

In line with these ideas, psychological literature has suggested that relative to lean offices, enriched offices are psychologically advantageous (Elsbach, 2003; Handy, 1990; Haslam & Knight, 2006; Myerson, 2007; Thompson, 2000; Vischer, 2005; Zelinsky, 2006). More specifically, it leads to the hypothesis that enriching workers’ office space with pictures and plants is likely to increase organizational identification (Hypothesis 1a; H1a), well-being (specifically, sense of psychological comfort, job satisfaction, and physical comfort; H2b), and productivity (H2c). In line with previous work (see Knight & Haslam, *in press*), we would also anticipate that (as with H2 and H3 below) organizational identification might also mediate the relationship between the experimental condition and other dependent variables.

The Social Identity Approach to Space Use

Yet despite being more sensitive to employees’ needs than lean approaches, it remains true that even the most benign, design-focused space management strategies still tend to assume that it is management’s prerogative to retain control of the workspace (Laing, Duffy, Jaunzens, & Willis, 1998; Peters & Waterman, 2004). This assumption is one that is increasingly being called into question—not least by designers themselves (Commission for Architecture and the Built Environment, 2004; Froggett, 2001; Zeisel, 2006). In particular, some psychologists have argued that employees should be encouraged to decorate their immediate space with meaningful artifacts to project their identity onto their own environment and to give some sense of permanency, control, and privacy (Baldry, 1997; Hall, 1968; Vischer, 2005). It has been noted that approximately 70% of American workers personalize their workspaces, but that managers and employees with enclosed offices decorate more than others (Wells & Thelen, 2002). Where open-plan offices are common, personalization of low-status working space is both infrequent and discouraged (Laing et al., 1998; Tapping & Shuker, 2002). Accordingly, it would seem that the decorative style of one’s working space is primarily predicted by status (Elsbach & Bechky, 2007; Wells & Thelen, 2002).

At a group level it is argued that collectively, teams should be free to express their own identity within their workspace, differentiating themselves from other groups without necessarily compromising identification with the organization as a whole (Abrams, Ando, & Hinkle, 1998; Peters & Waterman, 2004). In particular, this recommendation is informed by a social identity approach to organizational life (after Tajfel & Turner, 1979; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987; Turner, Oakes, Haslam, & McGarty, 1994), which suggests that employee recognition and

involvement have the capacity to increase motivation and engagement by increasing organizational identification (i.e., individuals' willingness to define themselves as members of a particular organizational unit; Ashforth & Mael, 1989; Haslam, Postmes, & Ellemers, 2003; Tyler & Blader, 2000). In line with this view, previous research has shown that higher levels of organizational identification are associated with an increased sense of job satisfaction (Kreiner & Ashforth, 2004; van Dick, 2004) and also with enhanced group performance (Worchel, Rothgerber, Day, Hart, & Butemeyer, 1998). Along these lines, a social identity approach to space management suggests that managers who involve employees in decision making are also likely to build a sense of shared identity that enhances the motivation and commitment of junior colleagues (Ashforth & Mael, 1989; Cornelissen et al., 2007; Ellemers, De Gilder, & Haslam, 2004). This view is also supported by Riketta's (2004) observation of a strong correlation between shared organizational identification and employees' willingness to engage in behavior that is beneficial to both the organization and job involvement (see also Organ, 1988; van Knippenberg, 2000).

Where decision making is not shared, management is likely to foster less intrinsic motivation and compliance may be contingent on higher levels of control and surveillance (Ellemers, van Rijswijk, Bruins, & de Gilder, 1998; McCabe & Black, 1997; Turner, 1991). This in turn may lead to lower morale (Ellemers et al., 2004; Oldham, Hackman, & Pearce, 1976), less cooperative behavior (Baldry et al., 1998; Organ, 1988; Paille, 2008; Tyler & Blader, 2000) and lower levels of productivity (Vischer, 2005). In this way, it may also compromise a company's bottom line (Ellemers et al., 2004; Hackman & Oldham, 1980; Lawler, 1986). A potential exception to this rule was highlighted by Ullrich, Christ, and van Dick (2009) who found that having a leader who is representative of the group can offset the effects of group members' lack of voice—particularly if those members identify highly with the organizational unit in question. However, these researchers also found that when leaders were not representative of group members, lack of voice was again associated with negative organizational outcomes.

On the basis of these approaches, we therefore hypothesize that empowering workers to manage and have input into the design of their own workspace—thereby allowing them to project their own identity onto it—will enhance organizational identification (H2a), well-being (H2b), and productivity (H2c).

Reestablishing Managerial Control

Historically, management has not empowered low-status workers (Hobsbawm, 1969; McCabe & Black, 1997). Indeed, the management literature generally counsels that managers should assert (or reassert) control of the workspace (Pruijt, 2003; Taylor, 1911). Giving autonomy to workers, only to remove it because management prefers its own options to those chosen by workers is seen by some literature as a legitimate option (Pruijt, 2003; Tapping & Shuker, 2002). However, the social identity approach outlined above would suggest that reintroducing managerial control into areas where workers are used to more autonomous conditions is likely to compromise organizational identification and thereby undermine productivity and well-being (Peters, 1989; Peters & Waterman, 2004). Along these lines, disempowerment within the workspace (Frederickson, 1989; George et al., 2004; Titman,

1991) has been found to engender a sense of alienation and discomfort (Baldry et al., 1998; Handy, 1990) and to reduce job satisfaction (Ashforth & Mael, 1989; Cohen, 2007). Meanwhile, research in both environmental design and psychology points to a link between a reduction in workplace autonomy and greater levels of stress-related complaint (Bringslimark et al., 2007; Danielsson & Bodin (2008); Scheepers & Ellemers, 2005). Similarly, a meta-analysis by Humphrey, Nahrgang, and Morgeson (2007) suggests that an integrated approach that accounts for social needs at work increases motivation and satisfaction. On the basis of these arguments (Keyte & Locher, 2004; Louis, 2007; Pruijt, 2003; Wood & Wall, 2007), we therefore predict that disempowering workers by overriding their input into workspace design will compromise organizational identification (H3a), well-being (H3b), and productivity (H3c) relative to an enriched or an empowered office environment.

The Present Research

To test the above hypotheses we conducted two experiments in which space management was manipulated across four independent conditions. In these, the lean condition is informed by a neo-Taylorist perspective, in which minimalist office space is intended to focus employees' attention solely on the work at hand (in particular through the imposition of a clean desk policy; Bibby, 1996; Fredrickson, 1989; George et al., 2004). The second, enriched condition, instantiates ideas from the design literature in which workers fulfill their job function in an office that incorporates art and plants, but where they have no input into their deployment (e.g., Duffy, 1997; Greenhalgh, 2002; Myerson, 2007). A third empowered condition is informed by social identity principles and allows participants to design their own office environment using a selection of the same art and plants as in the enriched condition but thereby allowing them to realize something of their own identity within their working space (De Croon, Sluiter, Kuijter, & Frings-Dresen, 2005; Elsbach, 2003; Elsbach & Bechky, 2007). Finally, in a disempowered space, participants' workspace design is overridden by the experimenter, so that an initial sense of autonomy within the workspace is taken away (B. E. Becker & Huselid, 1998; Wood & Wall, 2007).

Experiment 1

In our first experiment, participants were drawn from a wide cross-section of society and were recruited to take part in a study that was conducted in a university psychology department. Here participants were randomly assigned to one of the four experimental conditions described above to gauge the impact of various space management strategies on organizational identification, well-being, and productivity with reference to our three main hypotheses.

Method

Participants and design. There were 112 people (40 men, 72 women) ranging in age from 18 to 78 years ($M = 37.55$, $SD = 15.05$) who took part in the study. Of the sample, 31% described themselves as students, 61% as being in paid employment, and 8% as retired. Potential participants were recruited from a range of

sources, but most were drawn from a panel of members of the general community who had indicated a willingness to participate in psychological research. Participation was voluntary and unpaid, although where appropriate, traveling expenses were reimbursed.

Individual participants were randomly assigned to one of four conditions (lean, enriched, empowered, or disempowered). The main dependent variables were psychological comfort, organizational identification, job satisfaction, physical comfort, and productivity.

Materials and procedure. The laboratory "office" was a small interior office in a psychology department, measuring 3.5 m \times 2 m. The office had no windows or natural light. Participants arrived individually and it was explained to them that they would take part in an experiment examining performance on analytical, processing, and intellectual tasks. Participants gave their informed consent and confidentiality and anonymity were assured.

At every trial, the experimenter (Craig Knight) explained that he needed to confirm a room booking with a secretary, thus leaving the participant alone in the office space for 5 min to take in the ambient environment. The office contained a rectangular desk (1,600 mm \times 800 mm) and a comfortable office chair on castors. The room was lit by diffused, overhead fluorescent tubes, the floor was carpeted and an air conditioning system kept the room at a constant temperature of 21 °C.

In the lean condition, no further additions to the room were made. In the enriched condition, participants were shown into a space where six potted plants (each approximately 350 mm high) had already been placed toward the edge of the desk surface, so as not to impinge on the participants' working area. Six pictures (800 mm \times 800 mm) hung around the walls. The pictures were all photographs of plants enlarged onto canvas.

In the empowered condition, participants entered an office where the pictures and plants were placed randomly around the room. They were told that they could decorate the space to their taste using as many, or as few, of the plants and pictures provided as they wished. They could therefore work in a lean or very enriched space or at a point anywhere along that continuum. The disempowered condition involved the same initial procedure as the empowered condition. However, when the experimenter reentered the office, he looked at the chosen decorations, briefly thanked the participant and then completely rearranged the pictures and plants—thereby overriding the participant's choices. If challenged, participants were told that their designs were not in line with those required by the experiment. No further information was given until the final debrief.

Measures.

Card-sorting task. Once the experimenter returned to the office (or as soon as he had rearranged the pictures and plants in the disempowered condition), he asked the participant to perform a card-sorting task. Three packs of playing cards had been shuffled together and the participant was required to sort them back into the three constituent packs and to sort each pack into its four suits (hearts, clubs, diamonds, and spades). These suits then had to be ordered from ace to king and placed in discreet piles, leaving 12 piles altogether. The key performance measures were the time taken to complete this task and the number of errors made.

Vigilance task. After this, participants performed a vigilance task. For this purpose they were given an A4 photocopy of the same magazine article and asked to cross out and count all the

lower case letters "b" that were on the page. The time taken to complete the task was measured as well as the number of errors (missed "b"s).

In both cases the participants were told that they needed to perform the tasks as quickly and as accurately as possible.

Questionnaire. After they had finished both tasks, participants completed a 74-item questionnaire, in which items measuring different constructs were presented on five different pages. Most of these required a response on a 7-point scale ranging from 1 (*completely disagree*) to 7 (*completely agree*). The penultimate page obtained participants' demographic information. The first items constituted manipulation checks in which participants were asked to consider the managerial control of space (Tapping & Shaker, 2002; Taylor, 1911). There were three, 3-item scales that examined (a) involvement ($\alpha = .87$; e.g., "I felt engaged in what I was doing in the office"; after Lodahl & Kejner, 1965); (b) autonomy ($\alpha = .82$; e.g., "During this experiment I had control over my environment"; after Breugh, 1989) and (c) quality of workspace ($\alpha = .87$; e.g., "This was a pleasant room in which to work"; after Ferguson & Weisman, 1986).

The scales that followed were all based on previous studies of space management and organizational identification at work (Knight & Haslam, in press). Psychological comfort was measured using a 5-item scale ($\alpha = .87$; e.g., "I felt at ease during the experiment"; after Vischer, 2005). Organizational identification was measured by three items that assessed participants' identification with the university in which the study was conducted ($\alpha = .70$; e.g., "I identify with the university"; after Doosje, Ellemers, & Spears, 1995). Employees' positive experience of work was assessed using two scales (a) job satisfaction (5 items; $\alpha = .68$; e.g., "I enjoyed the "finding the letters" task"; after Haslam, O'Brien, Jetten, Vormedal, & Penna., 2005) and (b) physical comfort (5 items; $\alpha = .75$; e.g., "I felt too hot in the room"; after Spector et al., 2005). After completing the questionnaire, participants were debriefed and thanked for their participation.

Results

Analytic strategy. Questionnaire and performance data were analyzed by means of analysis of variance (ANOVA) with office condition (lean, enriched, empowered, disempowered) as a between-participants factor. Interitem correlations are shown in Table 1; means and effect sizes (η^2) are presented in Tables 2 and 3. Effect sizes indicate how much of the variance in the DV (dependent variable) can be accounted for by each IV (independent variable). Here an eta-square of .07 is considered moderate, .14 large (Sheshkin, 2004).

Manipulation checks. ANOVAs revealed effects for involvement, autonomy and quality of workspace, $F(3, 108) = 44.92, 38.21, 20.23$, respectively, all $ps < .001$, $\eta^2s = .56, .51, .36$, respectively. Orthogonal planned contrasts showed that (a) participants in the lean condition felt less involved, less autonomous, and thought they were in a poorer quality space than participants in other conditions; (b) that participants in the enriched office felt less involved and less autonomous than participants in the empowered condition; and (c) that participants in the disempowered condition felt less involved, less autonomous, and thought they were in a poorer quality space

Table 1
Experiment 1: Bivariate Correlations

Dependent variable	1	2	3	4	5	6	7
1. Involvement	—	.16	.65**	.46**	.08	.41**	.44**
2. Autonomy		—	.01	.02	.12	.06	.07
3. Quality of workspace			—	.75**	.04	.39**	.57**
4. Psychological comfort				—	.14	.40**	.70**
5. Organizational identification					—	.30**	.15
6. Job satisfaction						—	.35**
7. Physical comfort							—

** $p < .01$.

than participants in the enriched and empowered conditions. Relevant statistics are presented in Table 2.

Organizational identification. Analysis revealed a main effect for organizational identification, $F(3, 108) = 2.87, p = .04, \eta^2 = .07$. However, orthogonal contrasts only provided support for H3a in showing that participants in the disempowered condition identified less with the organization than participants in enriched and empowered conditions. Relevant statistics are presented in Table 2.

Well-being. Analysis revealed effects for psychological comfort, job satisfaction, and physical comfort, $F_s(3, 108) = 21.15, 5.55, 10.03$, respectively, $p_s = .001, .001, .001$, respectively, $\eta^2_s = .37, .13, .22$, respectively. Consistent with H1b, orthogonal contrasts showed that participants in the lean condition felt less psychologically comfortable, reported less job satisfaction, and expressed lower feelings of physical comfort than participants in other conditions. Consistent with H2b, orthogonal contrasts showed that participants in the empowered condition felt more psychologically comfortable and reported greater job satisfaction than participants in the enriched condition. Consistent with H3b, orthogonal contrasts showed that participants in the disempowered condition felt less psychologically comfortable and reported lower feelings of physical comfort than

participants in the enriched and empowered conditions. Again, relevant statistics are presented in Table 2.

Productivity. Analysis revealed effects for time taken to complete the card-sorting and the vigilance tasks, $F_s(3, 108) = 10.07, 4.44$, respectively, both $p_s < .01, \eta^2_s = .22, .11$, respectively. However, there were no effects for the number of errors made on either task, $F_s(3, 108) = 1.67, 0.91, p_s = .18, .44, \eta^2_s = .04, .02$, respectively. Consistent with H1c, orthogonal contrasts showed that participants in the lean condition took longer to complete both timed tasks than participants in other conditions. Consistent with H2c, orthogonal contrasts showed that participants in the empowered condition took less time to complete the card-sorting task than participants in the enriched condition. Consistent with H3c, orthogonal contrasts showed that participants in the disempowered condition took more time to complete the vigilance task than those in enriched and empowered conditions. Relevant statistics are presented in Table 3.

Discussion

This experiment provided support for our three core hypotheses. Consistent with H1, relative to the lean condition, participants in

Table 2
Experiment 1: Scale Properties, Means, and Effects for Measures of Participants' Subjective Experience

Dependent variable	Condition ($n = 112$)				Effects		Contrasts (t values)		
	Lean	Enriched	Empowered	Disempowered	$F(3, 108)$	Effect size (full η^2)	LvR, P, D, H1 ^a	RvP, H2 ^a	DvR, P, H3 ^a
Involvement ^b	2.56	3.21	5.77	3.18	44.92**	.56	6.08**	8.50**	5.04**
SD	1.06	1.34	0.91	1.15					
Autonomy ^b	2.90	3.77	5.93	3.95	38.21**	.51	6.90**	7.37**	3.55**
SD	1.20	1.31	0.85	0.96					
Quality of workspace ^b	3.32	5.39	5.49	4.57	20.23**	.36	7.10**	0.32	3.18**
SD	1.12	1.09	1.02	1.06					
Psychological comfort ^b	4.01	4.74	5.72	4.24	21.15**	.37	4.64**	4.22**	4.19**
SD	1.11	0.99	1.02	1.06					
Organizational identification ^b	4.60	5.25	4.64	4.33	2.87*	.07	0.56	1.88	2.17*
SD	1.19	1.13	1.14	1.37					
Job satisfaction ^b	4.82	5.26	5.71	5.31	5.55**	.13	3.39**	2.08*	0.91
SD	0.82	0.93	0.78	0.74					
Physical comfort ^b	4.56	5.49	5.74	4.59	10.03**	.22	3.19**	0.92	4.37**
SD	1.29	0.88	0.96	0.90					

Note. L = lean; R = enriched; P = empowered; D = disempowered; H1 = Hypothesis 1, (L < R, P, D); H2 = Hypothesis 2, (D < R); H3 = Hypothesis 3, (D < R, P, H).

^a Means relate to 7-point scales (1 [completely disagree]–7 [completely agree]). ^b Contrast related to relevant hypotheses.

* $p < .05$. ** $p < .01$.

Table 3
Experiment 1: Means and Effects for Performance Measures

Dependent variable	Condition (<i>n</i> = 112)				Effects		Contrasts (<i>t</i> values)		
	Lean	Enriched	Empowered	Disempowered	<i>F</i> (3, 103)	Effect size (full η^2)	LvR, P, D, H1 ^a	RvP, H2 ^a	DvR, P, H3 ^a
Card sorting task ^b (SD)	15.24 (3.20)	12.91 (3.19)	10.94 (2.64)	12.76 (2.70)	10.07**	.22	4.74**	2.51*	1.23
Card sorting task ^c (SD)	1.04 (2.02)	1.29 (1.98)	0.36 (0.95)	0.82 (1.22)	1.67	.04	0.61	2.15*	0.00
Vigilance task ^b (SD)	7.51 (1.92)	6.69 (1.76)	6.08 (1.20)	7.70 (2.45)	4.44**	.11	1.66 [†]	1.21	3.02**
Vigilance task ^c (SD)	19.54 (6.25)	17.64 (6.52)	18.21 (4.89)	19.82 (5.40)	0.91	.02	0.77	0.37	1.41
Total time ^d (SD)	22.75, 100% (4.12)	19.60, 86.2% (3.47)	16.74, 73.6% (2.39)	20.47, 90.0% (4.28)	13.11**	.27	4.81**	2.95**	2.73**
Total errors ^d (SD)	20.57, 100% (6.80)	18.86, 91.2% (7.40)	18.36, 89.3% (4.97)	20.64, 100.3% (5.96)	0.96	.03	0.93	0.30	1.39

Note. L = lean; R = enriched; P = empowered; D = disempowered; H1 = Hypothesis 1, (L < R, P, D); H2 = Hypothesis 2, (D < R, P, H);

^a Contrast related to relevant hypotheses. ^b Time given in minutes. ^c Number of errors. ^d Total time and total errors (productivity) are shown as a percentage of the control (Lean) condition.

[†] $p < .10$. * $p < .05$. ** $p < .01$.

enriched office space reported enhanced feelings of organizational identification and well-being, in line with previous claims made in the design literature (Elsbach & Beckhy, 2007; Zelinsky, 2006). It also led to the tasks being performed quicker, with no decrement in accuracy.

When participants were empowered to decorate their own working space, this led to further improvements in participants' perceptions of their working conditions. Consistent with H2, empowerment within the office space improved feelings of well-being (Faller, 2002; Haslam, Eggins, & Reynolds, 2003; Postmes et al., 2001; van Dick, Ullrich, & Tissington, 2006). Tasks were also completed more quickly but, more important, without any accompanying rise in errors. However, once this feeling of empowerment was overridden by the experimenters (i.e., in the disempowered condition), as predicted by H3, feelings of organizational identification and well-being fell relative to those of participants in both the enriched and the empowered conditions. Disempowerment also led participants to take longer to complete the two tasks (Peters, 1989).

Despite the support that it provides for our hypotheses, this first study also has some significant limitations. First, our sample represented a fairly wide cross-section of the population who had not necessarily experienced office work themselves. Second, the experiment took place in a university setting, whereas (for obvious reasons) the majority of previous design studies have been based in the workspace (e.g., Brill et al., 1984; Dravigne, Waliczek, Lineberger & Zajicek, 2008; Gensler, 2005; Gorjup, Valverde, & Ryan, 2008; Louis, 2007).

Third, although support for our hypotheses was generally strong, it was noticeably weaker on the measure of organizational identification. Indeed, the fact that there was no support for H1a or H2b meant that there could be no evidence of organizational identification mediating the relationship between the way space was managed and participants' well-being and productivity (as found in the previous survey research; Knight & Haslam, in press). In part, this may reflect the fact that identification was here operationalized by asking participants to express their level of identification with an organizational entity (the university), that was irrelevant both to their everyday lives and to this study. More relevant, then, was their identification with those who conducted the study itself. However, this was something we failed to assess.

Another concern was that the card-sorting task could be seen as unrepresentative of tasks typically performed in an office environment (Anastasi, 1988). Finally, this study did not include specific measures of organizational citizenship behavior (OCB; Organ, 1988) that might have allowed us to examine issues of workspace motivation and consideration. Along these lines, OCB is seen as a key indicator of relevant outcomes at the organizational level because it measures "behavior that is discretionary, not directly or explicitly recognized by the formal reward system, and in the aggregate promotes the efficient and effective functioning of the organization" and so would seem to be particularly important to address in this context (Organ, 1988, p. 4; see also Baker, Hunt, & Andrews, 2006; Messer & White, 2006; Tyler & Blader, 2000).

Experiment 2

Experiment 1 provided evidence that participants performed and felt better having been involved in decisions that affected their

workspace. As hypothesized, nonempowered and disempowered participants (after Baldry et al., 1998; Laing et al., 1998; Sewell, 1998; van Dick, Christ, & Stellmacher, 2004) were less satisfied and less productive than participants who were empowered. Nevertheless, as outlined above, the study had significant limitations. To address these issues, Experiment 2 used a sample drawn exclusively from a population of office workers. The experiment itself took place in a working office and contained more realistic, office-based tasks. The study also included a more relevant measure of organizational identification and an explicit measure of organizational citizenship behavior (Organ, 1988). These tasks were designed to replicate the straightforward tasks (information processing and management) and repetitive activities (vigilance) found in many low-skilled office jobs (C. Harris & Harris, 2006).

Although recognizing that self-reported OCB is of only limited validity (Baker et al., 2006); it was felt that developing a quantifiable measure of citizenship behavior would usefully augment the results of the study. On the basis of social identity theorizing, we anticipated that OCB would increase to the extent that workers identify with each other and with their employer (Haslam, 2004; Postmes et al., 2001). Thus, although the hypotheses for Experiment 2 were the same as those in Experiment 1, we also predicted that OCB would be more apparent in an enriched office than a lean office (H1d), that OCB would increase further in an empowered space (H2d), and that it would be reduced if empowered workers were subsequently disempowered (H3d).

Method

Participants and design. The design of Experiment 2 was the same as Experiment 1 but with the addition of a quantifiable measure of OCB. There were 47 office workers (28 men, 19 women) ranging in age from 22 to 61 years ($M = 36.23$, $SD = 9.57$) who took part in the study. Of the sample, 35% described themselves as nonmanagement staff, 30% as lower management, 26% as middle management, and 9% as senior management. Potential participants, all from commercial businesses, were contacted by mail, email, and telephone. Participation was on a voluntary basis and was unpaid.

Materials and procedures. The study was conducted in London in an air-conditioned commercial office approximately 4.5 m \times 6 m in size. The space housed an executive desk (approximate dimensions 2,200 \times 800 mm) with two, 90° returns of approximately 2,000 \times 600 mm, so that the effective desktop area took up three sides of a hollow square with the participant at its center. There was also a large matching credenza with eye-level storage in the room (approximately 1,800 high \times 2,200 wide \times 800 deep). Participants sat in a high backed, comfortable leather chair as they worked. The room had a raised Tec-Crete floor, with a large sea-grass rug beneath the desk covering the immediate working area. The door and most of the walls were glass. Given that the office used in Experiment 1 had no windows, views and external distractions in this second experiment were minimized by ensuring that participants sat with their backs to the outside world. Meanwhile temporary, opaque transfers were fixed to all other areas of glass up to eye-line height thus obscuring any further views. The study followed the same procedure as Experiment 1, using the same number of plants and pictures. Participants spent 5 min alone

in their workspace in which to absorb the ambient environment before the experiment began.

Measures. Although the instructions and timing procedures were the same as in Experiment 1, the measures in Experiment 2 varied slightly to include tasks that were more representative of an office environment (Anastasi, 1988). An additional OCB element was also added.

Information management and processing task. Participants were asked to work with a shuffled pile of corporate memoranda based on a fictitious company. They had to imagine that they were employees of this company and (a) sort the memoranda into chronological order (an information management task) and then (b) answer 15, multiple-choice questions based on the information contained in these memos (an information processing task).

Vigilance task. The experiment's second element, was exactly the same as in Experiment 1 and once more participants were told that they needed to perform the tasks as quickly and accurately as possible.

Organizational citizenship behavior task. This new measure took the form of a quantifiable, OCB task (after Organ, 1988; Williams Pitre, & Zainuba, 2000). This built on the participants' fictitious employment with the company described in the information management task. Participants were asked to imagine that in addition to a normal workload, they were responsible for 10 further tasks. Five of these were undesirable (e.g., "Draw up proposals about how the company should reduce its headcount") and five were desirable (e.g., "Represent the company at the annual Awards Dinner"; after Paille, 2008). Participants were told that any number of these tasks could be off-loaded onto a colleague and that this would have no additional implications for them as the company's management would make sure that the participants' peers did not find out the source of any increase in workload.

Questionnaire. The same questionnaire was used as in Experiment 1, but with two modifications. The three-item, organizational identification scale now reflected participants' identification with the organization managing (rather than the organization hosting) the experiment ($\alpha = .90$; typical item: "I identify with the organization that is running this experiment"; after Doosje et al., 1995), while the job satisfaction scale incorporated a measure of OCB (8 items; $\alpha = .90$; e.g., "If these were my normal working conditions I would stay behind to do extra work if necessary, even if I was not paid overtime"; after Haslam, O'Brien, Jetten, Vormedal, & Penna, 2005).

Results

Analytic strategy. Questionnaire and performance data were then analyzed by means of ANOVA with office condition (lean, enriched, empowered, disempowered) as a between-participants factor. Interitem correlations are shown in Table 4; means and effect sizes (η^2) are presented in Tables 5 and 6.

Manipulation checks. ANOVAs revealed effects for involvement, autonomy and quality of workspace, $F(3, 43) = 18.42, 29.96, 11.51$, respectively, all $ps < .001$, $\eta^2s = .57, .68, .45$, respectively. Orthogonal planned contrasts indicated that (a) participants in the lean condition felt less involved, less autonomous, and thought they were in a poorer quality space than participants in other conditions; (b) participants in the enriched office felt less involved and less autonomous than participants in the empowered

Table 4
Experiment 2: Bivariate Correlations

Dependent variable	1	2	3	4	5	6	7
1. Involvement	—	.01	.89**	.72**	.68**	.55**	.60**
2. Autonomy		—	.04	.12	.07	.05	.02
3. Quality of workspace			—	.79**	.62**	.55**	.62**
4. Psychological comfort				—	.64**	.60**	.61**
5. Organizational identification					—	.72**	.67**
6. Job satisfaction						—	.60**
7. Physical comfort							—

** $p < .01$.

condition; and (c) participants in the disempowered condition felt less involved, less autonomous, and thought they were in a poorer quality space than participants in the enriched and empowered conditions. Relevant statistics are presented in Table 5.

Organizational identification. Analysis revealed a main effect for organizational identification, $F(3, 43) = 4.29$, $p < .01$, $\eta^2 = .23$. However, although this effect was stronger than that obtained in Experiment 1, orthogonal contrasts again only provided support for H3a in showing that participants in the disempowered condition identified less with the organization than participants in enriched and empowered conditions. Relevant statistics are presented in Table 5.

Well-being. Analysis revealed effects for psychological comfort, job satisfaction, and physical comfort, $F_s(3, 43) = 20.50$, 7.00 , 6.65 , respectively, all $ps < .01$, $\eta^2_s = .65$, $.33$, $.32$, respectively. Consistent with H1b, orthogonal planned contrasts indicated that participants in the lean condition felt less psychologically comfortable, reported less job satisfaction, and felt less physically comfortable than participants in other conditions. Consistent with H2b, orthogonal contrasts showed that participants in the empowered condition felt more psychologically comfortable than participants in the enriched condition. Consistent with H3b, orthogonal contrasts indicated that participants in the disempowered condition felt less psychologically comfortable, reported lower levels of job satisfaction, and reported feeling less physically comfortable than participants in enriched and empowered conditions. Relevant statistics are again presented in Table 5.

Productivity. Analysis revealed effects for time taken to complete both the information management and the vigilance tasks, $F_s(3, 43) = 3.73$, 5.75 , respectively, $ps = .018$, $.002$, respectively, $\eta^2_s = .21$, $.29$, respectively. It also revealed effects for the number of errors made on the information management task $F(3, 43) = 4.17$, $p = .011$, $\eta^2 = .23$. At the same time there were no effects for the number of errors made on the vigilance task, $F(3, 43) = 1.23$, $p = .311$, $\eta^2 = .08$. Consistent with H1c, orthogonal planned contrasts showed that participants in the lean condition took longer to complete the information management task. There were no significant differences in the number of errors made on the information management task. Consistent with H2c, orthogonal contrasts showed that participants in the empowered condition took less time to complete the vigilance task than participants in the enriched condition. There were no significant differences in terms of the number of errors made on the information management task. Consistent with H3c, orthogonal contrasts showed that participants in the disempowered condition took longer to complete the vigilance task than participants in either the enriched or the empowered conditions. Participants in the disempowered condition also made significantly more errors on the information management task than those in the enriched or empowered conditions. Relevant statistics are presented in Table 6.

Organizational citizenship. Analysis revealed a main effect for the total number of tasks retained on the OCB task, $F(3, 43) = 4.77$, $p = .006$, $\eta^2 = .25$. Consistent with H1d, orthogonal planned contrasts indicated that participants in the lean condition retained

Table 5
Experiment 2: Scale Properties, Means, and Effects for Measures of Participants' Subjective Experience

Dependent variable	Condition ($n = 47$)				Effects		Contrasts (t values)		
	Lean	Enriched	Empowered	Disempowered	$F(3, 43)$	Effect size (full η^2)	LvR, P, D, H1 ^a	RvP, H2 ^a	DvR, P, H3 ^a
Involvement ^b (SD)	2.25 (1.37)	4.82 (0.91)	5.83 (0.66)	2.79 (1.24)	18.42**	.57	4.93**	1.81 [†]	5.14**
Autonomy ^b (SD)	2.44 (1.33)	4.33 (1.22)	5.94 (1.28)	2.48 (1.50)	29.96**	.68	5.14**	3.75**	6.92**
Quality of workspace ^b (SD)	3.39 (1.51)	5.47 (1.32)	5.69 (1.40)	3.82 (1.44)	11.51**	.45	4.08**	0.46	4.12**
Psychological comfort ^b (SD)	3.02 (1.44)	4.98 (1.06)	5.68 (1.23)	3.20 (1.64)	20.50**	.65	5.45**	1.95 [†]	6.66**
Organizational identification ^b (SD)	4.00 (2.10)	5.19 (1.19)	5.00 (1.13)	3.21 (1.41)	4.29**	.23	0.93	0.32	3.43**
Job satisfaction ^b (SD)	3.51 (1.69)	5.06 (1.13)	5.25 (0.98)	4.02 (1.75)	7.00**	.33	3.49**	0.43	2.87**
Physical comfort ^b (SD)	5.02 (1.28)	6.08 (1.55)	6.45 (1.25)	4.79 (1.25)	6.65**	.32	2.11*	0.84	3.81**

Note. H1 = Hypothesis 1, (L < R, P, D); H2 = Hypothesis 2, (R < P); H3 = Hypothesis 3, (D < R, P).

^a Contrast related to relevant hypotheses. ^b Means relate to 7-point scales (1 [completely disagree]–7 [completely agree]).

[†] $p < .10$. * $p < .05$. ** $p < .01$.

Table 6
Experiment 2: Means and Effects for Performance Measures

Dependent variable	Condition (<i>n</i> = 47)				Effects		Contrasts (<i>t</i> -values)		
	Lean	Enriched	Empowered	Disempowered	<i>F</i> (3, 43)	Effect size (full η^2)	LvR, P, D, H1 ^a	RvP, H2 ^a	DvR, P, H3 ^a
Information management/handling task ^b (SD)	32.04 (9.28)	25.49 (6.85)	21.29 (6.63)	27.27 (8.91)	3.73*	.21	2.75*	1.29	1.33
Information management ^c (SD)	1.42 (1.08)	1.00 (1.21)	0.75 (.97)	2.64 (2.06)	4.17*	.23	0.10	0.44	3.52**
Vigilance task ^b (SD)	8.42 (2.11)	8.03 (2.34)	6.13 (1.78)	9.67 (2.06)	5.75**	.29	0.68	2.24*	3.42**
Vigilance ^c (SD)	22.92 (10.16)	20.00 (9.97)	16.33 (8.99)	21.64 (9.98)	1.23	.08	1.21	1.01	1.07
Total time ^d (SD)	40.45, 100% (10.26)	33.53, 82.9% (7.62)	27.41, 67.8% (6.74)	36.94, 91.3% (9.70)	4.58**	.24	2.61*	1.67	1.98†
Total errors ^d (SD)	24.33, 100% (10.02)	20.42, 83.9% (8.91)	17.08, 70.2% (6.52)	24.09, 99.0% (9.87)	1.88	.12	1.32	0.95	1.70†
Negative OCB tasks retained (SD)	2.00 (1.91)	3.42 (1.17)	3.92 (.79)	2.82 (1.42)	4.20*	.23	2.97**	0.88	1.67
Positive OCB tasks retained (SD)	2.50 (1.31)	3.25 (.87)	2.75 (.97)	3.09 (.94)	1.25	.08	1.53	1.18	0.24
Total OCB tasks retained ^d (SD)	4.50, 100% (1.98)	6.42, 142.7% (1.78)	6.67, 148.2% (1.24)	5.91, 131.3% (1.30)	4.77**	.25	3.56**	0.40	1.13

Note. H1 = Hypothesis 1, (L < R, P, D); H2 = Hypothesis 2, (R < P); H3 = Hypothesis 3, (D < R, P); OCB = organizational citizenship behavior.

^a Contrast related to relevant hypotheses. ^b Time given in minutes. ^c Total time and total errors (productivity), and number of tasks retained (OCB) are shown as a percentage of the control (Lean) condition.

† $p < .10$. * $p < .05$. ** $p < .01$.

fewer OCB tasks (particularly, fewer negative tasks) than participants in other conditions. No other contrasts were significant (i.e., there was no support for H2d or H3d). Relevant statistics are presented in Table 6.

Discussion

The findings from this experiment are consistent with those from Experiment 1 and provide further support for our experimental hypotheses. Consistent with H1, relative to the lean condition, enriched office space led to improved feelings of psychological comfort, job satisfaction, and physical comfort. It also led to tasks being performed more quickly and to an increase in organizational citizenship behavior.

Consistent with H2, when participants were empowered to decorate their own working space, this led to a further improvement in feelings of psychological comfort and to an increase in their levels of productivity relative to participants in the enriched condition. As had been found in Experiment 1, and consistent with Hypothesis 3, among disempowered participants, feelings of psychological comfort, organizational identification, and physical comfort all fell relative to participants in both the enriched and empowered conditions. Disempowered participants also tended to take more time to complete the two tasks.

As well as replicating effects observed in Experiment 1, this study extended its findings within a working commercial office as opposed to a university laboratory and used a representative organizational sample. It also examined the impact of space management on organizational citizenship behavior, which was lower in the lean office than in all other conditions. This is in accord with observations in the social psychological literature, which suggest that when managers extend visible signs of care and empowerment to employees, this can enhance organizational identification and thereby increase the likelihood of workers engaging in more supracontractual activity that benefits both their colleagues and their employer (Baker et al., 2006; Williams & Anderson, 1991). As in Experiment 1, however, there was again no evidence that organizational identification played this mediational role, as effects on this measure provided less support for our specific hypotheses than responses on other outcome measures.

General Discussion

The two experiments reported above provide consistent support for our hypotheses and for the central claim of this paper, namely that design and empowerment both have an important role to play in determining people's responses to their work environment. In both experiments, well-being and productivity were enhanced by enriching a space (H1) and then further enhanced by empowering participants (H2) within the same working environment. However, disempowering participants (H3) had the effect of significantly compromising both well-being and productivity. Experiment 2 also indicated that enrichment and empowerment led to increased OCB (Organ, 1988). It is worth noting that in the empowered condition there were no significant differences on key dependent variables as a function of whether participants chose to create a spartan or enriched space. These hypotheses, and the level of support they received across the two experiments, are summarized in Table 7.

Table 7
Summary of Support for Hypotheses Across Both Experiments

Dependent variable	Hypothesis 1: Lean inferior to all other conditions		Hypothesis 2: Enriched inferior to empowered		Hypothesis 3: Disempowered inferior to enriched and empowered	
	Exp. 1	Exp. 2	Exp. 1	Exp. 2	Exp. 1	Exp. 2
Psychological comfort	++	++	++	(+)	++	++
Organizational identification	—	—	—	—	+	++
Job satisfaction	++	++	+	—	—	++
Physical comfort	++	++	—	+	++	++
Productivity—Time	++	++	++	++	++	(+)
Productivity—Errors	—	—	—	—	—	(+)
Organizational citizenship	Not tested	++	Not tested	++	Not tested	—

Note. Exp. = experiment; ++ = strong support ($p < .01$); + = support ($p < .05$); (+) = weak support ($p < .10$); — = no support ($p > .10$).

The evidence presented here is in accord with the view that lean conditions may indeed be psychologically impoverished (Munsterberg, 1913; Zelinsky, 2006) and that insufficient peripheral stimulation may be a factor in lower performance (Bringslimark et al., 2007; Peters & Waterman, 2004; Zeisel, 2006). Certainly, enriching the environment—in line with most animal studies (e.g., Larsson, Winblad, & Mohammed, 2002)—made a quantitative and qualitative difference to participants' perceptions and performances. As one of our participants remarked, "it's so nice to come into an office with plants and pictures, it makes a place feel more homely, even a glass box [of an office] like this." In line with claims in the organizational literature (B. E. Becker & Huselid, 1998; Lawler, 1986) and as suggested by research in the social identity tradition (Ellemers et al., 2004) having input into the design of their work space increased participants' feelings of autonomy and decisional involvement and this led to increases in comfort, job satisfaction and productivity. However, as a corollary, these effects were attenuated when participants were disempowered (Cohen, 2007; Peters, 1989).

From one perspective, these results may not seem at all surprising. Workers' perception of procedural fairness via participative decision making has already been equated with higher levels of organizational identification and greater job satisfaction (Ellemers et al., 2004; Haslam, 2004; Tyler & Blader, 2000). Nevertheless, these data sit uncomfortably with a large body of neo-Taylorist literature that promotes lean space, clean-desk policies, and standardized managerial control of working environments as keys to productivity (e.g., Fredrickson, 1989; Hyer & Wemmerlov, 2002; Marmot & Ely, 2000; Mills et al., 2007; Sewell & Wilkinson, 1992; Titman, 1991; Wilmott, 1993). Illustratively, Hobson (2006, p. 33) argued that to maximize efficiency, the office must be standardized to a pattern determined by management and clearly communicated to staff. Such an approach points to a gulf between managers empowered to think and the workers who are expected to respond to their injunctions (see Baldry et al., 1998). Hobson explained that "Having a defined, current best way of doing something is of course completely useless unless people use it. We (i.e., management) must communicate the new way of working to the people who will use it" (p. 38). This philosophy of standardization and control lie at the core of the lean office (see Keyte & Locher, 2004; Louis, 2007) in which the practice of "sorting" (George et al., 2004; Hirano, 1995; Peterka, 2006), encourages

managers to remove all items not directly related to the business process to promote "work focus" and to minimize distraction (Thompson, 2000).

Contrary to these ideas, the data from the present research indicate that a lean space over which employees have no control is the least productive use of the working environment. Instead, our findings suggest that welfare and productivity are most likely to be optimized by practices that empower the workforce (after Reicher & Haslam, 2006). Indeed, in the experiments here, empowerment was the key differentiating factor in increasing productivity by up to 32%.

When management follows the recommendations to limit or eliminate entirely the decisional involvement of low-status workers in environmental decision making (e.g., Brill et al., 1984; Duffy, 1997; Durmusoglu & Kulak, 2008; Faller, 2002; Gartenberg, 2006; George et al., 2004; Hirano, 1996; Titman, 1991), the result, as Vischer (2005) pointed out, is that apparently rational space alteration, such as the removal of a door or partition, made by managers and planners in the interests of efficiency, can mean a "loss of privacy, a loss of control, a loss of identity" for the powerless person who works in that space (p. 45). Such managerial intrusion into "established" workspace (Sewell, 1998) links to the fourth condition in the present studies, in which disempowerment of participants was found to be at least as disadvantageous as imposing a lean environment. Our results thus suggest that workspace management techniques such as "setting in order" (George et al., 2004; Hobson, 2006), which is prescriptive at the micro level—so that, for example, "a draftsman should locate all his stationery within reachable distance but not put (out) more pencils than required on an average day" (Peterka, 2006, para. 4)—are likely to compromise comfort, organizational identification, and ultimately organizational effectiveness.

These findings represent an advance on previous studies in providing a direct, quantitative assessment of the relative benefits of approaches to space management informed by Taylorist, design and social identity approaches. Although the patterns observed here accord with findings that have previously been observed in qualitative, case studies (e.g., Elsbach, 2003; Keyte & Locher, 2002; Laing et al., 1998; Peters & Waterman, 2004), the particular advantage of the present research is that it uses an experimental approach to manipulate relevant variables thereby increasing control over these variables and increasing confidence in the causal

status of our independent variables. These data thus provide strong support for previous suggestions that there may be value in organizations taking steps to empower all employees in the development and management of their work space. This conclusion is very much at odds with Taylorist principles and the managerial approach they have inspired, but it also points to some of the limitations of a design-led approach to space management that similarly lacks nonmanagerial input (Baldry et al., 1998; Furnham, 1990; Haberkorn, 2005; Hobbsawm, 1969; Louis, 2007; Masaaki, 1986; McGregor, 1960; Taylor, 1911; Zalesny & Farace, 1987).

Limitations and Further Research

Notwithstanding the support it lends our hypotheses, this research also has a number of limitations. The first of these is the nature of the work space, which, even in Experiment 2, was somewhat artificial. Participants were introduced to a strange space and asked to perform unfamiliar tasks—a situation clearly unlike most working offices in which workers are familiar with both their working environment and the often repetitious nature of their jobs (Baldry et al., 1998; Laing et al., 1998). In Experiment 2 it could be argued that instead of creating a more realistic setting within a commercial environment, we had instead simply created a laboratory in an office. This though, was very much the point, in that by excluding the role of elements that were extraneous to our purpose, the two studies allowed for a more forensic examination of different theoretical positions than has previously been possible (Mook, 1983; Turner, 1981). Indeed, in this respect, our manipulations may have exposed less striking effects than we might otherwise have achieved (e.g., had we disempowered participants in their own established office rather than one in which they were unfamiliar; see Peters & Waterman, 2004; Wegge, van Dick, Fischer, Wecking, & Moltzen, 2006; Zelinsky, 2006).

Second, our studies examined individuals in cellular space, whereas most low-status office workers work (a) in multiperson, open-plan offices and (b) in teams (see Baldry et al., 1998; Barker, 1993; Fredrickson, 1989; Laing et al., 1998; Millward et al., 2007). Accordingly, there is clearly a need for future studies to extend the reasoning of the present studies to investigate the behavior of groups of participants working in designated space. Our general expectation would be that the hypotheses explored here would also hold true in these contexts, although we might expect the effects to be moderated by social identity dynamics that would exacerbate both productivity and resistance (e.g., see Haslam, 2004).

Third, it is apparent that although we had expected the impact of our manipulations on key outcomes to be mediated by organizational identification (as they were in previous survey research; Knight & Haslam, in press), neither of the above studies provided any evidence of this. In part this was a consequence of the fact that the effects observed on our measure of organizational identification were weaker than those observed on other key measures (i.e., of well-being and productivity). Planned contrasts thus indicated that identification was lower when participants worked in disempowered rather than enriched or empowered space (supporting H3a), but there was no evidence that identification was lower in the lean office than others (H1a), or lower in the enriched office than in the empowered one (H2a). The reasons for this are unclear and certainly warrant further investigation. Although in Experi-

ment 1 there were problems with the way that the identification measure was framed, these were rectified in Experiment 2, but there was still only limited evidence of variation in identification across conditions. It is possible however, that this reflects the fact that the present studies manipulated rather than simply measured organizational identification. In particular, whereas in survey studies the meaning of identification is quite clear and is anchored in people's ongoing organizational experiences (reflecting what Rousseau (1998) referred to as *deep identification*; see also Riketta & van Dick, 2005), in the present context—in which participants were responding to a novel and unfamiliar organizational context—its meaning may have been less clear (reflecting what Rousseau termed *surface identification*, 1998) with the result that it did not covary quite so straightforwardly with the IV. Consistent with this point, Sigall and Mills (1998) sounded a cautionary note in identifying a range of reasons why experimental studies often fail to detect mediation when it is present (and vice versa; see also Haslam & McGarty, 2004).

It follows from this point, fourth, that there would be value in longitudinal research that examined the processes we have studied here over an extended period. The present studies do not show, for example, whether workers in the lean office perform better as time progresses. We find it interesting that the lean literature suggests they do not. Indeed, sustaining improvements associated with the introduction of lean practices is frequently cited as hard for managers to achieve (George et al., 2004; Hobson, 2006; Peterka, 2006). Conversely, it is important to establish whether improvements brought about by empowering employees will be maintained in the way that the literature suggests they are (Cohen, 2007; Duffy, 1997; Vischer, 2006).

Fifth, it is also the case that our OCB task would benefit from proper weighting. Originally we asked 12 office workers not involved in the study to rate which seven of 14 original tasks they considered undesirable and which seven they considered desirable. The top five undesirable and desirable tasks were then used in the experiment itself. However, had we also asked for these tasks to be explicitly weighted (e.g., in terms of time taken and popular/negative affect) the reliability of this measure might have been improved.

Finally, our research to date has concentrated on the world of work. However, it may be beneficial to examine the effects of empowerment in, for example, hospital or residential care environments. Literature tells us of the importance of high-quality emotional contact with family and friends in such settings (Deci, La Guardia, Moller, Scheiner, & Ryan, 2006) and of the importance of group identity within familial and social boundaries (Twigger-Ross, Bonaiuto & Breakwell, 2003). However would introducing elements of group choice into care situations increase or compromise physical well-being and feelings of satisfaction? Extending the rationale of the present study, we have begun to explore such questions among groups of older residents in care homes and it is interesting to note that our preliminary findings accord closely with the conclusions of the present research. Specifically, they indicate that residents' well-being and engagement are enhanced to the extent that living arrangements are not just enriched but also empowering (Knight, Haslam, & Haslam, in press).

Concluding Comments

The novel contribution of the present research lies in identifying theoretical and empirical connections between different strategies

of office space management and workers' well-being and productivity. In this, it also breaks new ground by demonstrating how strategies of empowerment can contribute not only to organizational productivity but also to employee welfare.

At the same time it suggests that popular approaches to office space management that overlook the psychological needs of employees may be misguided. For these approaches miss out on the benefits that accrue when employees are included in decisions about space management and hence come to identify both with that space and with the organization itself. In this respect, it appears that it is not only better for an office to be "green" rather than "lean," but also that employees within that office should be empowered to design their own workspace rather than having predetermined space configurations thrust on them.

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