

The role of nature in the context of the workplace

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Abstract

The well-being of the workforce is clearly a matter of concern to the employer. Such concern translates to considerable costs in the form of fringe benefit packages, health promotion programs, ergonomics, and other ways to reduce absence and enhance health and satisfaction. Despite such efforts, however, one way to address well-being that entails relatively low costs has been largely ignored in the work context. Proximity and availability of the natural environment can foster many desired outcomes, even if the employee does not spend a great amount of time in the natural setting. A theoretical framework is presented that helps explain why even the view from the window can have a positive impact with respect to well-being. Results from two studies offer some substantiation. Further research on the role of nature in the workplace is essential; however, decisions to provide health promoting programs and to enhance fringe benefit packages have not been offered as a direct consequence of empirical verification. While providing windows at work may not be a simple matter, other ways to increase contact with vegetation may provide a low-cost, high-gain approach to employee well-being and effectiveness.

Introduction

A multitude of factors influence productivity in the workplace. Many of these are human factors focusing on psychological issues that involve the performance of employees. Among these human elements are the interrelated topics of employees' motivation, job satisfaction, and well-being. Clearly it is in the employer's best interest to support these factors, not only for humane reasons but also to assure a cost-effective operation. What does it take to assure motivation, to enhance job satisfaction, and to foster well-being in the workplace? Despite the economic urgencies of maximizing the bottom line and the considerable literature on workplace productivity, the answers to these straightforward questions are, at best, incomplete. Additionally, the answers to questions about the cost effectiveness of efforts to support such human dimensions are particularly difficult to ferret out.

The purpose of this paper is to examine one

piece of this puzzle: the role of nature availability at the workplace in employee well-being. The immediate, nearby natural setting has been shown to play an important role in human well-being, particularly in the contexts of hospitals, prisons, and residential settings (Moore, 1981; Ulrich, 1984; Verderber, 1986; West, 1986; Kaplan and Kaplan, 1989). In contrast, surprisingly little attention has been devoted to the role of nature in the context of the workplace. Yet a large proportion of the population spends a substantial amount of time at a place of work. Many work sites are devoid of nature availability, while other settings include a major commitment to plantings. There are no ready answers to whether the money devoted to corporate landscaping is 'well spent', nor whether the lack of nature availability is directly detrimental to worker well-being. However, it is time to raise these issues and to examine the potential benefits of vegetation in the work context.

In looking at the potential role of nature at

work, I will first discuss theoretical reasons for examining this relationship and then look at some empirical work in the work setting. While the latter is not yet extensive, the implications are far-reaching; the paper will turn to these in the final section. Before addressing the 'nature' issue, however, I discuss some of the research on health promotion programs in the work context. The literature in this domain is quite extensive as are the corporate commitments to bring such programs to the workforce.

Health promotion programs

Health care costs are a major economic issue for the employer. Not only do many businesses and industries pay at least a portion of their employees' health insurance, but absenteeism directly affects output. Thus, the willingness of employers to invest in programs that are oriented to prevention, to enhancing wellness, and to educating employees with respect to health issues is hardly surprising. The assumption is that such health promotion efforts will generate cost savings, and that the savings will be greater than the expenses incurred in offering the programs (Aberth, 1986; Adams, 1988; Cooper, 1990; Caldwell, 1992).

The review of the literature on the effectiveness of these programs in meeting their presumed purposes is, at best, mixed. Warner et al. (1988), in an extensive effort to study the situation, recommend "healthy skepticism" toward the credibility of the reported effects. Studies are often "seriously flawed in terms of assumptions, data, or methodology" and many salient issues are often ignored. Several other authors (e.g. Chovil and Altekruze, 1986; Sloan and Gruman, 1988; Shepard, 1989; Chenoweth, 1990) would concur in this cautious interpretation, arguing that it is difficult to obtain the evidence, that participation rates are often extremely low, that those who participate may be a select group, and that the promoters of such programs may have an entrepreneurial interest in their success. In fact, it is not un-

sual for articles to be authored by individuals who are directly affiliated with sponsoring such programs (e.g. Patterson, 1987; Adams, 1988; Whitmer, 1992).

Yet despite the fact that "scientifically defensible knowledge [is] virtually or completely nonexistent" (Warner et al., 1988) in many cases, and that "80% of corporations that offer health promotion programs have established them without quantifiable proof that the programs actually save money" (Cauldron, 1990), health promotion is a part of the contemporary work scene.

Clearly the decision to invest in these programs is not based exclusively on economic considerations. In fact, a broad range of benefits are attributed to them, including corporate morale, confidence in the organization, recruiting and retention of personnel, and substantial improvement in the health and well-being of the workforce (Sperry, 1984; Sloan and Gruman, 1988; Shepard, 1989; Smith, 1990). For these benefits too there is little systematic empirical support.

The nature of health-promoting programs varies widely. They often emphasize lifestyle changes related to nutrition, weight loss and control, smoking cessation, alcohol consumption, and fitness, as well as educational approaches to reduce hypertension, cholesterol, substance abuse, and stress (Smith et al., 1986; Adams, 1988). It is no longer unusual for larger companies to have on-site fitness facilities for use of employees and their families.

While it may be surprising that employers offer such expensive opportunities with so little clear substantiation of the cost effectiveness, this situation is hardly different from other aspects of fringe benefits. The failure to be concerned about employees' health may, in the long run, be a far more expensive option.

Nearby nature

There are some interesting parallels between health promotion programs and the availabil-

ity of nearby nature. In both instances, empirical support would hardly be surprising; in fact, the assumption that such opportunities are beneficial is so strong that one would take positive results for granted and assume that studies that yield negative results must be flawed. Yet the emphasis on exercise, stress management, diet, and substance abuse are relatively recent societal concerns. Similarly, the awareness that nature in the immediate, everyday context may have psychological benefits was also absent not so long ago.

Moore's (1981) study showing differences in prisoner's use of health care facilities as a function of the view from their cells provided vivid imagery of the power of nearby nature. West's (1986) work corroborated these results in a distinctly different prison environment. Such results perhaps strike one as less immediately obvious than research on nature in the residential context. Nonetheless, even in the latter setting, the role that nature can play is striking.

Particularly striking in the residential context is the pervasiveness of the importance of nature across any demographic dimensions one might consider (Francis, 1987; Schroeder, 1988; Kaplan and Kaplan, 1989). Furthermore, the strong benefits that can accrue from a natural setting even if one is not actively engaged with it, are also noteworthy (Talbot and Kaplan, 1984; Talbot et al., 1987). Thus, a view of nature can play a significant role (Kaplan, 1985). Even without a view, the knowledge that the opportunity is there can be beneficial (Kaplan, 1980; Ulrich and Addoms, 1981).

Health promotion programs are presumed to have direct ties with well-being. Reduced fat consumption, controlled hypertension, and attention to substance abuse are all expected to affect health. The availability of nature, by contrast, does not have such direct links with physical or mental health. An explanation of why nature plays an important psychological role thus calls for a theoretical effort.

Attention restoration theory

The conceptual framework we have suggested to make this link involves the notion of mental fatigue (Kaplan, 1987; Kaplan and Kaplan, 1989). Unlike stress, mental fatigue need not be a function of a threatening situation nor one that is unpleasant. Mental fatigue is the consequence of sustained mental effort that requires focused or directed attention. In other words, what becomes fatigued is one's capacity to focus attention to demands that require effort. The reduced ability to concentrate can have serious and even dangerous consequences. It expresses itself in a variety of ways, ranging from making small errors to major mistakes, from being annoyed with fellow workers to being irritable and socially irresponsible.

To recover from such fatigue, one needs to rest the directed attention mechanisms. Sleep is one option for achieving such rest. However, it is not unusual for sleep to be inadequate for the task of recovering from prolonged mental effort. That is when vacations become an acute need. Also, sleep is often not a viable option in the course of the working day, although one's ability to direct attention may be wearing down.

Fortunately, there are other ways to alleviate mental fatigue. We have identified four properties of environments or experiences that are likely to be restorative. Briefly, these are:

- (1) being away, the sense that one is, at least conceptually, in a different place;
- (2) extent, the sense that this 'away' is of sufficient magnitude to permit one to be in it;
- (3) fascination, what William James (1892) called "involuntary attention", entails an effortless attention;
- (4) compatibility, the notion that there is a good fit between the demands of the setting and one's inclinations or purposes.

The role that each of these factors plays depends, to some degree, on the duration of the restorative experience. In the context of an ex-

tended wilderness experience, the arena in which we first found these properties to be salient (Kaplan and Talbot, 1983), one would expect all of them to be fully present. Even when one is curled up on the sofa absorbed by a well-told mystery many of these factors can come into play though the duration of the activity may be briefer.

Natural environments are not the only kind of restorative environment, but they seem to have substantial advantages over many other settings. Furthermore, it seems that even a very short opportunity to experience a natural setting can serve a restorative function. Thus, a view from the window might be called a micro-restorative experience, one that provides a brief respite to one's directed attention. Even in a moment's glance one might feel that one is far away; the snow on the tree, the changing colors of the leaves, the bird barely visible in the bush all draw one's attention effortlessly and provide the sense that one is somewhere else. Even such a brief opportunity to recover one's attentional capacity might be expected to enhance competence and cooperativeness.

Direct evidence for these contentions is not available. Thus the attention restoration theory (Kaplan et al., 1993), like conceptual frameworks in other instances, is built of empirical support taken from a variety of contexts, linking physiological and psychological properties and offering an agenda for needed further corroboration. From the perspective of this framework it would be reasonable to assume that the work environment is particularly likely to create mental fatigue. Permitting opportunities for microrestoration would thus be a particularly useful approach to increasing employees' well-being. While a 'break' is a form of such opportunity, its effectiveness may depend on the degree to which the proposed properties are available. Furthermore, the availability of a window with a view to nature may afford even more effective recovery.

Empirical support

There has been surprisingly little research on the psychological benefits of a windowed work setting.¹ The anecdotal evidence is compelling. Mention the issue of windows and employees are ready to express their dismay if their work setting lacks a view. Collins (1975), in an impressive effort to review the literature on 'windows and people', points to the "widespread opinion that people do not like to work in windowless offices" (p. 25), though evidence from more systematic research is scant. She cites a study by Ruys which found that adequate lighting did not make up for office workers' dissatisfaction with their windowless setting and "almost 50 per cent thought that the lack of windows affected them or their work adversely" (p. 24). Finnegan and Solomon (1981) found job satisfaction and work attitudes were significantly related to the presence of windows for their sample of 123 office workers and health care providers.

Lack of clear documentation notwithstanding, there is reason to believe that windows have been used as a work perk, with more or larger windows or corner views being the privilege of those higher in the organization. Farrenkopf and Roth (1980) provide some substantiation of this in the academic context. They reported that of their sample of 150 faculty members at two universities, half had windowed offices and those with higher academic rank had significantly more windows. Sommer (quoted by Collins, 1975, p. 26) reported that office personnel working in underground offices found their situation "harder to endure because of [their] knowledge that the executives have large offices upstairs with splendid views of the city".

Two studies we have carried out with respect to the role of nature in the workplace have

¹ Biner et al. (1993) provide some useful additional reference and empirical support published after this paper was set in print.

included a variety of measures related to perceived health, job and life satisfaction, and attitudes toward the work situation. The discussion here focuses on the 'view from the window' aspect of these studies.

Study 1

The initial effort (Kaplan et al., 1988) to study the role of nature in the workplace involved one large corporation and two public agencies, including a total of 168 employees. The majority of the participants were desk workers, with 55 having no view to the outside or views which included no natural elements and 60 who could see natural elements from their workplace. There were 48 participants whose jobs were mostly outdoors in natural settings (e.g. parks and recreation maintenance). Participation in the study was voluntary and anonymous with survey forms available to those who wished to respond. There is thus no way to determine a response rate nor can we assume a random sample. The cover page of the six page survey instrument, entitled 'Job Pressures Research Project' explained that the study is "an attempt to understand both the pressures people face and how they deal with them". Most of the questions entailed five-point rating scales (not at all ... a great deal). The survey asked about perceived job stresses, perceived effectiveness of various restorative opportunities, life satisfaction, physical health, and about some job setting characteristics.

The participants whose work was mostly outdoors had clearly different responses from those with desk jobs. They indicated that their job was significantly less demanding, and they felt less pressured, less frustrated, and less harried. Since the nature of the outdoor jobs was distinctly different from that of the others, it is impossible to determine whether these reported differences are directly attributable to being in the natural environment, or are a function of other job characteristics.

The comparison between the participants with relatively similar jobs (i.e. desk jobs), but whose access to nature in their view differed, is perhaps more useful. Here the results indicated fewer reported ailments for the individuals whose view included nature ($t(100) = 1.99, P < 0.05$). Those with a view of nature checked an average of 2.45 ailments (from a list of 11) as ones they had had in the last 6 months. For the employees without access to nature in their view, the mean was 3.02.

The survey for the two public agencies included, at their request, a single item related to overall job satisfaction. The comparison, based on availability of nature in the view for individuals with desk jobs at these two agencies showed a significant difference on this item ($t(34) = 2.07, P < 0.05$), with satisfaction higher for those who could see nature elements.

Study 2

The 615 participants in the second study all had relatively sedentary jobs, though these represented a wide spectrum in terms of job classification and pay grade. The sample consisted mostly of women (92%) and ranged widely in terms of age and how long they had worked for the current employer.

The survey was sent to a random sample of 1000, using the organization's internal mailing system. As a result, no return address could be used on the envelopes and undeliverable surveys could not be returned. Given the normal turnover of employees, it is reasonable to estimate that as many as 10% of the surveys did not reach the addressed person. Thus the exact return rate cannot be calculated.

The cover letter began with: "Hassles are a part of life". It indicated that the project is about "daily hassles and their costs, as well as exploring ways that help people recover from their effects. In particular, the study involves seeing whether plants and nature can be helpful in this process." Participants were assured of anonymity and complete confidentiality.

Return envelopes were provided so that no-one in the organization had access to responses, although the Personnel Department had approved of the study and cooperated in providing access to employees.

The five page survey included questions on health, psychological functioning, life satisfaction, job environment, satisfaction with job and its setting, recreational activities and home setting, as well as demographic questions.

With respect to the question of the view from work, participants were asked about the difficulty of seeing outside and their likelihood of doing so. In addition, a checklist was provided of potential features that could be seen out of the window. These were categorized subsequently as 'built' (street, parking lot, other buildings) or 'natural' (trees/bushes, grass, flowers). There were also questions on the satisfaction with the view from the workplace and satisfaction with the opportunity to look out and on whether the view was restorative.

Not surprisingly, the ratings of satisfaction with the view and the opportunity to look out were strongly related to the ease of doing so. However, what could be seen out the window made a big difference. There was no difference in satisfaction with the view (a scale comprised of three items) between respondents who could see more or fewer built elements. Nor did seeing other buildings, streets, or parking lots contribute to the restorativeness

of the view. The availability of nature in the view, however, strongly affected these satisfaction and restorative ratings. For example, the mean for the rating of satisfaction with view for those with no opportunity to see nature was 2.22, while for those with even a minimum amount of nature in their view the mean was 2.91. If the view included two or three of the listed natural elements, the respective means were substantially greater, 3.40 and 3.58 ($F(3,525) = 29.07, P < 0.001$).

The availability of a view and having natural elements in the viewshed similarly influenced other aspects of satisfaction with the work setting even with respect to conditions that are not directly impacted by having a window nearby. For example, satisfaction with visual privacy from co-workers, having control over the privacy and a sufficiently quiet setting (a scale named 'privacy') was strongly affected by the likelihood of looking out. Satisfaction with opportunities to personalize one's work area showed a similar pattern of responses.

The degree to which participants were satisfied with the opportunity to see out, to personalize their work area, and to have privacy were, in turn, important predictors of several aspects of their work and life satisfaction. Focusing on the satisfaction with view, in particular, Table 1 itemizes some of these significant relationships and provides a few sample items for the

Table 1
Relation of satisfaction with view to outcome measures (including sample items for scales)

Variable	No. of items	<i>F</i>	d.f.	<i>P</i>
Job challenge (e.g. amount of work you have to do, how interesting job is, how hard work is, how busy you are usually)	8	20.12	2,607	0.001
Frustrated (how frustrated you feel)	1	5.27	2,598	0.01
Task enthusiasm (e.g. enjoy getting really involved in a task, feel invigorated and excited about what you're doing)	7	12.82	2,605	0.001
Patient (being patient with others)	1	7.69	2,605	0.001
Life satisfaction e.g. my life is interesting and challenging, happy with my daily activities; have lots of opportunities)	5	6.86	5,605	0.001
General health (e.g. + rate health in general, – bad headaches, – feel that you are ill)	9	3.74	2,605	0.05

multi-item scales. These results point to the range of impacts that a view of nature can affect. Those with a view of nature felt less frustrated and more patient, found their job more challenging, expressed greater enthusiasm for it, and reported higher life satisfaction as well as overall health. Even though the data are all based on self-report, the employee's perception of his/her own enthusiasm about the job is, after all, a vital aspect of well-being.

Clearly many other environmental factors can affect people's job satisfaction and work attitudes. The data, however, did not yield equivalently strong outcomes for many other potential sources of satisfaction. Satisfaction with indoor plants, for example, had a far weaker relationship to these outcome variables. By contrast, it is worth noting that the perceived adequacy of the immediate natural environment in the home context was a more powerful predictor, especially of health measures.

While the survey relied heavily on rating scales, many participants added comments. The most common theme for these comments was windows. The lack of windows received much complaint (e.g. "a window would improve all aspects of work and my work situation") and the presence of windows was often noted enthusiastically (e.g. "my window is one of the greatest advantages of the position").

Conclusion and implications

The focus of the studies presented here is on windows in the workplace. The results corroborate previous work on the importance of windows in a variety of settings. Windows are a source of light, of sunshine, of information about the weather and about other happenings in the world outside. They provide a suggestion of the extension of where one is in time and space.

The results of both studies, however, suggest that given the availability of a window, it also matters what can be seen. If all that can be seen

are built elements, even if they do not obstruct the natural light or reduce access to the world beyond, the psychological benefits are not fostered. However, the elements of nature that seem to make such a strong difference need not be any more than a few trees, some landscaping, or some signs of vegetation. In fact, the presence of other buildings or parking lots does not seem to be a problem, as long as the natural world is there too. Given these results, it is not surprising that Heerwagen and Orians (1986) and Sommer (reported by Collins, 1975) found that individuals in windowless offices resorted to decorating their walls with visual materials dominated by nature themes.

Windows provide an excellent means to rest directed attention for a brief moment or for a longer time. To be able to glance up from one's work and experience bits of nature is likely to be helpful. That is not to say, however, that windows are the only way to enhance contact with the natural world while at work. Having natural areas at the work site can be useful for views as well as for more direct involvement. Company-provided picnic benches in a shady spot are often popular at lunchtime. Corporate areas with places to walk or opportunities to observe wildlife would also be worthy of study in terms of their restorative benefits.

Whether one can place an economic value on the view from work in terms of work productivity is an unanswered question. The same can be said about many other factors that employers have become willing to support. Stress management workshops, good fringe benefit packages, access to fitness facilities, education on nutrition, and programs that address substance abuse are all widely accepted and may play important roles in the work context without a clear and direct link to productivity.

While these may all contribute to job satisfaction and improve the employees' outlook, there are important differences between the opportunity to view nature and many of the other factors. The immediate work setting confronts the employee continuously. The

ability to maintain a train of thought, to remain composed and civilized in the face of constant interruption and annoyances, may be much more dependent on the microenvironment of the workstation. Opportunities to exercise and to take breaks from the desk or workstation are doubtless of great importance. It is likely, however, that microrestorative opportunities play a particularly important role in reducing attentional fatigue.

The lack of empirical work on this topic is unfortunate. The unanswered questions are numerous and the opportunities for evaluation are hardly lacking. Not only is further substantiation necessary to increase the likelihood of nature availability in the work context, but also to provide information about the range of approaches that have yielded positive outcomes. Such material will prove essential for developing guidelines that can be used in the future. Relative to many fringe benefit costs, making nature available can be one of the least expensive items but also one with far-reaching consequences.

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