



Nature at home and at work: Naturally good? Links between window views, indoor plants, outdoor activities and employee well-being over one year



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HIGHLIGHTS

- We studied two-directional associations of nature exposure with employee well-being.
- Physical activity in nature during free time predicted vitality.
- Exposure to the natural world at work was not linked to the well-being measures.
- Conversely, affective well-being predicted the type of nature exposure.
- Physical activity in nature is a potential strategy for enhancing employee vitality.

ARTICLE INFO

Article history:

Received 1 February 2016

Received in revised form

22 November 2016

Accepted 13 December 2016

Keywords:

Indoor plants

Window view

Physical activity

Nature exposure

Workplace

Well-being

ABSTRACT

We investigated two-directional relations between various types of exposure to the natural world, at work and at home, and employee well-being. In total, 841 employees answered an electronic questionnaire twice with a one-year interval. Path analysis indicated that frequent physical activity in natural surroundings during free time predicted greater vitality over a one-year period after including control variables. The use of one's yard/garden and happiness were marginally positively associated over time. None of the variables involving exposure to the natural world at work were linked to the well-being measures. In the reverse direction, creativity at work predicted more frequent and vitality less frequent use of one's domestic garden. Happiness was marginally positively related to the frequency of physical activity in nature. The results suggest that free time physical activity in natural surroundings is a potential strategy for enhancing employee vitality across time.

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1. Introduction

Looking at the natural world from the window can be regarded as a “micro-restorative” experience that according to the Attention Restoration Theory (ART) can fence off frustration and boost enthusiasm about one's job thus promoting employee well-being (Kaplan, 1993), i.e., optimal psychological functioning and experience (Ryan & Deci, 2001). Being exposed at workplaces to window views over greenspace has been related to several well-being outcomes like lower physiological arousal and anxiety (Chang & Chen,

2005) and better job satisfaction (Lottrup, Stigsdotter, Meilby, & Claudi, 2013) compared with built urban views.

The link between nature exposure and well-being is evident also in the psychophysiological stress recovery theory (SRT), another major theoretical perspective in environmental psychology (Ulrich et al., 1991; Bratman, Hamilton, & Daily, 2012). According to SRT, a visual encounter with natural scenes prompts an automatic shift towards more positive emotional states, increases parasympathetic activity inducing relaxation (Gladwell et al., 2012), and blocks negative emotions and thoughts.

Complementing the idea of the restorative effects of nature by ART and SRT, some studies have suggested that exposure to the natural world also has (re-)vitalizing effects (Ryan et al., 2010). Vitality includes positive feelings that are more energized than the feelings of restoration or relaxation (Ryan et al., 2010). Subjective vitality

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is a feeling of aliveness (Nix, Ryan, Manly, & Deci, 1999) and activated positive affect (Ryan et al., 2010). Vitality increases positive coping responses, better self-control and enhances productivity (Ryan & Deci, 2008), all relevant to employee well-being. In the literature, the vitalizing effects of nature exposure have received less research attention than the stress-reducing aspects. Thus, in this study we investigate whether the perceptions of the use of natural elements at work and at home are related to positive and self-enhancing aspects of employee well-being, particularly subjective vitality. Moreover, a relevant outcome deserving investigation in this context is the feeling of creativity at work which may be related to vitality and result from attention restoration and lower stressful arousal after nature exposure (Atchley, Strayer, & Atchley, 2012).

In the following, we review studies on the associations of window views, plants, and physical activity in nature with well-being and work-related outcomes. We maintain that important gaps in research concern causal directions and the relative importance of different types of nature exposure. Our study aims to address these gaps by using a longitudinal design including several types of nature exposure.

1.1. Gaps in knowledge: the relative importance of the types of nature exposure and causal directions

Despite a large body of empirical results, the relative importance of different forms of exposure to the natural world for well-being remains elusive. Many studies have focused on nature exposure only within the workplace (Aries, Veitch, & Newsham, 2010; Largo-Wight, Chen, Dodd, & Weiler, 2011). In this study, we compare the perceptions of exposure to the natural world at the workplace with the perceptions of exposure to the natural world in residential and free time environments. To the best of our knowledge, only one study so far has taken into account the latter when studying the relationship between the use of greenspace at the workplace and well-being (Gilchrist, Brown, & Montarzino, 2015). The cross-sectional results of that study indicated that knowledge workers' use of greenspace near their workplaces and window views of nature were positively associated with self-reported well-being when controlling for the use of domestic garden and outdoor activity.

Other cross-sectional studies have demonstrated several well-being benefits but have not increased our understanding about the temporal and causal nature of the relationships. For example, existing survey studies have related *offices with plants* (versus lean offices) with greater overall job satisfaction, self-rated quality of life (Dravigne, Waliczek, Lineberger, & Zajicek, 2008), self-reported creativity, and work satisfaction (Bringslimark, Hartig, & Patil, 2007). Regarding *physical activity (PA) in natural surroundings*, a link to less need for recovery from work has been reported (Korpela & Kinnunen, 2011). Conversely, the higher the level of emotional demands at the job, the more often the outdoor recreation areas in the vicinity of home are visited on workdays (Degenhardt, Frick, Buchecker, & Gutscher, 2011).

Experimental research on nature exposure and well-being, in turn, has focused mainly on short-term effects (Knight & Haslam, 2010) and shown mixed results. For instance, one study found that working in “green offices” resulted in better performance in an attention capacity test (Raanaas, Evensen, Rich, Sjøstrøm, & Patil, 2011) whereas another study found no change in either directed attention capacity or self-reported restoration (Evensen, Raanaas, Hägerhäll, Johansson, & Patil, 2015). However, experiments with follow-ups have indicated that enriching a previously lean office with plants was associated with less disengagement (e.g., feelings of apathy or tiredness) among employees, which in turn enhanced their workplace satisfaction in the short-term (2 weeks) and the long-term (3.5 months) (Nieuwenhuis, Knight,

Postmes, & Haslam, 2014). Studies comparing nature walks with urban walks have shown positive short-term effects of nature walks on attention restoration and on nervous system arousal (Aspinall, Mavros, Coyne, & Roe, 2015; Hartig, Evans, Jamner, Davis, & Gärling, 2003; Park, Tsunetsugu, Kasetani, Kagawa, & Miyazaki, 2010). Similarly, a study comparing different lunchtime walks in the workplace showed improvement in self-reported mental health only in the nature walk group (Brown, Barton, Pretty, & Gladwell, 2014). Exposure to nature in the form of gardening has shown short-term restorative effects on mood and cortisol when compared to indoor reading (van den Berg & Custers, 2011).

Some longitudinal intervention studies suggest a predictive role for nature exposure in well-being. For example, gardening as well as nature-based therapies have been related to better overall health and well-being among adults (Groenewegen, van den Berg, de Vries, & Verheij, 2006; Währborg, Petersson, & Grahn, 2014). Longitudinal studies with a focus on the general population have suggested that more greenspace in residential areas is related to lower levels of stress (Ward Thompson et al., 2012) and that moving to greener areas is related to greater subsequent happiness and life satisfaction (White, Alcock, Wheeler, & Depledge, 2013).

1.2. Research questions and hypotheses

The present study addresses several gaps in the research by exploring relationships between self-reported exposure to the natural world both at work and at home and employees' experiences of well-being. We study the positive and self-enhancing aspects of well-being: vitality, happiness, vigor, and creativity. These relationships are examined over time (one year) as longitudinal evidence comparing different types of nature exposure is scarce. Furthermore, we aim to investigate exposure to the natural world in a wider context than previously by controlling for theoretically relevant job characteristics and the stability of well-being experiences over time.

To contribute to the rare comparisons between different types of exposure to the natural world, we selected perceived nature exposure variables that reflect different environments – natural elements at work (the number of indoor plants, views from windows, looking out of the window), at home (looking out of the window, being in the garden), and during free time (physical activities in natural surroundings). The only study so far controlling for the presence of a domestic garden and participation in outdoor activities (Gilchrist et al., 2015) did not control for the frequency of looking out of windows or the use of the domestic garden. Moreover, our nature exposure variables represent a perceived dimension of increasing immersion in natural surroundings and an increasing amount of physical activity (from sitting and looking at plants to outdoor recreation). This concurs with some indications in the literature of a linear dose–response relationship between exposure to the natural world and well-being outcomes (Fjeld, 2000; Jiang, Li, Larsen & Sullivan, 2014).

As the majority of earlier studies are cross-sectional causality has remained largely an open question. In our study, we aim to generate better conditions for causal hypotheses by using a two-wave panel design. We use a one-year time-lag as previous studies provide a range from one year (Astell-Burt, Mitchell, & Hartig, 2014; Kinnunen & Feldt, 2013; White et al., 2013) to five years for potential long-term effects. In a 5-year follow-up study, green qualities around the residence in an interaction with physical activity predicted mental health (e.g., happiness, ability to face problems and enjoy everyday activities) for women (Annerstedt et al., 2012). To understand these previous results and justify the one-year lag, we speculate that the types of nature exposure in our study (e.g., looking out, being physically active) represent ongoing daily, weekly, or monthly recurrent loops of behaviors that, in principle, can

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