

Setting-dependent constraints on human restoration while visiting a wilderness park



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ABSTRACT

Contact with nature can promote health and well-being through providing opportunities for restoring diminished psychological resources. Among those factors relevant for experiencing restoration are having a sense of being away from stress and daily demands. However, only little is known about how perceived interdependencies (in terms of social, behavioral and cognitive aspects) between settings usually relied on for restoration and those settings where stress and demands are encountered may impact having a sense of being away, and thus influence perceived restoration. In a visitor survey ($N = 115$) conducted at the Wilderness Park Zürich those perceived setting interdependencies that might influence having a sense of being away were assessed. The relationship between perceived setting interdependencies, having a sense of being away and restorative outcomes was analyzed by employing a structural equation model. The perceived setting interdependencies accounted for 26% of the explained variance for experiencing being away and had a negative indirect and total effect on perceived restorative outcomes. The more setting interdependencies a park visitor reported, the lower were the ratings for having a sense of being away and restorative outcomes. Researchers and practitioners who work with restorative environments and related domains are encouraged to further elaborate on setting-related aspects that may promote or hinder experiencing being away while spending time in an environment that is usually used for restorative purposes. These insights may be used to improve restoration of depleted psychological resources, to promote health and well-being, and thus to increase the overall visiting experience.

MANAGEMENT IMPLICATIONS

Researchers and practitioners who work with restorative environments and related domains are encouraged to further elaborate on setting-related aspects that may promote or hinder experiencing being away while spending time in an environment that is usually used for restorative purposes. These insights may be used to improve restoration of depleted psychological resources, to promote health and well-being, and thus to increase the overall visiting experience. In this case study, the restorative effects of the park can be influenced by park management by

- keeping crowding effects low; and
- providing environmental conditions which stand in contrast to the urban environment.

Both measures would enhance the sense of being away, which is one crucial component of restorational effects.

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1. Introduction

In many western, industrialized countries, daily life is defined by a heavy workload, stress, and a sedentary lifestyle (WHO, 1986; Hansmann, Hug, & Seeland, 2007; Prentice & Jebb, 1995). Physical activity in daily life is decreasing (Brownson, Boehmer, & Luke,

2005), while workload is increasing (Kompier, Cooper, & Geurts, 2000). A likely consequence is that the amount of perceived stress also rises because stress is perceived when people believe or experience that their personal resources can no longer match the demands they encounter in daily life (Lazarus, 1966). A vast body of literature on health and well-being provides persuasive evidence that a sedentary lifestyle, heavy workload and increasing stress are associated with growing incidences of coronary and heart diseases (e.g., Krantz, Berntsson, & Lundberg, 2005), increased likelihood of developing tumors (e.g., Fisher, Fitzgibbon, Glasgow, Haire-Joshu, Hayman, Kaplan, Nanney, & Ockene, 2011), and higher overall mortality (Kopp & Rethelyi, 2004).

Maintaining or increasing health and well-being thus becomes a major challenge for those individuals who experience stress (e.g., due to a heavy workload). Recreation is a promising factor for finding relief from stress and daily demands because it enables people to recover from depleted resources and fatigued attention (Hammit, 2004). Recent research in the domain of restorative environments suggests that recreation especially in relatively natural environments can be associated with increased (self-reported) well-being and both mental and physical health (e.g., Bowler, Buyung-Ali, Knight, & Pullin, 2010; Abraham, Sommerhalder, & Abel, 2010). The well-being benefits of recreating in relatively natural settings can often be explained by restoration of depleted resources, such as the psychological resource to direct attention. Those environments that not only permit but also promote restorative processes are commonly termed restorative environments (Hartig, 2004).

1.1. Attention restoration

Research on restorative environments often focuses on the extent to which individuals experience attention restoration when spending time in different environments. One theory that guided many of these studies is the attention restoration theory (ART) proposed by Kaplan and Kaplan (1989) and Kaplan (1995). ART assumes that people need to direct a certain amount of attention to cope with daily demands and tasks – for example, when focusing on traffic or concentrating on the job. ART further proposes that humans have a limited cognitive capacity of directed attention. This capacity will diminish as concentration needs to remain on a high level over a longer period of time (e.g., Kaplan & Berman, 2010). Once the psychological resources for directed attention are depleted, mental fatigue will follow. Experiencing mental fatigue is associated with several negative outcomes. For instance, mentally fatigued individuals likely need a longer time for planning tasks and are less flexible in solving problems, which are constraints of task performance in general (e.g., Baker, Olson, & Morisseau, 1994; Lorist et al. 2000; van der Linden, Frese, & Meijman, 2003).

The theory further assumes that restoring the psychological resources for directed attention is a key factor for maintaining health and well-being (Kaplan, 1995). Particularly, spending time in relative natural environments for recreational purposes likely supports the process of restoration (Kaplan, Kaplan, & Ryan, 1998; Kaplan, 1995) as environmental characteristics provide the opportunity to let one's mind wander, which implies that an individual does not have to strain his/her psychological resources to willfully direct attention on specific aspects of the environment. To be considered restorative, environments should thus provide a setting that is perceived as psychologically distant from everyday demands, fascinating, coherently ordered, and compatible with what one wants to do and must do in that setting (Kaplan & Kaplan, 1989; Kaplan et al., 1998; Kaplan, 1995; Hartig, 2004). Although relatively natural environments are considered to more likely be restorative than built environments (Kaplan, 1995), the

idea that restorative processes depend only on environmental characteristics is too simplistic. Research on restorative environments concerns transactions that join a person and an environment (Hartig, 2004), implying that whether or not these person–environment transactions promote restoration is predominantly a question of what a person brings to the exchange with the environment (e.g., experiences, expectations, etc.). The term “environments usually or typically relied on for restoration” is therefore used instead of “restorative environments” throughout this study to emphasize that whether an environment promotes restorative processes or not is relative to what an individual brings to the human–environment transaction.

Additionally, the specific kind of restorative experience has to correspond with the type of depleted resource. Sleep might for example not be appropriate to recover from depleted social resources for which restoration could require pleasant activities with those persons with whom relational bonds have been weakened (Hartig, Catalano, & Ong, 2007; Hartig, Catalano, Ong, & Syme, 2013). Theorizing in restorative environments research still requires further understanding of the possible impact of social, cognitive or behavioral processes on restorative outcomes. Bingley (2013) reported that a woodland work setting could be associated with negative effects on health and well-being for those people who depend on income from forest work, and von Lindern, Bauer, Frick, Hunziker and Hartig (2013) found that forest professionals reported lower restorative outcomes of forest visits during leisure time compared to individuals who had no forest-related occupation. The constraint of restoration mainly took place through an impaired sense of being away. Apparently it would be worthwhile to investigate “having a sense of being away” in more depth. It is not precisely clear what exactly a sense of being away is from a psychological perspective, nor which psychological conditions promote or constrain having a sense of being away. Thus the question arises: Which (psychological) conditions foster or constrain recovery of depleted psychological resources through having a sense of being away while spending time in an environment that is typically relied on for restoration?

A promising approach is to not only focus on environmental characteristics that enhance an individual's probability to experience restoration, but to also take the human–environment transaction into account. In this regard the behavior setting theory by Barker (1968) provides useful insights.

1.2. Restoration in the light of behavior setting theory

The behavior setting theory integrates the psychological, social, and physical aspects of environments. It combines these aspects in complementary relationships with specific behavior and social roles (Wicker, 1992), resulting in so-called “behavior settings” (BS). In the course of a day, people usually move from one BS to another, and as they assume different roles they also use different functions of BS. For instance, the BS changes both from “home/family” to “work” when physically leaving the home to go to the workplace, but also when deciding to stay at home and work in the home office.

Interaction between humans and physical objects is essential for BS (Barker, 1978). BS are therefore defined by individuals, physical objects and behavior involving interaction between individuals as well as between individuals and objects. With regard to recreation and restoration, a BS can be defined as one or more individuals who perform any kind of recreational behavior in an environment that is usually relied on for restoration. The behavior setting theory offers an approach to assess restorative effects in terms of having a sense of being away. It implies that every BS has its specific characteristics that hinder or foster (or even evoke) particular behavior (Schoggen, 1989). It is further believed in

behavior setting theory that BS can be differentiated by their degree of interdependence. The more interdependence there is, the harder it becomes to discriminate two BS from each other (Schoggen, 1989). The idea of interdependencies comprises seven different aspects that characterize a BS and allow an understanding of how one BS differs from another – if at all. These characteristics are described below (cf. Schoggen, 1989).

Behavioral interdependence means the degree to which a person performs the same behavior or perceives the same activities in two BS. A good example is when people work at their home–office which implies an increasing interdependency and less differentiation between the home BS and the work BS. *Inhabitant interdependence* is strong for two BS if the same individuals are present in both of them. *Leadership interdependence* is characterized by the degree to which a specific person acts as a leader despite different situations. This is the case if, for example, the same person decides what to do when at work and also during leisure time. *Spatial interdependence* is given when the same space is used for different functions. A good example of high spatial interdependence is provided by the same seminar room at a university building which is used for examinations in the afternoon and a social event in the evening. Thus, the physical environment stays the same while the social context changes. *Interdependence based on temporal contiguity* is defined as the degree to which two events happen at the same time. A high interdependence value for this dimension results from a situation where, for example, a person wants to have conversations with guests at a party but is at the same time occupied with preparing drinks. *Interdependence based on behavior objects* is understood as the degree to which a person uses the same objects in different situations and at different events – for example, when a person uses a company smartphone in his or her leisure time. *Interdependence based on commonality of behavior mechanisms* assumes that settings are highly interdependent when people perform the same types of behaviors in different situations or at different events.

With this definition of BS and their characteristics (for further details see Schoggen, 1989), it becomes apparent that having a sense of being away may be connected to perceiving an environment as having the lowest possible interdependencies with those BS that put demands on one's capacity for directed attention. In other words, when strong BS interdependencies are experienced in an environment typically relied on for restoration, the restoration process is likely to be constrained (cf. Hartig, Kylin, & Johansson, 2007). This may be the case when visiting a wilderness park for recreational purposes and then encountering one's boss there or being reminded of duties by receiving a work-related cell phone call. While having a sense of being away is likely susceptible to BS interdependencies, other dimensions, like fascination or coherence, might remain relatively unaffected by those interdependencies (cf. von Lindern et al., 2013). Fascination and coherence derive to some extent from the perception of environmental characteristics, while having a sense of being away explicitly means not just being physically away but also being away in a psychological manner from daily demands and stress (Kaplan et al., 1998). A conceptual model that visualizes these considerations is displayed in Fig. 1.

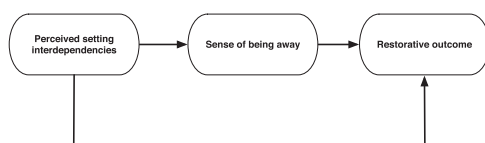


Fig. 1. Conceptual model of perceived restorative outcomes after spending time in an environment typically relied on for restoration. The process of restoring depleted psychological resources may be facilitated or constrained, depending on perceived setting interdependencies. These interdependencies may function either directly or indirectly via an impaired sense of being away.

1.3. Aim and rationale of the study

The goal of this study was to find empirical evidence for the assumed relationship between the perceived BS interdependencies of having a sense of being away, and perceived restoration while spending time in an environment that is ordinarily used for restoration, giving rise to the following research question:

- Do individuals who report more interdependencies with attention-demanding or stress-evoking behavior settings, while spending time in an environment typically relied on for restoration, have a constrained sense of being away and consequently report fewer restorative outcomes compared to those individuals who report fewer BS interdependencies?

Answering this question requires an assessment of restorative processes for individuals who suffer from heavy workload or stress and have depleted psychological resources for directed attention. Therefore, the target population consists of employed people who report at least a minimum of stress due to daily demands or work. Additionally, a measure for perceived behavior setting interdependencies has to be employed.

Answering the research question is highly relevant for practitioners and researchers working with potentially restorative environments and related domains because it helps generate a deeper understanding of the process of restoring depleted psychological resources for directed attention. In addition to focusing on characteristics that render an environment as more or less restorative, the current research offers an approach for shedding light upon characteristics of behavior settings as features of person–environment transactions that may facilitate or constrain restorative processes. These insights may also be used by park visitor managers to develop guidelines for how to provide the most restorative experience for their clients. Furthermore, the insights may encourage people working in the health domain to tailor interventions for more effective health promotion for people who suffer from heavy workloads and related stress.

2. Material and methods

2.1. Study area

The study was conducted as an on-site visitor study at the “Wilderness Park Zürich” in Switzerland. Although the park is named “Wilderness Park,” it is not located in a complete “wilderness” area as one could expect in North America, Scandinavia, or other countries with large remote areas. Instead, the Wilderness Park Zürich is federally approved as “Nature Discovery Park.” It covers a total area of about 12 km² and is comprised of forests, wilderness, and wild animals (Stiftung Wildnispark Zürich, 2012). The wilderness park is divided into the Langenberg Wildlife Park and the Wildnispark Sihlwald, and the survey was employed in the latter. A train station and a parking lot are a seven-minute walk from the visitor center of the wilderness park. The visitor center provides food and drinks, contains a museum, and offers a resting place for visitors, and a newly constructed outdoor playground for children in front of it. Close to the visitor center are several places to make campfires and prepare food. With its many services the visitor center constituted a good location for conducting the on-site survey.

2.2. Procedure and sample

First, a questionnaire was designed to investigate the perceived restorativeness of the park visit, perceived behavior setting

interdependencies, perceived stress, socio-demography, and general aspects of visiting behaviors. The results of an on-site pre-test survey among 19 wilderness park visitors suggested that no changes needed to be applied to the questionnaire: however, the pre-test revealed that the recruitment procedure needed adjustment. It was initially planned to hand out on-site questionnaires at both the train station and at the visitor center. However, almost no visitor agreed to participate in the study at the train station. The main reasons were that either the people had just arrived or that upon leaving, they got to the station just a few minutes before their train departed, leaving too little time to complete the questionnaire. Therefore, recruitment focused on the visitor center, the nearby picnic areas and the playground.

Data collection took place during three weekends in autumn 2012. The weather conditions were mostly sunny without any rain and comparable on all days when the fieldwork took place. During data collection, two researchers were present. They were instructed to engage every visitor at the visitor center, the nearby picnic sites, and the playground (within view of the visitor center). The researchers introduced themselves to the visitors, stating that they were conducting a visitor study to evaluate the wilderness park in order to improve the visiting experience. They also mentioned that the park management supported the study, which was conducted by the Swiss Federal Institute for Forest, Snow and Landscape Research. The visitors were told that they could help improve the park and contribute to a scientific study on recreation if they completed a questionnaire on-site.

Study participants had to be at least 18 years old and had to have completed their visit when they responded as most questions required an evaluation of the visit. All participants received written information about the purpose of the study on the cover page of the questionnaire. The information also stated that participation was completely voluntary and could be terminated at any time without providing any reasons. The participants were informed that all data would be used for the evaluation of the Wilderness Park, the scientific analyses and subsequent publication, and that any personal information would be anonymized and would never be passed on to any third party. Informed consent was obtained by stating that participants should only complete the questionnaire and return it if they understood and agreed with the information. As an incentive, participants were offered a hot drink of their own choice from the visitor center (coffee, tea, etc.), and they received a small piece of chocolate after completion, which took on average 16 min ($SD=7.4$ min). Groups of visitors were provided one survey per person. One of the researchers was always present at the visitor center to assist participants if necessary, while the other researcher was recruiting participants.

Through this procedure, data from 142 visitors were collected over three weekends. After screening the data, three cases had to be excluded from further analyses. Two respondents actually were park employees, and one respondent returned a questionnaire with missing values on all variables. Furthermore, to be included in this research, participants had to report a minimum amount of stress or had to perceive attentional demands concerning their daily life or work. If participants did not report any attentional demands or stress, it was assumed that they had no or few depleted psychological resources and, thus, no or only little need for restoration. These individuals were not considered as part of the target population, which was supposed to have a score of at least four or higher on the perceived stress scale (Cohen, Kamarck, & Mermelstein, 1983; see measurements below). This score of four equals the minimum score plus a half standard deviation. Based on this inclusion criterion another 24 individuals were excluded.

Therefore, the analysis is based on a total sample of 115 wilderness park visitors who have at least some need for restoration. The mean age was 44.0 years ($SD=12.8$ years); 59.5% were female,

33.9% were male, and 6.6% did not indicate their gender. The level of formal education was rather high: 42.3% had graduated from university or technical college (primary school: 2.7%; vocational school: 22.5%; high school: 11.7%; higher educational training: 18.9%). The majority of the visitors were accompanied by their partner (60%), and another 28.3% had children with them. Most visitors were accompanied by at least one other person (90%), while 10% visited the park alone. In 55% of the cases, it was the respondent's own idea to visit the park, while 29.2% stated that it was their partner's idea. All participants were employed at the time of the study and they visited the Wilderness Park for recreational purposes. The average level of employment was at 75.3% ($SD=32$) of full-time equivalent. The mean self-reported perceived stress level was 13.6 ($SD=6.1$), which is comparably high in terms of the norm data reported by Cohen and Williamson (1988).

The overall response rate was estimated at 65–70%. A precise response rate could not be calculated because during one heavy-use weekend some visitors mistook the researchers for park guides and occupied them with questions about the park and the researchers lost track of their visitor count. However, for the other weekends response and rejection rates were tracked correctly, which resulted in a response rate of 68%.

2.3. Measurements

In addition to socio-demographic questions, the survey contained measures for assessing the perceived restorative outcome of the park visit, having a sense of being away, fascination and perceived coherence of the park, perceived behavior setting interdependencies while visiting the park, and perceived stress during the last seven days. These measurements are detailed in the following.

Perceived restorative outcome of the visit was the main outcome assessed in the present study. The scale was adapted from Hunziker et al. (2012) and was extended to cover a broader range of aspects relevant for restoration, health and wellbeing. It comprised five items concerning self-reported health- and mood-related outcomes after the visit. The items were introduced by the question "How do you feel after today's park visit?" A total of five outcome dimensions (recovered, relaxed, stressed, able to focus, able to direct attention) were rated on a 5-point bipolar scale (-2 =much less than before, 0 =same as before, $+2$ =much more than before; the scale sum score ranged from -10 to 10). Reliability can be considered to be good, with Cronbach's alpha = .82 ($n=104$, five items).

Sense of being away was measured by the sub-dimension "psychological detachment from work" taken from the recovery experience questionnaire (Sonnentag & Fritz, 2007). This scale was employed because it measures psychological detachment from work and thus reflects having a sense of being away when performing recreational activities for people who experience work-related demands. The scale originally stated "After work, at leisure time..." and was followed by four items ("I forget work," "I do not think of my work," "I manage to detach from my work," and "I manage to get distance from my work-related requirements"). In order to better fit the wilderness park context, the introduction was changed from "After work, at leisure time..." to "In the wilderness park..." Otherwise, the respondents might be puzzled because they might not think of being in the wilderness park as being "after work" when it was, for instance, Sunday afternoon. The item "The park visit is for me a way to get away from everyday life" was added to this measure to also account for non-work related aspects of the sense of being away dimension. All five items could be answered on a 5-point bipolar scale ranging from -2 (not true at all) to $+2$ (totally true). The Cronbach's alpha for the

sense of being away was 0.83 ($n=110$; five items) and the scale sum score ranged from -10 to 10 .

Fascination was assessed with four items selected from the fascination subscale of the perceived restorativeness scale (Hartig, Kaiser, & Bowler, 1997). The items were “This place has fascinating qualities,” “There is much to explore and discover here,” “My attention is drawn to many interesting things,” and “The setting is fascinating.” These items were rated on a 7-point scale (-3 =not at all; $+3$ =completely). Cronbach’s alpha for *fascination* was 0.77 ($n=115$; four items), with a scale sum score between -12 and 12 .

Coherence was measured by three items in total. The items were formulated according to attention restoration theory (Kaplan & Kaplan, 1989) and were worded “Everything in the wilderness park fits together,” “I perceive everything here as coherently ordered,” and “Things here complement each other and create something whole.” Responses could range from -3 (not at all) to $+3$ (completely). The Cronbach’s alpha for *coherence* was 0.90 ($n=111$; three items), and the scale sum score ranged from -9 to 9 .

Perceived setting interdependencies between demanding/stressful settings and the setting used for restoration were assessed by a total of five items. These items were designed to describe how a wilderness park could vary from daily events and situations that might be experienced as stressful or demanding. Although Schoggen (1989) described seven aspects of BS, only five could reasonably be assessed in this study by including *cognition and social encounters, objects and activities*; the aspects related to *space and time* were omitted because the time and spatial behavior setting characteristics were constant for all respondents (all respondents visited the Wilderness Park during their leisure time and intended to recreate there; see also the above description of the sample and inclusion criteria for participating in the study). For assessing the perceived setting interdependencies (‘SI’) regarding stressful and demanding cognition and social encounters, the wording was “When visiting the wilderness park, how often...” followed by “...do you think about stressful or demanding situations?”, “...do you encounter other people with whom you also have contact in stressful and/or demanding situations?”, “...do people who have leadership in stressful and/or demanding situations also have the lead here?” These three items could be answered on a 5-point scale, ranging from 0 ([almost] never) to 4 ([almost] always). A second aspect of experiencing SI was associated with objects and activities. This aspect was assessed by two items. The wording of the first item was “If you think now about activities you typically perform when in stressful or demanding situations (e.g., at home or at work)... have you also performed one of those activities (or very similar ones) here while visiting the wilderness park?” The response scale ranged from 0 (no, the activities I perform here and in stressful/demanding situation are completely different) to 4 (yes, the activities I perform here and in stressful/demanding situations are [almost] the same). The second item for measuring perceived SI concerning activities was worded “Please think now of objects you typically associate with stressful or demanding situations (e.g., mobile phone, agenda). Have you used the same objects during your visit here?” The answer scale ranged from 0 (no, I used completely different objects during my visit and in stressful/demanding situations) to 4 (yes, I used these objects during my visit). The answers provided to these items were designed to indicate how far an individual experiences SI between stressful/demanding settings and while visiting the wilderness park. The items belonging to the scale were designed to represent the dimensions that are used to discern different settings (Schoggen, 1989). The perceived setting interdependency scale received an internal consistency of $\alpha=0.68$ ($n=100$; five items). This is still an acceptable value although a higher alpha is preferable. The scale sum score ranged from 0 to 20.

Perceived Stress was assessed by using the perceived stress scale (Cohen & Williamson, 1988; Cohen et al., 1983). The scale comprises 10 items concerning feelings and thoughts associated with stress and confidence. The wording was, for instance, “In the last week, how often have you felt nervous and ‘stressed?’” or “During the last week, how often have you felt that you were on top of things?” All 10 items were measured on a 5-point scale, ranging from 0 (never) to 4 (very often). Cohen et al. (1983) and Cohen and Williamson (1988) provided evidence that higher scale sum scores are associated with more depressive symptoms, higher frequencies of illness and lower self-reported health. Cronbach’s alpha for the perceived stress scale was 0.86 ($n=112$; 10 items) and can be considered to be good. The scale sum score ranged from 0 to 40.

2.4. Statistical treatment of data

All analyses for the present study were conducted using SPSS 22 for Mac and Mplus for Mac, Version 7.1 (Muthén & Muthén, 2010). A multiple-mediator regression model was formulated in Mplus. The model hypothesized that perceived SI and the dimensions of coherence, fascination, and having a sense of being away would predict reported restoration. Specific mediation-paths from perceived SI to reported restoration via having a sense of being away, fascination, and coherence were defined in the structural equation model. These specific paths represent the indirect effects of perceived SI on reported restoration outcomes (e.g., Geiser, 2010). In the first step, the measurement model was tested before the hypothesized paths were defined in the second step. The model also included age, gender, education and perceived stress during the last seven days as control variables. Missing data were treated with full information maximum likelihood procedures (‘FIML’; Arbuckle, 1996).

When interpreting the results, the 95% confidence intervals for direct, total indirect, specific indirect, and the total effect were taken into account (Geiser, 2010; Muthén, 2011). Please note that all items were originally presented in German. All analyses conducted depend on self-reported and cross-sectional survey data. This means that the results should not be interpreted in a strict causal sense.

3. Results

This section will first present the descriptive results and the correlational associations for all variables in this study. Then, the results derived from the structural equation model, which was designed to test the possible impact that perceived SI have on the sense of being away, fascination, and coherence and on perceived restoration after visiting the Wilderness Park (as depicted in Fig. 1) will be presented. Finally, the indirect effect that perceived SI might have on perceived restoration mediated through having a sense of being away, fascination, and coherence was tested.

The descriptive and correlational analyses revealed substantial and meaningful correlations between perceived SI, having a sense of being away, and stress perceived during the past seven days (see Table 1).

These results indicate that the more a person perceives interdependencies between the Wilderness Park and those behavior settings that are perceived as stressful or demanding for attentional resources, the less likely it is for that individual to experience having a sense of being away. At the same time, perceiving strong SI can be associated with higher levels of perceived stress during the past seven days and with slightly lower sum scores for self-reported restoration, although the latter correlation is rather weak and statistically not significant.

Table 1
Means (*M*), standard deviations (*SD*), and correlation matrix for the variables in the analyses. Descriptive values based on mean sum scores for all used measurements.

Construct	<i>M</i>	<i>SD</i>	Correlations										
1) Perceived setting interdependence	3.8	2.9	(1)										
2) Sense of being away	5.3	3.6	-.34**	(2)									
3) Coherence	5.6	2.8	.05	.16	(3)								
4) Fascination	5.4	3.8	-.10	.22*	.61*	(4)							
5) Perceived stress during last seven days	13.6	6.1	.28**	.07	-.01	-.04	(5)						
6) Perceived restoration of visit	4.5	3.1	-.15	.30**	.24*	.25**	.17	(6)					
7) Age (years)	44.0	12.8	-.04	.04	-.04	-.04	.01	-.02	(7)				
8) Education ^a	-	-	-.06	-.04	-.05	-.01	.01	.05	-.12	(8)			
9) Gender ^b	-	-	-.07	.10	-.13	-.18	-.05	-.10	-.11	.03	(9)		

Note. All *n*=96–115;

* = *p* < 0.05;

** = *p* < 0.01

^a Codes for education: 1=no degree, 2=primary school, 3=vocational school, 4=high school, 5=higher professional training, 6=technical college/university; higher numbers indicate higher level of education.

^b Codes for gender: 1=female, 2=male.

A substantial positive correlation emerged between being away and perceived restorative outcomes after visits. Furthermore, the perceived restoration after the visits was also positively associated with coherence and fascination. In other words, those respondents who had a sense of being away and perceived the Wilderness Park as coherent and fascinating also reported higher amounts of restoration after the visit. Another strong positive correlation was found between coherence and fascination. None of the socio-demographic variables had any substantial correlation with any of the other variables.

The mean sum score for perceived stress during the last seven days was in the range of the norm group values reported by Cohen and Williamson (1988) although marginally higher. With a mean sum score of 3.8 (*SD*=2.9) and a theoretical range from 0 to 20, the surveyed park visitors reported a relatively low amount of perceived SI overall, which is understandable as the park was on average perceived as an environment that was relatively free from stimuli, cues, or individuals that were associated with stress or daily demands. Thus, the sum score for having a sense of being away (*M*=5.3, *SD*=3.6; *Min*=-10, *Max*=+10) was quite high, and the park visitors reported overall high levels of restorative improvement after the visit (*M*=4.5, *SD*=3.1; *Min*=-10, *Max*=+10).

For further analyses regarding the relationship of perceived SI, having a sense of being away, coherence, fascination, and perceived restoration after the park visit, a multiple-mediator regression model was defined and tested within the structural equation model (see Fig. 2).

The specified model fit the data well according to standard fit indices available for such tests: $\chi^2(187)=258$; $\chi^2/df=1.4$;

CFI=0.95; TLI=0.93; RMSEA=0.06, 90%-CI [0.04, 0.07], *p*=0.23; SRMR=0.09 (see Geiser, 2010; Hu & Bentler, 1999). The model accounted for 22% of the explained variance for self-reported restorative outcomes. The amount of explained variance for having a sense of being away was 26%, whereas perceived SI did not explain any variance for fascination or coherence.

The results from the model test indicated significant associations between self-reported restorative outcomes and coherence (beta=0.32, *p*=.04) and having a sense of being away (beta=0.37, *p*<.01). The effect of fascination (beta=-.17, *p*=.34) on self-reported restorative outcomes was not significant. The amount of perceived SI did not affect fascination (beta=-.11, *p*=.32), coherence (beta=.00, *p*=.99), or the restorative outcome directly (beta=-0.07, *p*=.63), but did impact having a sense of being away (beta=-0.51, *p*≤.01).

When focusing on the indirect impact that perceived SI might have on self-reported restorative outcomes, the results from the multiple mediation analyses indicated no significant mediation via coherence (beta=.00, *p*=.99, 95%-CI [-.07, .07]) or fascination (beta=0.02, *p*=.50, 95%-CI [-.04,.08]). The mediation via having a sense of being away was, however, significant (beta=-0.19, *p*=.02, 95%-CI [-.35, -.03]). The total indirect effect (that is all defined mediation-paths combined) and the overall total effect (that is total indirect and direct effects combined) indicated a negative and statistically significant impact from perceived SI on self-reported restorative outcomes (beta_{indirect}=-0.17, *p*=.04, 95%-CI [-.33, -.01]); beta_{total}=-0.24, *p*=.04, 95%-CI [-.48, -.01]).

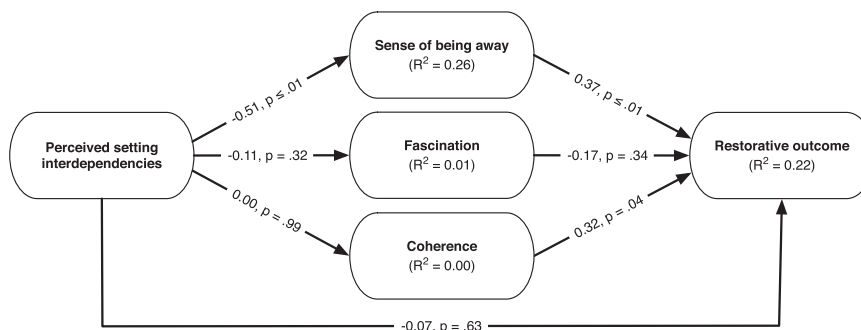


Fig. 2. Results from the structural equation model that was defined to test the relationship between perceived setting interdependencies, perceived restorativeness of the park visit (sense of being away, fascination, coherence), and self-reported restorative outcomes (*N*=115, standardized path coefficients are presented). Please note that the measurement model and the control dimensions (age, gender, education, and perceived stress during the last seven days) have not been included in the figure for legibility.

4. Discussion

In sum, the correlation analysis and the tested model provided evidence that perceiving strong SI between environments relied on for restoration, like the wilderness park, and BS where people experience stress lowers the self-reported restorative outcome of the park visit. Perceiving strong SI thus undermines having a sense of being away from daily demands and stress. Particularly, having a sense of being away was lower for people who reported more SI compared to those individuals who reported less SI. Although having a sense of being away can be constrained by experiencing more SI, almost all park visitors indicated positive restorative outcomes, like improved feelings of relaxation or an improved ability to direct attention after the visit. However, the results suggest that park visitors benefit more from restorative outcomes after the park visit the less SI they report (e.g., the less they encounter other people whom they associate with stressful events, or the less they interact with the same or similar objects they also interact with in stressful and attention demanding situations). Overall, the results provide empirical evidence for the theoretical assumptions derived from the behavior setting theory and show that restorative outcomes after visiting an environment usually relied on for restoration (e.g., relatively natural) depend on the perception of the BS in terms of setting interdependencies.

Interestingly, only the total and total indirect effects from perceived SI on self-reported restorative outcomes were statistically significant, whereas the direct effect was not. Apparently, perceived SI might have an indirect impact on restoration that is totally mediated through the sense of being away. The finding that perceived SI did not affect the dimensions of coherence or fascination is in accordance with theoretical considerations, as these two dimension are likely based more heavily on the perception of the environment compared to having a sense of being away, which explicitly contains the component of psychological distance from stress and attentional demands. This assumption is also supported by finding a strong correlation between fascination and coherence and a relatively weak correlation between a sense of being away and fascination or coherence, respectively.

The goal of this study was to introduce assumptions of the behavior setting theory into restorative environments research in order to deepen the understanding of the person–environment transactions that promote restorative processes. To the best of my knowledge, this combination has not been investigated so far. When interpreting the findings, several limitations should be considered. First, all results are derived from cross-sectional data, implying that the correlational nature of the data limits the ability to make strict causal claims. Second, although the model accounted for 22% of the explained variance in self-reported restoration as the main outcome variable, the question what other factors impact restorative outcomes after the park visit remains unanswered. Three possible explanations might be considered in this regard. To begin with, some influencing factors may not have been covered by the present study. These might include different individual preferences for (near-natural) environments or different kinds of activities performed during the park visit (e.g., Hunziker et al., 2012). In addition, the amount of self-reported restoration and well-being could be associated with satisfying basic psychological needs (e.g., Deci & Ryan, 2008; Rackow, Scholz, & Hornung, 2013; Ryan & Deci, 2000). Integrating these aspects into the model would likely account for additional amounts of explained variance concerning restorative outcomes. Furthermore, methodological aspects should also be considered. The structural equation model specified for the present analysis is based on underlying multiple linear regression analyses. It assumes a linear association between all latent variables in the analysis (e.g., the more people have a sense of being away, the stronger the restorative outcomes they

report). However, the relationship between restorative outcomes and some of the predicting variables is not necessarily linear. In that case, the amount of explained variance would be limited by definition. Furthermore, the R^2 coefficient depends on a comparison of the specified model with a baseline model. Such a baseline model assumes explicitly that all variables are uncorrelated and implies that a constant value (e.g., the mean of the dependent variable) would be the best predictor for the outcome variable (in this case, the mean score of self-reported restoration). Thus, R^2 indicates how much variance a model explains relative to that baseline model (for details on linear regression and R^2 see, e.g., Field, 2013; Muthén & Muthén, 2010; Olejnik & Algina, 2000; Rosseel, 2012). Please note that these explanations for the amount of variance that could not be explained by the model are not mutually exclusive, but more likely complement each other.

Third, the scale used for measuring perceived SI should be scrutinized carefully. Although the responses acquired during the pre-test and the actual fieldwork suggest that people understood the items in the intended way, the Cronbach's alpha for the SI scale was lower than expected. It was the first time the scale was applied, so no comparable analyses about its reliability or validity exist. The definition of settings where stress and daily demands are experienced was rather open and vague in the survey, leaving the kind of situations people were internally referring to somewhat unclear when answering the respective items. However, the responses were meaningful and interpretable, and correlative associations with other items and scales were reasonable and as expected. Apparently, the participants understood the content of the items belonging to the scale in a comparable way. Of course future research should focus on scale development and validation so that the psychometric characteristics of the newly developed measure allow for a more reliable and substantial interpretation of the results. Therefore careful interpretation of the results presented here is recommended, as it is not too clear how reliable and valid the measurements for perceived SI were. However, the amount of explained variance through the measurement of perceived SI for having a sense of being away was relatively high, and the results from the correlation analyses and the multiple-mediator structural equation model were consistent with theoretical assumptions. In addition, the measures for having a sense of being away, coherence, and fascination were not completely taken from established scales, like the perceived restorativeness scale (Hartig et al., 1997) because of the nature of the study: It was designed as a visitor survey, and the questionnaire had to be as short and concise as possible. Implementing the original and complete scales was not possible because the questionnaire was reviewed by research colleagues as being too repetitive and time-consuming for ad-hoc application at the wilderness park. However, those items were chosen for the measurements that typically cover the underlying dimensions to the best of my knowledge, and the Cronbach's alphas were all in acceptable ranges. Although the measurements achieved by the original and complete scales would have been preferable, it can thus be argued that the measures used in this work cover the underlying constructs that they were meant to measure conceptually.

Fourth, the results were derived from a relatively small convenience sample. Participants were recruited at the visitor center and were free to participate in the study. Thus, the sample might contain some self-selection bias, for two reasons: the response rate of 65–70% implies that approximately one-third of the visitors did not participate in the study. Although the majority of them stated that they did not have enough time left to complete the questionnaire or simply wanted to enjoy a day with their family, it remains unknown whether their answers would have systematically differed from those answers that were given by the visitors who agreed to participate. Furthermore, not every visitor actually

came to the visitor center. Thus, the results may represent only a specific subgroup of visitors and should not be generalized to a broader population of Wilderness Park visitors without any further arguments for doing so. However, the pre-test indicated that the chosen recruitment strategy was the most feasible one in terms of available resources (e.g., personal and financial resources, likelihood of successful recruitment, etc.).

Finally, all results are based on self-reported data, representing another potential source of bias (e.g., Chao & Lam, 2010; Corral-Verdugo, Bonnes, Tapia-Fonllem, Fraijo-Sing, Frías-Armenta, & Carrus, 2009; Fishbein & Ajzen, 2010). Therefore it remains unclear to what extent the results can be generalized to other recreational settings.

Limitations notwithstanding, the major strength of this study is its contribution to the understanding of human restoration. By emphasizing the relationship of the perceived interdependencies between BS where stress and attentional demands are experienced and those settings that are used for restorative purposes during leisure time, this study opens the field for innovative approaches in restorative environments research, management of (wilderness) parks, and comparable fields of application: The presented study provides an approach for how characteristics BS (e.g., cognition and social encounters, objects and activities) might be assessed and how they could facilitate or constrain perceived restorative outcomes of spending time in environments usually relied on for restoration. The environmental characteristics were the same for all visitors of the wilderness park, but the amount of self-reported restorative outcomes after the park visit varied systematically and meaningfully with the amount of perceived SI. This finding indicates a psychological effect of the person–environment transaction in environments typically used for restoration. The relevance of focusing on SI that might foster or constrain a sense of being away has recently been demonstrated, for example, by von Lindern et al. (2013) and Bingley (2013). The present study should be assessed similarly as it intends to contribute to strengthening the research on psychological processes that are likely to constrain or foster the restorative outcomes of spending time in environments that allow and promote restoration.

Such research also has practical implications. For example, health-promoting interventions might be tailored to lower perceived SI between recreational activities and demanding BS so that individuals experience a stronger sense of being away. This might be the case when visiting potentially restorative environments with persons who are not associated with stressful and attention demanding situations or when leaving the cell phone at home. Thus, the perceived sense of being away might be stronger, and consequently the restorative outcomes are likely to improve. Such an intervention might be a good alternative compared to re-designing an environment from, for example, urban-artificial to a more natural environment because such an intervention targets individual behavior and positively impacts the person–environment transactions that are associated with initiating restorative processes.

Of course, it has to be acknowledged that so far only little research has been undertaken on these topics, and consequently no sound conclusions can be drawn yet. Obviously further specific studies and critical discussion of the measurements for perceived SI and the respective results are needed. Moreover, future research should clarify to what extent the results are generalizable to different contexts and cultures. It remains unclear whether the “Wilderness Park Zürich” is comparable to “wilderness parks” in other countries or cultures. Specifically, the assumption of the underlying psychological processes that might constrain restorative processes (e.g., by undermining the sense of being away) when combining ideas from the behavior setting theory with

research on restorative environments has to be tested in different kinds of environments and in different cultures and populations. Nevertheless, this study hopefully encourages practitioners, researchers, and colleagues from environmental psychology, restorative environments research, and related disciplines to more strongly consider the characteristics of BS as possible facilitators for or barriers to restoration and well-being.

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References

- Abraham, A., Sommerhalder, K., & Abel, T. (2010). Landscape and well-being: a scoping study on the health-promoting impact of outdoor environments. *International Journal of Public Health*, 55(1), 59–69. <http://dx.doi.org/10.1007/s00038-009-0069-z>.
- Arbuckle, J. L. (1996). Full information estimation in the presence of incomplete data In: G. A. Marcoulides, & R. E. Schumacker (Eds.), *Advanced Structural Equation Modeling* (pp. 243–277). Mahwah, NJ: Erlbaum.
- Baker, K., Olson, J., & Morisseau, D. (1994). Work practices, fatigue, and nuclear power plant safety performance. *Human Factors: The Journal of the Human Factors and Ergonomics Society*, 36(2), 244–257. <http://dx.doi.org/10.1177/001872089403600206>.
- Barker, R. G. (1978). *Habitats, Environments, and Human Behaviour: Studies in Ecological Psychology and Eco-behavioral Science from the Midwest Psychological Field Station* (pp. 1947–1972). San Francisco: Jossey-Bass.
- Barker, R. G. (1968). *Ecological Psychology: Concepts and Methods for Studying the Environment of Human Behavior*. Palo Alto, CA: Stanford University Press.
- Bingley, A. (2013). Woodland as working space: where is the restorative green idyll? *Social Science & Medicine*, 91, 135–140. <http://dx.doi.org/10.1016/j.socscimed.2013.02.050>.
- Bowler, D. E., Buyung-Ali, L. M., Knight, T. M., & Pullin, A. S. (2010). A systematic review of evidence for the added benefits to health of exposure to natural environments. *BMC Public Health*, 10(1), 456. <http://dx.doi.org/10.1186/1471-2458-10-456>.
- Brownson, R. C., Boehmer, T. K., & Luke, D. A. (2005). Declining rates of physical activity in the United States: what are the contributors? *Annual Review of Public Health*, 26, 421–443. <http://dx.doi.org/10.1146/annurev.publhealth.26.021304.144437>.
- Chao, Y.-L., & Lam, S.-P. (2010). Measuring responsible environmental behavior: self-reported and other-reported measures and their differences in testing a behavioral model. *Environment and Behavior*, 43(1), 53–71. <http://dx.doi.org/10.1177/0013916509350849>.
- Cohen, S., & Williamson, G. (1988). Perceived stress in a probability sample of the US In: S. Spacapan, & S. Oskamp (Eds.), *The Social Psychology of Health: Claremont Symposium on Applied Social Psychology* (pp. 31–67). Newbury Park, CA: Sage.
- Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior* (pp. 385–396), 385–396. <http://dx.doi.org/10.2307/2136404>.
- Corral-Verdugo, V., Bonnes, M., Tapia-Fonllem, C., Fraijo-Sing, B., Frías-Armenta, M., & Carrus, G. (2009). Correlates of pro-sustainability orientation: the affinity towards diversity. *Journal of Environmental Psychology*, 29(1), 34–43. <http://dx.doi.org/10.1016/j.jenvp.2008.09.001>.
- Deci, E. L., & Ryan, R. M. (2008). Self-determination theory: a macrotheory of human motivation, development, and health. *Canadian Psychology/Psychologie Canadienne*, 49(3), 182. <http://dx.doi.org/10.1037/a0012801>.

- Field, A. (2013). *Discovering Statistics using IBM SPSS Statistics* (Fourth Edition ed.). London: SAGE Publications Ltd.
- Fishbein, M., & Ajzen, I. (2010). *Predicting and Changing Behavior – The Reasoned Action Approach*. New York: Psychology Press.
- Fisher, E. B., Fitzgibbon, M. L., Glasgow, R. E., Haire-Joshu, D., Hayman, L. L., Kaplan, R. M., Nanney, M. S., & Ockene, J. K. (2011). Behavior matters. *American Journal of Preventive Medicine*, 40(5), e15–e30. <http://dx.doi.org/10.1016/j.amepre.2010.12.031>.
- Geiser, C. (2010). *Datenanalyse mit Mplus – Eine anwendungsorientierte Einführung* (1 ed.). Wiesbaden: VS Verlag für Sozialwissenschaften.
- Hammitt, W.E. (2004). A restorative definition for outdoor recreation. In Proceedings from Northeastern Recreation Research Symposium.
- Hansmann, R., Hug, S.-M., & Seeland, K. (2007). Restoration and stress relief through physical activities in forests and parks. *Urban Forestry & Urban Greening*, 6(4), 213–225. <http://dx.doi.org/10.1016/j.ufug.2007.08.004>.
- Hartig, T. (2004). Restorative environments In: C. Spielberger (Ed.), *Encyclopedia of Applied Psychology* (pp. 273–279). San Diego: Academic Press.
- Hartig, T., Catalano, R., & Ong, M. (2007). Cold summer weather, constrained restoration, and the use of antidepressants in Sweden. *Journal of Environmental Psychology*, 27(2), 107–116. <http://dx.doi.org/10.1016/j.jenvp.2007.02.002>.
- Hartig, T., Catalano, R., Ong, M., & Syme, S. L. (2013). Vacation, collective restoration, and mental health in a population. *Society and Mental Health*, 3(3), 221–236. <http://dx.doi.org/10.1177/2156869313497718>.
- Hartig, T., Kaiser, F. G., & Bowler, P. A. (1997). *Further development of a measure of perceived environmental restorativeness* Working paper, 5. Retrieved 12.7.2012 from <http://www.ibf.uu.se/PUBL/Wp/Wp5.pdf>.
- Hartig, T., Kylin, C., & Johansson, G. (2007). The telework tradeoff: Stress mitigation vs. constrained restoration. *Applied Psychology*, 56(2), 231–253. <http://dx.doi.org/10.1111/j.1464-0597.2006.00252.x>.
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6(1), 1–55. <http://dx.doi.org/10.1080/10705519909540118>.
- Hunziker, M., von Lindern, E., Bauer, N., & Frick, J. (2012). Das Verhältnis der Schweizer Bevölkerung zum Wald. *Waldmonitoring soziokulturell: Weiterentwicklung und zweite Erhebung – WaMos, 2* Retrieved from.
- Kaplan, R., & Kaplan, S. (1989). *The Experience of Nature: A Psychological Perspective*. Cambridge: Cambridge University Press.
- Kaplan, R., Kaplan, S., & Ryan, R. L. (1998). *With People in Mind – Design and Management of Everyday Nature*. Covelo, CA: Island press.
- Kaplan, S., & Berman, M. G. (2010). Directed attention as a common resource for executive functioning and self-regulation. *Perspectives on Psychological Science*, 5(1), 43–57. <http://dx.doi.org/10.1177/1745691609356784>.
- Kaplan, S. (1995). The restorative benefits of nature: toward an integrative framework. *Journal of Environmental Psychology*, 15(3), 169–182. [http://dx.doi.org/10.1016/0272-4944\(95\)90001-2](http://dx.doi.org/10.1016/0272-4944(95)90001-2).
- Kompier, M. A. J., Cooper, C. L., & Geurts, S. A. E. (2000). A multiple case study approach to work stress prevention in Europe. *European Journal of Work and Organizational Psychology*, 9(3), 371–400. <http://dx.doi.org/10.1080/135943200417975>.
- Kopp, M. S., & Rethelyi, J. (2004). Where psychology meets physiology: chronic stress and premature mortality – the Central-Eastern European health paradox. *Brain Research Bulletin*, 62(5), 351–367. <http://dx.doi.org/10.1016/j.brainresbull.2003.12.001>.
- Krantz, G., Berntsson, L., & Lundberg, U. (2005). Total workload, work stress and perceived symptoms in Swedish male and female white-collar employees. *European Journal of Public Health*, 15(2), 209–214. <http://dx.doi.org/10.1093/eurpub/cki079>.
- Lazarus, R.S. (1966). Psychological stress and the coping process. Retrieved from (<http://psycnet.apa.org/psycinfo/1966-35050-000>).
- Lorist, M. M., Klein, M., Nieuwenhuis, S., Jong, R., Mulder, G., & Meijman, T. F. (2000). Mental fatigue and task control: planning and preparation. *Psychophysiology*, 37(5), 614–625. <http://dx.doi.org/10.1111/1469-8986.3750614>.
- Muthén, B. (2011). Applications of causally defined direct and indirect effects in mediation analysis using SEM in Mplus. Retrieved from (<http://gseis.ucla.edu/academic-programs/education/aqm/aqm-resources/events-2010-2011/Muthen-causalmediation.pdf>).
- Muthén, L. K., & Muthén, B. O. (2010). *Mplus User's Guide* (6 ed.). Los Angeles, CA: Muthén & Muthén.
- Olejnik, S., & Algina, J. (2000). Measures of effect size for comparative studies: applications, interpretations, and limitations. *Contemporary Educational Psychology*, 25(3), 241–286. <http://dx.doi.org/10.1006/ceps.2000.1040>.
- Prentice, A. M., & Jebb, S. A. (1995). Obesity in Britain: gluttony or sloth? *BMJ: British Medical Journal*, 311(7002), 437. <http://dx.doi.org/10.1136/bmj.311.7002.437>.
- Rackow, P., Scholz, U., & Hornung, R. (2013). The German psychological need satisfaction in exercise scale. *Swiss Journal of Psychology*, 72(3), 137–148. <http://dx.doi.org/10.1024/1421-0185/a000107>.
- Rosseel, Y. (2012). lavaan: An R Package for Structural Equation Modeling. *Journal of Statistical Software*, 48(2).
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68. <http://dx.doi.org/10.1037/0003-066X.55.1.68>.
- Schoggen, P. (1989). *Behavior Settings: A Revision and Extension of Roger G Barker's Ecological Psychology*. Stanford, CA: Stanford University Press.
- Sonnentag, S., & Fritz, C. (2007). The recovery experience questionnaire: development and validation of a measure for assessing recuperation and unwinding from work. *Journal of Occupational Health Psychology*, 12(3), 204. <http://dx.doi.org/10.1037/1076-8998.12.3.204>.
- StiftungWildnispark Zürich. (2012). Im Sihlwald entsteht etwas Einzigartiges. Retrieved 10.2.2014, from (http://www.wildnispark.ch/files/pdf/Zuerichs%20Wildnis_Sihlwald/Wildnispark_Zuerich_Faktenblatt_Sihlwald.pdf).
- van der Linden, D., Frese, M., & Meijman, T. F. (2003). Mental fatigue and the control of cognitive processes: effects on perseverance and planning. *Acta Psychologica*, 113(1), 45–65. [http://dx.doi.org/10.1016/S0001-6918\(02\)00150-6](http://dx.doi.org/10.1016/S0001-6918(02)00150-6).
- von Lindern, E., Bauer, N., Frick, J., Hunziker, M., & Hartig, T. (2013). Occupational engagement as a constraint on restoration during leisure time in forest settings. *Landscape and Urban Planning*, 118, 90–97. <http://dx.doi.org/10.1016/j.landurbplan.2013.03.001>.
- WHO. (1986). Ottawa Charter for Health Promotion. Retrieved 2.10.2014, from (http://www.euro.who.int/__data/assets/pdf_file/0004/129532/Ottawa_Charter.pdf).
- Wicker, A. W. (1992). *Making Sense of the Environment In: W. B. Walsh, K. H. Clark, & R. H. Price (Eds.), Person-Environment Psychology: Models and Perspectives* (pp. 158–191). Hillsdale, NJ: Lawrence Erlbaum Associates.