Some Developments in Restorative Environments Research

Terry Hartig

Attentional restoration and psychophysiological stress reduction approaches have been proposed for understanding how natural and other environments aid recovery from excessive demands on functional capacities. Two series of studies have tested aspects of these frameworks. The first consisted of experiments which mapped the emergence of attentional, emotional and physiological outcomes in conjunction with comparisons of the restorative potentials of commonplace urban and natural environments. The second was dedicated to the development of a measure of perceptions related to the restorative potentials of environments. Restorative potentials of select sites were measured with items intended to represent the constructs being away, fascination, coherence and compatibility. The sites differed along theoretically relevant dimensions and were evaluated by subjects from different populations under various field and simulation conditions. The paper summarizes the main findings from each series of studies, drawing attention to the structure of restorative experiences, the time course of restoration and the relative restorative values of natural and urban environments.

Keywords: directed attention restoration, natural environments, perceived restorativeness, restorative environments, stress reduction.

Restorative environments enable recovery from excessive demands on the capacities that people need to function effectively and to otherwise lead satisfying lives. Although some form of restoration presumably could occur in almost any place, natural environments are disproportionately represented among environments considered to be restorative, at least by people in urbanized “Western” countries such as Sweden and the USA. Anecdotal accounts relate that it is often to natural settings that people will go to find something like a restorative experience, to take a break, to clear their minds, to unwind and so on. A preoccupation with natural environments likewise appears in empirical research on restorative environments. Much like those who make anecdotal statements about restorative values of natural environments, researchers typically see the urban environment as the setting for the too-heavy demands which potentiate restoration. This natural-urban opposition reflects the convergence in restorative environments research of two long-held concerns in environmental psychology (Hartig & Evans, 1993). One is for the harmful effects of conditions common for urban populations, such as high density and sound levels. The other is a concern for natural area amenity values that are undermined by poor land management practices and urbanization. These converging concerns underlie a basic hypothesis in restorative environments research: People are not likely to be restored under conditions which may contribute to a deficit in the first place. Accordingly, most experiments in this area have focused on differences in the restorative potentials of natural and urban environments.

Different theories have been proposed for understanding the ways in which natural and other environments might aid in restoration. The formulations most widely cited in the area are a stress reduction framework (e.g. Ulrich, 1983) and an attention restoration framework (e.g. Kaplan & Kaplan, 1989). This paper describes some developments in a research program which builds on these formulations. The first section covers some basic features of the frameworks, summarizes strategies for testing their relative utilities and describes experiments which used different combinations of these strategies. Major concerns of these studies are the character of the prior condition from which people are to be restored and the time course for the emergence of different outcomes (emo-
tional, performance, physiological). The second part of the paper outlines studies carried out to develop a Perceived Restorativeness scale (PRS). The PRS is meant to help in exploring the content of restorative experience, in examining relations between operative factors and outcomes and in evaluating the restorative potential of a broad range of environments.

**EXPERIMENTAL TESTS OF RESTORATIVE ENVIRONMENTS THEORY**

The stress reduction and attention restoration approaches have noteworthy similarities and differences. The distinguishing characteristics of greatest significance have to do with the antecedent condition from which an individual is to be restored, the negative aspects of that condition, the restoration process and the length of time that process might continue.

In the Kaplan and Kaplan (1989) framework the antecedent condition is directed attention fatigue (DAF). Directed attention, or concentration, is assumed to depend on a central inhibitory capacity that becomes fatigued or depleted when demands are prolonged. Negative corollaries thought to follow from depletion of this inhibitory capacity include irritability, failure to recognize interpersonal cues, increased error in tasks requiring directed attention and inability to plan. Restoration of directed attention capacity can be achieved when the person experiences fascination, which is assumed to be effortless and without capacity limitations. When functioning on the basis of fascination, demands on the central inhibitory capacity are relaxed and capacity can be renewed. Fascination can be engaged by objects or events, or by processes of exploring and making sense of an environment. Yet fascination, although necessary, is not sufficient (Kaplan, 1995); other factors in person–environment interactions also play a role in the restorative experience. One is being away from the work one usually does and from the pursuit of given goals and purposes. Another is extent, or the sense that a physical or conceptual environment available for restoration is both sufficiently large in scope to entertain continued exploration and sufficiently coherent so that one can make sense of what is seen going on around oneself and relate it to some larger frame of reference. A fourth factor, compatibility, encompasses the person’s inclinations, environmental supports for activities and environmental demands; it exists when there is a match between what one wants to do, what one can do and what one must do in the given setting. High compatibility is thought to allow for reflection and deeper levels of restoration.

The depth of restoration is assumed to be a function of the extent to which being away, fascination, extent and compatibility characterize a given person–environment interaction. The degree to which these factors work is related to aspects of the person and the environment and to the amount of time spent in the environment. Since these factors can operate over extended periods, effects of restoration as treated by this framework may emerge over extended periods. So, for example, Hartig, Mang & Evans (1991) reported two field studies in which subjects who spent time (40 minutes or several days) within natural settings showed better proofreading performance (an index of attentional capacity) than subjects who spent time in urban or other conditions. Other research speaks to the possibility of a broader range of outcomes. For example, recovering cancer patients who had regular, brief restorative experiences showed gains in life quality (Cimprich, 1993) and participants in a multi-day outdoor program had changed perspectives on self and life (Kaplan & Talbot, 1983).

In contrast to attention restoration theory, the stress reduction framework of Ulrich (1983) is concerned with emotional and physiological recovery from stress. Stress in this framework is a process of responding to a situation perceived as challenging or threatening to well-being. It is manifest in negative emotions and short-term changes in physiological systems which are indicative of heightened arousal. As with stress itself, restoration from stress is thought to be a potential mode of affective responding to a given visual stimulus array. It is thought to occur in situations where a scene initially elicits feelings of mild to moderate interest, pleasantness and calm. For one who is stressed and needing to renew resources, it could be adaptive to continue viewing the scene in a non-vigilant manner. While viewing, negative affects are replaced by positive ones, the person’s interest is held, negative thoughts are blocked and arousal declines. Such restorative responses are thought to be initiated very rapidly by the perception of certain patterns of environmental preferenda, which are configural aspects of the visual stimulus array whose vague character may precede conscious cognitive judgments, but which can be effective in eliciting a generalized affective response (Ulrich, 1983, p. 89; after Zajonc, 1980). These responses are assumed to be so rapid as to preclude conscious, “cold” cognition. Qualities of the visual stimulus array such as moderate depth, moderate complexity, the presence of a focal point and contents such as vegetation and water are seen as particularly...
conducive to restoration.

Given the concern for rapid-onset aesthetic/physiological responses and for brief encounters with natural scenes, it is not surprising that studies guided by this framework have been mainly concerned with restorative experiences of short duration. Experiments in this line of research have involved 10–18 minute simulations of natural and urban environments and have documented differential change in the emotional and physiological outcomes measured during or immediately after the period of the simulation. For example, subjects in one study (Ulrich et al., 1991) were stressed by an industrial accident film and then viewed a 10-minute videotape of one of six conditions: a natural environment with or without water; an outdoor mall under one of two conditions of pedestrian flow; an urban commercial street under one of two vehicular traffic levels. Muscle tension, skin conductance, heart period and pulse transit time (a correlate of systolic blood pressure) were tracked during the stressor and the recovery period. Recovery trajectories for these measures were found to differ with type of environment, after collapsing groups into nature, pedestrian mall and traffic conditions; nature simulations promoted the fastest returns toward baseline levels and the lowest overall levels. Differences in emotions also spoke to greater restorative value of the nature condition.

While the emphasis so far has been on differences between the frameworks, some similarities should also be mentioned. Of necessity, both frameworks specify an antecedent condition from which people are to be restored. Restoration is then reflected in positive change specifically in those aspects of functioning seen as having been previously impaired. Also, both frameworks generate statements about natural environments in general having greater restorative potential than many contemporary urban settings. These statements issue from shared assumptions about the persistent adaptedness of human physiological and/or psychological capabilities to conditions that held in the environments of prehistory.

The various similarities and differences between the frameworks raise questions that can help guide theory development. The question of first importance is whether stress reduction and directed attention restoration are necessarily related. Ulrich et al. (1991) have referred to the possibility for fascination to work in presumably stressful situations and for prolonged performance of tasks requiring directed attention to also entail negative emotions and the involvement of physiological systems. They appear to suggest that directed attention restoration is an aspect of stress reduction. Kaplan and Kaplan (1989) have noted that DAF can occur in the absence of threats or negative evaluations, that it can arise in work that is enjoyed and that stressful experience need not engender DAF. More recently, Kaplan (1995) has described ways in which DAF and stress might stand in relation to one another:

1. DAF may potentiate stress and performance impairments;
2. stress may prompt distraction such that subsequent functioning requires a fatiguing expenditure of directed attention capacity;
3. an aversive stimulus may prompt both stress and decline in the attentional resource.

Arguably, neither stress reduction nor attention restoration of itself is entirely responsible for the full range of restorative effects described in the literature. Attention restoration theory as currently articulated does not take up physiological aspects of stress reduction and the stress reduction framework does not account for recovery of directed attention capacity and related phenomena. Further theory development in the area and the empirical research that will follow from it, must thus consider whether each framework alone is best suited to the explanation of restorative effects, or whether some synthesis of the frameworks will have greater utility than either alone. The studies described next approach the latter possibility by first considering whether the frameworks are complementary, each lending itself to the explanation of particular effects that emerge within particular time intervals, given appropriate antecedent conditions. A central concern of this approach, then, is with the time course for the emergence of attentional, emotional and physiological outcomes.

To begin empirically assessing the relative utility of the frameworks, a series of experiments has been initiated in which three basic strategies have been applied in different combinations. One has been to use treatment periods of different lengths, ranging from roughly 15 minutes to one hour. The selection of the different durations follows from previous studies (e.g., Hartig et al., 1991; Ulrich et al., 1991) which have shown emotional and physiological changes in the short term and attentional performance gains over a longer term. A second strategy has been to use measures that tap the different outcome dimensions specified by the frameworks. This has meant including measures of physiological activity, emotional states and directed attention capacity. Not only does this strategy enable testing of hypotheses issuing from each framework, but convergence of the different measures also allows stronger state-
ments about the relative restorativeness of the natural and urban environments under study. The third strategy has built on the assumption that arousal reduction is a key aspect of stress reduction and has involved manipulating the possibility for arousal reduction to take place. This has meant trying to ensure either that subjects had low or normal levels of sympathetic arousal when testing for the emergence of attentional outcomes within a specific period, or that subjects were both aroused and attentionally fatigued prior to treatment. Three experiments will be described which illustrate different combinations of these strategies and which tell us something more about the emergence of different restoration outcomes and the time course of restoration. Like the previous experiments in this area, each involved a comparison of natural and urban environments.

In Experiment One (Hartig, Bök, Garvill, Olsson, & Gärling, in press), 102 Swedish students were randomly assigned to six groups in a factorial design that crossed three simulation conditions (nature, urban, no-simulation control) with two task conditions (task, no-task). Prior to the simulations (or, in the case of the no-simulation condition, prior to completing the outcome measures), task group subjects performed a 50-minute task designed to induce DAF without elevating arousal. Following the simulations, subjects in the urban and nature simulation groups (both task and no-task) provided a sample of saliva so that their levels of cortisol could be compared. This comparison was a check on arousal due to the pre-simulation task and it suggested that those groups did not have significantly different levels of arousal at simulation onset (there is typically a 15–20 minute delay between environmental event and resultant change in salivary cortisol level). Thus, post-simulation differences between groups are less easily attributed to stress reduction.

The simulations consisted of a series of 80 photographic slides showing progression either along streets in the urban core of Stockholm or along a trail in a forested recreation area in Umeå, the city in which the subjects were living. The duration of the simulations was about 14 minutes, a period intermediate in length to the simulations used by Ulrich (1979 — 18 minutes) and Ulrich et al. (1991 — 10 minutes) and so known to be of sufficient duration for the emergence of emotional and physiological outcomes.

Two forms of post-simulation outcome were examined. One was attentional capacity as reflected in performance (accuracy and speed) on a task in which lines of random letters are searched for target letters. The other outcomes were self-reported emotional states. The findings of most interest at present were that the nature simulations resulted in higher positive emotions (e.g., feeling friendly or affectionate, warm-hearted or cheerful) than did the urban simulations, without accompanying reliable differences in performance measures. Consistent with earlier studies, these results indicate that differential emotional effects emerge early in person–environment interactions (within 14 minutes, if not sooner). They also suggest that directed attention restoration as reflected in performance is a more time-intensive process.

Experiment Two (Hartig et al., in press) was a partial replication of Experiment One. It involved only nature and urban simulation conditions, with 18 Swedish university students randomly assigned to each condition. The design was simplified in part because the attentional fatigue manipulation was different from that used in Experiment One. Rather than completing a non-arousing, attentionally demanding task prior to viewing the simulations, subjects were taken through the experimental procedure just after attending a 3-hour lecture. It was assumed that the lecture served as a naturalistic, non-arousing attentional fatigue induction. The simulations shown to subjects were the same as those used in Experiment One and the outcomes were again performance on the search task and self-reported emotional states. As in Experiment One, statistically significant differences between the nature and urban simulation groups were found for self-reported emotions but not for attentional capacity as reflected in task performance. As before, subjects in the nature group reported more positive emotions than did subjects who viewed the urban simulation.

The results of these two experiments speak to two related issues. The first has to do with whether the emotional outcomes detected in the two experiments were manifestations of directed attention restoration, stress/arousal reduction, or both processes. It is possible that attention restoration was underway during the simulations and contributed to emotional outcomes. Conceivably, change in directed attention capacity is influential in subjective awareness before it is detectable with performance measures. On the other hand, it may have been the case that arousal was initially elevated to some degree by the novelty of the experimental context. While this might allow differential arousal reduction to be invoked as an explanation after all, such an explanation is difficult to reconcile with the very low self-reported arousal seen in all groups in Experiment One, including the no-
simulation, no-task control group, which provided the self-reports within minutes of beginning the experiment. Given that attention restoration was underway and generated the emotional results uncovered, a second issue is whether attentional performance effects can emerge within a period which previous research has shown to be adequate for the emergence of differential physiological and emotional effects. Although the results of these experiments suggest that performance effects require more time than emotional effects, these results should be considered suggestive rather than conclusive and it remains to be seen whether more sensitive performance indicators will show effects earlier on.

A third experiment (Hartig, 1993) cannot be described in detail here, given the complexity of the procedure. The design of the study was similar to that of Experiment One, in that the different environment conditions (natural and built/urban) were crossed with task and no-task conditions. However, it was conducted in field settings and included a 60-minute treatment period previously found to be adequate for the emergence of attentional performance effects.

Furthermore, the 60-minute pre-treatment task was designed to be both stressful and attentionally fatiguing. Measures of emotion and attentional performance were obtained from the 112 subjects at the pretest, during the walk in the field setting and at the post-test. Measures of blood pressure were obtained at 10-minute intervals throughout the lengthy procedure and measures of salivary cortisol were obtained in conjunction with some blood pressure measures obtained at the field site. Preliminary results include numerous environment-x-task interactions that make simple statements about effects problematic. Still, the results largely agree with the previous research in that:

1. between-group differences in emotional and physiological outcomes were seen early in the treatment period, whereas attentional performance effects did not emerge until posttest;
2. the natural environment condition produced generally more positive effects.

The differential emergence of the various effects suggests that stress reduction and recovery of directed attention capacity may coincide in a restorative experience, given an antecedent condition that is both stressful and attentionally fatiguing, with those processes being expressed in different measures at different points in time. Further experimentation using additional measures of attentional capacity, again in conjunction with measures of emotion and physiology, will be needed to address the questions raised by this and the other two experiments.

In closing, an issue of concern to all three experiments was the relative restorativeness of natural and urban environments. In each study, the natural environment condition produced generally more positive outcomes than did the urban condition. There is convergence on this point across different types of measures within Experiment Three, in the same type of measure (self-reported emotion) across all of the experiments and across experiments carried out under laboratory versus field conditions. Still, these findings should not be generalized to all possible pairs of natural and urban environments. There is a need for comparisons involving a wider variety of both types of environments and for examination of other settings that may be paired with respect to stress and restoration, such as work and the home place.

### MEASURING RESTORATIVE QUALITY IN ENVIRONMENTS

Another way to advance our understanding of restorative environments is to examine the content of people’s experiences in different environments and the relations between aspects of their experience and restoration outcomes. The main objective of a second series of studies has been to develop a tool that can help in this, a standardized measure of perceptions bearing on the restorative potential of given environments. Such a measure can also make it easier to compare restorative potentials in a larger set of environments. One can gain an initial estimate of restorativeness based on subjects’ perceptions before expending resources to measure restoration outcomes in different environments of interest.

In each of the four studies in this series (Hartig, Korpela, Evans, & Gärling, in press), the restorative potentials of several environments were gauged in terms of items meant to represent the constructs in the attention restoration framework: being away, fascination, extent and compatibility (Kaplan & Kaplan, 1989; Kaplan & Talbot, 1983). Subjects were asked to indicate the extent to which each of a set of statements applied to their experience in a given environment. Some of the statements are as follows: Spending time here gives me a good break from my day-to-day routine (Being Away); My attention is drawn to many interesting things (Fascination); There is a great deal of distraction (Coherence); I have a sense that I belong here (Compatibility). Responses were made on 7-point scales (0 = Not at all; 6 = Completely). Altogether, the version of the PRS referred to here included 16 items. Note that the items ultimately retained to represent extent
were mainly concerned with its coherence aspect; that subscale has been labeled accordingly here.

The general research design was for all the studies rather simple. Student subjects (American, Swedish, or Finnish) evaluated a series of settings using the PRS, an emotional-state scale and, in the first two studies, another environmental evaluation scale. The two other scales enabled examination of PRS discriminant, convergent and criterion validities.

The environments evaluated were selected for the initial study according to a two (natural vs. built) by two (outdoor vs. indoor) by two (high vs. low judged restorativeness) scheme. The Kaplans' theoretical framework indicates that natural environments and outdoor settings will, in general, offer more opportunity for restorative experience, given a human predisposition to be fascinated by certain natural features and greater opportunities for active exploration of the physical environment when outdoors. Including a high and low prejudged restorativeness site in each of the cells in the research design (natural/outdoor; natural/indoor; built/outdoor; built/indoor) gave another opportunity to test the sensitivity of the scale to differences between environments. The study environments were as follows: a rock garden in the center of a large park (N/O/H); an open lawn adjacent to a major street (N/O/L); an outdoor shopping mall (B/O/H); a loading dock facing onto a parking area (B/O/L); a study room with soft chairs and views out onto trees and landscaping (N/I/H); a much larger study room with hard seats and large windows facing onto adjacent trees (N/I/L); a game room with pool tables and video games (B/I/H); the bottom floor of a large parking structure (B/I/L).

It may seem contrary that there are built elements in some of the natural environments and natural elements in some of the built environments. A requirement of complete “builtness” or complete “naturalness” was not imposed in part because it would have precluded filling all of the cells in the design of the first study. Yet it was not only a matter of experimental convenience. The natural environments that many people most often experience have been shaped in some way by human hands, or contain some form of human artifact. Furthermore, in many human environments people have the chance to focus on both natural and built features. Thus, sites were selected for each cell on the basis of their most notable features, such as predominance of vegetation or visual dominance of views onto vegetation. Within each cell, the selection of high and low restorativeness sites was guided by theory and subjective impressions of the researchers.

While all eight of the sites were used in the first study, only four of the sites were used in the others. The four sites used in all studies were the two natural and two built sites expected to differ most in terms of restorative potential (i.e., the primary sites: N/O/H; N/I/L; B/O/H; B/I/L). There were no clear expectations about differences among the remaining four sites. For example, it was an open question whether subjects would rate the open lawn as more or less restorative than the game room. Aside from the number of sites evaluated, the studies differed in the manner in which the sites were presented to subjects. It was of interest whether simulations would be adequate to elicit evaluations of a place’s restorative potential and whether restorativeness ratings obtained with environmental simulations would be comparable to those obtained under naturalistic conditions.

In sum, then, the study designs were as follows: in Study One, all subjects (American students, n = 115) gave on-site evaluations of the four primary sites and some (n = 39) also evaluated the remaining four sites; in Study Two, evaluations were made of only the four primary sites, with American students (n = 95) randomly assigned to on-site vs. video simulation conditions; in Study Three, Swedish subjects (n = 75) evaluated photographic slide simulations of the four primary sites; and in Study Four, Finnish subjects (n = 78) evaluated the same photographic slide simulations.

Due to space limitations, only results bearing on the internal consistency of a priori subscales, the factor structure of the PRS and the sensitivity of PRS subscales to differences between sites are mentioned here. These results were highly consistent across the studies. First of all, the internal consistency of each of the four a priori PRS subscales (being away, fascination, coherence, compatibility) was for each site in each study generally adequate to high, with the majority of the Cronbach’s alpha values above .80. These results indicate generally good reliability for the a priori subscales; however, there were some instances in which the internal consistency of the being away and coherence subscales was low (< .70).

Principal factor analyses were used to examine the correspondence between the a priori subscales and the empirical factors in the data for each of the four primary sites. When four factors were specified for extraction and oblimin rotation, it was found that separate factors typically were loaded on by the a priori Coherence (4 items), Fascination (5) and Compatibility (5) items respectively. The a priori Being Away (2) items aligned with Fascination
or Compatibility items. However, correlations among factors were often strong and the item composition of the factors was not uniform across sites and studies. The most stable factor structure appeared to involve two factors, with the Being Away, Fascination and Compatibility items loading on the first factor and Coherence items defining the second factor. That four empirical factors were not found to consistently load on the a priori items in the expected manner could owe more to limitations of the items than to theoretical limitations. Further work with modified item sets and confirmatory factor analyses will be useful in addressing this possibility. Whatever the case, the present factor analytic results suggested that subsequent checks on validity and sensitivity of the scale should be based on composite scores for the factors from the 2-factor solution. Thus, remaining analyses referred to only General (the combined a priori Being Away, Fascination and Compatibility items) and Coherence composite scores (the mean of the ratings for constituent items).

Comparisons of the site ratings within each of the studies indicated that the PRS General and Coherence scores were sensitive to actual differences between environments. There were a variety of comparisons to consider, not all of which can be discussed here. With reference to theoretically relevant differences among the given environments, the results indicate that the PRS was indeed a sensitive measure. The outdoor vs. indoor comparison was only possible in Study One, given that in the other studies the indoor sites (N/I/L; B/I/L) were also those sites chosen to represent low restorativeness potentials for the given cells, while the outdoor sites represented the high restorativeness potentials for their cells (N/O/H; B/O/H). The only outdoor vs. indoor comparison unconfounded with pre-judged restorativeness used the data from Study One subjects who had evaluated all eight sites and this comparison showed that the outdoor sites were given higher ratings on average than were the indoor sites with respect to both the General and Coherence scores. A natural vs. built comparison was possible in all four studies and in all studies this comparison showed that the natural environments on average had higher General and Coherence scores than did the built sites.

Note that both the outdoor vs. indoor and the natural vs. built comparisons only allow statements about ratings averaged across multiple sites. Comparisons involving individual sites do not always conform to statements based on such average ratings; some built and/or indoor sites were in fact rated more highly on one or both of the subscales than some natural and/or outdoor sites. For example, in Study One both the outdoor parking lot (B/O/L) and the large study room with plants (N/I/L) had lower General scores than the game room.

There were two sets of comparisons between individual sites that were of particular interest. One involved comparisons of the high and low judged restorativeness sites in each of the four main cells of the Study One design. In each cell the high vs. low judged restorativeness distinction was accurately represented in General scores; however, when Coherence scores were tested, the difference only registered between the environments in the B/O cell and in the B/I cell. This may owe to the generally high coherence in the natural sites more so than to insensitivity of the scale.

The other set of comparisons between individual sites involved the four primary sites, for which a particular pattern of means was expected. This pattern was found to hold in the General scores, such that in all four studies the N/O/H site was given a higher evaluation than the B/O/H site, which was given a higher evaluation than the N/I/L site, which was given a higher evaluation than the B/I/L site. The same pattern was not found, however, in Coherence scores; the N/O/H mean was in each study higher than the B/O/H mean, but the B/O/H mean was in each study lower than the N/I/L mean, which was in turn higher than the mean for the B/I/L environment. If one accepts this result as an accurate reflection of conditions in the given environments, it indicates that Coherence evaluations may not always parallel those for the other factors and that places with the same overall level of perceived restorativeness may have different degrees of coherence, being away, fascination and compatibility.

A final set of comparisons to mention here concerned the possible differences in evaluations obtained on-site and with simulations in Study Two. Looking across the environments, no reliable differences in evaluations were found between the two experimental conditions for either the General or the Coherence subscale. This suggests that simulations are a valid means for eliciting a mean evaluation of restorative potential. Furthermore, the pattern of between-site differences in subscale means was consistent across studies, no matter whether the sites were experienced first-hand or with video or slide simulations and no matter whether subjects were American, Swedish, or Finnish.

Given the patterns of differences among mean ratings seen in the four studies, it appears that the PRS items reliably distinguish among sites known to differ on theoretically significant
dimensions. These results, in combination with the findings bearing on internal consistency of the a priori subscales, the factorial validity of the instrument and the convergent, discriminant and criterion validities of the subscales, suggest that the version of the PRS referred to here is a good first step in the development of a measure of factors thought to work in restorative experiences.

CONCLUSIONS

Restorative environments research can help improve our understanding of adaptive processes working in person–environment interactions. The experiments and instrument development studies in the present research program demonstrate different approaches that can be used in restorative environments research. They also offer insights into the time course for the emergence of different restoration outcomes, the content of restorative experiences and the restorative potential of different kinds of environments.

REFERENCES


Hartig, Terry, Kalevi Korpela, Gary W. Evans and Tommy Gärling, 1996. Validation of a Measure of Perceived Environmental Restorativeness (Göteborg Psychological Reports, 26:7). Gothenburg: Department of Psychology, Göteborg University.


