

1-1-1993

Restorative Environments

Thomas R. Herzog
Grand Valley State University

Follow this and additional works at: <http://scholarworks.gvsu.edu/gvr>

Recommended Citation

Herzog, Thomas R. (1993) "Restorative Environments," *Grand Valley Review*: Vol. 9: Iss. 1, Article 18.
Available at: <http://scholarworks.gvsu.edu/gvr/vol9/iss1/18>

This Article is brought to you for free and open access by ScholarWorks@GVSU. It has been accepted for inclusion in Grand Valley Review by an authorized administrator of ScholarWorks@GVSU. For more information, please contact scholarworks@gvsu.edu.

RESTORATIVE ENVIRONMENTS

Thomas R. Herzog

See if you can relate to this scenario. Jim has a lot on his mind. His boss has been acting "strange," and Jim is not sure whether there is a problem with his own job performance or the firm might be in financial difficulty. His marriage is not quite right either. Things are not the way they used to be. Are he and Sheila growing apart? There are also kid problems. Shawn is unusually sullen lately. His eyes seem bloodshot, or could that be Jim's imagination?

Against this background, consider Jim's typical daily routine. Every morning he does forty minutes on the freeway, playing dodge ball with idiots who seem to be tuning up for the Indy 500. At the office, important decisions must be made, usually based on incomplete information or hunches. The only certainty is who will be held accountable if things go sour. The pace is hectic. Then, after work, there are another forty minutes of even more vicious dodge ball, followed by a complete litany before supper of each family member's latest crises and problems.

The result of this lifestyle is that Jim tends to tune out his family and use a lot of Maalox. It is becoming more and more difficult to maintain focus at work. The close calls on the freeway are happening more frequently. If Sheila or Shawn point out that he isn't listening, Jim tends to lose his cool and say things he later regrets. It is getting harder and harder to concentrate or even care.

It may not be this bad at your house, but many of you will probably have little trouble relating to the scenario, given suitable substitutions. Psychologists speak of stress, overload, and burnout when describing people like Jim. For reasons that will soon be clear, I prefer the term "mental fatigue." Whatever it is called, the problem is not gender specific. The scenario could easily have been written with Sheila in the starring role. The plain fact is that mental fatigue seems to be a common problem of modern life, especially modern urban life.

My purpose here is to analyze mental fatigue from a psychological point of view. The analysis focuses on the concept of attention and leads naturally to suggestions about the kinds of settings in which one can recover from mental fatigue. Such settings are referred to as restorative environments. The theoretical ideas presented here have their origin in the psychological writings of William James (1892) but have been most clearly presented in *The Experience of Nature*, by my longtime mentors and friends, Rachel and Stephen Kaplan (1989).

Mental Fatigue and Recovery

James distinguished between two kinds of attention, directed (or voluntary) and involuntary. Directed attention requires effort because what one is attending to is not

interesting or fascinating. Effort is needed to stay focused on the currently relevant material while suppressing distraction from competing material that may be more interesting or compelling. For example, Jim has to stay focused on the freeway fliers while ignoring the very appealing models on the roadside billboards. At the office, he must concentrate on his business deals while suppressing intrusive thoughts about his family problems. In other words, he must make a mental effort to direct his attention.

After a period of sustained distraction suppression, the neural mechanisms responsible for such suppression become fatigued. The psychological result is called mental fatigue. In its wake comes a broad array of cognitive and affective consequences: lowered ability to concentrate, think clearly, solve problems; heightened irritability and less inclination to be helpful or even civil. The mentally fatigued person is less competent at getting along in the world and thus more prone to accidents and other dangers. You may recognize yourself in this description. Mental fatigue happens to all of us. We differ only in how often and how deeply we are fatigued.

Mental fatigue is not the same thing as stress. The two often go together, but they need not. Stress implies a stimulus interpreted as potentially harmful. Mental fatigue requires sustained effortful concentration. Meeting a bear during a walk in the woods will likely be stressful but will not necessarily produce mental fatigue. Reading or writing a thoughtful essay will probably produce some mental fatigue but little stress. It follows that the vast research literature on stress, though surely interesting, is of little help in understanding mental fatigue.

What the mentally fatigued person needs is a chance to recover, a chance to rest the fatigued directed-attention mechanism. Taking a nap might be helpful, but one is often in situations where napping would be counterproductive: think of poor Jim on the freeway or at the office. Alternatives would obviously be useful. The analysis of mental fatigue presented here clarifies the essential feature of any such alternative. The mentally fatigued person needs a situation or setting that does not require the use of directed attention.

That brings us to the second kind of attention proposed by William James. Involuntary attention requires no effort, because the material attended to is interesting or fascinating. There are many sources of fascination. Some are unlearned, presumably the result of evolution, including such stimuli as snakes, blood, fires, caves, and many others listed by James. Other sources of fascination represent a complex combination of innate bias and cultural overlay: sports, horror movies, eating, sex. Fascination can be based entirely on learning. Expert chess players can easily become absorbed by board patterns that would hold little attraction for most of us. Similar statements could be made about experts in any domain. Finally, fascination can be based on process rather than content. The cognitive processes of recognizing, predicting, and evaluating, when carried out in reasonably challenging situations, are effortlessly interesting. Again, use of such processes presumably conferred a survival advantage on our evolutionary ancestors. Process-based fascination probably has much to do with the attraction of story telling, gambling, and humor.

There are, then, many sources of fascination. Any of them could be used to recover from mental fatigue. But resting directed attention by using involuntary attention is only one component of a broader process that we may refer to as mental restoration. Jim surely needs to rest his fatigued directed attention, but he also needs to work through his "life" problems, those involving his family and job and perhaps even his place in the larger scheme of things. The pursuit of fascination will be of little help, and may actually be a hindrance, in confronting and dealing with such problems.

Reflection and Natural Environments

The second component of mental restoration is reflection. The term refers broadly to serious thought about any of life's unresolved concerns. Serious thought may not completely resolve such concerns, but it does provide the opportunity to use a powerful coping strategy. Often problems that cannot be eliminated can be rendered manageable if they can be interpreted as part of a meaningful framework in which they make sense. An environment that supports such reflection as well as recovery from mental fatigue would provide an optimal restorative experience. But reflection requires both time and mental space. Therein lies the rub.

Humans can deal with only a small portion of their stored knowledge at any given time. Psychologists use the phrase "limited capacity" to refer to the small amount of material that humans can think about at one time. The limited capacity of humans for actively thinking about and dealing with information is one of the most widely researched and firmly established findings of modern psychology. Sources of strong fascination, which elicit high levels of involuntary attention, tend to use up the limited processing capacity of most humans. Thus, we have the ironic situation that the two components of mental restoration, recovery from mental fatigue and reflection, tend to be at odds with each other. Strong fascination, the optimal treatment for mental fatigue, prevents reflection by monopolizing our limited processing capacity. When attention is riveted, there is no room to think deep thoughts.

There is a way out of this dilemma. Imagine a setting that has enough fascination to permit recovery from mental fatigue but not so much as to exhaust one's limited processing capacity. Directed attention could rest and yet there would still be room for reflection. Presumably such a setting would have a moderate level of fascination. If the setting also had something to offset the pain that often accompanies reflection on serious problems, it would be the ideal restorative environment. An elementary but extremely useful fact of human nature is that pleasure and pain tend to inhibit each other. Although some disturbed individuals apparently are able to derive pleasure from pain, the norm is that the two experiences are incompatible. Many sources of pleasure are based on strong fascination and thus would not meet our requirements. Most of the sources of fascination discussed earlier have this drawback. The striking, perhaps unique, exception is aesthetic pleasure. Thus, a setting that provides both aesthetic pleasure and moderate fascination would be just the thing for a complete restorative

experience. The Kaplans (1989) have coined the phrase "soft fascination" to describe settings that combine aesthetics and moderate fascination.

What would a setting with soft fascination look like? Fortunately, examples abound. They fall into the broad category of "ordinary" natural environments. We are talking about settings like pleasant back yards, gardens, nature trails, field-and-forest settings, and so forth. Such settings are typically described as quiet, peaceful, or tranquil. They are the kinds of places people seek out when they need to think things over or get their head together. Ordinary natural environments provide just the right combination of aesthetic pleasure, moderate fascination, and low directed-attention load for a complete restorative experience.

Not all natural environments qualify. Some are too high in fascination (spectacular post-card views), others too low in aesthetics (stagnant ponds covered with green slime). It is also true that many people have "special" places for reflection that are devoid of nature elements. The fact remains that ordinary natural settings are widely used and almost perfectly suited for mental restoration.

Researchers are just beginning to explore the question of what kinds of natural environments and what features of natural environments are most likely to have the quality of tranquility or soft fascination. Patrick Bosley and I investigated eleven types of natural settings in an attempt to distinguish tranquility from preference or liking (Herzog & Bosley, 1992). Not surprisingly, the two affective qualities were strongly and positively correlated. Nevertheless, we found that tranquility was rated significantly higher than preference for the nature categories of field-forest settings, large bodies of water, and misty mountains. Examination of individual settings suggested three specific features of environments higher in tranquility: foreground openness for field-forest settings, surface calmness for waterscapes, and mistiness for mountains. More research of this kind is needed to understand the specifics of soft fascination.

Mental Restoration Research

Research on the role of ordinary natural settings in promoting mental restoration (recovery from mental fatigue and/or engaging in reflection) is relatively new. Even so, some very intriguing findings have been obtained. Many of the studies included measures of directed-attention functioning (to track recovery from mental fatigue) and reflection. To date, reflection has been assessed primarily by self-report measures. Directed-attention functioning has been assessed by both self-report and performance measures. The latter involve performance on tasks like proofreading or searching texts for specified target letters. Such tasks clearly require the use of directed attention, because neither the material nor the task itself is the least bit interesting.

One set of studies investigated window views. In a widely cited study, Roger Ulrich (1984) examined recovery from gall-bladder surgery in relation to the view from the patient's hospital room. He found that patients with a view of nature had shorter postoperative stays and took fewer analgesics than those with a view of a brick wall. Other studies have reported beneficial effects of nature views in both work settings

and prisons. Although none of these studies dealt directly with mental restoration, they inspired a study that did. Carrie Gilcher (1992) reasoned that college students are likely candidates for mental fatigue. She administered a battery of directed-attention performance measures to a sample of college students and compared the results for those living in dorms with and without nature views. The students with nature views had significantly higher scores on several of the measures.

Bernardine Cimprich (1990) studied breast cancer patients during the course of their treatment. She argued that such patients would be especially prone to mental fatigue because of the attentional demands made on them by both the illness and its treatment. This proved to be true in the early phase of treatment, as indicated by performance on a battery of six tests of directed attention. She then compared performance over a three-month period of patients randomly assigned either to a regimen of simple outdoor experiences or to no intervention. The former group showed consistent improvement on the directed-attention tests, but the non-intervention group did not. A long-term follow-up at eighteen months found significant performance declines in those patients who had shown improvement during the initial study, a sobering reminder of the need to maintain beneficial interventions.

Some studies have provided valuable insights about the second component of mental restoration, reflection. Chapter Four of *The Experience of Nature* describes a long-term study of a wilderness program sponsored by the Forest Service. Program participants kept diaries and responded to both structured and open-ended questions at various times during their wilderness experience. Of the many benefits documented by these data, one is especially pertinent here. After solo experiences in the wilderness, respondents rated highly a set of items such as "figuring out what kinds of things are important to you" and "thinking about who you are and who you want to be". Likewise, diary entries contained many comments of a reflective nature. The following chapter on "nearby nature" documents similar benefits for simple natural areas near residential settings. Among other things, they are seen as places to think, forget worries, regain serenity, and enjoy solitude. The chapter also describes an ambitious study on the psychological benefits of gardening. The most highly rated benefit was not food production, sense of control, or even fascination with nature. It was the sense of tranquility, peacefulness, and quiet afforded by gardening.

Lisa Canin (1991) studied AIDS caregivers, another group prone to both burnout and mental fatigue. The caregivers rated various restorative activities for frequency of participation. Other sets of items assessed self-perception of effective functioning, mental fatigue, and restorative benefits. The general finding was that quiet activities and nature activities were most helpful. In contrast, high-fascination activities like watching television, shopping, and sports (watching or participating) were much less effective. In other words, restorative activities that supported reflection as well as recovery from mental fatigue were most beneficial. Those that supported only the latter did not fare as well. AIDS caregivers apparently have a need to ponder the larger questions of life and death as part of their mental coping. This study dramatically illustrates the importance of such reflection.

The most exciting studies of all (to a hard-nosed researcher) would be those in which either mental fatigue or type of restorative experience was manipulated experimentally. I know of only one such study. Hartig, Mang, and Evans (1991) subjected participants to forty minutes of an attention-demanding task designed to induce mental fatigue. The participants were then randomly assigned to one of three forty-minute "restorative" experiences: a nature walk, an urban walk, or reading magazines. Finally, a proofreading measure of directed-attention performance was administered. The nature walkers detected significantly more proofreading errors than either of the other two groups. From the stress literature comes another remarkable finding. Roger Ulrich and his colleagues (1991) found that visual substitutes (color/sound videotapes) can produce significant reductions in stress. Specifically, exposure to tapes of natural settings were more effective in reducing experimentally induced stress than were tapes of urban settings. Moreover, only a ten-minute tape was needed to do the job.

Now these are the kinds of findings that make you want to get involved. With my colleagues Hong Chen and Lynda Crane, I will soon launch an experimental study of recovery from mental fatigue as a function of different restorative experiences. We plan to induce mental fatigue by having participants work on a demanding task, much in the manner of the Hartig study. Participants will then be exposed to one of five "restorative" experiences: color slides of either field-forest settings, urban settings, or ambiguous objects (produced by either multiple exposures or superimposition); a second dose of the fatiguing task; or simple rest. A battery of directed-attention measures will be administered before and after fatigue induction and also after the restorative experience. We hope to be able to document fatigue induction by comparing pre- and post-induction attention measures. We also hope to demonstrate differential recovery from fatigue based on the nature of the "restorative" experience. In particular, we expect that exposure to natural settings will be more effective than exposure to urban settings and hopefully at least as effective as simple rest. Exposure to ambiguous objects or a second dose of the fatiguing task should prevent recovery and thus produce the worst performance on the final administration of the attention tests.

Implications

Both theory and research on restorative environments converge on a single conclusion: the importance of ordinary natural settings for psychological well-being. Such settings facilitate recovery from mental fatigue at the same time that they provide the opportunity for much needed reflection on life's important concerns. It would be a profound mistake to regard these benefits as luxuries we can do without. Inability to concentrate can produce disastrous consequences in any number of situations. Lack of opportunity for reflection frustrates one of our deepest human needs, the need to maintain clarity and find meaning in a confusing world.

There are many things we can do to apply the ideas discussed here. As a society, we can make a real commitment to the preservation and addition of nature experiences in urban settings. It could easily be made more difficult to rip out trees in

the name of progress. On the other side of the coin, vest-pocket parks and public gardens represent the kinds of settings to be encouraged as urban oases for mental health. When designing buildings, planners should make a conscious effort to provide window views of natural areas wherever possible. There is literature supporting the use of visual substitutes like photos and drawings when views of the real thing are not possible. As individuals, we can undertake many low cost activities to foster mental restoration: taking brief nature walks, gardening, putting in the yard, animal watching, taking pictures, or making drawings of natural areas, to name a few. If you can manage it, consider doing your article writing or other attention-demanding activities beneath the shade of a tall old tree, as I am doing. Such simple measures are neither burdensome nor time consuming. Their psychological payoff is immense.

References

- Canin, L. H. (1991). *Psychological restoration among AIDS caregivers: Maintaining self care*. Doctoral dissertation, University of Michigan.
- Cimprich, B. (1990). Attention Fatigue and Restoration in Individuals with Cancer. *Dissertation Abstracts International*, 51B, 1740.
- Gilker, C. M. (1992). *Views to Nature: Effects on Attentional Capacity*. Masters Thesis, University of Wisconsin.
- Hartig, T., Mang, M., & Evans, G. W. (1991). "Restorative Effects of Natural Environment Experiences." *Environment and Behavior*, 23, 3-26.
- Herzog, T. R., & Bosley, P. J. (1992). "Tranquility and Preference as Affective Qualities of Natural Environments." *Journal of Environmental Psychology*, 12, 115-127.
- James, W. (1892). *Psychology: The Briefer Course*. New York: Holt.
- Kaplan, R., & Kaplan, S. (1989). *The Experience of Nature: A Psychological Perspective*. New York: Cambridge.
- Ulrich, R. S. (1984). "View through a Window May Influence Recovery from Surgery." *Science*, 224, 420-421.
- Ulrich, R. S., Simons, R. F., Losito, B. D., Fiorito, E., Miles, M. A., & Zelson, M. (1991). "Stress Recovery During Exposure to Natural and Urban Environments." *Journal of Environmental Psychology*, 11, 201-230.