



Restorative Environments

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GLOSSARY

restoration The process of renewing, recovering, or reestablishing physical, psychological, and social resources or capabilities diminished in ongoing efforts to meet adaptive demands.

restorative environment An environment that promotes (and not merely permits) restoration.

stress A process of responding to an excess of demands relative to the resources needed to cope with those demands.

People inevitably deplete adaptive resources in everyday life. Persistent failure to restore needed resources will ultimately harm psychological and physical health. Restoration proceeds more effectively in some environments than in others due to a relative absence of demands as well as to qualities that promote restoration. Knowledge of the restoration-promoting qualities of environments can serve applied health fields.

1. INTRODUCTION

People inevitably deplete physical and psychological resources as they meet self- and externally imposed demands within changing environments. Failure to reestablish vital capabilities for effective action can harm health through multiple pathways. Some of those pathways have received close attention in research on the effects of chronic stress. As commonly defined, stress arises from an excess of demands relative to the resources needed to cope with those demands. This formulation implies that stress becomes chronic when excessive demands persist and the person can neither acquire the new resources needed to obviate those demands nor apply available resources more effectively. Less obviously, stress may also persist when the person cannot access an environment that supports sufficiently rapid or complete restoration of necessary resources diminished in the effort to cope.

In searching for the sources of chronic stress, researchers have identified a variety of social and physical environmental stressors such as crowding and noise. A relative absence of such demands may permit restoration. However, restorative environments warrant definition in positive terms rather than in negative terms. Environmental psychologists, in extending research on topics such as landscape aesthetics and psychological benefits of wilderness experience, have proposed qualities of environments that promote restoration. This theorizing has value for fields concerned with psychosocially

mediated relations between environment and health, such as health psychology, public health, social epidemiology, and psychosomatic and preventive medicine.

2. ESSENTIAL COMPONENTS OF THEORIES ABOUT RESTORATIVE ENVIRONMENTS

To better understand the current status and avenues for further development of theories about restorative environments, consider what such theories must include. First, a theory must specify some condition from which a person becomes restored. Second, it must describe the process of restoring some set of resources. Finally, it must characterize the environments that promote a process of restoration.

2.1. Antecedent Condition

Restoration cannot occur unless the possibility for restoration exists. Necessarily, before a person can become restored, he or she must have depleted some of those resources that are useful for maintaining and improving adaptation to the environment. Whether those resources are biological, psychological, or social, their availability is essential to continued adaptation. Over the long run, an inability to renew depleted resources may have grave consequences for effective action, subjective well-being, and physical health.

That the resources of interest here regularly and predictably become diminished helps one to distinguish the driving concerns of restorative environments theory from those of therapies and rehabilitative strategies. True, restorative environments applications can serve goals of therapy and rehabilitation defined by one health professional or another. Yet therapy often has to do with capacities that a person never had and, thus, that could become “restored” only with reference to normative criteria based on some population. Alternatively, therapy and rehabilitation may focus on capacities that a person has lost to an accident or some pathological process rather than in the normal course of adaptation to a continuously changing environment. This means that restorative environments theory has a broader reach than do therapy and rehabilitation in general. It does not necessarily exclude relatively unusual events that may reduce some capacity for action, but its area of concern extends to states that reflect normal “wear and tear.”

2.2. Restorative Process

The term “restoration” denotes some set of processes through which one or more individuals renew or reestablish adaptive resources or capacities that have become diminished. Whether the resources of interest have a biological, psychological, or social character, the processes included under the restoration rubric here have in common a psychosocial character. Having specified an antecedent condition, a theory ought to define the given restorative process in terms of the resources that become restored and the psychological, physiological, and/or social mechanism(s) for their renewal. Furthermore, because all processes extend through time, a complete description of a restorative process will refer to temporal features and parameters such as stages in restoration and the time required for restoration. Measurements of appropriate variables at various time points provide evidence as to whether or not restoration is actually under way.

2.3. Environmental Context

All restoration occurs in the course of some activity, and all activity occurs in some environment. Restorative processes are not necessarily specific to a particular environment, but they may proceed more readily or smoothly in some activities and environments than in others. Those environments that promote (rather than merely permit) restoration can be referred to as “restorative.” Whether with respect to their physical, social, activity, temporal, or spatial features, some form of contrast with another relatively demanding environment is implicit in the description of an environment as restorative.

2.3.1. Significance of the Natural–Urban Distinction

One set of contrasts aligns with a coarse distinction between natural and urban environments. In studying restorative environments, some researchers have focused on people living in cities who occasionally go to relatively natural environments for restoration. Convergent practical concerns motivate this focus. First, most people today reside in urban areas. Conditions common in urban areas can impose heavy demands on people. Second, it might not be easy to ensure that people who live in cities have easy access to natural environments. Other people may prefer to close off access to those environments and disturb their natural character in the pursuit of economic gain.

Although these problems are related, work on them within environmental psychology has, for the most part, proceeded independently. A large body of research attests to harmful effects of noise, crowding, air pollution, and other demands in urban areas. Another large body of research describes psychological and social amenity values of natural areas placed at risk by urbanization and the extraction of timber, minerals, and so forth. In restorative environments research, the practical and theoretical connections between these bodies of work become distinct.

3. EXTANT THEORIES ABOUT RESTORATIVE ENVIRONMENTS

Two theories have guided most of the research on restorative environments to date. Both are rooted mainly in research on the psychological values of natural environments, but in specifying an antecedent condition from which people might need restoration, both have referred to work performed under the general “environmental stress” rubric.

3.1. Directed Attention Restoration

Building on some 30 years of research on environmental cognition, environmental preferences, and the psychological benefits of nature experiences, Stephen and Rachel Kaplan developed a theory concerned with the capacity for directing attention.

3.1.1. Antecedent Condition

The Kaplans assumed that a person’s ability to direct attention depends on a central inhibitory capacity. To focus on something that is not of itself interesting, the person must inhibit competing stimuli that are more interesting. Doing so requires effort, and with prolonged or intensive use, the person’s ability to inhibit competing stimuli will diminish or become fatigued. The Kaplans described a variety of negative consequences that the person may suffer when this inhibitory capacity diminishes, including irritability, failure to recognize interpersonal cues, reduced self-control, and increased error in performance of tasks requiring directed attention. Their account of directed attention fatigue has much in common with accounts of cognitive effects and aftereffects of stress or informational overload.

3.1.2. Restorative Process

According to attention restoration theory, a person can restore a diminished capacity for voluntarily directing attention when he or she experiences fascination, a mode of attention that the Kaplans assumed to have an involuntary quality, to be effortless, and to not have capacity limitations. When a person can rely on fascination in ongoing activity, demands on the central inhibitory capacity are relaxed and a capacity for directing attention can be renewed.

Regarding the time course of attentional restoration, the Kaplans proposed that a restorative process may continue through several stages, ranging from clearing one’s head of random thoughts and cognitive “clutter,” to renewing directed attention capacity, and ultimately to reflecting on matters of personal importance.

3.1.3. Environmental Context

As described by the Kaplans, fascination is engaged by objects or events or by processes of exploring and making sense of an environment. Yet fascination is not sufficient for restoration. Attention restoration theory also specifies being away, or getting psychological distance, from the work one usually does and from the pursuit of given goals and purposes—hence, from further demands on directed attention. Another factor is extent, that is, the sense that a physical or conceptual environment available for restoration is sufficiently large in scope to entertain continued exploration and is sufficiently coherent so that one can make sense of what is seen going on around himself or herself and relate it to some larger frame of reference. A fourth factor, compatibility, encompasses a person’s inclinations, environmental supports for his or her activities, and environmental demands. It rests on the match among what a person wants to do, what the person can do, and what the person must do in the given environment. The Kaplans proposed that high compatibility allows for deeper levels of restoration.

Although many environments might afford the experience of being away, fascination, extent, and compatibility, the Kaplans argued that natural environments should do so more readily than do other environments. For example, natural environments may afford being away more readily due to a scarcity of reminders about work demands and a relative absence of people (with whom interactions may require directed attention). The Kaplans also asserted that natural environments are rich in aesthetically pleasing features, such as

scenery and sunsets, which evoke moderate or “soft” fascination that permits a more reflective mode.

3.1.4. Empirical Tests

Several quasi- and true experiments have tested the proposition that experiences of natural environments should promote better restoration of a capacity to direct attention than should experiences of other environments. In these studies, the researchers have operationalized directed attention capacity in terms of performance on tasks that require a participant to focus attention. For example, Hartig and colleagues reported a field experiment in which differential proofreading performance was seen after 40 minutes spent in either a nature reserve, a city center, or a passive relaxation condition. On average, posttest proofreading performance of participants randomly assigned to the natural environment condition was better than that of participants assigned to the other two groups.

3.2. Psychophysiological Stress Recovery

A second theory, developed by Roger Ulrich, focuses on patterns of affective and aesthetic response to visual stimulus characteristics of an environment. Of the range of possible reactions to what one sees in an environment at a given moment, Ulrich had a particular interest in those that promote psychophysiological stress reduction.

3.2.1. Antecedent Condition

Ulrich defined stress as a process of responding to a situation perceived as demanding or threatening to well-being. He further assumed the operation of an evolved system for directing behavior in situations relevant to continued survival. That system depends on “hard-wired” affective responding in the selection of a behavioral strategy (i.e., approach or avoidance) and the simultaneous mobilization of physiological resources needed to execute that strategy. Stress becomes manifest in self-reports of negative emotions and short-term changes in physiological systems that indicate negative affect and heightened autonomic arousal.

3.2.2. Restorative Process

This theory focuses primarily on restoration from stress as a potential mode of affective responding to a visual

stimulus array. It proposes that restoration can occur when a scene elicits feelings of mild to moderate interest, pleasantness, and calm. For a person who enters a situation experiencing psychophysiological stress and needing to renew resources for further activity, it could be adaptive to continue viewing the scene in a nonvigilant manner. While the scene is being viewed, negative affects are replaced by positive ones, the person’s interest is held, and physiological arousal declines.

3.2.3. Environmental Context

It is believed that such restorative responses are initiated very rapidly by the perception of certain visual patterns in the environment. Ulrich described these as aspects of the visual stimulus array that might not provide enough information for conscious cognitive judgments but that, nonetheless, can effectively elicit a generalized affective response. He proposed that qualities of the visual stimulus array, such as moderate depth, moderate complexity, and the presence of a focal point, will promote restoration. Nature enters into this theory as well in that particular environmental contents—vegetation and water—may rapidly evoke positive affective responses. People may be biologically prepared to quickly acquire and retain a liking for environmental features that would have been significant for the survival of our early ancestors. These include water, uniform grassy ground cover, and the forms and distribution of trees characteristic of savannah landscapes—a setting of human evolution.

3.2.4. Empirical Tests

Experiments guided by this theory have involved 10- to 18-minute photographic simulations of natural and urban environments and have documented differential change in emotional and physiological outcomes measured during or immediately after the period of the simulation. For example, Ulrich and colleagues reported a study in which participants viewed a stressful industrial accident film followed by a 10-minute video of either a natural setting, urban traffic, or an outdoor pedestrian mall. Poststressor recovery trajectories for frontalis muscle tension, skin conductance, heart period, and pulse transit time differed as a function of the environment viewed, with nature simulations promoting the fastest returns toward baseline and the lowest overall levels. Changes in self-reported affect converged with the physiological results in showing greater restorativeness with the nature videos.

4. CONCLUSIONS AND PROSPECTS

The theories just reviewed propose a variety of restorative qualities of environments, including complexity, depth, and focality in the visual stimulus array as well as being away, fascination, extent, and compatibility in the experience of the purposive actor. Both theories emphasize the relative restorative power of some natural environments, assuming that people remain adapted, to some degree, to the environments of our prehistoric ancestors and observing that those evolutionary settings would contrast sharply with today's demanding urban environments. Research guided by these theories has found, with considerable consistency, relatively greater restorativeness of commonplace, nonthreatening natural environments as compared with urban outdoor environments.

4.1. Prospects for Theory and Empirical Research

One perspective on the future of restorative environments research encompasses the possibilities for working with the two theories just overviewed. First, their claims about the mechanisms at work in restoration may well need refinement or revision in the light of independent developments in other areas of psychological inquiry. Second, tests of each theory can more closely consider attributions about the restorative qualities they propose. For example, to what extent does fascination versus being away account for a possible difference in attentional effects of sampled urban and natural environments? Third, studies can test predictions about how a given restorative process leads to some novel outcome, as was done in Kuo and Sullivan's study of directed attention fatigue and aggression by residents of urban low-income housing with barren versus green surroundings. Fourth, the moderating role of individual differences in attention restoration and stress recovery remains little studied by environmental psychologists. Just as individuals consistently distinguish themselves in the face of demands, as with the heightened physiological reactivity of a repressive coping style, so too may individuals show distinctive patterns of restoration. To take a final example, future work can further explore the complementarity of the two theories. The theories appear to deal with processes that can run simultaneously, albeit not for the same duration. They specify antecedent conditions that might not necessarily be related to one another; that is,

a reduced capacity for directing attention may occur independently of the elevated physiological arousal characteristic of stress and vice versa. And although both of the theories note how particular environmental configurations hold attention, they then diverge in following the implications of this for different resources, namely, directed attention capacity versus physiological response capabilities.

The prospects for restorative environments research involve more than further work with the extant theories. The general theoretical framework provided at the outset opens a broader perspective. It implies possibilities for theoretical extension through reference to other antecedent conditions, restorative processes, and environmental variables. For example, the theories reviewed previously have rather little to say about how social factors might work in promoting (vs permitting) restoration. Noting this gap, Staats and Hartig discussed how the presence of another person can enable and enhance restoration in a given environment. Another person can enable restoration by making it possible for an individual to enter an environment of high restorative quality, for example, by providing protection. Issues of access aside, once in a given environment, another person might enhance the restorative quality of the environment by providing the individual with welcome observations and interpretations that increase interest in the environment.

To take another example, consider the cumulative effect of repeated restorative experiences on a specific person's relationship to a given place. Recognizing that people do commonly establish such relationships, Korpela and colleagues proposed that a person becomes attached to places relied on for restorative experiences and that such attachments, in turn, contribute to that person's identity. Furthermore, a place may become more restorative for that person due to the personal bonds. Thus, restorative experience, place attachment, and place identity become reciprocally influential.

4.2. Practical Prospects

Beliefs about restorative qualities of environments have appeared over millennia and across cultures. Some such beliefs, expressed in paradisiacal religious imagery, arguments for wilderness preservation, claims about the values of national and urban parks, and philosophies of institutional health care, have attributed restorative quality to natural scenery and features such as vegetation and water.

Recent practical efforts have sought to capitalize on the growing body of empirical research on the restorative values of nonthreatening natural settings and scenery in combination with improved understanding of the biological and behavioral pathways through which chronic stress harms health. At the scale of buildings and their immediate surroundings, architects, interior designers, and landscape architects have used “healing gardens,” landscape paintings and photographs, and window views of natural elements to make highly technological, (often) anxiety-arousing health care settings more humane. Design measures sensitive to user needs for restoration may translate into improved patient outcomes such as less pain and shorter stays. They may also yield benefits to worried family members and hard-working staff.

At the scale of neighborhoods and cities, local decision makers weighing the value of competing land uses can consider increasingly well-grounded claims that green areas serve health. A well-articulated urban green structure can provide urban residents with easily accessible opportunities for exercising and for interrupting the stress process during the course of everyday life in the city. That said, visual access to natural scenery through windows in residences and workplaces may provide restorative benefits independent of physical activity. The increment paid for a pleasant view from a dwelling or hotel room speaks to the value that people attach to such benefits.

People value views with other than natural content, to be sure, and not all restorative environments are natural environments. By considering the potential restorative value of human environments in general, and translating the knowledge secured into policy, planning, and design measures, one can better support adaptation and, thus, promote health and well-being.

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See Also the Following Articles

Conservation Behavior ■ Environmental Assessment ■ Environmental Design and Planning, Public Participation in ■ Environmental Psychology, Overview ■ Pro-environmental Attitudes and Behavioral Change ■ Residential Satisfaction and Perceived Urban Quality ■ Urban Environments and Human Behavior

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