

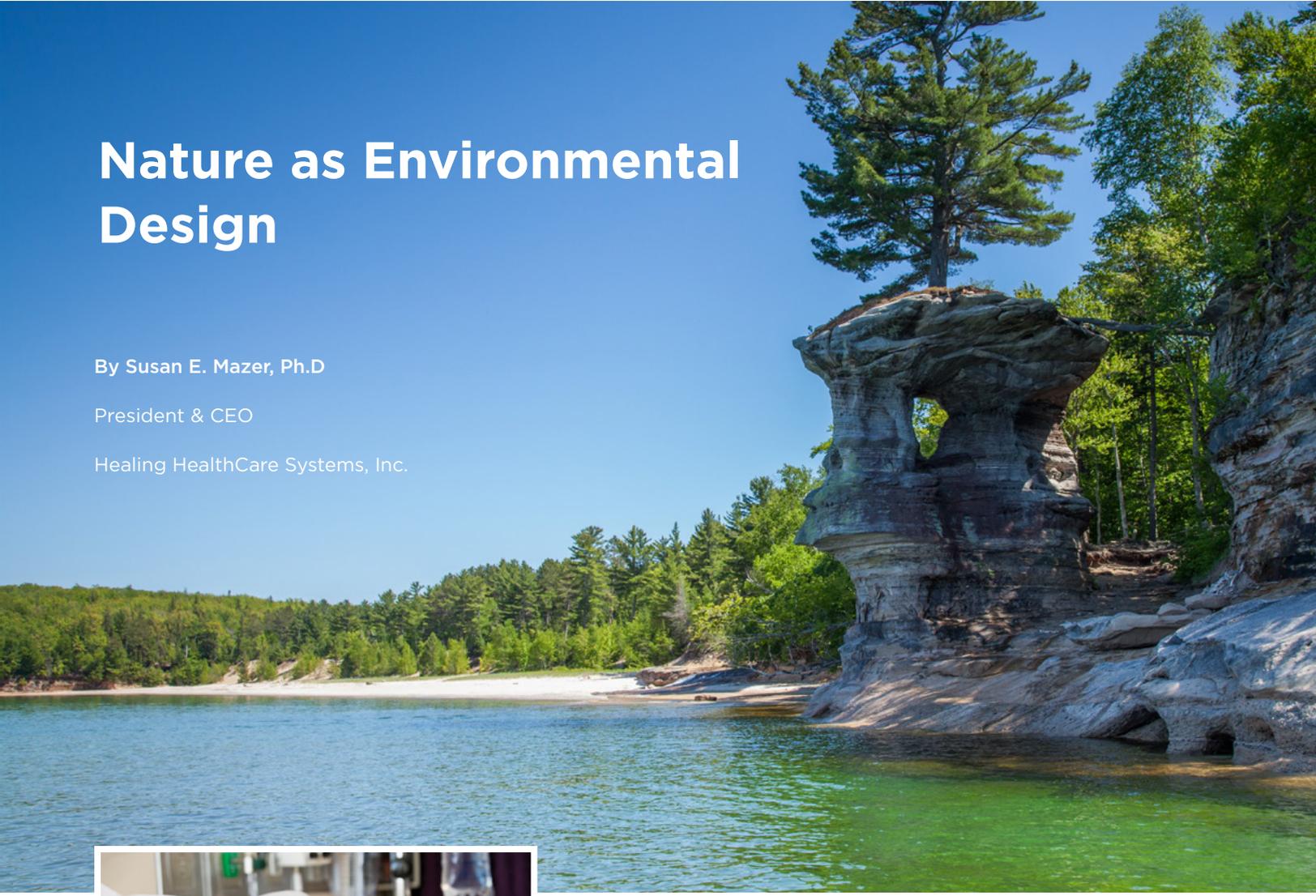
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Nature as Environmental Design

By Susan E. Mazer, Ph.D

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ABSTRACT

Although the benefits of nature imagery with accompanying music have yet to be studied significantly, there is ample research to point to the effectiveness of music and nature separately — as well as in combination. This paper explores the use of nature as environmental design to create a positive distraction, providing therapeutic benefits, as well as helping to mask other distracting sounds in the hospital environment.

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I have seen, in fevers (and felt, when I was a fever patient myself), the most acute suffering produced from the patient (in a hut) not being able to see out of a window, and the knots in the wood being the only view. I shall never forget the rapture of fever patients over a bunch of bright-coloured flowers. I remember (in my own case) a nosegay of wild flowers being sent to me, and from that moment recovery becoming more rapid. (Nightingale, 1860)

Florence Nightingale could not have better validated studies that were to define the benefits of nature and natural elements done over a century after she wrote her Notes on Nursing. She further characterized the environment of care, the “sick room” as requiring fresh air and natural sunlight, something to stimulate the mind and body, beauty as well as functionality. She was most sensitive to the need for patients to have hope symbolized in all that they saw, heard, and experienced (Nightingale, 1860). Nightingale did not isolate nature or quiet, fresh air or warmth, cleanliness or good diet from patient care. Rather, in the middle of the 19th century, prior to penicillin and other modern drugs, the environment of care was primary care. Well integrated into daily life, “nature” was linked to Godliness and considered requisite for recovery from illness. Therefore, to not mandate and arrange for its presence was foreign to culture and practice.

The role of nature, its prominence in our daily lives and our health, is not only undisputed, but also well

documented. Walks in the park, gardening, fresh sunlight, the smell and sound the surf, as well as birds singing -- all of these are considered the best of our life experiences. To the hospitalized patient confined to a narrow bed, tethered to IV poles and constrained by illness and debilitation, these experiences exist only in memory, in the abstract, or as provided in some symbolic way. Nature elements can mitigate some of the generic, impersonal features common to institutional care environments. But there are many factors to consider when incorporating nature in a healthcare environment. Sunlight streams through the hospital window for the patient who has access to one. Of course, if direct sunlight hits the bed, glare and uncomfortable heat could also plague that same patient. Views to nature, so clinically significant following the breakthrough study by Ulrich (1984), are accessed by patients whose rooms are not on the upper floors. For those patients whose windows are far above the surrounding grounds, the sky or the tops of other buildings may be the only view. Furthermore, any connection to nature for a patient who cannot ambulate may be limited to potted plants removed from their natural habitat, flowers that are cut and bloom for only a few days, and photographs or videos of natural settings. How effective is nature when it is provided in unnatural settings, in technologically dominated spaces, where actual nature is not accessible?

The Broader Background

In a study that looked at the ways in which people feel a “connectedness to nature,” Mayer and Franz created a scale that could be used to quantify the relationship between humans and nature (2004). The study supported connection to nature as “an important predictor of... subjective wellbeing.” It also saw an overlap into altruistic behavior and self-reflection. Perrin and Benassi subsequently defined what the scale measured and, as opposed to emotional connectedness, claimed that it indicated one’s cognitive beliefs (2009). In reviewing both studies, what seems more relevant is that the perception of nature as part of one’s self, life, values, or beliefs, has an impact on behavior and health.

While individuals may feel connected to nature, there is a clear distinction between what is considered “natural” and “unnatural.” Studies have revealed that natural environments were thought of as those without human interference, environments devoid of human artifacts and, as well, devoid of people (Vining, Merrick, and Price, 2008). Within the study, Vining, et al. also asked, “What words come to mind when you think of a natural environment?” and, “What words come to mind when you think of an unnatural environment?”

The responses for natural environment were beauty, serenity, calm, peaceful, pristine, tranquil, pleasing, soul satisfying, beautiful, and quiet. The responses for unnatural environment were jarring, discordant, tainted, busy, noisy, populated, and out of synch. While this study looked at the dichotomy between natural and unnatural on a global framework, having nothing to do with healthcare, the responses offer some insight into the attitudes and expectations that are held regarding natural settings or the symbols of nature, and the built urban industrial environment.

The Biophilic Environment

When Edward O. Wilson came out with his evolutionary theory that human beings were inherently attracted to life and all living things, it added substantially to the overall discussion

regarding human beings and nature. While remaining a hypothesis, when applied to research considering how human beings respond to nature, biophilia replaced a psychological or emotional rationale with one of inherency. Nonetheless, although a welcome explanation to what could not before be explained, the direct proof that Biophilia is factual has not been found. Rather, the theory is used to justify or explain patterns of behavior, beliefs, and responses (Schroeder, 2005; Kellert and Wilson, 1993).

When we consider hospitalized patients as profiled by their confinement, nature is most often provided as potted flowers, artificial plants, photographs, paintings, prints, or any other representation. Therefore, the very environment it is intending to affect, in this case, delineates nature. Ulrich et al further points to the restorative impact of nature images on patient outcomes, implying some parity between real nature and mediated nature (2008). In this case, only visual stimuli were considered, although natural experiences stimulate all the senses. And, even with this limitation, nature, whether as a symbol or icon, is therapeutic.

In its most “real” state, natural environments are multisensory experiences, with each sense being aroused to some degree. Flowers and plants, grass and trees have identifiable scents. The wind, birds, insects, and other creatures make sounds. The wind brushes on one’s cheeks and the sunlight is warm. For the acute care patient, while the object represented -- a flower, tree, or landscape -- will be identifiable, the accompanying sounds or scents are more difficult to provide. For this reason, nature, whether real or simulated, actual or mediated, is actually a representation of a larger experience, providing a positive distraction and a time for reflection (Mayer, McPherson Frantz, Bruehlman, Senecal, & and Dolliver, 2009; Roger S. Ulrich, et al., 2008).

Dijkstra points out that the exclusive or singular value of specific environmental stimuli is far more difficult to verify than the value of multiple factors working in tandem (2006). According to Craik’s person-environment theory that claims there is no separation between an individual and his or her environment,

the senses serve to integrate the two, as to be inseparable. The role of nature can then be assumed to be even more pronounced to the patient whose sensitivities are heightened (Salthouse and Craik, 1991).

Attention Restoration Theory

Attention Restoration Theory (ART) addresses the mental fatigue that can occur when direct attention held over long period of time causes diminished capacity. "Attentional fatigue is a manifestation of overuse of the neural inhibitory mechanism underlying the capacity to inhibit competing stimuli" (Tennessen and Cimprich, 1995). "The result is a lowered ability to concentrate and suppress distraction, heightened irritability, and a greater likelihood of accidents or errors in functioning" (Herzog, Chen, Primeau, 2002). In this state, noise, discomfort, lights, or any other distraction becomes strongly intrusive, rather than mild annoyances. ART claims that a restorative environment can assist an individual in recapturing his or her attention ability. Given the nature of the healthcare environment and requirements for critical levels of attention, the diverse risks of attention fatigue are relevant.

The qualities of the restorative environment must meet four criteria:

1. It must feel like a person is being taken to another place, sufficiently different from where they normally are
2. It must coherent, understandable
3. It must be complex enough to be engaging, have a quality of "fascination"
4. It must be compatible with the individual and serve the expectations or purpose of the environment

(De Kort, Meijndersa, Sponseleeb, and IJsselsteijna, 2006; Herzog, et al., 2002; Mayer, et al., 2009; Tennessen and Cimprich, 1995; Ulrich, et al., 2008).

These four qualities can definitively serve as standards for effectively introducing nature in the healthcare

environment.

Another point of view on this topic that is worth considering is described by Schroeder (2007) as the "good gestalt," when a place or view is experienced as in the right order, having a balanced aesthetic and devoid of any detractor. This is also in keeping with the concept of the natural environment being one without human intervention or disturbance, artifacts, or incongruence.



In the picture of the Colorado River and red rock (above), the fence can be seen as a barrier, an interruption, which would be disturbing to the sense of place the picture represents. This perception could interrupt the restorative qualities of this pictorial view of nature.



In contrast, the picture of the garden in Sri Lanka (above) is completely devoid of human interaction and is, itself, "nature made" as opposed to a well-groomed human made garden. In addition, there

is a depth of field that offers both complexity and accessibility -- a sense of place and possibility beyond itself. The picture, as a whole, if considered a "view of nature," is wholly undisturbed, even by the photographer, who is the surrogate viewer.

Mediated Nature

"Mediated environments can...shape our 'reality' and, contrary to much belief, may even constitute our 'realities' of various phenomena" (Adams, 2005). This statement brings to the fore powerful options for nature at the bedside. Adams distinguishes between authentic nature, simulated nature, and televised nature. Representative or symbolic nature. "Authentic nature" is the real thing: the places we go, the flowers that bloom in the forest, the rivers and lakes we sail or swim in. "Simulated nature," according to Adams, is nature in unnatural settings: zoos, shopping mall landscapes, botanical gardens, and the like. "Televised nature" and, "Representative nature," includes the Discovery Channel, National Geographic productions, documentaries about the earth, plus nature photography, art, and artificial and virtual representations of plants, flowers, rocks, and whole vistas. These are mediated nature -- natural images or figures translated into another medium.

Ulrich (1984) points to views of nature having a therapeutic effect; windows bring the outdoors indoors to some degree. The "natural atrium" model designed by John Portman in the first Hyatt Regency in Atlanta in 1967 was so successful that for guests, the "outdoors" is the lobby, with the hallways as the sidewalks. Portman launched a new revolution in the experience of indoor space, which, to some critics, excluded those actually on the streets. And, while the Portman innovation became well known for glass elevators, the use of outdoor elements contributed to how the space functioned. Basically, the atrium model became self contained and included as much natural ambience as an outdoor environment (High Museum of Art, 2009).

The "indoors" to acute care patients, however, is limited most often to their hospital room, if not the bed in which they are hoping to recover. Regarding

televised nature, not all available nature programming is therapeutic or appropriate for a highly medicated or otherwise impaired patient for whom the television takes on a profound role. Since television offers both visual and auditory information, its impact is greater than, for example, a potted plant. Aggressive animals, reality TV depictions of hurricanes (or Tsunamis), flooding, restless oceans, and fast moving rivers can be fearful, overstimulating, and increase anxiety.

The most common use of nature in hospitals today is "man-made" nature, such as healing gardens, landscaping, aquariums, fountains, and mediated nature—indoor plants, artificial plants, nature pictures (photography and artwork). With the multidisciplinary research that has been forthcoming, together with the onset of evidence-based design, nature has become ever more prominent in the interior and exterior design of hospitals.

What is not discussed, however, and is an issue that deserves more study, is sensory habituation. This occurs when a stimulus is repeated or is unchanging, diminishing arousal over time and exposure. Change is what stimulates; sameness desensitizes us to our surroundings. For that reason, hospital smells are most noticeable to visitors; continuous noise becomes unnoticeable to the staff; views are most attractive the first time we see them.

This phenomenon, well researched in humans from birth through death, offers several challenges when we consider what is most effective for the patient.

First, to the human ear, nature sounds are repetitive. They are also heard out of context to the patient who has no corresponding visual cue. They have been effective for patients who hear them with still photographs for a short period of time (Diette, Lechtzin, Haponik, Devrotes, and Rubin, 2003). However, over a long period of time, nature sounds may become ineffective, if not agitating.

The use of nature sounds, first introduced in audio recordings when the New Age genre was created in the late 1970's, became popular in meditation recordings, and is a style of music intentionally

selected to be stress reducing. However, for the immobile patient, the sounds of birds or rushing water may not be restful when they are out of context and broadcast through two-inch bedside speakers. Furthermore, in the natural setting, these sounds are hardly continuous. They vary in intensity, quality, location -- and attention also varies. Considering the patient who is listening through bedrail speakers or a single pillow speaker, over time, or separated from the visual context, these sounds take on a different character and, as such, may be more disconcerting than helpful.

Second, visual habituation occurs when the same view is unchanging. This can occur if the same picture is on the same wall for an extended period or if the viewer has no option of alternate views. This factor becomes meaningful not only to the patient, but to the staff whose relationship to the hospital environment is longer term and demands that they be alert and aware of where they are. Basically, unchanging environments are ineffective, unseen, and wear on the individuals and groups who are subject to them.

The Need for Variety

"... The nerves of the sick suffer from seeing the same walls, the same ceiling, the same surroundings during a long confinement to one or two rooms. ... The effect in sickness of beautiful objects, of variety of objects, and especially of brilliancy of colour is hardly at all appreciated. ... Variety of form and brilliancy of colour in the objects presented to patients are actual means of recovery. ... You little know... how the very walls of their sick rooms seem hung with their cares; how the ghosts of their troubles haunt their beds; how impossible it is for them to escape from a pursuing thought without some help from variety. ...A patient can just as much move his leg when it is fractured as change his thoughts when no external help from variety is given him (Nightingale, 1860).

Over a century after Nightingale wrote the above statement, the value of positive distractions was verified as being a solution to a negative distraction, requisite to the health of the mind and body, and included in healthcare design.

Dijkstra points out that in relationship to color, the environmental context informs preference (2008). The concept that the patient environment is distinct from other everyday experiences is highlighted not only by Nightingale and Dijkstra, but also by ART and the Theory of Supportive Environments that both claim the degree of restorative effectiveness is relative to the acuity of the patient. Because acuity is changeable, the patient environment, including the use of nature and music, must be dynamic rather than stagnant.

Conclusion

While the challenge of nature sounds has been discussed, the benefits of nature imagery with accompanying music have yet to be studied significantly. Nonetheless, there is ample research to point to the effectiveness of music and nature separately and in combination. Music that offers enough complexity and accessibility can fulfill the requirements to be a positive distraction. Because of the ways in which visual and auditory senses are integrated, the music can bring a richer multisensory experience with which to engage than just passive nature alone. Also, music offers an increase in pleasure and relaxation while masking other distracting sounds.

The circumstances surrounding the hospitalized patient are unique and require due consideration regarding the details that make up the patient experience. Furthermore, for the confined patient, family members, or the nurse whose task it is to care for the ill, music and nature mitigate the impersonal, stressful and technologically dominated hospital environment, easing the many hours that comprise the patient experience.

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Dr. Mazer has published articles in numerous national publications and is a frequent speaker at healthcare industry conferences. She writes about the patient experience in her weekly [blog](#) on the Healing HealthCare Systems website and is also a contributing blogger to the Huffington Post's "Power of Humanity" editorial platform, dedicated to infusing more compassion into healthcare and our daily lives.

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