

1

Designing the Urban Physical Environment for Better Health

New Understandings of Health

Text by Alan Dilani and Angelia Sia
Images by Alan Dilani
Additional image as credited

In this approach that stems from the work of Aaron Antonovsky, “salute” refers to health whereas “genic” refers to origins. Together, “salutogenic” means the causes or origins of health.

A significant proportion of people live in cities today, and inevitably, urban living affects population health. It is therefore important to understand how we can adapt to this era of chronic “lifestyle” diseases.

To start off, there are various perspectives on what constitutes health. From a biomedical viewpoint, health is considered to be a condition without diseases. The holistic viewpoint emphasises multiple dimensions of health, including physical, psychological, emotional, spiritual, and social. There are also the research perspectives—the pathogenic versus salutogenic approaches. Pathogenic research investigates factors that cause diseases, with the aim to find medical treatments. Salutogenic research, on the other hand, is based on identifying wellness factors that maintain and promote health, rather than investigating factors that cause disease. In this approach that stems from the work of Aaron Antonovsky, “salute” refers to health whereas “genic” refers to origins. Together, “salutogenic” means the causes or origins of health. When combined, the two research perspectives offer a deeper knowledge and understanding of health and disease.

A well-designed built environment can positively shape the social, psychological, and behavioural patterns of society, leading to improved well-being and better health. In 1997, the interdisciplinary global network International Academy for Design & Health (IADH) was established to achieve the mission of improving human health, well-being, and quality of life through the application of research-based design. Today, IADH develops scientific knowledge and works with universities, advocates, governments, and industries throughout the world on how they can implement the salutogenic design approach to improve health in all types of infrastructure, from healthcare to education, custodial environments, public spaces, the workplace, and indeed our homes.

Psychosocially Supportive Design

The salutogenic approach involves psychosocially supportive design that stimulates and engages people, both mentally and socially, promoting an individual's sense of coherence (SOC). The basic function of psychosocially supportive design is to start a mental process by attracting human attention, which may reduce anxiety and promote positive psychological emotions. It aims to stimulate the mind in order to create pleasure, creativity, satisfaction, and enjoyment.

So what is causing and maintaining healthy people? Antonovsky developed the concept of a SOC, maintaining that a person with a high SOC will choose the most appropriate coping strategy in a stressful situation. The concept of SOC has three vital components: first, comprehensibility; second, manageability; and third, meaningfulness. A person with a strong SOC scores high on all three components. Comprehensibility implies that the individual perceives the surrounding environment and events happening in the world as coherent. If something unexpected happens, such as an accident or a personal failure, those that understand why it is happening have a higher SOC than those that cannot. A person with a low SOC perceives himself or herself as unlucky. Manageability means that the individual feels that he or she is influencing events happening around him or her and does not perceive himself or herself as a victim of circumstance. Antonovsky believes that a person's sense of meaningfulness is connected to his or her perception that there are important and meaningful phenomena in life. Meaningfulness is the component that motivates a person's SOC.

Planning the Physical Environment

The physical environment can be shaped to increase an individual's

SOC. Physical elements can contribute to stress and are therefore essential factors to consider in the exercise to increase comfort. Despite that, the majority of us in cities spend most of our time in indoor environments; there is a lack of knowledge about how these environments affect a person's health and well-being.

There is also a general belief that humans are always adapting to the environment. Often called the theory of adaptation, this belief indicates that people become less conscious of their environment the longer they reside or work in that given environment. In order to create supportive physical environments, it is crucial to understand an individual's fundamental needs. It is also necessary for different professional disciplines to willingly cooperate to create the best conditions for humans.

Such multi-disciplinary cooperation is demonstrated in the planning and development of a zoo. Just before it is built, it is a common practice for architects, designers, biologists, landscape architects, animal psychologists, and building specialists to collaborate to create an environment that optimises the living conditions for the animals. Factors such as materials, vegetation, and lighting are taken into consideration; animals need enough space to eat, sleep, and decide when to be social or seek solitude. Even their need for control and choice has been noticed. The aim is to create an environment that will support the animal's physical, psychological, and social well-being.

Ironically, humans do not seem to make the same demands when a designing a workplace.

Models Supporting the Salutogenic Approach

The idea to view the physical environment as a health-promoting factor dates all the way back to the nineteenth century. Florence Nightingale developed a theory of healthcare that emphasised the importance of physical elements to individuals' health. Examples of physical elements, such as noise, illumination, and daylight, were considered vital factors for a person's mood.

Heerwagen and others created a framework for a salutogenic design, which highlighted the following factors: first, social cohesion, with both formal and informal meeting points; second, personal control for regulating lighting, daylight, sound, temperature, and access to private rooms; and third, restoration and relaxation with quiet rooms, soft lighting, access to nature, and a good view.

In Kagan and Levi's stress theory model, they describe how the physical environment is the foundation on which societal organisation is built and, in the long run, promotes health or disease. The model is used within the field of architecture to integrate design elements with health and well-being.

Emdad has recently developed a model called Instability of Pyramids of Stress (IPS). This new framework takes neuroergonomics into consideration in relation to workplace health. For example, there is a risk that the employee may develop stress-related symptoms and disease if he or she experiences high demands from the surrounding environment but does not receive any reward. The employee may also experience stress if the reward is too low or inadequate, or if he or she does not have any suitable strategies in relation to psychosocial factors, home and family factors, or neuroergonomics. This mode integrates all of these factors and focuses on health, burnout, cardiovascular diseases, and short-term memory.

Nature's Influence on Mental Health

Access to nature definitely plays an important role in promoting urban population health. Most people have some kind of relationship with nature, and among them are those who value diverse natural environments greatly. Many urbanites desire to get away from everyday life during the weekends and holidays and "regain" their strength in relaxing and natural recreational areas.

What makes people feel at ease in nature? Do natural environments affect people in different ways? Is it possible to draw any general conclusions about nature's influence on the human being?

Kaplan and Kaplan developed the Attentional Restorative Theory (ART), which identifies two attention systems: direct and indirect. Indirect attention does not demand any energy or effort from a person and is activated when something exciting suddenly happens or when one does not have to focus on anything in particular. Direct attention is activated as soon as a person needs to concentrate and focus on a task and simultaneously block other disturbing stimuli. After an intense period of direct attention, a person is in need of restoration; otherwise he or she will easily become mentally exhausted. People who have been using their direct attention without resting often become impatient and irritated, and it has been shown that a mentally exhausted person often commits so called "human errors". A person who does not have the capacity to concentrate often becomes thoughtless, less cooperative, and less competent. Therefore, in order



1. A natural environment made accessible to humans supports both the physical and psychological well-being of a person (Illustration: Feng Dexian).

2. Melbourne's new Royal Children's Hospital is an example of how design

for healthcare can adopt a more holistic salutogenic approach.

3, 4. The design of Royal Children's Hospital introduces daylight and nature into work and healthcare settings.

to work efficiently, it is vital to have a well-functioning attention system and to find time for restoration. In contrast to the city environment, nature contains very little information that must be sorted and assessed (Kaplan and Kaplan 1989). In nature, the higher cognitive centres can therefore rest, which gives the visitor restorative experiences.

Studies have distinguished the following four needs for individuals who are in need of restoration and recreation: first, the need for being away from everyday life and its surrounding sounds, routines, and crowding; second, the need for fascinating stimuli that effortlessly stimulate the individual and diminish the risk of him or her becoming bored; third, the need for extent, or immersion in an environment that sustains exploration, which can create a feeling of being in a completely different world; and fourth, the need for compatibility when performing one's tasks. The restorative environment should be inviting, well balanced with aesthetic beauty, and allow people to reflect. Nature, with its colours, forms, and scents, is unparalleled in encouraging people to forget about everyday life. It is therefore very important that natural environments are accessible at the workplace for optimal work performance efficiency.

According to Van den Berg, Hartig, and Staats, several studies have confirmed that human beings perceive natural environments as more restorative than urban environments. Therefore, when human beings are tired and mentally exhausted, nature is an appropriate place for restoration. Other studies have shown that even viewing nature through a window has positive health outcomes.

The Physical Environment and Productivity

With respect to increasing productivity, companies often focus on employee competence and personal motivation rather than on the physical environment and design. Herzberg, in his research, observed employees' motivation and the relationship between their behaviour and physical environment. When the physical environment is perceived as disturbing, it can negatively affect the employee's motivation and thereby productivity. Herzberg emphasised that it is necessary to have access to a physically supportive environment, such as nature, which can contribute to the employee's motivation.


Maslow's theory of motivation is one of the most well-known theories related to human need and motivation. While it was developed to analyse and explain the social environment, it can also be applied to the physical environment. For instance, the need for safety can be achieved through designed environments that allow people to have a good visual overview. If humans are not stimulated by their surroundings, they can easily lose interest, which can result in reduced performance. On the other hand, too much stimulation can lead to stress, since a person may not have the capability to deal with the stimulation. Increased knowledge and consciousness about the relationship between improved health and increased profitability would affect how designers, architects, and managers design, build, and maintain buildings. For instance, improved indoor climate could improve employees' health, decrease the number of sick leave days, reduce healthcare needs, and increase productivity, which in turn strengthen the company's human capital and lead to higher profitability.

Health research is still primarily focused on the risk and prevention of diseases, which is the pathogenic rather than salutogenic approach. More studies on the latter to create knowledge of which environment factors contribute to health and well-being can thereafter be formulated into planning and design guidelines. In this field, it is also important to have an interdisciplinary perspective where different individuals with different backgrounds and knowledge—like psychologists, architects, landscape architects, doctors, behavioural scientists, and health promoters—work together.

A New Health Paradigm

The salutogenic approach provides a basic theoretical framework for psychosocially supportive design, which can promote health and well-being. With both achieved, the productivity and profitability of organisations will be increased.

There is a need to systematically conduct more empirical studies that investigate and verify the salutogenic model and identify a range of wellness factors in psychosocially supportive design. It is time to step into the new millennium where the salutogenic approach and psychosocially supportive design are leading the way for a new paradigm.

Finally, it is necessary to understand Winston Churchill's quotation—"We shape our buildings, then they shape us"—which states that the buildings we design have a significant impact on human behaviour. 

References

- Kreitler, Hans, and Shulamith Kreitler. 1972. *Psychology of the Arts*. Durham: Duke University Press.
- Kryter, Karl D. 1994. *The Handbook of Hearing and the Effects of Noise*. San Diego: Academic Press.
- Küller, Rikard. 1995. "Färgens inverkan på människan" [The colour's effect on humans]. In *Upplevelse av färg och färgsatt miljö* [Experience of colour and painted environments], edited by Anders Hård, Rikard Küller, Lars Sivik, and A Svedmyr, 13-30. Stockholm: Byggnadsforskning.
- Küller, Rikard. 2002. "The influence of light on circarhythms in humans." *Journal of Physiological Anthropology* 21: 87-91.
- Küller, Rikard, and Carin Lindsten. 1992. "Health and Behaviour of Children in Classrooms with and without Windows." *Journal of Environmental Psychology* 12: 305-317.
- Lack, Leon, and Helen Wright. 1993. "The effect of evening bright light in delaying the circadian rhythms and lengthening the sleep of early morning awakening insomniacs." *Sleep* 16: 436-443.
- Lai, Hui-Ling, Chia-Jung Chen, Tai-Chu Peng, Fwu-Mei Chang, Mei-Lin Hsieh, Hsiao-Yen Huang, and Shu-Chuan Chang. 2006. "Randomized controlled trial of music during kangaroo care on maternal state anxiety and preterm infants' response." *International Journal of Nursing Studies* 43: 139-146.
- Lang, Thierry, Christiane Fouriaud, and Marie-Christine Jacquinet-Salord. 1992. "Length of occupational noise exposure and blood pressure." *International Archives of Occupational and Environmental Health* 63: 369-372.
- Lawrence, Roderick J. 2002. "Healthy Residential Environments." In *Handbook of Environmental Psychology*, edited by Robert B. Bechtel and Arza Churchman, 394-412. New York: John Wileys & Sons.

- Lawson, Brian. 2001. *The Language of Space*. Oxford: Architectural Press.
- Leather, Phil, Diane Beale, and Lucy Sullivan. 2003. "Noise, psychosocial stress and their interaction in the workplace." *Journal of Environmental Psychology* 23: 213-222.
- Leather, Phil, Mike Pyrgas, Di Beale, and Claire Lawrence. 1998. "Windows in the workplace: sunlight, view, and occupational stress." *Environment and Behaviour* 30: 739-762.
- Leder, Helmut, Benno Belke, Andries Oeberst, and Dorothee Augustin. 2004. "A model of aesthetic appreciation and aesthetic judgements." *British Journal of Psychology* 95: 489-508.
- Lee, Angela O.K., Yuet Foon Loretta Chung, Moon Fai Chan, and Wai Ming Chan. 2005. "Music and its effect on the physiological responses and anxiety levels of patients receiving mechanical ventilation: a pilot study." *Journal of Clinical Nursing* 14: 609-620.
- Levi, Lennart. 1972. *Stress and Distress in Response to Psychosocial Stimuli* [Avhandling för doktorexamen]. Stockholm: Karolinska institutet.
- Maslow, Abraham H. 1987. *Motivation and Personality*, 3rd ed. New York: Addison Wesley Longman.
- Mathews, Kenneth E., and Lance K. Canon. 1975. "Environmental noise level as determinant of helping behavior." *Journal of Personality and Social Psychology* 32: 571-577.
- Maxwell, Lorraine E. 2006. "Crowding, Class Size, and School Size." In *Safe and Healthy School Environments*, edited by Howard Frumkin, Robert Geller, Leslie Rubin, and Janice Nodvin, 13-19. New York: Oxford University Press, Inc.
- McCaffrey, Ruth G., and Marion Good. 2000. "The Lived Experience of Listening to Music while Recovering from Surgery." *Journal of Holistic Nursing* 18: 378-390.
- Millis, Keith. 2001. "Making Meaning Brings Pleasure: The Influence of Titles on Aesthetic Experiences." *Emotion* 1: 320-329.
- Moore, Ernest O. 1981-82. "A prison environment's effect on health care service demands." *Journal of Environmental Systems* 11: 17-34.
- Moore, T., D.J. Carter, and A.I. Slater. 2004. "A study of opinion in offices with and without user controlled lightning." *Lighting Research and Technology* 36: 131-146.
- Nilsson, Ulrica. 2003. "The effect of music and music in combination with therapeutic suggestions on postoperative recovery." Linköping University Medical Dissertation No. 809, Department of Medicine and Care, Division of Nursing Science, Faculty of Health Sciences, Linköping Universitet, Linköping, Sweden.
- Nordenfelt, Lennart. 1991. *Hälsa och värde* [Health and Value]. Stockholm: Bokförlaget Thales.
- Ogińska-Bulik, Nina. 2005. "The role of personal and social resources in preventing adverse health outcomes in employees of uniformed professions." *International Journal of Occupational Medicine and Environmental Health* 18: 233-240.
- Persinger, Michael A., Sandra G. Tiller, and Stan A. Koren. 1999. "Background sound pressure fluctuations (5dB) from overhead ventilations systems increase subjective fatigue on university students during three-hour lectures." *Perceptual and Motor Skills* 88: 541-456.
- Saito, Emiko, Yoko Sagawa, and Katsuko Kanagawa. 2005. "Social support as a predictor of health status among older adults living alone in Japan." *Nursing and Health Science* 7: 29-36.
- SHSTF (Swedish Association for Health Care and Nursing Employees). 1989. "Florence Nightingale's anteckningar om sjukvård—ur vårt tidsperspektiv" [Florence Nightingale's Notes on Nursing—what it is and it is not]. Research report 31. Skellefteå: Artemis Bokförlag.
- Spychiger, Maria. 2001. "Music Education is Important—Why?". In *Musikens roll i barns utveckling: Festival & Forum 21, Nalen, Stockholm 31 Aug - 3 Sept 2000* [The Role of Music in the Development of Children: Festival & Forum 21, Nalen, Stockholm, 31 Aug - 3 Sept 2000], edited by Georg Matell and Töres Theorell, 110-122. Stockholm: Institutet för psykosocial medicin, Karolinska Institutet.
- Staples, Susan L. 1996. "Human Response to Environmental Noise." *American Psychologist* 51: 143-150.
- Stokols, Daniel. 1992. "Establishing and Maintaining Healthy Environments." *American Psychologist* 47: 6-22.
- Suominen, Sakari, Hans Helenius, Helena Blomberg, Antti Uutela, and Markku Koskenvuo. 2001. "Sense of coherence as a predictor of subjective state of health results of 4 years of follow-up of adults." *Journal of Psychosomatic Research* 50: 77-86.
- Taylor, C.W. 1984. "Promoting health strengthening and wellness through environmental variables." In *Behavioral health: A handbook of health enhancement and disease prevention*, edited by Joseph D. Matarazzo, Sharlene M. Weiss, J. Alan Herd, Neal E. Miller, and Stephen M. Weiss, 130-149. New York: John Wiley & Sons Inc.
- Tennessen, Carolyn M., and Bernadine Cimprich. 1995. "Views to nature: effects on attention." *Journal of Environmental Psychology* 15: 77-85.
- Ulrich, Roger S. 1984. "View through a window may influence recovery from surgery." *Science* 224: 420-421.
- Van den Berg, Agnes E., Terry Hartig, and Henk Staats. 2007. "Preference for Nature in Urbanized Societies: Stress, Restoration, and the Pursuit of Sustainability." *Journal of Social Issues* 63: 79-96.
- Verderber, Stephen. 1986. "Dimensions of person-window transactions in the hospital environment." *Environment and Behaviour* 18: 450-466.
- Vischer, Jacqueline C. 2005. *Space Meets Status—Designing Workplace Performance*. New York: Routledge.
- Yoshida, T., Y. Osada, T. Kawaguchi, Y. Hoshiyama, K. Yoshida, and K. Yamamoto. 1997. "Effects of road traffic noise on inhabitants of Tokyo." *Journal of Sound and Vibration* 205: 517-522.