

HAPI

Health
And
Places
Initiative

September 2014

Mental Health, Health, and Place

A RESEARCH BRIEF
VERSION 1.0



Photo by Ann Forsyth

The HEALTH AND PLACE INITIATIVE (HAPI) investigates how to create healthier cities in the future, with a specific emphasis on China. Bringing together experts from the Harvard Graduate School of Design (HGSD) and the Harvard School of Public Health (HSPH), it creates a forum for understanding the multiple issues that face cities in light of rapid urbanization and an aging population worldwide.

Health and Places Initiative
<http://research.gsd.harvard.edu/hapi/>
Harvard Graduate School of Design

The Research Briefs series summarizes recent research on links between human health and places at the neighborhood or district scale and provides background for a number of other forthcoming products—a set of health assessment tools, planning and urban design guidelines, urban design prototypes, and neighborhood cases. While the Research Briefs draw out implications for practice, it is these other tools that really provide specific, real-world guidance for how to create healthy places.

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Thanks to Heidi Cho, Lydia Gaby, Andreas Georgoulas, Emily Salomon, and Dingliang Yang for assistance and to Rebecca Miles and María Luisa Gómez Jiménez for helpful comments.

Suggested Citation:
Health and Places Initiative. 2014. Mental Health, Health, and Place. A Research Brief. Version 1.0. <http://research.gsd.harvard.edu/hapi/>

Big Ideas

- Much of what we know about mental health and the built environment relates to the mental health benefits of contact with nature. “Nature” is loosely defined in the literature and may range from highly cultivated green areas to untouched wilderness locations.
- For many people contact with nature aids mental health (psychological well-being), cognitive restoration (concentration), stress recovery, and social interaction (Wells and Donofrio 2011).
- Mental health and cognitive benefits can come from very little exposure to the outdoors. As little as a view of nature or five minutes exercising outdoors is enough for at least modest mental health benefits.
- There is mixed evidence that exercising outdoors in natural environments could have mental and physical benefits above and beyond exercising indoors.
- Not much is known about how different user groups, subcultures, and types of outdoor environments differ in use and impact.
- However, environments can also create some psychological distress or fatigue e.g. from crowding or complexity.
- In general, planners and designers can aid mental health by providing opportunities for even small amounts of contact with nature: views of green from buildings, street trees, and park networks, for example. They can also limit distress through better design. However, many design interventions are at the scale of the dwelling interior.

What the Research Says

There is a decades-long body of work examining how interacting with nature is beneficial to human both mental health (psychological well-being), cognitive functioning (concentration), stress reduction, and social interaction (Wells and Rollings 2012). This includes experiences viewing nature or natural scenes, and direct contact with nature. Studies have been conducted in parks, prisons, hospitals, work places, community gardens, and roadways (Maller et al. 2005, 48).

Theories about the cognitive benefits of nature tend to focus on the “restorative” aspect of nature, conceptualized by Kaplan and Kaplan (1989) as including fascination (effortless interest), a feeling of being away or escape, extent (a sense of depth or larger whole), and compatibility with inclinations. In this research moderately complex or tranquil natural scenes that provide modest amounts of involuntary attention are contrasted, favorably, with more complex and stimulating urban ones that are overall less restorative (Berman et al. 2008).

Other work outlines the problems with some aspects of the built environment e.g. that high rise dwelling units can be distressing for mothers with young children (Evans 2003). We review some of this material in this Brief but also cover it in the HAPI Research Brief on housing.

Health Issues

Research consistently shows (short-term) mental health benefits come from exposure to green, natural environments (Frumkin 2001). Recent systematic reviews include Barton and Pretty (2010), Bowler et al. (2010), Coon et al. (2011), Lee and Maheswaran (2010), whose methods are described later in this review. Maller et al. (2005) also presents a summary of the evidence and literature review. Less work has been done to systematically synthesize research on implications of green exposure for cognition, though results are generally positive (e.g. Berman et al. 2008; Matsuoka 2010).

Mental health effects of green environments: synthesis of review findings¹

Reinforcing positive states:

- Revitalization
- Positive engagement
- Energy
- Self-esteem
- Positive mood

Countering negative states:

- Tension

1. Barton and Pretty 2010, Bowler et al. 2010, Coon et al. 2011, Lee and Maheswaran 2010, Maller et al. 2005.

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- Confusion
- Anger
- Depression
- Fatigue
- Sadness
- Negative moods
- Stress

Unclear effects of nature:

- Anxiety
- Tranquility/calmness

Place Issues

Environmental contexts examined in this body of research vary from urban to rural, and include both natural and artificial environments.

Exposure to natural environments might include exercising in natural environments, being within a natural place, or even looking at a view of trees from a window.

It is unclear whether particular types of environments (e.g. urban parks, beaches, wilderness) are more beneficial to mental health than others. It is also unclear how much nature is needed to have an effect.

Example: Barton and Pretty (2010) conducted a large meta-analysis (n=1,242) in the UK on green exercise (activity in the presence of nature) and mood. They found that all types of green environment improved mental health, but greater effects were found in the presence of water.

Example: Dean et al. (2011) systematically searched seven online databases for existing literature on the relationship between biodiversity and mental health in urban settings, to determine if there was any relationship between amount of biodiversity in the landscape and improvements in well-being. They found, "Based upon this review, we identified only one original research paper that directly investigated the link between biodiversity per se and mental health" (Dean et al. 2011, 878-879).

In hospitals, even just a view of nature is beneficial.

Example: Dijkstra et al. (2006) conducted a systematic review of environmental conditions that improve health outcomes of hospital patients through psychological effects. They reviewed over 500 articles and found 30 met all their criteria for inclusion. The review found that sunlight and views of nature out the window had positive effects on patients' mental and physical health. Sunlight was found to have "positive effects on length of stay, mortality rate, perceived stress and pain (p.173)." Also, "Both the presence of windows and a natural view have positive effects on clinical outcomes, such as delirium, sleep and length of stay (p.175)."

Example: A classic study by Ulrich (1984) compared hospital stays with a view of a brick wall versus a view of nature. Patients with a view of nature had shorter hospital stays, took fewer medications, and had slightly fewer minor postsurgical complications.

Example: Evans (2003, 537) in a review of the built environment and mental health, argues "studies on house type converge on the conclusion that high-rise, multiple dwelling units area inimical to the psychological well-being of mothers with young children and possibly that of young children themselves. These effects seem particularly pronounced in low-income families." He speculates this may be due to factors such as social isolation, lack of spaces for developing social networks, and the need to keep children in the unit.

Vulnerable Groups

Theoretically, if exposure to outdoor green spaces has immediate positive mental health outcomes, then inaccessibility to such spaces could promote health inequalities. However, other confounding factors make this complex to disentangle.

Low-income families may be vulnerable to negative mental health effects of certain built environment configurations, e.g. high rise, or poorly maintained housing, or neighborhoods of low physical quality. It is difficult to untangle social and environmental causes, however.

Things for Certain (or semi-Certain)

Systematic literature reviews, explained below, continue to show a consistent beneficial relationship between exposure to green areas or natural environments, and mental health.

Exposure to green outdoor spaces improves mental health, at least short-term.

Example: Barton and Pretty (2010, 3947) conducted a large meta-analysis (n=1,242) in the UK, which “assessed the best regime of dose(s) of acute exposure to green exercise required to improve self-esteem and mood (indicators of mental health).” They found, “Greatest changes come from 5 minutes of activity, and thus suggest these psychological measures are immediately increased by green exercise. The changes are lower for 10–60 minutes and half-day, but rise again for the whole day duration” (Barton and Pretty 2010, 3949).

Example: Bowler et al. (2010, 456) conducted a systematic review of the relationship between the natural environment and health and well-being. Out of thousands of articles, twenty-four were selected as meeting relevance and quality criteria: “Overall, the studies are suggestive that natural environments may have direct and positive impacts on well-being, but support the need for investment in further research on this question to understand the general significance for public health.”

Example: Lee and Maheswaran (2010, 212) conducted a systematic review of the academic literature on health benefits of urban green spaces, where they screened hundreds of articles from the past ten years and then appraised the quality of the thirty-five relevant articles identified. They found that “Most studies reported findings that generally supported the view that green space have a beneficial health effect.”

Things up in the Air

Exercising outdoors (or a view of nature) seems to have a small degree of mental and physical benefits above and beyond exercising indoors, but robust evidence is lacking and authors often combine multiple outcomes (e.g. cognitive function and mental health).

Example: Coon et al.’s (2011, 1761) systematic review of literature of whether participating in physical activity outdoors versus indoors has a greater effect on various forms of mental and physical wellbeing (11 trials, 833 adults included) found that, “Compared to exercising indoors, exercising in natural environments was associated with greater feelings of revitalization and positive engagement, decreases tension, confusion, anger, and depression, and increased energy. However, the results suggested that feelings of calmness may be decreased following outdoor exercise. Participants reported greater enjoyment and satisfaction with outdoor activity on physical wellbeing or the effect of natural environments on exercise adherence.”

Example: Lee and Maheswaran’s (2010, 212) systematic review describes several psychological, emotional, and mental health benefits of green spaces. However, since most of the literature is from qualitative literature sources there is a lack of robust evidence. Therefore, “There is weak evidence for the links between physical, mental health and well-being, and urban green space.”

Example: Bowler et al.’s (2010, 456) systematic review and meta-analysis found “...some evidence of a positive benefit of a walk or run in a natural environment in comparison to a synthetic environment. There was also some support for greater attention after exposure to a natural environment but not after adjusting effect sizes for pretest difference. Meta-analysis of blood pressure and cortisol concentrations found less evidence of a consistent difference between [natural vs. synthetic] environments across studies.” This could mean that outdoor exercise has a greater benefit to perceived mental health and mood than on related physiology.

See also Matsuoka and Sullivan (2011).

Implications

In these HAPI Research Briefs we aimed to find implications for planning and design at roughly the neighborhood level. These could include quantifiable standards, more qualitative but yet evidence-supported insights, and other good practices. Not every topic has a full complement of these implications.

Standards and Insights

Given the associations between mental health and proximity to green spaces, there is an inherent opportunity for planning and designing both public and private open space.

Whenever possible, provide views of green spaces from buildings, especially hospitals but also other buildings where people would benefit from stress reduction, etc. (Dijkstra et al. 2006; Ulrich 1984).

Provide opportunities for urban residents to get outdoors in green spaces: for example, plant street trees and create off-road trails and park networks. As little as 5-minutes of activity outside is enough for mental health improvements (Barton and Pretty 2010).

Other Good Practices

It is not clear how preferences for particular sorts of scenes relate to health. Studies in many locations have identified that people like views of nature. However, what kind of natural views are best varies with location, ethnic background, age, and other factors. Some groups like more vs. less manicured spaces; others water vs. vegetation vs. recreational facilities in parks; still others appreciate abundant vegetation, while different people want clear sight lines in a high crime area (Gobster 2002, 151; Design for Health 2007). Thus the character of exposure to nature varies by place and person, but a substantial body of work shows most people like it. The take away for practice is to provide either locally relevant places or a variety of green environments.



Photo by Ann Forsyth

Spending even a short time outdoors can have positive benefits for mental health and mood. Exercising outdoors may have benefits above and beyond exercising indoors.



Photo by Ann Forsyth

Providing options is important, since people have different preferences for outdoor space.

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