



Designing human-friendly cities

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The physical space where personal and social life develops largely determines people's wellbeing. According to the United Nations (2020), about 56.2% of people currently live in urban areas, and this figure is expected to grow to about 60.4% by 2030. Previous survey-based and experimental studies had shown the impact of urban design on intergenerational and social inclusion, crime prevention, and physical and mental health. Environmental Psychology and Neuroscience can provide evidence-based criteria for designing human-friendly cities by examining people's experiences and behaviors in urban spaces.

People have a great influence on the physical space they inhabit. At the same time, the physical space where personal and social life develops largely determines people's wellbeing. According to the United Nations (2020), about 56.2% of people currently live in urban areas, and this figure is expected to grow to about 60.4% by 2030. Over time, the criteria that guide urban environments' design have been extended from needs related to work and consumption to others that include conserving historical heritage and natural resources, promoting sustainability, and improving people's well-being, including those with special needs, such as the elderly, children, or people with disabilities.

Environmental Psychology and Neuroscience can provide evidence-based criteria for designing human-friendly cities by examining people's experiences and behaviours in urban spaces. The human experience of a physical space is a complex phenomenon that begins



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with the perception of the environment's sensory features. Based on this multisensory experience, along with cultural and personal factors, individuals recreate their understanding and give value to the environment. Specifically, the human experience in an environment can be affected by different temporary and permanent conditions of the perceivers and of the environment itself (Piga & Morello, 2015). On the one hand, perceivers are influenced by permanent factors such as their personal history, culture, education, skills, and memories; as well as by temporary factors such as their physical and emotional state at that specific moment or their transitory social condition (alone, in a group, or in a crowd). On the other hand, the physical environment also presents permanent and semi-permanent conditions (e.g., buildings, open spaces, urban furniture), recurrent conditions (e.g., seasonal cycles), and temporary conditions (e.g., the flow of people and cars). Design has direct control over permanent and semi-permanent conditions. Recurrent conditions can also be controlled to a certain extent, for example, by planting trees, which helps to lower the temperature and absorb CO₂. With regard to temporary conditions, the design cannot control them directly, but it can guide and inform people (e.g., providing walking and cycling infrastructure).

Previous survey-based research has repeatedly shown the impact of urban environments on intergenerational and social inclusion, crime prevention, and physical and mental health. For instance, there is evidence suggesting that some characteristics of urban environments can exacerbate exclusion and isolation of particular social and age groups (e.g., Shirazi, 2020). These features include insecure and unwelcoming urban setting, traffic congestion, poor transport, and lack of services and amenities. Regarding the physical and mental health of urban dwellers, although living in a city has advantages in terms of access to health resources; it also has risks associated with a demanding and stressful social environment and greater social disparities. In fact, mood and anxiety disorders are more prevalent in city dwellers and schizophrenia incidence is about doubled in people born and brought up in cities (e.g., Zumelzu & Herrmann-Lunecke, 2021).

Additionally, numerous experimental studies have recently been conducted to understand the person / environment relationship (e.g., Karakas & Yildiz, 2020). Neuroscience techniques that register the physiological activity of the brain (e.g., functional magnetic resonance imaging) and the physiological activity of the peripheral nervous system (e.g., eye-tracking) have revolutionized the research on environmental awareness. New technologies, such as virtual reality for the simulation of physical spaces, have also recently been incorporated into this field of research. What's more, outside the laboratory, at the street level, it is also possible to record individuals' movements in real urban environments while measuring different psychophysiological variables, thanks to specially designed apps and new affordable devices that can be paired with phones.

One of the most widely documented findings in this area of research is the beneficial effect of incorporating nature elements into urban spaces for physical and mental health: lowering blood pressure and heart rate, reducing stress and neural activity in the brain areas linked to mental illness, or improving the emotional wellbeing, among others (see Maller et al., 2006, for a systematic review). The nature elements that have been shown to be most beneficial are water, breezes, daylight, gardens, and animals. Not only being in contact and interacting with these elements, but also observing them has positive consequences on health (e.g., simply watching fishes swimming in an aquarium lower blood pressure and heart rate). These positive effects are even more remarkable for special populations with diverse abilities and needs. For instance, children with attention deficit hyperactivity disorder (ADHD) present fewer symptoms when playing in nature compared to other types of environments. Also, people with dementia and autism can benefit from sensory gardens which provide opportunities to actively explore environment using all their senses. Some organizations, such as the 7 Senses Foundation in Australia (www.7senses.org.au), promote the design of rich urban spaces that encourage curiosity, development, and learning.

In the coming decades we will witness a rapid development of research on the relationships between urban design and cognitive experiences. This will be extremely helpful to evaluate the performance of existing urban spaces and guide the design of comfortable, healthy, sustainable, safe, and inclusive environments in the future.

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