

## Colin Ellard

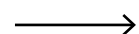
### Places to love

Conference : Getting the measure *Baukultur* – pour un espace de vie de qualité  
4<sup>th</sup> and 5<sup>th</sup> November 2019 at the Pavillon Sicli in Geneva  
Keynote session 2: Is quality quantifiable?

Some people may believe in love at first sight, but most of us understand that true love involves mutual trust, respect and commitment. The thrill of physical attraction may sometimes bring us together, but it is not what *keeps* us together. Similarly, our relationships with the built environment are founded in part on physical attraction (or repulsion) but it is harder to account for the alchemy that is responsible for the true long-term love of a place. Both are important considerations in the measurement of the human response to high-quality *Baukultur*.

We now know a great deal about the psychological and neuroscientific basis of place-liking, and the broad strokes of the story are largely biological. Jay Appleton, a geographer, who, in his book *The Experience of Landscape* (1975) first described the essential physical features that attracted us to landscapes. He tried to relate key features, such as the duality of prospect (the ability to see) and refuge (the ability to be protected from gaze) to the biological problems of habitat selection that are faced by all animals. The influence of such factors as prospect and refuge are easy to observe in our behaviour in everyday settings, such as public places where we like to inhabit the margins rather than the centres. At around the same time as Appleton's work, the influential biologist E.O. Wilson published his landmark book *Sociobiology* (1975), which set into motion an entirely new field of psychology based on explanations of behaviour undergirded by evolutionary adaptation. From these foundations sprang much current work in both neuroaesthetics and evolutionary psychology, which suggests that we can account for things that most of us like in everything from fine art to architecture by reference to the biological and evolutionary underpinnings of our minds. For example, most people express a preference for curves as opposed to sharp edges, symmetry rather than lopsidedness, and intermediate levels of complexity rather than those that are either sterile and empty or crowded and chaotic. In my own research, for example, I have shown that when research participants are invited to spend time in front of different styles of building facade, not only will they express negative emotion in front of facades lacking in complexity, but their nervous systems will fall into a state of quiescence much like that observed in laboratory tasks that elicit acute boredom. Not only does such a finding help to establish a link between environmental design and human response based on ancient instincts to seek out information, but it provides an object lesson in the potential public health impact of high-quality *Baukultur*. In short, poorly designed urban settings can have a negative effect on our mental state, even potentially leading to physical disease.

Another very important stream of research that relates to place-liking concerns the human response to scenes of nature. An influential early experiment by Roger Ulrich (1984) demonstrated that hospital patients recovering from surgery experienced quicker recovery and less pain if they were housed in rooms that showed views of nature from their windows. Following this, an avalanche of research has suggested that the experience of nature not only produces a positive effect on emotional state (the biophilia hypothesis) but also changes fundamentally the manner in which we are able to pay attention to objects and events in the world (attention restoration theory). These theories and the mass of evidence that supports them have clear implications for urban design and the production of high-quality *Baukultur*. At the simplest level, they argue for the importance of the inclusion of natural features and materials in any human environment, no matter how urbanised. Indeed, one recent study drew a clear connection between the inclusion of natural features in urban neighbourhoods and a constellation of public health variables, including the incidence of metabolic and cardiac disorders (Kardan et al, 2015). Simply put, this research illustrated the feasibility of generating concrete measures of the public health impact of urban tree cover. Further, the finding that only trees in public areas (and not, for example, trees in the private lots behind suburban residences) seemed to contribute to the effect suggested that it is the *views* of the trees that were most important rather than, for instance, the



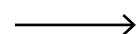
ability of urban vegetation to help remove pollutants from the air.

Research on the mechanism by which nature exerts its beneficial effects on those who experience it has been complex and difficult. Some research has suggested that views of nature may be rich in certain basic mathematical properties, and it is these properties that cause the beneficial effects. Work in my lab (Valtchanov & Ellard, 2015) suggests that the critical variable may have to do with a basic property of the visual stimulus referred to as a “spatial frequency”. Any reasonably complex visual scene contains information at a range of spatial frequencies, where high frequencies carry information about fine details whereas low spatial frequencies contain some basic layout and contour information. It turns out that natural scenes have a characteristic signature with respect to the amount of content that is present at different spatial frequencies, and that there is an area of the human brain, called the parahippocampal place area, that responds strongly to this signature. So, just as we seem to have a biological predisposition to like curves and symmetry, we may gravitate towards natural scenes because of ancient brain circuitry that evolved originally to attract us to locations of bounty: food, protection and perhaps certain forms of information.

Another proposed mechanism meant to account for our attraction to nature and its beneficial effect is also based on the mathematical properties of scenes and is not completely unrelated to the spatial frequency idea. Some have argued that the key ingredient in natural views that drives their positive influence on emotion and behaviour has to do with the property of self-similarity (Taylor, 2006). Take, for example, the typical appearance of a fern frond. What is seen is a repeating pattern that appears at a number of different scales ranging from the shape of the overall frond to the shape of the very smallest frondlet. Some research has shown that we have strong preferences and unique physiological signatures even for abstract designs that have the same types of self-similarity as those found in genuine nature (Taylor, 2011).

Regardless of whether the spatial frequency or fractal accounts of the beneficial effects of nature exposure have greater explanatory power in the end, the key point is that both types of finding suggest that it might be possible to obtain such beneficial effects in ways other than simply by planting lots of trees and bushes in cities. If the key is to get the maths of design right, then this could be accomplished in many different ways by employing biomimetic designs – those that simulate the appearance of nature. The influential architectural theorist Christopher Alexander, though he never engaged directly with the emerging scientific literature that suggested the power of nature to influence psychological state, has produced a mass of important work that is very much in resonance with these ideas. Perhaps most comprehensively in his four-volume masterwork *The Nature of Order* (2003-2004), Alexander argued that commodious design included a coherent set of properties and patterns that, in his view, reached back for a thousand years in traditional building practices and which, when executed well, produced buildings that possessed life. Even a cursory examination of some of Alexander’s critical patterns suggests a tantalizing connection to current science in environmental psychology and neuroaesthetics. Not coincidentally, many of the buildings that Alexander references as examples of commodious design have high values of self-similarity. Indeed, recent experimental work has begun to verify the power of some of Alexander’s theoretical arguments by measuring human preference to natural designs containing some of the features that he described (Coburn et al, 2019). With the resurgence of interest in high-quality Baukultur and its resonance with Alexander’s body of work, it may well be time for a renewed investigation of his important ideas and their relevance to these current efforts.

Though there are many signposts in the current science that point to some of the key principles involved in designing places that we like, understanding how a *like* becomes a *love* is a more challenging step and one for which most current research in cognitive neuroscience and environmental psychology is, so far, ill-equipped. One important reason for this has to do with the pragmatics of research in psychology, which often neglects cultural variables. Henrich et al (2010) argue that most such research employs western, educated, industrial, rich and democratic (WEIRD) participant pools, hence far too often having little to say about the influence of important cultural variables on psychological responses to the environment. It is entirely reasonable to suppose that many emotional responses to particular types of buildings and street-scapes might depend integrally on culture, history and memory rather than on the momentary fit between a shape or contour and the architecture of a human mind shaped by millennia of evolutionary pressures. Depending on the background of the observer, for example, it seems obvious that the characteristic features of a mosque would have an entirely different effect when seen on the streets of Jakarta as opposed to those of Paris. Such differences are not born of biology but rather, like the differences between real human liking and loving, emerge over the course of experience and follow a trajectory that is punctuated by transactions



that promote respect, trust and commitment. Because such effects ripen over long periods of time, they are not easy to measure well in laboratory settings or even in field studies of the type that I have employed in much of my work. That said, though, I have sometimes observed effects that I believe reflect the operation of such cultural influences. These effects have appeared serendipitously and unexpectedly when the strong spotlight of my somewhat reductionist approach is disturbed by a small jitter, suddenly revealing powerful new contours resting in the shadows.

One example of such a finding comes from some early fieldwork that I conducted on the streets of Manhattan's Lower East Side. During curation of a series of street locations for testing emotional and physiological responses to a variety of streetscape variables, I selected a site in front of a well-known affordable housing complex in the city. To my eyes, the aesthetic values of the basic, cinderblock construction with crudely stencilled unit numbers and hostile design features in place to prevent loitering were almost assured to generate a combination of high arousal, perhaps even some anxiety, and low levels of positive emotion. By lucky chance, I had been sure to ask participants to report their place of residence. To my surprise, the responses to the site were bimodal, with those participants who lived near the site showing a tendency towards much higher levels of positivity than visitors to the city who had come from afar. In qualitative data, local observers were more likely to note the nearby presence of a playground, the rich network of social connections that they knew about among occupants of the building, many of whose families had lived in the immediate area for multiple generations. For those participants, their responses reflected strong affection for the site based on a long series of positive transactions that had presumably contributed to feelings of trust, acceptance and expressions of commitment very much like those hallmarks of authentic love between two human beings.

Ultimately, developing a toolkit that can measure responses to such variables of culture that grow over time and influence our responses to place will be of integral importance to any effort to quantify the impact of high-quality Baukultur on human emotion. Unlike some others, though, I see no reason to suppose that such measures will be impossible to construct. Though simple seven-point scales of attraction or basic biometric measures may not be sufficient, the rich range of measures available to social scientists should make it possible to characterise enough of the human response to the culture of place to make possible an evaluation of the impact of a specific design. Happily, such characterisations could go well beyond rudimentary binary responses or crude rankings and, through nuanced application, could contribute substantially to the effort to improve high-quality Baukultur. Indeed, any genuine attempt to build meaningful measures of the human response to Baukultur will need to confront and solve such problems.

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