TESTING, TESTING!

A PSYCHOLOGICAL STUDY ON CITY SPACES AND HOW THEY AFFECT OUR

BODIES AND MINDS



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Testing, Testing! was a BMW Guggenheim Lab urban project conceived by Colin Ellard and New York Lab Team member Charles Montgomery. The experiment was conducted in New York, Berlin, and Mumbai in collaboration with Colin Ellard and the University of Waterloo. Part urban think tank, part community center and public gathering space, the BMW Guggenheim Lab is a mobile laboratory traveling globally with the goal of raising awareness of important urban challenges and inspiring an ongoing conversation in cities around the world. <u>bmwguggenheimlab.org</u>



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Colin Ellard is a professor of cognitive neuroscience at the University of Waterloo in Canada, and the director of its Research Laboratory for Immersive Virtual Environments, where he studies wayfinding, cognition, and emotion in the built environment. He has published peer-reviewed articles in visual perception, environmental psychology, cognitive mapping, virtual reality and neuroscience in North America and Europe and has presented his work to international audiences at conferences in the areas of cognitive science, neuroscience, environmental graphic design, architecture, and planning. He consults and collaborates regularly with architects, designers, planners, and artists both in Canada and abroad. Ellard provides a popular account of his work in his 2009 book You Are Here, which garnered strong praise from the New York Times, PBS, Scientific American, New Scientist and many other print and broadcast media outlets. colinellard.com



Charles Montgomery writes, experiments, and creates conversations about cities, sustainability and human wellbeing. His forthcoming book, Happy City, (2013, Farrar, Straus & Giroux) examines the intersection between urban design and the emerging science of happiness. Montgomery's writings on urban planning, psychology, culture and history have appeared in magazines and journals on three continents. His first book, The Last Heathen, won the 2005 Charles Taylor Prize for Literary Non-fiction and vigorous praise from reviewers in The New York Times, The Guardian and elsewhere. Among his numerous awards is a Citation of Merit from the Canadian Meteorological and Oceanographic Society for outstanding contribution towards public understanding of climate science. At the Museum of Vancouver and elsewhere, Montgomery creates experiments that help citizens transform their relationships with each other and their cities. He has advised and lectured planners, students, and urban decision-makers across Canada, the USA and England. thehappycity.com

INTRODUCTION

What effect does the city have on your brain and physiology?

In a series of tours, Colin Ellard of the University of Waterloo gathered evidence about the psychological effects of public spaces near the Lab in each of its host cities. The tours—which departed from the Lab's main site and operate in its vicinity— were open to the public and allowed participants to join Ellard in measuring the city's effects on their minds and bodies; this international experiment promises to reveal new insights about metropolitan life and inform the future of urban design and planning.

Most research in the psychology of place and place preference has been conducted in laboratory settings, where participants are asked to view and respond to a scene, often one they've never seen before. What is much rarer is research in which our thoughts, feelings, and physiology are monitored on the street itself so that we can see how environment influences psychology during a dynamically unfolding experience of urban life.

The methods that we have pioneered for this study have allowed us to open a window into the mind while a person is actually wandering the streets as they would during many different kinds of everyday experiences in the city. Not only are such methods useful for advancing our theoretical understanding of the influence of design on behavior, but they also constitute a valuable toolkit that can potentially be applied to a range of site-specific questions in urban psychology.

Many of the models of human behavior designed to explain our behavior in cities assume that we are all the same and that we inhabit a city as a swarm of ants inhabits a nest. Our methods pay credence to our individual psychologies and provide tools by which we can quantify our preferences, moods, memories and our very physiology so that we can develop a more comprehensive and deeper understanding of the influence of urban design on human behavior.

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DATA RECORDING

Tour participants were issued with special devices to record their responses to the different spaces visited.

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Participants carried smartphones which were specially programmed to ask them location-specific questions about their current mood and levels of arousal, and to invite them to contribute words and sentences describing their impressions as related to what they experienced at each location. Participants wore bracelets that measured their skin conductivity—a standard measure of physiological arousal.

TOUR DEBRIEFING

Bringing it all together

At the conclusion of each walk, participants were gathered at the Lab for a detailed debriefing/brainstorming session with the facilitators of the walk.

Body variables, measured as a function of location in the city can be mapped. Shown below, for example, is an image of data collected from a New York City Lab walk, shows the rising stress levels of a group of participants asked to cross a busy and complicated intersection.

Above is a debriefing session at the conclusion of one of the New York walks.

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Below reveals an image, for example, taken from a New York City Lab walk, shows the rising stress levels of a group of participants asked to cross a busy and complicated intersection.

A GLOBAL EXPERIMENT

Testing Testing! tours were conducted in all three cities the BMW Guggenheim visited, namely: New York, Berlin and Mumbai.

NEW YORK CITY TOUR

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During August 3, 2011 – October 16 2011 17 tours with 134 participants were conducted through the city streets of New York.

NEW YORK CITY TOUR

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Initial findings:

As expected, the greenspace stop showed highest levels of positive mood and lowest levels of self-reported arousal. People also preferred open facades (Macondo) to closed facades (Whole Foods).

The physiological arousal levels in New York look surprisingly similar, however this is because there was a great deal of individual variability in this data, suggesting that one's response to a site varies heavily depending on one's background and individual experience.

MOOD Self-reported based on a 5 point scale

AROUSAL

Self-reported based on a 5 point scale

PHYSIOLOGICAL

Measured over a 1 minute epoch beginning when participants arrived at each stop

BERLIN CITY TOUR

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During June 15, 2012 – July 29 2012 a total of 11 tours with 89 participants were conducted through the city streets of Berlin.

BERLIN CITY TOUR

Initial findings:

As in New York, highest positive mood was reported in the greenspace stop (cemetery), and permeable facades (Fast Food) were preferred to impermeable ones (Hard façade).

The physiological arousal levels in Berlin show a notable lack of correspondence between self-reported arousal and physiological arousal at some sites (Cemetery and Fast Food stops)

AROUSAL Self-reported based on a 5 point scale

PHYSIOLOGICAL

Measured over a 1 minute epoch beginning when participants arrived at each stop

MUMBAI CITY TOUR

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During December 9, 2012 – January 20 2013 a total of 11 tours with 47 participants were conducted through the city streets of Mumbai.

MUMBAI CITY TOUR

Initial findings:

Self-reported mood was consistently more negative in the more congested and noisy locations (Stops 4-6) than than in the quieter ones (Stops 1-3). Interestingly self-reported arousal was reported as higher in the quieter locations as well.

There was a marked lack of correspondence between selfreported arousal and physiological arousal. Participants reported relatively low arousal at Stops 4-6 yet physiological measures suggested arousals was high at some of these spots (4 and 5.)

MOOD Self-reported based on a 5 point scale

AROUSAL

Self-reported based on a 5 point scale

PHYSIOLOGICAL

Measured over a 1 minute epoch beginning when participants arrived at each stop

KEY FINDINGS

MOOD

Self-reported based on a 5 point scale

AROUSAL Self-reported based on a 5 point scale

4 …

Food stalls

PHYSIOLOGICAL

Measured over a 1 minute epoch beginning when participants arrived at each stop

4 ··· ... 3 ··· ... 2 ··· ... 1 ··· ... 0 ··· ... Cemetery Hard Facade Lab

BERLIN

MUMBAI

Green Spaces

Generally, people showed the highest levels of positive affect in green spaces (NY stop 3, Berlin stop 5, Mumbai stop 3) but patterns of self-reported arousal for this stop were mixed. In Berlin and Mumbai, self-reported arousal was high in our greenspace stop, a cemetery and a hospital garden, respectively. This may be because these spaces generated a different set of cognitive associations than those of the more "pure" garden space used in New York.

Permeability

People showed higher affect in stops with high permeability (New York stop 2, Berlin stop 6) than at those with low permeability (New York stop 1, Berlin stop 3). This finding is in accord with other evidence from studies of urban behavior showing the unpopularity of closed, low permeability facades.

Quieter Locations

In Mumbai, people showed high positive affect and high self-reported arousal at the quiet and less crowded locations (stops 1-3) than at the noisy and busier locations. This was not the case in other cities (for example, in New York, stops 2 and 6 were very busy whereas stop 5 was very quiet and uncrowded).

Self-reporting

The relative lack of fit between self-reported arousal and physiological arousal is quite important. It suggests that we are not particularly good at monitoring our own internal states during everyday urban experiences, likely because we are continually adapting to our current context. Because extensive exposure to stressful arousal has a clear link to chronic disease, this finding has strong implications for public health.

KEY FINDINGS

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Influence of residence status:

In New York, we were able to compare responses of visitors to the city with residents. Although there was a rough correspondence between measures from these groups, there were some interesting contrasts as well. For one thing, residents responded more strongly to façade permeability than non-residents (note that for non-NYC residents, the normal pattern of response to permeability was actually *reversed*. Generally, self-reported arousal was somewhat higher in visitors than in residents and both self-reported mood and arousal were much higher in visitors than in residents for the stop on the Allen Street median (stop 6), an ambiguous and somewhat undeveloped location. Contrasts such as these suggest that, as we move through a city space, our mood and arousal levels are not just affected by our immediate sensory experiences but also by our memories, understanding, and experiences of a place.

Self-reported based on a 5 point scale

AROUSAL Self-reported based on a 5 point scale

NYC RESIDENTS NON-NYC RESIDENTS