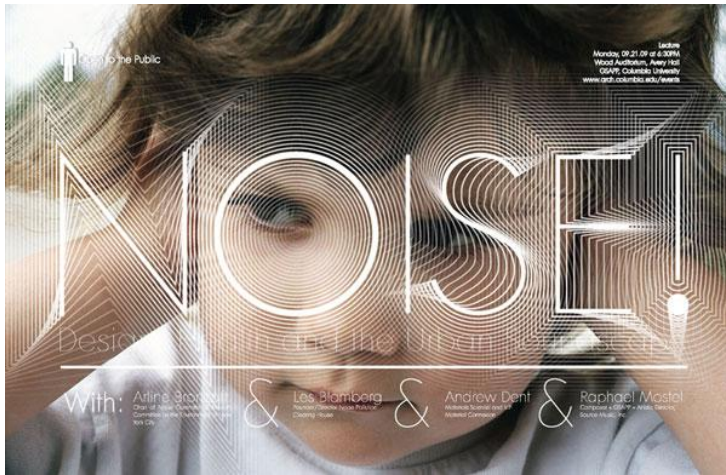


# Restorative values and cognition ability improvement effects of man-made park in Hong Kong downtown area

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# Background

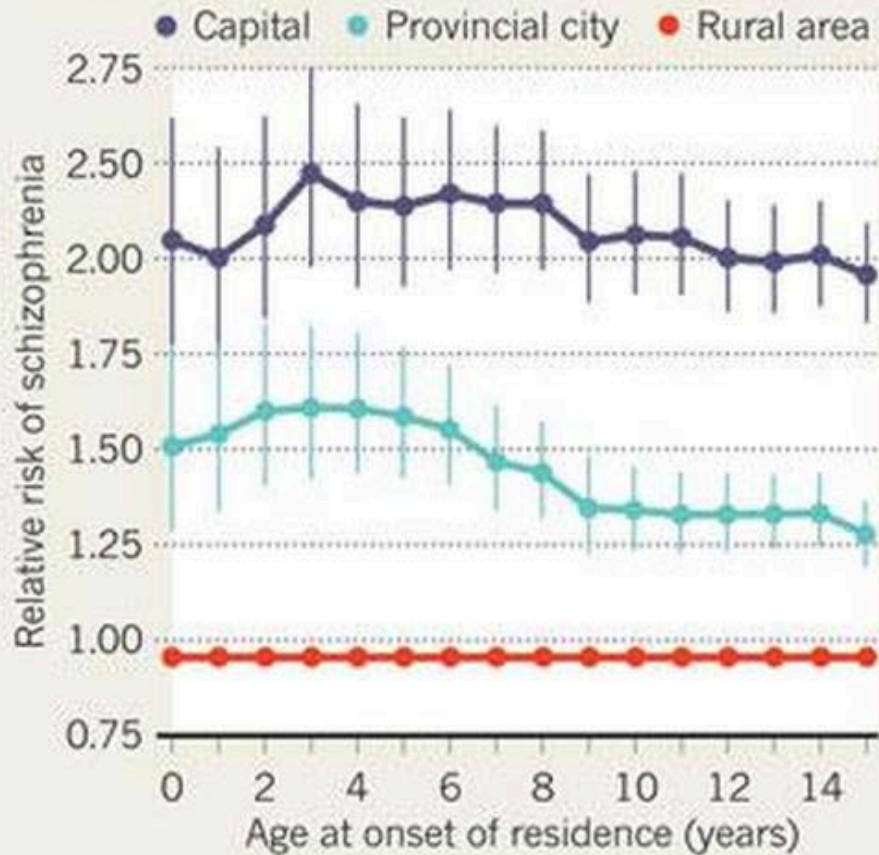




# Background

## DOSE RESPONSE?

A 2001 study in Denmark showed that people who grew up in larger cities had a higher risk of schizophrenia.



A. ABBOTT, *Nature of Neuroscience*, City living marks the brain, **474**, 429; 2011

nature

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NATURE | LETTER



## City living and urban upbringing affect neural social stress processing in humans

Florian Lederbogen, Peter Kirsch, Leila Haddad, Fabian Streit, Heike Tost, Philipp Schuch, Stefan Wüst, Jens C. Pruessner, Marcella Rietschel, Michael Deuschle & Andreas Meyer-Lindenberg

[Affiliations](#) | [Contributions](#) | [Corresponding author](#)

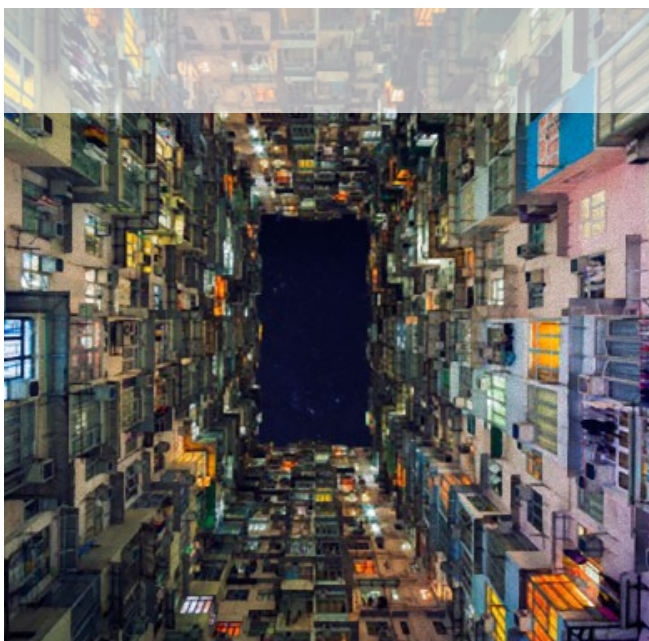
*Nature* **474**, 498–501 (23 June 2011) | doi:10.1038/nature10190

Received 03 December 2010 | Accepted 12 May 2011 | Published online 22 June 2011

Florian Lederbogen *et al.* *Nature of Neuroscience*, Environmental influence in the brain, human welfare and mental health, 18, 1421–1431 (2015)



# Background



## Hong Kong



# Background

- *The Hong Kong Mental Morbidity Survey (2014)* shows that **one in six** of the city's residents has a common mental disorder, like anxiety or depression, either now or will in his or her lifetime.
- *The Mental Health Association of Hong Kong (MHA)*, found that a dramatic **50 percent** of respondents felt they had poor mental health. **Twenty-five percent** reported levels of stress and anxiety— **250 times the global average** —and **60 percent** reported job stress. And in a survey of **students** that same year, also carried out by the MHA, **10 percent** polled had thought about suicide at least once.
- The number of **young people** seeking treatment for mental health problems at public facilities increased steadily between 2010 and 2016, with the biggest jump – **78 per cent** – seen in those under 15 years of age.



# Background



**Lack of responding urban design guidelines**



# What have been done?

## Laboratory



## Outdoor empirical study

Experience the environment

Answer the questions afterwards

Do the Pre-test and Post-test

## Cities

New York

Berlin

Zurich

Mumbai

Darmstadt



# Study purpose

---

## **Hong Kong**

**Pedestrian level: walk on the street and observe the surroundings**

**In the context of Hong Kong environment, man-made parks located in downtown area**

- (1) are more restorative than built environments;
- (2) Are helpful to improve cognitive ability;





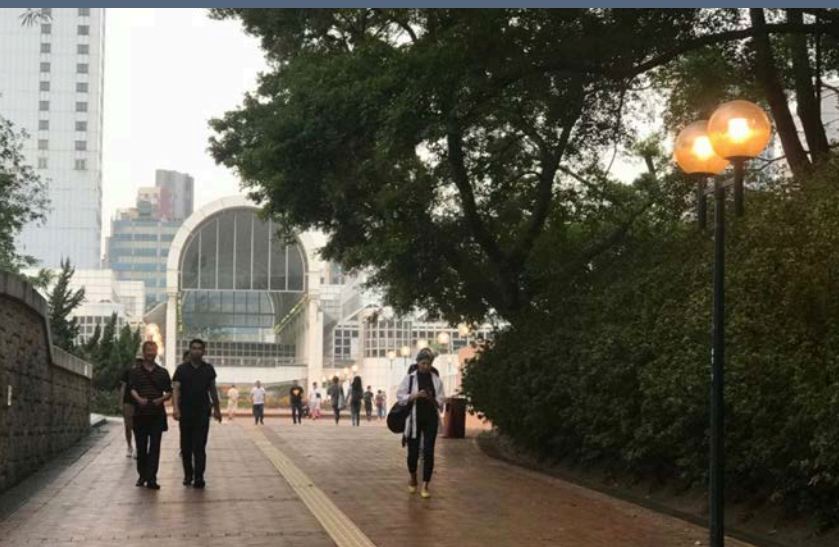
# Tsim Sha Tsui: The commercial center







**Tsim Sha Tsui: Kowloon Park**  
20.35 hectare



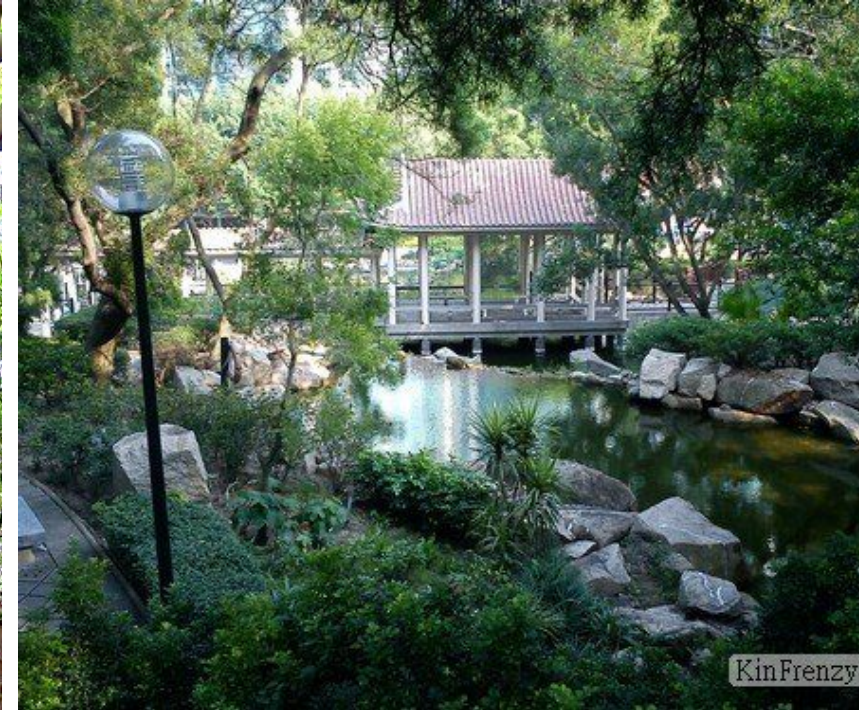




# Hong Hum: The residential center





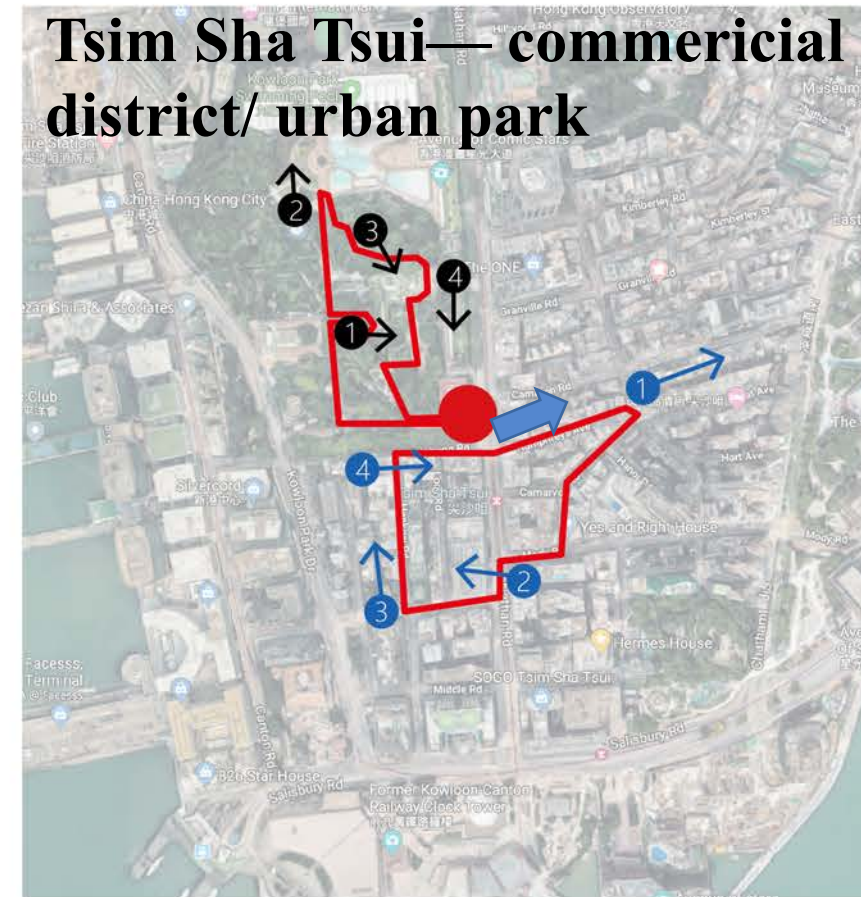
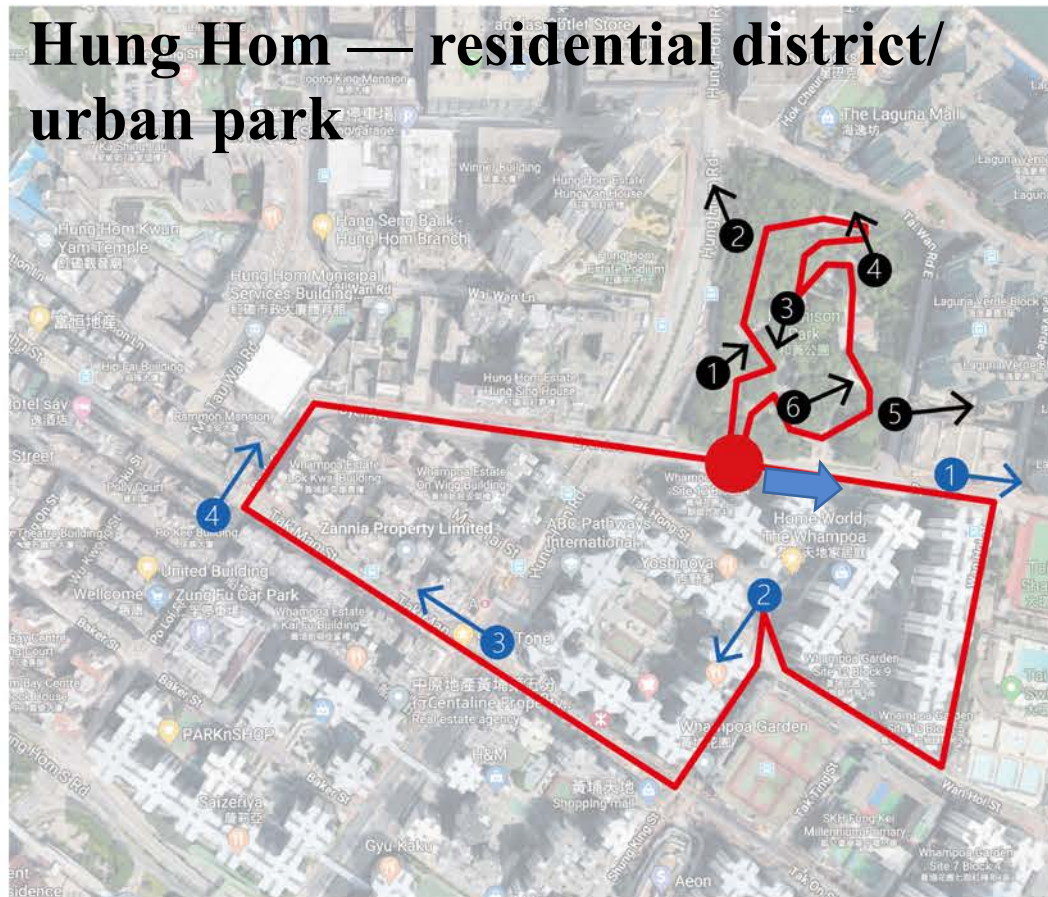


**Hong Hum: Hutchison Park**  
2.9 hectare





# Method: walking route and procedure



Cognition Pre-test

Cognition Mid-test

Cognition Po-test



Stopping point



Walking route  
clockwise



Observation direction

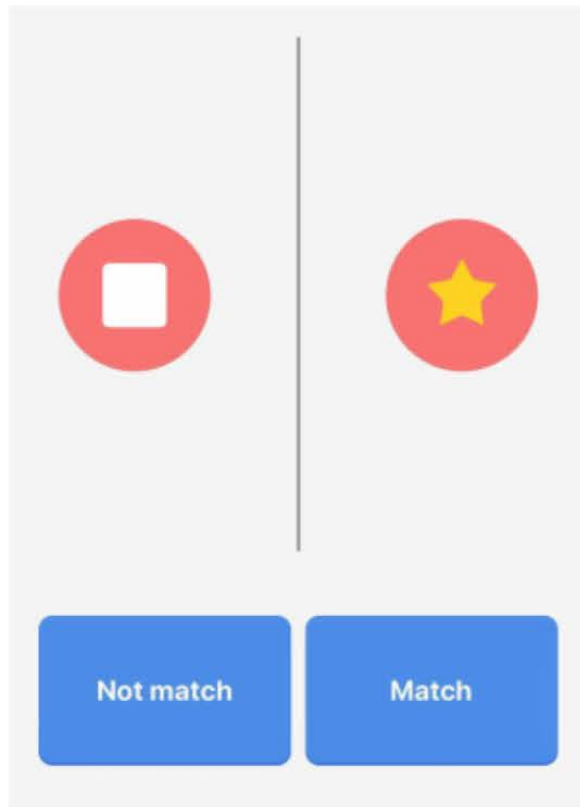




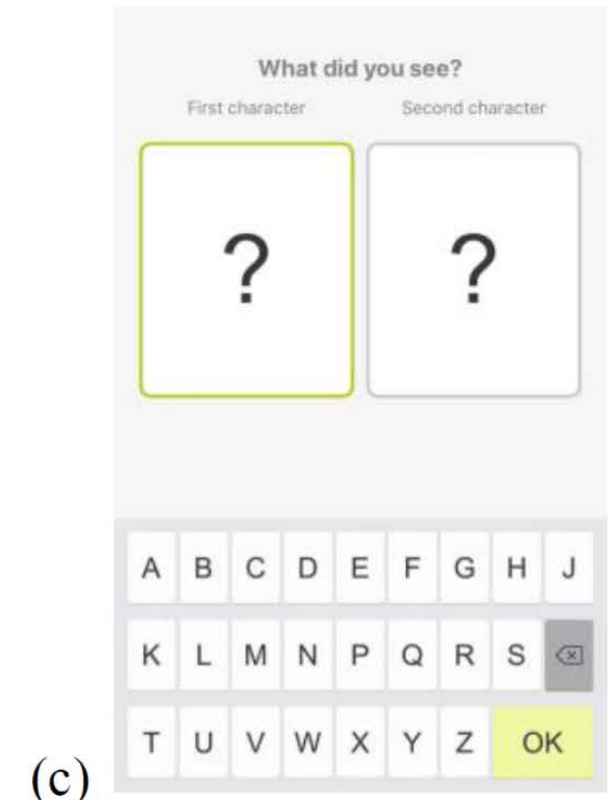
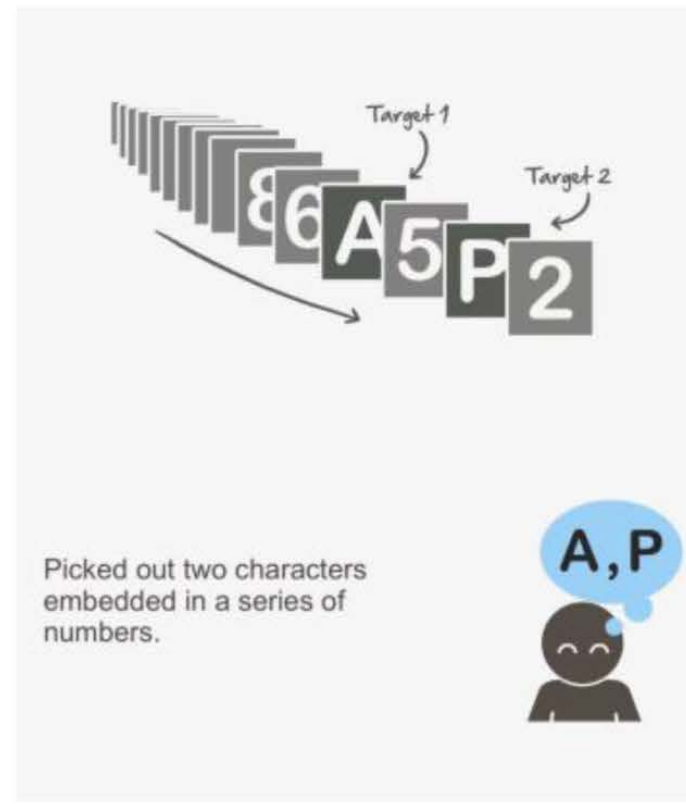
# Method: the cognition tests



## cognitive reaction test



## attention blink test



# Method: the restorative component scale



The place make me far away from pressure in daily life.

I feel I belong to the place.

I can temporarily out of the daily routines.

I can do what I like here.

I am out of people's expectation here.

The place make me far away from my responsibility.

I want to stay here longer.

The place recall me memory.

The place is memorable significance.

I am attracted by a lot of things without any effort.

I have unexpected discoveries here.

I feel the environment is boring.

I feel the environment is monotonous.

I can watch, listen, feel and think a lot here.

The place brings freshness to me.

I feel very annoying here.

I feel the place is messy.

The place consists excessive information.

completely agree

Agree

Disagree

completely disagree

(+2)

(+1)

(-1)

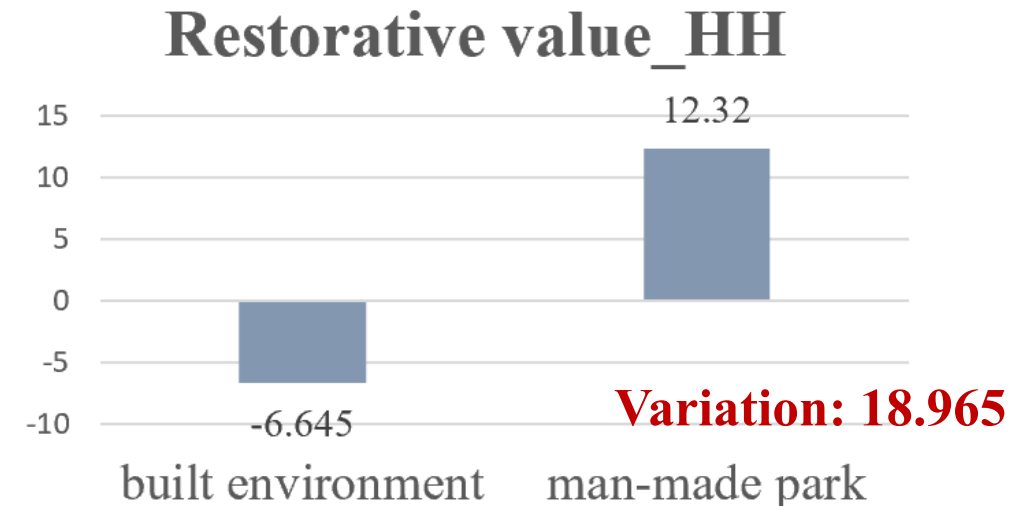
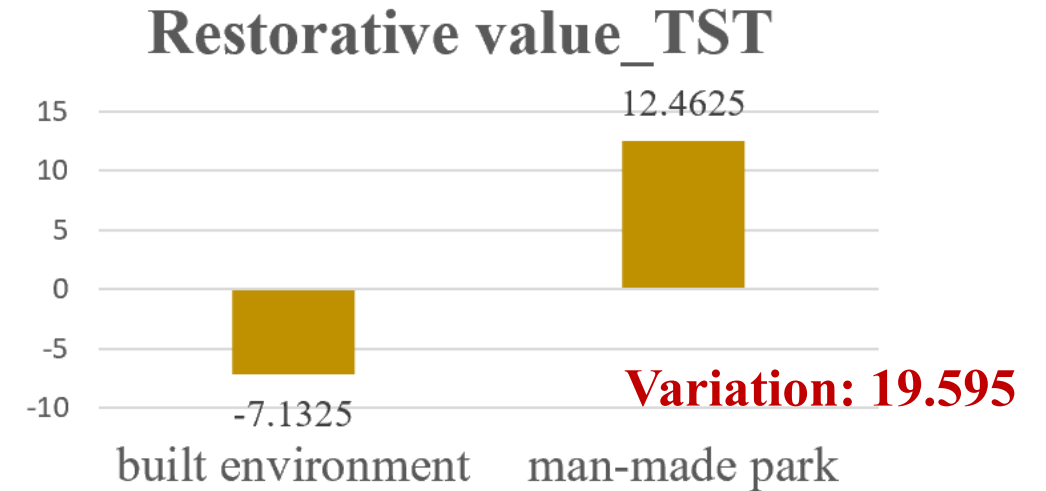
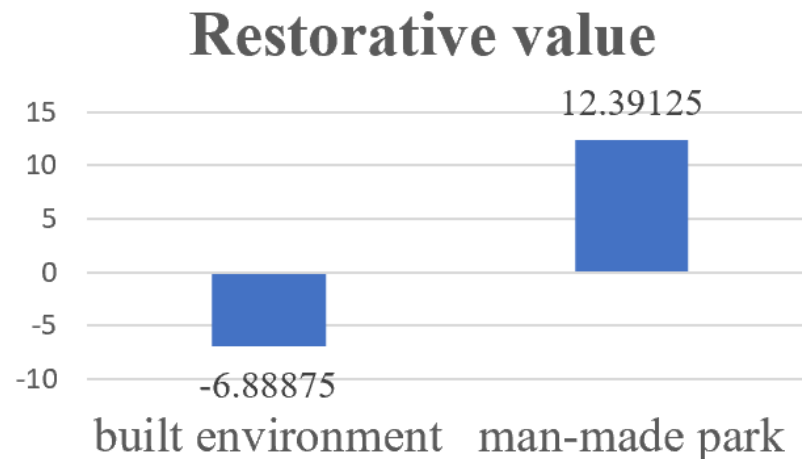
(-2)

*Laumann, K., Gärling, T., & Stormark, K. M. (2001). Rating scale measures of restorative components of environments. Journal of Environmental Psychology, 21(1), 31-44.*



# Key Findings: Restorative value

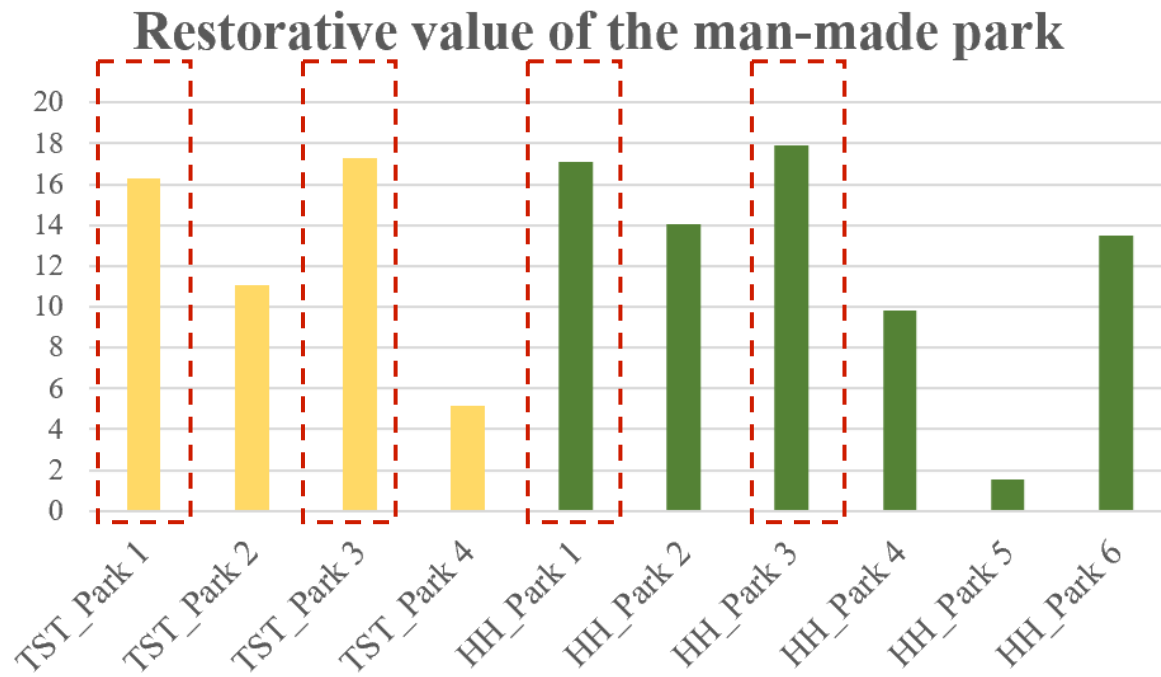
- the restorative score of man-made park (*mean value: 12.4*) is **significantly higher than built environment** (*mean value: -6.86*);
- people would feel **less restoration in a commercial area than residential area**;
- **Variation** between the built environment and man-made park is larger in TST route than HH route;
- The **arrangement of the landscape** is more important than the **size of the park** (Kowloon Park is nearly ten times larger than Hutchison Park);





# Key Findings: Restorative value

- In Hong Kong, dynamic water might be the dominant element among the landscape types to increase restorative value;
- However, we could not tell the high score in TST and HH park 1 is not caused by the changing of environment. Because both of them are the first points in park part.

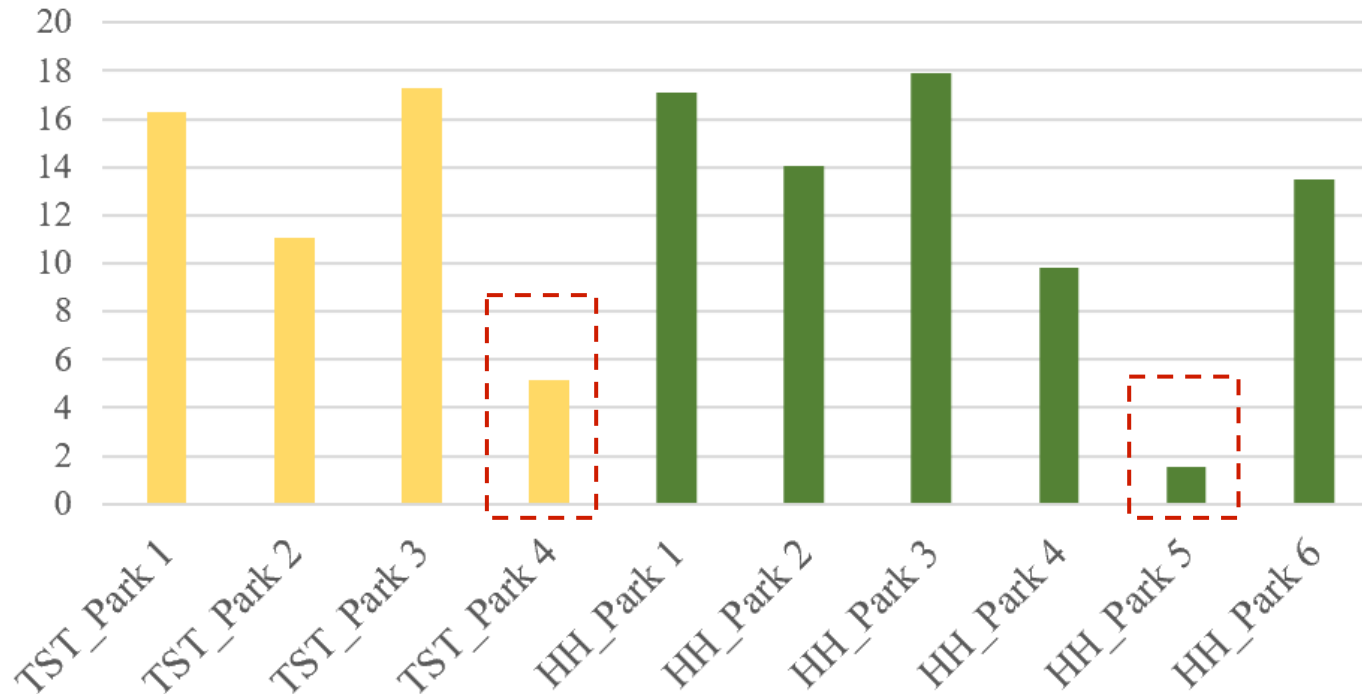




# Key Findings: Restorative value

- The **simple and repeat landscape elements** do not have significant effect on increase the restorative value. Design **a diverse scenery** might be a useful implication to landscape design in Hong Kong;

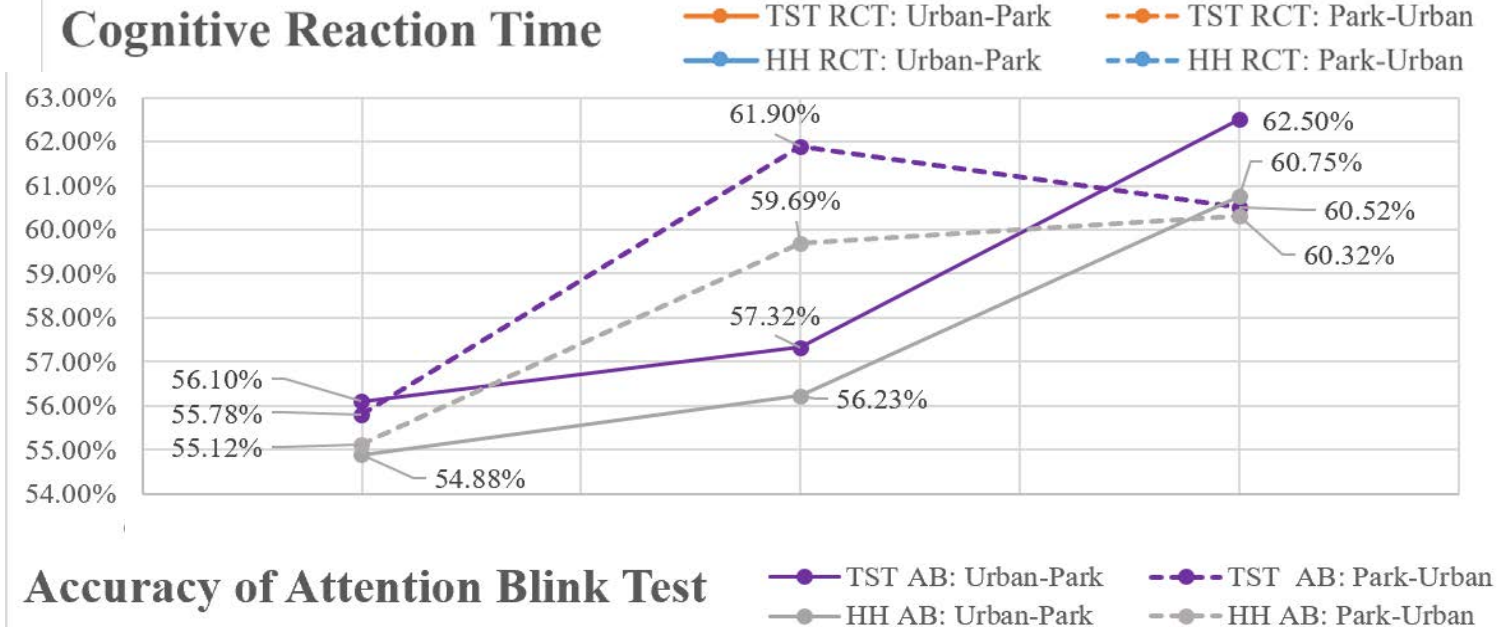
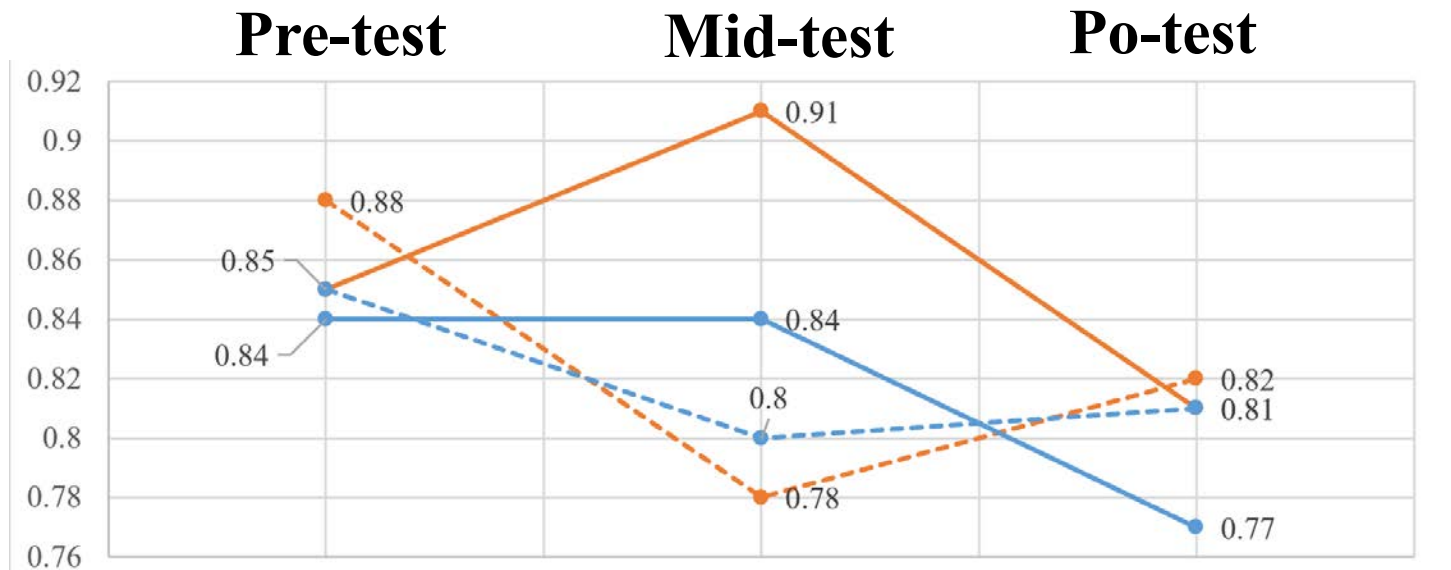
Restorative value of the man-made park





# Key Findings: Cognition test

- Participants process the information **faster** and have **higher** accuracy to tell the second target in AB test in **Mid-test** if they walk the park part first, and their performance both **get worse** in the **Po-test** after walking the urban part. It could partly exclude the effects from repeat training;
- For the groups walked urban part first, their processing time is longer in Mid-test compared to Pre-test, but their accuracy of AB test is higher. There are significant improvement effects after walking park part (Po-test).



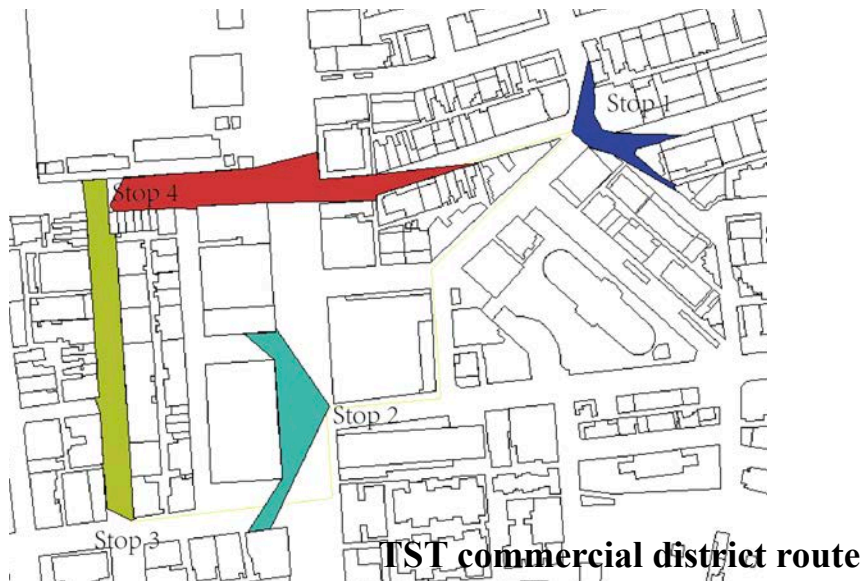


# Future Study

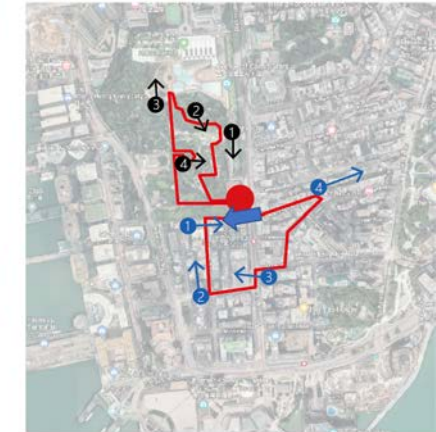
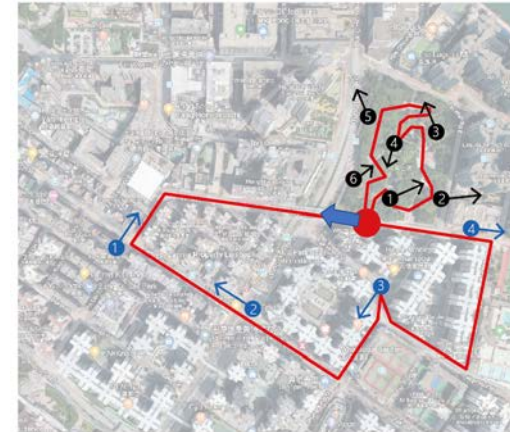
- Compare HK results with other studies

- Regression model (static data)

$$Re = -0.852 * \text{noise} + 2.051 * \text{isovist\_maxradial} + 0.24 * \text{GVR} + 0.944 * \text{isovis\_compactness} + 1.729 * \text{isovist\_area} - 191.28 \quad (R^2 = 0.32, p = 0.05)$$



- Opposite Walking Direction



Pre-test  
Mid-test  
Pro-test



Stopping point



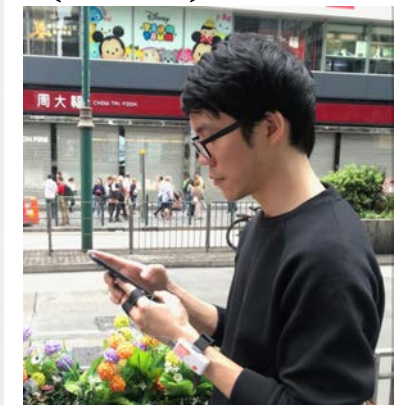
Walking route  
Counterclockwise



Observation direction



- Dynamic emotional data (SCR) VS visual factors





**Thank you !**

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