Enclosure and Its Health Promoting Effects of Urban Open Spaces

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Background

- Natural environment and elements have healing effects
  - Lower arousal which is central in stress responses
  - Lower levels of fear and anger
  - Higher levels of positive feelings
  - Etc.
- Artificial natural environments' health promoting effects
  - Lead to better treatment effect and satisfaction
 - Reduce risk of developing stress-related illnesses
  - Etc.

Background

- High and increasing urbanization level
  - More and more people have been tightly bound within the urban area
  - Not all of them can experience pure nature on an everyday basis
- Urban open spaces with natural elements become more essential for city dwellers' well-being.

Is it enough by natural elements alone? Does spatial configuration contribute to health promoting effect?

Enclosure

- A region (PPA) in the human brain specifically responses to enclosure

- The enclosing surfaces define the boundary of the space, subsequently decide its structural and ordering characteristics

- Many natural materials can be employed

Environmental preference

Open space design

enclosure

Health promoting outcomes
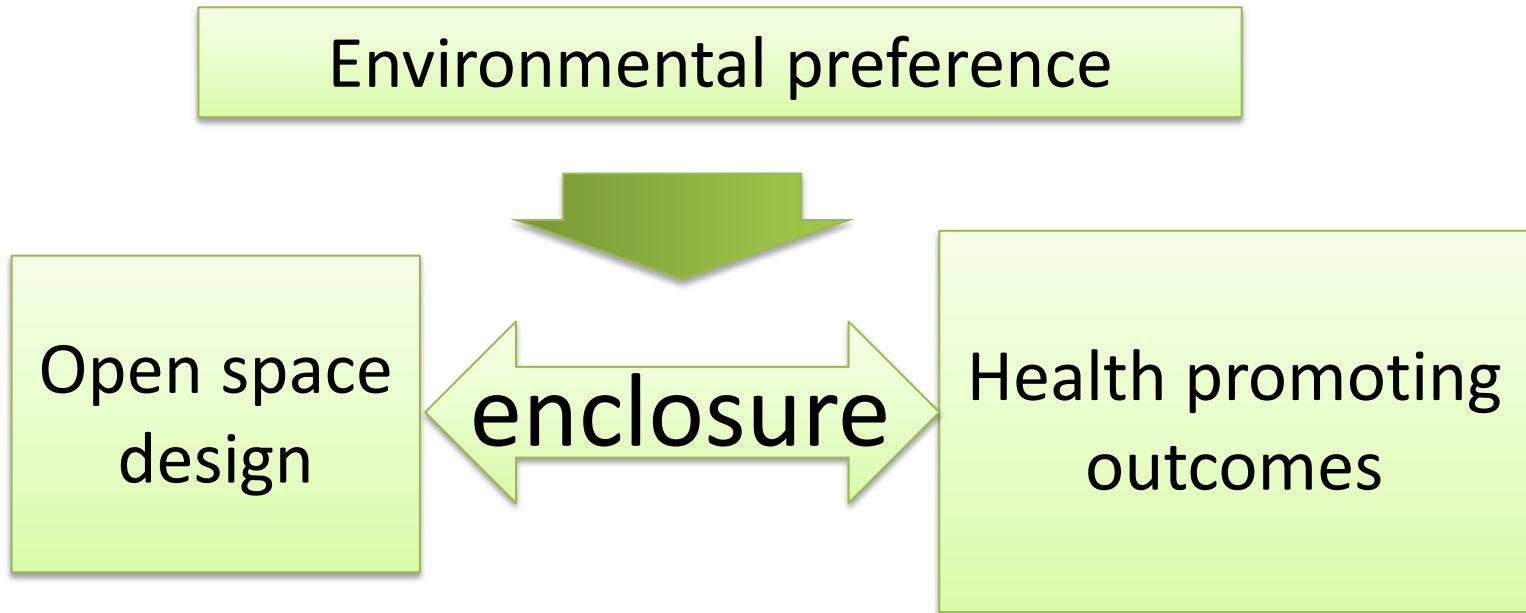
- Hypothesis: enclosure of urban open space affects health outcomes on environmental preference

Environmental preference

- Coherence: the extent to which the scene "hangs together"
- Legibility: the extent to which an environment can be read easily and explored without getting lost
- Complexity: the number and variety of elements that are found in a scene
- Mystery: a promise of further information

Methodology

- Questionnaire survey
  - 26 spaces

  - Semantic measurement- 7-point scale
    - Coherence: harmonious-dissonant
    - Legibility: legible-illegible
    - Complexity: complex-simple
    - Mystery: mysterious-plain
  - Rank all the spaces on enclosure extents and then give each of them a score within 0 to 100

Methodology

- Non-professional
  - Randomly selected in public housing estates at least 500 meters away from any selected spaces
  - 178 valid samples

- Professional
  - Randomly selected in Faculty of Architecture, HKU
  - Mainly postgraduate students taking design and research programs
  - 63 valid samples

Results: non-professional

- Difference on perceptions based on enclosure (One-way ANOVA)
  - Coherence ($F_{(25, 4602)}=3.116$, $p<.000$)
  - Legibility ($F_{(25, 4602)}=3.209$, $p<.000$)
  - Complexity ($F_{(25, 4602)}=9.554$, $p<.000$)
  - Mystery ($F_{(25, 4602)}=7.553$, $p<.000$)

- Pearson Correlation

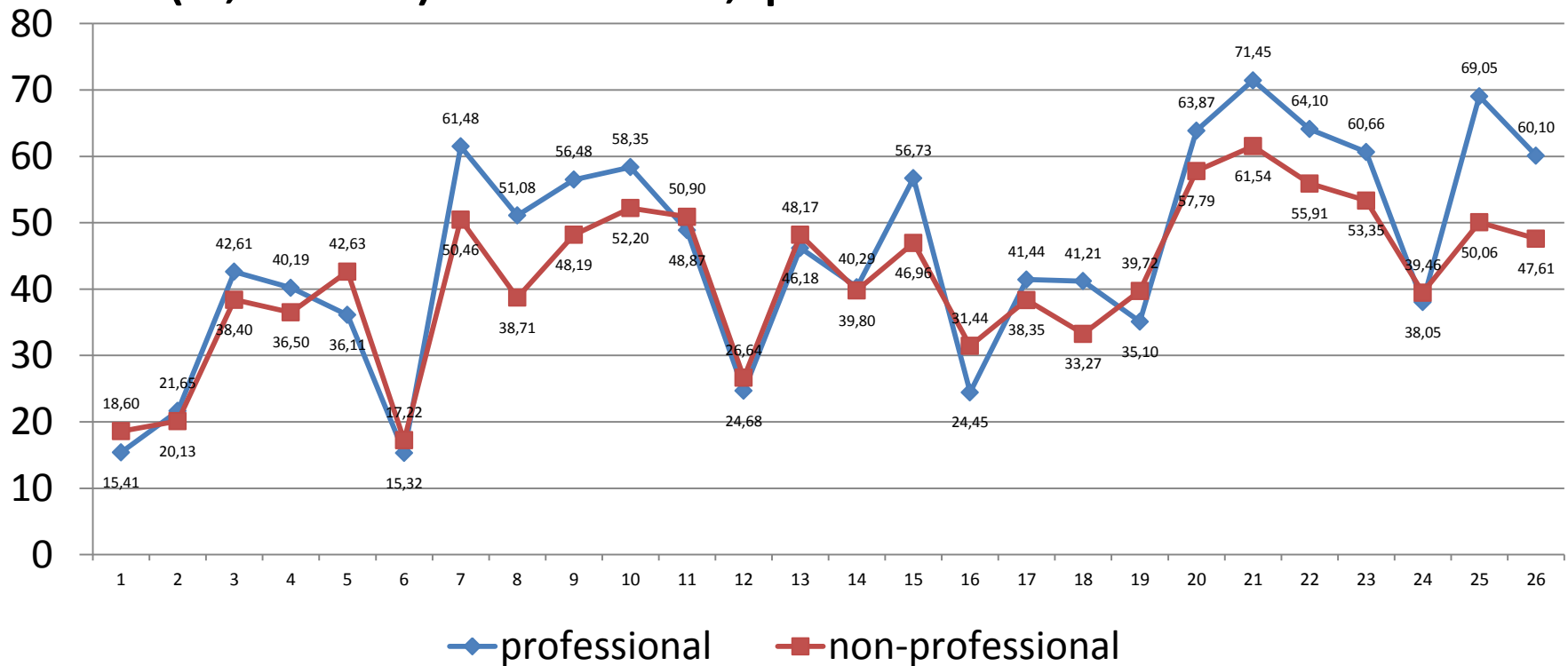|		coherence	legibility	complexity	mystery
Enclosure	Pearson Correlation	**.634**	**.465**	-.082	-.141
	Sig.	**.000**	**.017**	.692	.494

Results: professional

- Difference on perceptions based on enclosure (One-way ANOVA)
  - Coherence (F(25, 1612)=5.270, p<.000)
  - Legibility (F(25, 1612)=4.327, p<.000)
  - Complexity (F(25, 1612)=7.005, p<.000)
  - Mystery (F(25, 1612)=7.988, p<.000)

- Pearson Correlation

		coherence	legibility	complexity	mystery
Enclosure	Pearson Correlation	.328	**.587**	-.130	**-.452**
	Sig.	.102	**.002**	.526	**.020**

Result: non-prof. vs prof.

- Perception of enclosure:
  $F_{(1, 6264)} = 108.384$, $p < .000$

Enclosure mean values for each space (non-prof. & prof.)

# Result: non-prof. vs prof.

- Perceptional difference by professional identity
  - Coherence ($F(1, 6264)=108.204$, $p<.000$)
  - Legibility ($F(1, 6264)=184.989$, $p<.000$)
  - Complexity (no sig. difference)
  - Mystery ($F(1, 6264)=6.398$, $p=.011$)

Discussion

- Enclosure may affect people's preference or reaction towards the environments
  - Sense of control
  - Familiarity towards space
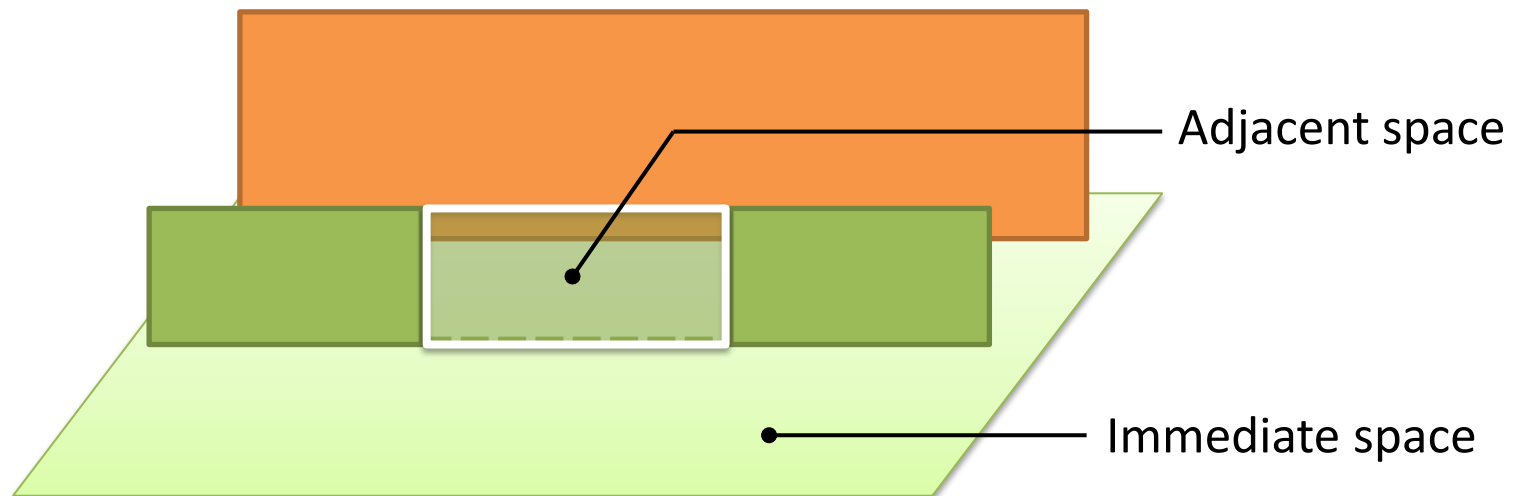 - Make sense of the environment and decide how comfortable people feel in a place

Discussion

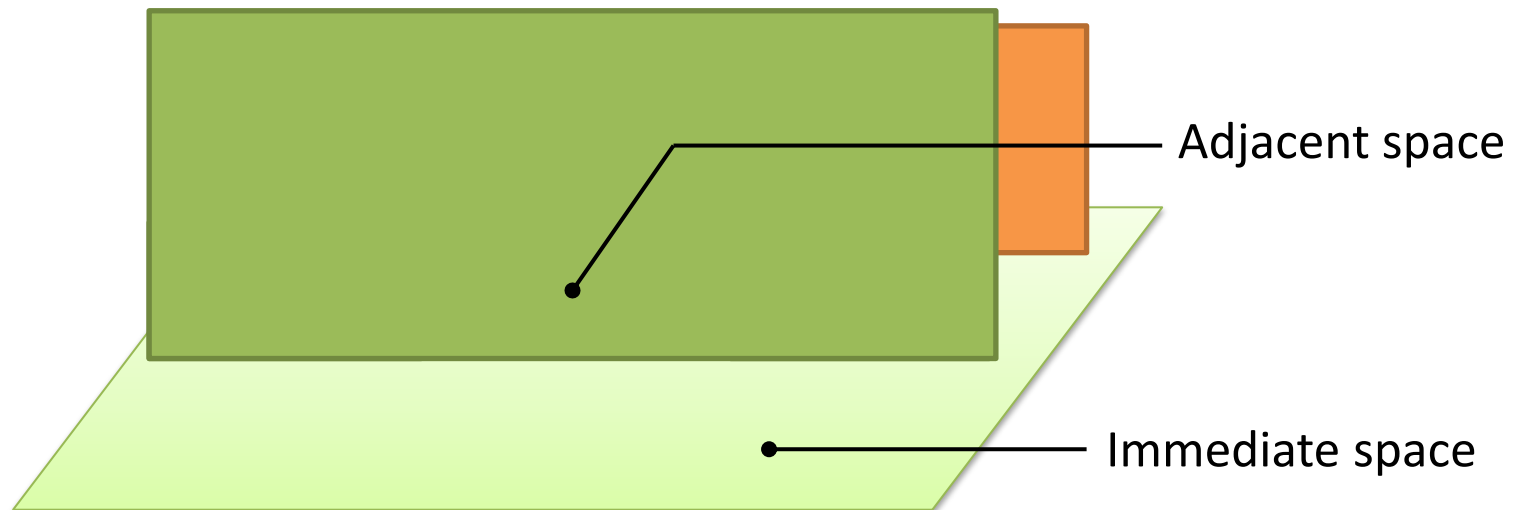- Legibility increases when extent of enclosure increases—non-prof. & prof.

Adjacent space

Immediate space
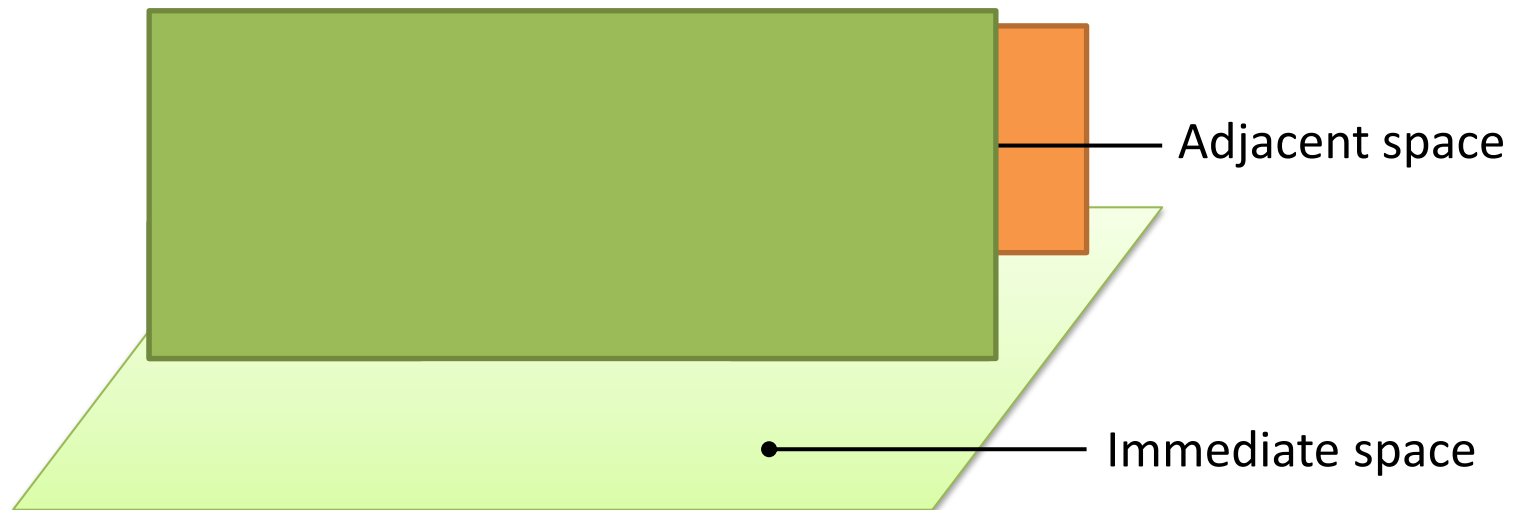
Discussion

- Coherence increases when extent of enclosure increases—non-prof.

Adjacent space

Immediate space

Discussion

- Mystery decreases when extent of enclosure increases—prof.

Adjacent space

Immediate space

Discussion

- Mystery decreases when extent of enclosure increases—prof.

- Complexity does not significantly correlated with enclosure for neither non-prof. nor prof.

Conclusion

- Extent of enclosure in urban open space turns out to be essential to subjects' perception and preference on coherence, legibility and mystery

- Such influences mainly focus on differentiating immediate spaces from their adjacent environments

- Spatial enclosure is suggested as important for users' health, at least mentally

- Differences between non-prof. and prof. suggest specific perspectives concerning on health promoting designs

THANK YOU!