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Enclosure and Its Health Promoting Effects of Urban Open Spaces

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(Deputy head of Division of Landscape Architecture, Faculty of Architecture, HKU)
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
• 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

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<tr>
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<th>complexity</th>
<th>mystery</th>
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<tr>
<td>Pearson Correlation</td>
<td>.634</td>
<td>.465</td>
<td>-.082</td>
<td>-.141</td>
</tr>
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</table>

| 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

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<td>Pearson Correlation</td>
<td>.328</td>
<td>.587</td>
<td>-.130</td>
<td>-.452</td>
</tr>
<tr>
<td>Sig.</td>
<td>.102</td>
<td>.002</td>
<td>.526</td>
<td>.020</td>
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Result: non-prof. vs prof.

- Perception of enclosure:
  \[ F(1, 6264)=108.384, \quad p<.000 \]

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

• Perceptualional 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.
Discussion

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

• Mystery decreases when extent of enclosure increases—prof.
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!