**Assessment of aesthetic preferences in relation to vegetation-created enclosure in Chinese urban parks: A case study of Shenzhen Litchi Park**

**Abstract**

Building on the mystery/complexity/legibility/coherence model of Kaplan & Kaplan (1989) and landscape visualization techniques the paper presents a case study analysing people’s aesthetic preferences for scenes with varying levels of enclosure created by vegetation. Participants were asked to view 48 computer-generated urban park scenes with different levels of enclosure and to rate them for three aesthetic preference factors: coherence, complexity and legibility. The results are as follows: (1) If the visual and/or physical setting is enclosed; participants will give lower ratings for legibility than in open scenes. (2) Physically open scenes are rated as more coherent than physically enclosed scenes. (3) Participants rate complexity for physically enclosed scenes lower than for physically open scenes. (4) In addition, responses show significant correlations between aesthetic preference and demographic factors such as gender and park uses. It is concluded that enclosure as a predictor variable for landscape preference has practical significance for future urban landscape research and design.

**Keywords**

vegetation-created enclosure, aesthetic preference, Chinese urban parks, landscape visualization, landscape preference.

**4 Discussion**

With reference to Kaplan & Kaplan (1989), it can be argued that coherence helps to provide a sense of order and allows attention to be directed. From an environmental psychology perspective, the results suggest that trade-offs exist between complexity and coherence. One such trade-off is that if the scenes were visually complex, they lacked coherence (Kaplan & Kaplan, 1989). The survey supports Kaplan and Kaplan´s model and suggests that at least the predictor variables complexity, legibility and to a lesser degree coherence also apply to Chinese urban parks.

Lynch (1960) points out in his book The Image of the City that legibility is focused on visual quality and an understanding of the cityscape and way-finding abilities. More recently, Shi, Gou, and Chen et al. (2014) noted that if spatial enclosure is increased, the assessment ratings of coherence and legibility will correspondingly decrease. This suggests that people tend to evaluate spaces as more coherent and legible if the space is open and simple. If background scenes contain important landmarks, these landmarks help people in terms of orientation, whereas enclosed scenes result in lower legibility ratings.

**4.1 Recommendations**

In the Chinese context, urban parks can be classified as green space-dominant parks or architecture-dominant parks (Li, Ouyang, and Meng et al., 2006). Li (2007) notes that the green space-dominant parks in China were mainly built to enrich the urban environment through various functions such as entertainment, ornamental functions, cultural protection and habitat provision. However, within the literature there remains a lack of insight into how to incorporate specific public preferences into the planting design; this research may partly fill this gap. At the urban park scale, taking peoples’ assessments of landscape composition into consideration, natural factors seem to influence peoples’ perception of the environment more than artificial elements (Lü, 2013). In addition, Herzog & Miller (1998) note that preference is positively correlated with openness. Therefore, the results could be used to inform urban park design strategies. Improving visually open and easily legible spaces, which are suitable for different functions, and enhancing the legibility of these spaces could improve urban park design. Regarding the aesthetic preference variables first defined by Kaplan & Kaplan (1989), participants’ evaluations of coherence (pleasantness of the views), complexity (functional setting) and legibility (orientation) are also helpful at the planting design stage. Furthermore, at the city scale, considering urban parks as one of the most important components of urban green networks, high ratings of legibility could create visually integrated green corridors for the whole city. If the edges of urban parks are also designed as vegetation-created scenes, the relationship between enclosure and aesthetic preference could be realised. Visual and physical enclosure of such boundaries would help to clarify and enhance the relationship between parks and their urban surroundings in order to better integrate these types of open public green spaces into the planning of the wider region.

**4.2 Methodological Limitation**

The relationship between enclosure and coherence does not show a clear trend in this experiment. Although there are 600 plant species available in Xfrog libraries, some specific indigenous plant species, such as Litchi chinensis, Lagerstroemia speciose, were not available in this database, which made it necessary to replace these models with species of a similar shape and height. Litchi chinensis was replaced by Indian Sandalwood, and Lagerstroemia speciosa was replaced by Persian Ironwood. In terms of methodology, Wherrett (2000) suggests that it is essential for the assessment of visual preference to present multiple landscape components together. In order to obtain results on coherence, it may be suggested that more diverse forms of vegetation, displaying more vibrant colours and textures, should be tested.

Li, Liu, and Hao (2010) analyzed descriptive data stratified by age, and found that the main users of Chinese urban parks are either the older (older than 46 years old) or the younger age groups (younger than 15 years old). However, the majority of participants in this online questionnaire were 25-34 years old, and are generally highly educated. This might be because the questionnaires were distributed online through social media, and one might expect young and middle-aged people working in offices or studying to be more likely to use such web sites. It would be beneficial to be able to include a greater number of older or younger participants to enhance the authenticity of the data.

**5 Conclusion**

This study answers the question “How does enclosure, created by vegetation, affect aesthetic preferences in Chinese urban parks?”. There are significant differences in peoples’ aesthetic preferences with regard to enclosure created by vegetation in Chinese urban parks: 1) If the visual and/or physical scene is enclosed, people perceive legibility as lower than in open scenes. 2) In visually open scenes, there are no significant differences in participants’ sense of coherence if the physical enclosure is changed. Under visually enclosed situations, physically open scenes are perceived as more coherent than physically enclosed scenes. 3) Participants’ ratings of complexity were lower in physically enclosed scenes compared to physically open scenes. In contrast, in physically open scenes, there are no significant correlations between visual enclosure and complexity. However, in physically enclosed scenes, participants gave higher ratings for complexity in visually open scenes than in visually enclosed scenes. 4) According to the analysis of demographic factors, age and other demographic factors didn´t seem to make a difference.

Comparing the findings of this research to previous studies, it concluded that landscape visualization techniques using 3D vegetation models and 2D materials together are adequate to research aesthetic preferences in small-scale urban parks. The visualization section verified the feasibility of using parameterized 3D vegetation plugins in preference studies. Based on the Litchi Park case study, this research has demonstrated its practical importance in providing design recommendations and that the well-established environmental preference model by Kaplan & Kaplan (1989) also applies to Chinese urban parks. In conclusion, the results on enclosure and aesthetic preference are of practical use to future urban park design, and the framework of the research can be used as guidance for future research on the urban landscape in China.