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Consensus in visual preferences: The effects of aesthetic quality and landscape types

Ronghua Wang [a], Jingwei Zhao [b,*], Zhenyu Liu [c]

[a] School of Urban and Environmental Science, Jiangsu Normal University, Xuzhou, China
[b] School of Arts and Design, China University of Mining and Technology, Xuzhou, China
[c] College of Art and Architecture, University of Idaho, Moskow, USA

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ABSTRACT

Our research used pictures of four different landscapes to study the effects of two possible sources (visual aesthetic quality (VAQ) and landscape types) on the consensus of visual preferences among 156 undergraduate respondents. There were ten pictures each of urban, urban green space, farm, and forest landscapes presented for visual preference assessment. We found that VAQ assessment had a significantly positive linear relationship with judgment consensus when the four landscape types were combined. However, this relationship differed when examining one individual landscape type, it varied depending on the different landscape types. Thus landscape types had a significant influence on the consensus. Additionally, we found that consensus increased when a landscape was well maintained and had greater vegetation coverage.

1. Introduction

Worldwide, visual aesthetic quality (VAQ) is obviously considered an important natural resource just like water, soil, mines and fossil fuels (Kane, 1981) and is valuable for the human physical and psychological health (Velarde et al., 2007; Kurdoglu and Kurdoglu, 2010). VAQ helps protect cultural heritage (Jessel, 2006), and increasing tourism potential of a place (Ewald, 2001). Thus the protection and improvement of VAQ have received widespread attention in recent years. Visual aesthetics assessment is considered a reliable method to increase VAQ of a landscape by design and management (Arriaza et al., 2004; Zhao et al., 2013).

Visual aesthetic assessment is mainly divided into two approaches: the objective, based on a physical paradigm, and the subjective, based on a psychological paradigm (Lothian, 1999; Daniel, 2001). The objective approach regards aesthetic quality as an intrinsic attribute of a landscape. The subjective approach assumes that aesthetic quality is a subjective value derived by the eyes of the beholder (Lothian, 1999; Tveit, 2009). However, many who conduct research on aesthetic preference assessment believe that it is a process of interactions between the physical characteristics of a landscape and the psychological responses of those who view the landscape (e.g. Strumse, 1996; Tveit, 2009; Vouligny et al., 2009; Molnarova et al., 2012). Thus, aesthetic preference assessment is the procedure of respondents' perception of landscape attributes, which attracts great attentions from scientific community, and builds a paradigm of perception-based assessment (Daniel, 2001). Despite the vast majority of studies conducted to understand the assessment of aesthetic quality, only a small amount of work involves consensus in aesthetic preference judgment, and thus consensus among observers remains poorly understood. But some research indicates that a consensus of landscape perception should be regarded as the central issue (Purcell and Lamb, 1984; Hagerhall, 2001).

Consensus in aesthetic preference judgment was influenced by many factors, such as scenic quality, landscape types, variability among respondents, and idealized mental image of respondents, etc. (Hagerhall, 2001; Kalivoda et al., 2014). In order to simplify our research, we studied the effect of two possible factors (scenic quality and landscape types). To reduce the impact of our respondents' demographic variables as much as possible, the respondents were limited to undergraduates in the same discipline and of the same age.

Previous literature suggests that some landscape characters are driving factors for VAQ (Arriaza et al., 2004; Yao et al., 2012; Zhao et al., 2013). Since this research is focused on VAQ's effect on consensus, we wanted to understand how these characters drive consensus. To do so, we chose 11 landscape characters by referring

* Corresponding author.
E-mail address: 852683076@qq.com (J. Zhao).

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to the characters identified in published literature and analyzing the characteristics of landscapes studied. Our hypotheses and their logical bases follow:

(1) Landscapes with polar aesthetic qualities (extremes, such as very unappealing or very beautiful) produce a higher consensus than landscapes with moderate aesthetic qualities. Polar aesthetic quality is an easy judgment for respondents to make and Hagerhall (2001) indicated a low variance for a quick and holistic judgment;
(2) Natural landscapes produce a higher consensus among respondents than man-made landscapes, perhaps because humans have lived in natural environments for most of their evolutionary history. Human perception of the natural environment is very similar. On the other hand, man-made landscapes are easily influenced by culture; individuals from different cultural groups have quite varied perceptions of man-made landscapes and thus lead to high variance in aesthetic judgment;
(3) Landscape characters favorable to human survival, such as plants and water, have a great influence on consensus in aesthetic judgment, a hypothesis based on evolutionary theory, published by Appleton (1975) and Kaplan and Kaplan (1989).

2. Methods

2.1. Photographs

In order to explore the effect of landscape types on variation in aesthetic preference judgment, we selected four landscape types: urban landscape, farm, urban green space, and forest. Photographs were used in place of actual landscapes in a manner that has been widely used in previous studies (e.g. Arriaza et al., 2004; Canas et al., 2009; Pflüger et al., 2010; Zhao et al., 2013); and photographs are considered a valid medium for such research (Daniel and Meitner, 2001; Palmer and Hoffman, 2001). The photographs were taken at eye-level on clear or less cloudy days, from 10:00 a.m. to 4:00 p.m. to control for similar lighting conditions in mid-summer 2013, during which time the vegetation retained a relatively constant appearance. The equipment was a SONY mini SLR camera with focal length 35 mm and aspect ratio 3:2. The camera was positioned horizontally; the views were selected randomly, however they were deliberately focused to capture the principal characteristics of the landscape type.

The photographs of urban landscapes and urban green spaces were taken in the city of Xuzhou in eastern China, with its typical warm, humid monsoon climate. The photographs of the farm landscapes were taken in the rural areas around Xuzhou, and the forest photographs were taken in Huangcangyu Forest Park, about 25 km southeast of the city (Fig. 1). Although more than a hundred photographs were taken, only ten were selected for each of the four landscape types by panel of qualified landscape architects; their criteria were good photographic quality, high-level representation of the landscape types, and wide variation within each type. The resulting 40 photographs became the stimuli for the visual preference assessments and landscape characters' judgments. Fig. 2 is a sample of each landscape type.

2.2. Survey of respondents' visual preference

Undergraduate students in art and design at China University of Mining and Technology located in Xuzhou were the respondents for this study in order to minimize great variation among respondents, increase efficiency, and reduce cost. Previous work demonstrates that students are suitable of landscape assessment (Yao et al., 2012).

We conducted the survey in a small classroom in September 2014. The 9.2×6.0 m-space accommodated 35 students and allowed for a comfortable distance between the projected photographs and respondents. The photographs (slides) were randomly projected twice on a 1.6×1.2 m white screen. First, all slides were shown briefly one by one so that the pictures made a general impression for the respondents. Second, they were shown in ten-second intervals so that the respondents could rank the landscapes. The visual preference of a photograph was divided into seven ranks (scores) ranging from "not at all beautiful = 1" to "extremely beautiful = 7" in the manner suggested by the work of Hands and Brown (2002) and van den Berg and Vlek (1998). The respondents were encouraged to use the entire range of the rating scale. The survey was repeated five times in this same space with five different groups of respondents, totaling 156 respondent surveys, of which 144 submitted valid questionnaires. These included 63 males and 81 females, 102 of which self-identified as city dwellers, and 42 who lived in rural areas; the average age was 21.22, with a standard deviation of 1.79.

2.3. Landscape characters judgment

Nine landscape architects judged the 11 landscape characters listed in Table 1. This panel included three teachers and six postgraduates from Jiangsu Normal University and China University of Mining and Technology. They were shown 40 digital photographs using the same method as in the aesthetic preference assessment by the students. However, in the place of the ten-second viewing for assessment by the students, the panel viewed the next photograph only after everyone had finished assessing the current photograph. There was a ten-minute break after fifty minutes. The average score of the panel was used as the score for each photograph of the particular landscape character.

2.4. Data analysis

We used SPSS 17.0 to analyze the data. The consensus was measured by the standard deviation (SD) in visual preference judgment within the respondents. There is a negative relationship between SD and consensus. One-way ANOVA was used to check landscape types' effect on consensus, and curve estimate regression analysis was used to explore the relationships between VAQ and SD. In addition, correlation analysis and stepwise multiple linear regression analysis was conducted to explore the influences of landscape characters on judgment consensus.

3. Results

3.1. Overall evaluation of visual aesthetic quality and variation in aesthetic preference judgment

For all of the photographs, the scores for VAQ ranged from 5.432 (highest) to 2.135 (lowest); the mean score was 4.024. SD in aesthetic preference judgment ranged from 1.388 (highest) to 0.697 (lowest), with a mean of 1.014. Fig. 3 illustrates the four pictures with the two highest and the two lowest values of SD. Regarding landscape types, the descending order of the mean scores of VAQ was urban green space, then forest, farm and urban landscape; the descending order of the mean values for SD was farm, followed by urban landscape, forest, and urban green space (see Table 2 for details).