



Consensus in landscape preference judgments: The effects of landscape visual aesthetic quality and respondents' characteristics



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ABSTRACT

Landscape's visual aesthetic quality (VAQ) has been widely regarded as a valuable resource worthy of protection. Although great effort has been devoted to determining the factors driving aesthetic preferences, public consensus in judgments has been neglected in the vast majority of such studies. Therefore, the aim of our study was to analyze three main possible sources of judgment variance: landscape VAQ, landscape type, and variability among respondents. Based upon an extensive perception-based investigation including more than 400 hikers as respondents, we found that variance in respondents' judgments differed significantly among assessed landscape scenes. We discovered a significant difference in judgment variances within each investigated respondent characteristic (gender, age, education level, occupational classification, and respondent's type of residence). Judgment variance was at the same time affected by landscape VAQ itself – the higher the VAQ, the better the consensus. While differences caused by characteristics indicate subjectivity of aesthetic values, the knowledge that people better find consensus for positively perceived landscapes provides a cogent argument for legal protection of valuable landscape scenes.

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1. Introduction

It has become more and more obvious in the last few decades that landscape's visual aesthetic quality (VAQ) should be considered as a resource valuable for maintaining good psychic health in human beings (Kurdoglu and Kurdoglu, 2010), along with such matters as protecting biodiversity (Angileri and Toccolini, 1993), cultural heritage (Jessel, 2006), and the tourism potential of a landscape (Ewald, 2001). Conserving landscape VAQ is therefore often considered to be in the public interest.

Visual aesthetic quality can be viewed from the perspectives of two approaches to its assessment – objective and subjective (Lothian, 1999; Daniel, 2001). From the objective viewpoint, a landscape's VAQ is due to its elements and attributes. The subjective approach, meanwhile, regards landscape value as a product of the human mind. Two ways of assessing landscape aesthetics are used in the context of these approaches. Expert-based assessment follows prescribed rules and/or guidelines and systematically

evaluates a landscape's beauty with respect to its physical features (e.g., form, line, texture, color) and to relationships among these features (e.g., variety, unity, vividness, harmony). Perception-based assessment, on the other hand, uses choices, rankings or ratings (usually represented by photographs) provided by samples of human viewers (Daniel, 2001). Whereas expert-based assessment is widely employed in landscape management practice, perception-based assessment is mostly used in scientific studies (Daniel, 2001).

As conflicts arise when expert-based assessment diverges from public preferences (De la Fuente de Val et al., 2006), a combination of objective and subjective approaches has recently gained support (Daniel, 2001; Arriaza et al., 2004). The criteria for expert-based assessment should respect the findings of perception-based research. On the other hand, when human preferences for VAQ are inconsistent with other important values, such as ecological, cultural, or historical values, "the role of perception-based assessments will shift from determination of public preferences... to diagnose of pathological preferences and prescription of cures" (Daniel, 2001).

Perception-based assessment has increasingly been used to study landscape VAQ in recent decades (e.g., Kaplan and Kaplan, 1982; Coeterier, 1996; Ode et al., 2009). In accordance with landscape visual aesthetic concepts, it has been found that VAQ is

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influenced by landscape elements, landscape attributes, and characteristics of survey respondents. Landscape elements more accentuated than others by survey respondents include vegetation (Angileri and Toccolini, 1993), water (Dramstad et al., 2006; Bulut and Yilmaz, 2009), well-preserved human-made elements (Arriaza et al., 2004), and meadows (Clay and Daniel, 2000). Also understood to be highly important are certain landscape visual attributes, such as openness (Strumse, 1994), unity (Coeterier, 1996), color contrast (Arriaza et al., 2004), vividness (Bulut and Yilmaz, 2009), and naturalness (Palmer, 2004; Ode et al., 2009). Within settlements and in regard to architecture, preferred are such elements as traditional architecture (Nasar and Kang, 1999; Kalivoda et al., 2010) and family houses (Sullivan, 1994), small lots (Pynnonen et al., 2005), and contextuality (Stamps, 1994). Meanwhile, Stamps and Nasar (1997) found considerably lower preferences for scenes with wires, automobiles, and other disturbing elements. Thus, tidiness of scenes apparently influences perception as well. As to respondents' characteristics, it has been proven that occupation (Rogge et al., 2007; Svobodova et al., 2012), level of education (Angileri and Toccolini, 1993; Tveit 2009), and gender (Ode et al., 2009) contribute most to the formation of visual preferences. Nevertheless, Strumse (1996) proved the effects of group differences to be relatively small compared to those of landscape elements and attributes.

Although great attention has been devoted to finding those factors driving aesthetic preferences, consensus among respondents has been neglected in the vast majority of studies employing perception-based assessment. According to some authors, however, public consensus should be regarded as a central issue in landscape perception research, as application of preference studies implies agreement among individuals (Purcell and Lamb, 1984; Stamps and Nasar, 1997; Hagerhall, 2001). Daniel (2001) anticipated future consensus-building efforts to comprise one approach to 21st-century landscape management. Implicitly, then, it is necessary to identify factors affecting consensus.

Hagerhall (2001) summarized that consensus is affected by three main factors: (i) VAQ of assessed landscapes, (ii) landscape type and the extent to which assessed landscapes meet idealized mental images, and (iii) variability among respondents. Concerning landscape VAQ, it has gradually come to be hypothesized that judgment consensus is likely to occur for positively, negatively, or both positively and negatively perceived landscapes (Kates, 1967; Dearden, 1981; Hagerhall, 2001). Mostly, however, these views have consisted of assumptions rather than resulting from consensus-focused research. Hagerhall (2001), in particular, had emphasized the impact upon consensus of how a given landscape type fits the generally perceived mental image for that type. She had stated that the better a given landscape matches an idealized image of its landscape type the lower is the variance in preference judgments (i.e., the stronger is the consensus) that is to be expected. Almost nothing is known about the third possible driver of judgment variance that consists in differences among respondents. Only Angileri and Toccolini (1993) had focused in part on the effect of education level and agronomic experience, but no conclusions were reached on this issue. Although Hagerhall (2001) expressed respondents' variability using cluster analysis, she did not address the particular characteristics of the respondents.

The aim of our study, therefore, was to analyze the three main possible sources of judgment variance – the effects of landscape VAQ, landscape type, and variability among respondents – on the basis of an extensive perception-based investigation. The study included more than 400 respondents. To our knowledge, this is the first study systematically to analyze judgment variance in relation to respondents' characteristics, including gender, age, education level, and occupational classification.

2. Materials and methods

2.1. Study area and experimental design

The research was conducted in four protected landscape areas (PLAs) in the Czech Republic (Blaník, Český kras, Kokořínsko, and Železné hory). All are situated in or close to the region of Central Bohemia (see Fig. 1). PLA is a Czech national designation defined by Act No. 114/1992 Coll. (Czech National Council, 1992) and that is intended for protecting large areas with harmoniously formed landscapes of characteristic relief and prevalence of natural or semi-natural ecosystems. Such classification indicates landscapes with relatively high VAQ. All study areas are situated near to Prague, the capital city of the Czech Republic. As most people there live in towns or cities, they prefer green places for recreation (Bulut and Yilmaz, 2008). Thus, studied areas with high VAQ and high proportion of greenery are greatly frequented by hikers.

Hikers' opinions regarding landscape aesthetics were examined. Respondents were surveyed at 12 spots across all four PLAs during late summer 2010. Heterogenous survey sites were chosen to ensure that a wide range of hikers would be included. The sample was built up in a self-selective statistical procedure, typically termed to be "haphazard" or "convenience" sampling (Babbie, 2010). In practice, this means that all the hikers passing a given spot at a given time were approached. They were asked to complete and return a questionnaire *in situ*. A high response rate (about 90%) was achieved. A total of 442 respondents were surveyed, which was about 100 in each PLA. The decision to use hikers as our respondents can be justified by several reasons, as described in Section 4, where possibly resulting biases also are discussed.

To examine attitudes of respondents toward 24 different landscape scenes (see Fig. 2 for a sample or ES1 for the full set), a closed-ended, self-administered questionnaire was used. About 10 min were required to complete the questionnaire. Scenes were presented using photographic representation, which is considered to be a valid medium for such research (Daniel and Meitner, 2001; Palmer and Hoffman, 2001). To create a pool of scenes, about 400 color photographs were taken in all four of the examined PLAs during early summer 2010 using a Panasonic DMC-TZ5 compact camera, with focal length 35 mm and aspect ratio 4:3. The photographs were taken in uniform weather and light conditions. After selecting high-quality pictures, a pool of 175 representative scenes was established. Photographs were not altered in any way.

The pool of scenes was divided into two basic assessed landscape types: open landscapes and rural settlement landscapes (see



Fig. 1. Study areas.

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