



## Visual quality: An examination of a South American Mediterranean landscape, Andean foothills east of Santiago (Chile)



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### ARTICLE INFO

#### Keywords:

Landscape assessment  
Scenic beauty  
Vegetation density  
Visitor preferences

### ABSTRACT

This study assessed landscape visual quality in a sector of Andean foothills, east of Santiago, Chile. Sample photographs were taken in four dominant native landscape types that were systematically selected on the basis of four categories of vegetation density. Visitors ( $n = 180$ ) were randomly sampled from among the residents of Santiago. The results showed that native vegetation has a positive impact on visual quality. Sclerophyllous shrublands and ravines (associated with semi-arid forests) are rated higher than savannahs of “espinales” and shrublands with succulent plants (associated with semi-arid grassland with shrubs). Findings also indicate that landscape scenes with high-vegetation density have a positive effect on visual quality, while those with a low density have a negative one. The key is the amount of visual access, which also increases people’s perceptions of safety and orientation. Finally, results showed that information variables are associated with people’s visual appreciation. Two preference factors were found to be consistent with the model of spatial information of Kaplan and Kaplan (1989). The implications of the results for the enhancement of public consensus in the planning and management of the Andean foothills, east of Santiago, are also discussed.

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### Introduction

Mediterranean ecosystems are amongst the most threatened on Earth. More than 41% of these ecosystems have been converted from farmland to urban use. Only 5% of their natural area is protected worldwide. In Central Chile, the alteration of the Mediterranean landscape has resulted in a deterioration of natural, cultural and scenic values. Overall, these landscapes have been dramatically reduced and homogenized over the past five centuries (Aronson et al., 1998). Native vegetation is an important component of the physiognomy of the landscape of Central Chile. Its contribution to wildlife habitat and protection against soil erosion should also be considered (Fuentes and Hajek, 1979). At present, there is an increased awareness and interest towards the better management of the landscape. This includes using less conventional aspects of non-market benefits, such as environmental and ecosystem services (Nassauer, 2012).

Despite a long tradition of studies that have identified the factors that people use to define visual quality, little attention has been paid to the Mediterranean semi-arid landscape. Landscape

visual quality, which is synonymous with both scenic beauty and aesthetic value, can be defined as the relative aesthetic excellence of a landscape and is embodied in its visual merits. These can be examined in terms of either observer appreciation or objective characteristics (Daniel, 2001). Studies of landscape visual quality conducted in various forest and rural ecosystems in North America and Europe have typically shown that vegetation, especially when it is well developed, ease of movement, topographic variation and water quality, especially when clean and transparent, have all been strongly associated with visual quality (Bernáldez, 1985; Gundersen and Frivold, 2008). Other features that appear to affect visual quality are naturalness (Ode et al., 2009), diversity (De La Fuente De Val et al., 2006), and complexity (Hagerhall et al., 2004).

Of all the variables, vegetation has been regarded as a particularly powerful factor in visual quality. Specific features of vegetation, such as type, density and visual penetrability, are stronger indicators of scenic beauty than other physical measures of forests (Ribe, 2005; Bradley and Kearney, 2007). Generally, visually impenetrable forests, as well as very open landscapes, are preferred less than landscapes with an intermediate-range density (Bjerke et al., 2006). The key is the amount of visual access, which also increases people’s perceptions of safety and orientation (Kaplan and Kaplan, 1989).

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However, these aspects have been rarely investigated in Mediterranean semi-arid landscapes. Many of the discussions about forest and rural landscapes of North America and Europe relating to vegetation, forms and shape of the landscape, may not be particularly relevant within the context of a Mediterranean semi-arid landscape. This is due to the distinctiveness and uniqueness of Mediterranean vegetation in terms of structure, foliage colour, shape and texture. This is also the case with regards to topography and soils, and the varied degrees and patterns of exploitation of the landscape (Fuentes and Hajek, 1979). Thus, in comparison with the forests of North America and Europe, Mediterranean semi-arid landscapes are often open with scarce and pale vegetation, which includes a mixture of grass, shrubs and scattered trees, in a landform composed of high or low-rolling hills.

The relationship between vegetation and visual quality is an important aspect too. Previous research in other Mediterranean-like landscapes (principally in Mediterranean basins and in Australia) have shown that vegetation has a positive influence on visual quality (Gómez-Limón and de Lucio, 1999; Misgav, 2000; Williams and Cary, 2002; Nir, 2004). Lamb and Purcell (1990) found that tall and dense vegetation was judged more naturally than low, open vegetation. People could identify managed changes in vegetation structures, but became less discerning as the height of vegetation increased. Arriaza et al. (2004) investigated the visual quality of agricultural landscapes on the basis of a survey of people's preferences of two rural areas. The results showed that preferences increased in a decreasing order of importance with the degree of the wilderness of the landscape and the percentage of the plant cover. Rechtman (2006) developed a study of the visual evaluation of open-Mediterranean landscapes in Israel and discovered a general trend of a preference for landscapes that embody naturalness, large quantities of vegetation, visual complexity and drama (as opposed to manmade components, barren scenery, monotony, and disharmony in the appearance).

There is little research on landscape visual quality in Central Chile in relation to Mediterranean landscapes. The few studies that do exist were carried out during the 1980s (Filp et al., 1983; Fuentes et al., 1984). Hoffmann and Hoffmann (1980) studied the perception of vegetation by the locals and tourists of mountainous areas in several localities in Central Chile. In general, people preferred landscapes with high-wooded vegetation; however, they had little perception either of the ecological roles of the vegetation or of the consequences of human activity on mountain ecosystems.

Also, in studies of landscape visual quality, cognitive aspects have an important role in the understanding of the environment. These research findings also have been relatively consistent across a wide range of forest types in North America and Europe. Purcell and Lamb (1998) conducted a study of the relationship between preference and naturalness. The results showed that preference varied significantly between the different types of vegetation formation. The density and extent of the view could be defined in terms of Kaplan and Kaplan's (1989) model of environmental preference.

According to cognitive theory, human beings have evolved by preferring landscapes characterized by a particular balance between order and uncertainty that are composed of four separate factors: *coherence*, *complexity*, *legibility* and *mystery*. These four elements are associated with the need of our species to rapidly access, understand and make sense of the environment to meet its basic needs. The particular element that helps this understanding in the immediate time frame is the coherence of the environment. When the observer is involved with the environment, for example during exploration, it is the complexity of the environment that aesthetically engages the individual. When the observer is engaged in a prolonged interaction with the environment, the experience is

linked to aesthetic satisfaction, if the environment is legible, and, in the case of exploration, if it generates mystery. People seem to like a mixture of complexity, mystery, coherence, and legibility. The importance of each factor in predicting preference varies according to landscape type and situations.

However, of all the variables, mystery is the one preference that can be applied to a particularly large variety of environments and situations (Kaplan and Kaplan, 1989). This might be more applicable to scenes of nature than for other kinds of scenes, especially where complexity and coherence is valued more greatly.

Stamps (2004) showed that the relationship between informational variables and preferences is not simple. He constructed a meta-analysis that covered 61 articles, 12,452 participants and 3125 photos. A key finding from this meta-analysis was that the results have been difficult to replicate. The correlations between coherence and preference, complexity, legibility, or mystery have been heterogeneous, and the range of results has been too wide to determine the degree and direction of the relationships.

Some of the problems have been in line with the original material, although not the meta-analysis (Stamps, 2004). This research suggests one possible way to reduce these errors in measurement and how they might be replaced in a way to measure informational concepts. Other alternative options might be to use photos with more visible functions to assist in understanding and exploration and in basic aspects of informational theory.

Thus, a new kind of research utilizing other landscape types with distinct features, such as in the case of the semi-arid Mediterranean, could in part contribute to improving results between visual quality and all four information variables.

The research reported here is a portion of an extensive survey. The goal of this research was to examine the attitudes, behaviour, perception and preferences of people towards the Andean foothills, east of Santiago, Chile, which are associated with Mediterranean semi-arid landscapes. The specific objectives addressed in this paper were to: (1) identify cognitive components of landscape preferences; (2) determine the influence of landscape types on visual quality; (3) determine the influence of vegetation density on visual quality; and (4) determine the influence of socio-demographic variables on visual quality.

## Materials and methods

### Study area

The study was conducted in a sector of the Andean foothills, east of Santiago, Chile, 12 km from the city centre (Fig. 1). This area represents a traditional Mediterranean semi-arid landscape in Central Chile, characterized by high, steep mountains with deep ravines. The piedmont is covered by sclerophyllous shrublands and espinales (*Acacia caven* savanna). Hillsides are covered by xerophytic forest (shrubs with succulent and thorny plants). Ravines are covered by a sclerophyllous scrub.

### Field survey and participants

Visitors to the Andean foothills, east of Santiago, were interviewed from five selected sites. These sites were chosen because they are often frequented by visitors and are distributed evenly in the study area (Fig. 2). At each site, 36 visitors, 18 years or older, were contacted randomly, and no more than one visitor per group was chosen in order to avoid duplication. Interviews were conducted on all seven days of the week between 11:00 and 18:00 in October and November of 2005. In total, 226 visitors were contacted. 180 visitors answered and completed a field questionnaire on site. Each visitor was individually given a short introduction to

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