

# *A Multi-national Study of the Perception of Visual Impacts*

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## INTRODUCTION

THE FIRST PRINCIPLE of the Rio Declaration on Environment and Development (United Nations Conference on Environment and Development (UNCED), 1992) proclaims, "Human beings ... are entitled to a healthy and productive life in harmony with nature". Principle 17 declares, "Environmental impact assessment, as a national instrument, shall be undertaken for proposed activities that are likely to have a significant adverse impact on the environment and are subject to a decision of a competent national authority". However, the Rio Summit's Agenda 21 (UNCED, 1993) gave scant recognition to landscape aesthetics and the role it plays in human well-being.

The world community's commitment to improving human well-being through wise ecosystem management continues to mature. In his report on the role of the United Nations in the twenty-first century, Kofi Annan (2000) announced the Millennium Ecosystem Assessment (MA). "The MA is an international assessment designed to meet the needs of decision-makers and the public for scientific information concerning the consequences of ecosystem change for human well-being and options for responding to those changes" (Alcamo *et al*, 2002, p 5). The framework for the assessment recognises three direct forms of ecosystem services that benefit people: provisioning, regulating and cultural. As a cultural benefit, aesthetics is explicitly recognised as an important service to which all people have a right. While recognised as important, the framework gives little hope that cultural services will or can receive the same sort of scientific treatment as other ecosystem services.

Cultural services are tightly bound to human values and behavior and thus perceptions of cultural service values are more likely to differ among individuals than, say, perceptions of the importance of food production (Alcamo *et al*, 2002, p 51).

Forty years of landscape perception research has demonstrated that it is indeed possible to assess this cultural service reliably, and that there is less difference among individuals than we are typically prepared to admit. However, little of this research has investigated whether the aesthetic values associated with ordinary landscapes and the impacts of development spans across diverse national cultures. It seems possible that evaluators from different cultures may react very differently to the same visual impacts. It also seems reasonable that belief in a pan-national value, such as environmentalism, may be closely associated with the perceived severity of visual impacts.

## KEY WORDS

*Cross-cultural comparison*

*Landscape perception*

*Visual impact assessment*

*New Environmental Paradigm*

*(NEP) scale*

In the mid-1980s a group of faculty from eight countries collected data to demonstrate that rating scales could effectively capture judgements of landscape aesthetics from respondents across diverse nations (Palmer *et al*, 1990). That research demonstrated the efficacy of visual simulations and the comparability of two approaches to measuring visual impacts. The research reported here builds on that study by adding respondents from four additional countries. In addition, it investigates a new research question: To what extent do nationality and environmental values influence judgements of visual environmental impacts?

## METHODS

Data collection for this study was a cooperative international effort coordinated by the author. Respondents were students recruited at colleges in Austria (A), France (F), Germany (G), Hong Kong (H), Italy (I), Japan (J), Korea (K), central New York (N), Puerto Rico (P), Spain (S), Utah (U) and Yugoslavia (Y). They evaluated the scenic value of 16 realistic colour simulations of visual impacts based on an assigned value of 100 for the pre-impact condition. The magnitude of the impact was the difference between this scenic rating and 100. Each student also completed the New Environmental Paradigm (NEP) scale, a widely used measure of environmental values (Dunlap and Van Liere, 1978). The NEP scores were used to divide the respondents into three similarly sized groups, representing high, medium and low environmentalism.

The 16 paired simulations were obtained from visual simulation professionals. They represented dry scrub, grassland, temperate forest and urban environments. Impacts included power facilities, utility lines, mining and vegetation management. A six-colour web press was used to print four pairs, or eight simulations to a page; each image is approximately 5.5 x 8.3 centimetres.

## RESULTS

A total of 674 respondents from 12 countries responded to the survey. Figure 1 shows the mean visual impact rating for three levels of environmentalism within each country. An investigation of this figure shows that there are clear differences in the mean ratings among the respondents from these countries. In addition, there appears to be a general pattern that respondents with a lower NEP score tend to perceive less visual impact, while those with higher NEP scores appear to perceive greater visual impacts.

The statistical significance of these patterns can be tested by analysis of variance (ANOVA). The model used considers the differences among the 12 countries, as well as the differences among the respondents within each country. In addition, it considers the effect of environmentalism (that is, three NEP-levels) on perceived visual impacts, and the interactive effect between country and environmentalism. The results indicate that all four factors are statistically very significant, and collectively account for approximately 39 percent of the variation in perceived visual impacts.

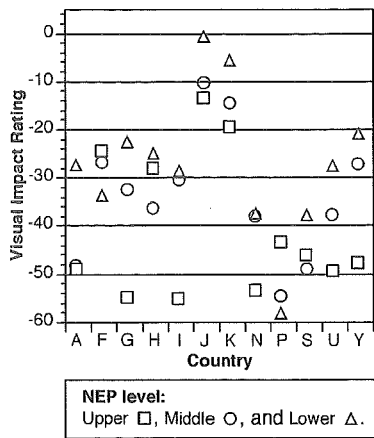


Figure 1: Mean visual impact ratings of respondents with high, middle and low NEP scores from 12 countries.

First, the differences among respondents within each country are significant ( $F = 7.41, p = .0001$ ). This is a statistical affirmation that, even within a cohesive group, there can be differences among individuals. There is also a pattern of significant differences among the countries ( $F = 2.50, p = .0044$ ). A statistical test (Turkey's Least Significant Difference) can be used to determine which countries have similar mean impact values and which differ. The first group includes those countries with highest impact ratings: Puerto Rico, Germany, Austria, New York, Spain and Italy. The next group is slightly less critical of these visual impacts: Italy, Yugoslavia, Utah, France, and Hong Kong. Italy is a member of both groups, and joins New York, Spain and Yugoslavia as transition sub-group. Korea and Japan form a third group that is distinctly less critical of these visual impacts.

Respondents within each of the three levels of environmentalism also have significantly different mean evaluations of visual impact ( $F = 8.57, p = .0002$ ). Those who scored higher on the NEP scale also gave higher visual impact ratings (mean = -30.4), while those with the lower NEP scores gave lower visual impact ratings (mean = -23.0). The middle third of the respondents also gave intermediate visual impact ratings (-30.4). As seen in Figure 1, this relationship holds true for Germany, Japan, Korea, Utah and Yugoslavia. In several countries, the mid-level environmentalists gave visual impact ratings similar to the more environmental group (Austria and Spain) or the less environmental group (Italy and New York). Hong Kong is an anomaly where the most and least environmentally sensitive gave less severe visual impact ratings than the mid-level environmentalists. Finally, the general pattern is reversed in France and Puerto Rico, where the more environmentally sensitive were less sensitive to the visual impacts. It is this mix of patterns that makes the interaction between country and environmentalism significant ( $F = 11.27, p = .0001$ ).

## CONCLUSIONS AND DISCUSSION

This study demonstrates that it is possible to measure perceptions of visual impacts in a way that can be incorporated into environmental impact assessments. However, it appears that there may be significant differences among national cultures about the severity of visual impacts and these differences may affect the way such tools are used. The results also acknowledge that there are significant differences among individuals within each national group. Rather than demonstrating the futility of trying to summarise human perceptions, this reinforces the need to develop reliable results by recording the evaluations of many people instead of just a few (Palmer and Hoffman, 2001). Finally, the analysis indicates that there is a general relationship between environmentalism and the perception of visual impacts. However, this relationship is not uniform across countries and warrants further investigation.

It is time to renew investigations of the link between visual landscape perceptions and our sense of well-being. This study demonstrates that there are differences among national cultures, but it does not shed light on the root causes of these differences. Is it due to the sample of landscapes used in the study (for example, the landscape

may have seemed most alien to the Japanese and Koreans who also were less sensitive to the impacts)? Do different national cultures have different landscape ideals against which they make their judgements? Perhaps it is time that we focused on characterising the landscape images shared by a national culture or sub-culture. Similarly, this study demonstrates a relationship between environmentalism and the sensitivity to visual impact. Are there other pan-national movements or values that influence our sensitivity to visual and other environmental impacts? Further, much needs to be understood about how this relationship is moderated by national culture.

#### ACKNOWLEDGEMENTS

This project was partially supported by a grant from Nature Experience Research Group in the United Kingdom. Simulations were provided by EDAW Incorporated of San Francisco, California, Environmental Planning and Design Associates of Portland, Maine and Stephen RJ Sheppard. Many faculty contributed to the data-collection phase, including: Andreas Muhar (Austria), Koh Dong-hee (Korea), Jacques Gury (France), Christian Krause and Erich Buhmann (Germany), Ken Wong (Hong Kong), Gilberto Oneto (Italy), Ryuzo Ohno (Japan), James Palmer and Richard Smardon (New York), Yezmin Hernandez (Puerto Rico), Santiago Alonso (Spain), John Ellsworth (Utah), and Andrej Pogacnik (Yugoslavia). Angel Rios served as the graduate research assistant for this project.

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