

# The Influence of Planned-Change Context on the Evaluation of Natural Landscapes<sup>1</sup>

A.E. van den Berg & C.A.J. Vlek

## Abstract

The influence of planned-change context on evaluations of natural landscapes was examined in an experimental setting. Five landscape photographs, depicting one agrarian landscape and four natural landscapes with varying degrees of human influence, were either presented as 'five existing Dutch landscapes', or as 'one existing landscape and four plans for nature development from this landscape'. Respondents were asked to evaluate the landscapes from one of three perspectives that matched their own background and interests, i.e. the perspective of a rural resident, the perspective of a cyclist, or a neutral perspective. As predicted, planned-change context negatively affected the perceived beauty of natural landscapes, particularly if landscapes were judged from a user perspective, and if natural landscapes had a low degree of human influence. Planned-change context did not affect relative preferences for natural landscapes in pairwise comparisons with the agrarian landscape. It is concluded that at least part of the beauty perceived in natural landscapes is derived from the knowledge that people bring into their aesthetic judgments.

The prediction of the scenic consequences of alternative management plans is an important element in every land-use planning procedure (Daniel and Schroeder, 1979). Preferably, predictions of scenic consequences should be based on scenic-beauty judgments of those who are most affected by the planned changes: residents, visitors and other local interest groups. Unfortunately, judgments of these groups often appear to be biased by contextual influences. Studies in the field of landscape aesthetics have shown that residents and visitors frequently reject planned changes in favor of the existing landscape (cf. Sell and Zube, 1986; Staats and Van de Wardt, 1990; Willis and Garrod, 1992). Although there is no conclusive evidence that rejections of planned changes by local interest groups are context-induced, it seems likely that evaluations of planned changes at least partly reflect a resistance to change in general instead of a resistance to the specific contents of the planned change.

In the present study, effects of experimentally manipulated planned-change context were studied with regard to the evaluation of nature development plans. The latter were thought to be relevant because, in The Netherlands, nature development is becoming an increasingly important instrument in policy strategies aimed at protecting and enhancing biodiversity (cf. Ministry of Agriculture, Nature Management, and Fisheries, 1996). The first objective was to examine *whether* planned-change context may exert an independent influence on evaluations of natural landscapes. A second objective was to investigate *how* planned-change context, provided it exerts an effect, affects evaluations of natural landscapes.

## Contextual Influences on Landscape Evaluations

Research on environmental aesthetics has shown that landscape evaluations may be affected by various contextual influences. For example, in an early study, Simpson et al. (1976) demonstrated that managed forest areas were evaluated more favorably when the presentation of these landscapes was preceded by a persuasive message citing the ecological benefits from forest-management techniques. In a similar vein, Hodgson and Thayer (1980) demonstrated that natural landscapes were evaluated less favorably when they were presented with labels implying human influence. Other studies have shown that landscape evaluations may also be

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<sup>1</sup> This chapter is based on Van den Berg & Vlek (1998).

influenced by less conspicuous contextual variables, such as the attractiveness of the landscapes that are presented alongside with the target landscape, and specific aspects of the judgmental task, including instructional sets, item order and response scale formats (Brown and Daniel, 1987; Eiser et al., 1993).

In short, the available evidence indicates that landscape evaluations are sensitive to many, sometimes very subtle, contextual variations. Considering that change is a significant factor in the experience of both urban and rural areas (Sell and Zube, 1986), it seems reasonable to expect that landscape evaluations will be influenced by this factor. Despite the relevance of the change context for environmental perception and evaluation, few studies have explicitly focused on the influence of planned-change context on landscape evaluations. Moreover, previous studies have typically suffered from methodological confounds between contextual variables and other relevant variables such as familiarity or expertise. For instance, one interesting study by Staats and Van de Wardt (1990) examined the effects of increasing the scale of a small-scale landscape on the evaluation of that landscape. Three groups of respondents participated in this study: (a) residents of a small town near the study area, (b) visitors staying on a camp site close to the area, and (c) students from a distant town who were unfamiliar with the area. Unlike the residents and the visitors, the students were not informed about the fact that the large-scale landscapes depicted possible future alternatives for the existing, small-scale landscape. The results of this study showed that the residents and visitors gave higher beauty ratings to the small-scale landscape, and lower beauty ratings to the large-scale landscapes than the students. Unfortunately, because the students were also less familiar with the area than the residents and visitors, it is difficult to determine whether the differences in beauty ratings between the groups were determined by differences in the respondents' knowledge about the planned-change status of the large-scale landscapes, or by differences in respondents' familiarity with the area.

#### **Resistance to Change: A Perceived-Risk Perspective**

With regard to the question of how the context of planned change might affect landscape evaluation, common sense holds that people are generally averse to planned change, as is implicit in the popular notion of 'resistance to change' (see Wolsink, 1994, for an analysis of the assumptions underlying lay theories on resistance to planned change; see also Van den Berg, 1995b). Empirical investigations, such as the study by Staats and Van de Wardt (1990) mentioned earlier, have tended to corroborate this view. Several authors have tried to explain people's supposed resistance to change by pointing out that change implies risk (e.g. Schwarz, Wänke, & Bless, 1994; Willis and Garrod, 1992). Research on risky decision making has demonstrated that people are generally risk averse (see Yates, 1992, for an overview). Importantly, risk aversion is a function of people's reference point at the time of choice (Kahneman and Tversky, 1979). Risk aversion is strongest when the status quo is viewed as a gain situation. In gain situations, people tend to perceive risky options as threats to the status quo (Highhouse and Yüce, 1996; Lopes, 1986). Applied to landscape evaluations, planned-change context may transform a landscape into a risky alternative to the status quo, leading to less favorable evaluations of the landscape. This effect may be particularly strong for plans in rural areas, since rural areas are typically associated with important values such as agricultural productivity and a stable and traditional way of life (cf. Sell and Zube, 1986; Strumse, 1996).

The foregoing implies that the context of planned change may lead to more negative evaluations of landscapes that represent planned-changes because it turns these landscapes into a threat to the status quo. This analysis suggests that resistance to planned change may be intensified by factors that increase the perceived threat of planned changes. Clearly, planned changes may be perceived as more threatening if people are personally affected by the consequences of the planned changes. Thus, people who are personally involved with the status quo landscape, for example because they live in it, or because they use it for recreational activities, can be expected to react more negatively to planned changes than people who are not personally involved with the status quo.

Another important determinant of perceived threat may be the degree of similarity between the status quo and the planned change. More specifically, plans that are more dissimilar to the status quo may present a

greater threat to the status quo than plans that involve only a minor change (cf. Willis and Garrod, 1992). Therefore, factors that determine similarity may influence perceived threat. Research on landscape evaluation has shown that the distinction between the natural and the human-influenced is the most important underlying dimension of judgments of landscape similarity (e.g., Ullrich and Ullrich 1976; Ward and Russell, 1981; Wohlwill, 1983; for a review see Hartig and Evans, 1993). Experts on nature development have also used degree of human influence as a criterion for distinguishing different types of natural landscapes. For example, according to the Dutch handbook of target nature types, natural landscapes may be classified into four broad categories ranging from approximately natural landscapes with a very low degree of human influence to more human-influenced natural landscapes that require regular maintenance (Bal et al., 1996). Because of its influence on perceived landscape similarity, degree of human influence may moderate negative effects of planned-change context. For example, if an existing landscape is highly cultivated - which is typically the case in most nature development locations - plans to change this landscape into a wild, unmanaged natural area are likely to be judged more negatively than plans to change this landscape into a more managed natural area, because the latter are perceived to be more similar to the existing landscape, and hence, less threatening.

### **The Present Research and Hypotheses**

In the present study, five landscape photographs, depicting one agrarian landscape and four natural landscapes with varying degrees of human influence, were either presented as 'five existing Dutch landscapes', or as 'one existing landscape and four plans for nature development from this landscape'. Respondents were asked to evaluate the landscapes from a perspective that matched their own background and interests, i.e., the user perspective of a rural resident or a cyclist, or the neutral perspective of a nonuser. In line with the present argument, it was first predicted that planned-change context would affect evaluations of natural landscapes in a negative way. Second, it was predicted that negative effects of planned-change context would be stronger if landscapes were judged from a user perspective than if landscapes were judged from a neutral perspective. Finally, negative effects of planned-change context were predicted to be stronger for unmanaged natural landscapes with a low degree of human influence than for managed natural landscapes with a relatively high degree of human influence.

## **Method**

### **Respondents**

A total of 120 respondents from three different user backgrounds participated in the experiment: 40 rural residents (26 males and 14 females; mean age 48 years), 40 recreational cyclists (22 males and 18 females; mean age 33 years), and 40 'nonusers' (24 males and 16 females, mean age 32 years). The group of rural residents consisted of members of a Rotary Club and their wives who all lived in small villages in the region where the photo of the agrarian landscape was taken (Northern Groningen). Recreational cyclists and nonusers were staff members and other personnel of the University of Groningen, recruited via e-mail messages on the computer network. All cyclists possessed a sports bike, and they regularly cycled in various parts of Northern Groningen. The nonusers did not possess a sports bike, and did not engage in outdoor recreational activities on a regular basis. All respondents participated voluntarily and received the Dutch equivalent of about \$US8 for participation.

### **Stimuli**

The stimulus set consisted of five photographs; one agrarian landscape, and four computer-made photographic simulations of natural landscapes (Figures 1A-E). The photographic simulations were designed in such a way that they could be realistically presented either as four existing landscapes, or as four plans for nature development from the agrarian landscape. The agrarian landscape depicted a flat, cultivated and open grassland area, typical for the region of Northern-Groningen with which the rural residents and cyclists were familiar. The

simulations included two unmanaged natural landscapes with a low degree of human influence (a swamp and a rough field) and two managed natural landscapes with a relatively high degree of human influence (a riverside landscape and a small lake). In designing the simulations, special care was taken that the natural landscapes would not systematically differ with regard to other typical characteristics of the agrarian landscape, i.e., openness and flatness.



Fig. 1. (A) Photo of an agrarian landscape, presented as an existing landscape in the change condition, (B) computer simulation of a swamp, (C) computer simulation of a riverside landscape, (D) computer simulation of a small lake, and (E) computer simulation of a rough field.

All photographs were presented in a fixed order at a size of approximately 20 x 10 cm on a color computer screen.

### Design

In each user group, respondents were equally and randomly assigned to one of two conditions. In the no-change condition, the landscapes were introduced as 'five different Dutch landscapes'. In this condition, the landscapes were indicated by letters A to E. In the change condition, the landscapes were introduced as 'one existing landscape somewhere in the Netherlands and four plans for nature development from this landscape'. In this condition, the agrarian landscape was labeled as the 'existing landscape', while the natural landscapes were labeled as 'plans' (plus index letter). In each condition, the experimental instructions encouraged the rural

residents and cyclists to judge the landscapes from their own user-perspective.

In order to avoid a confound with familiarity, respondents were not told where the photograph of the existing agrarian landscape was taken. After completing the ratings of this landscape, however, they were asked in which of the twelve Dutch provinces they thought the photograph was taken. Analyses of these data revealed no differences between the two conditions as regards the number of respondents that gave the correct answer. Sixty percent of the respondents in the no-change condition, and sixty-one percent of the respondents in the change condition recognized the agrarian landscape as a landscape from the province of Groningen.

### Experimental Task and Dependent Variables

All instructions and questions, as well as the photographs, were presented using an Authorware program for Apple MacIntosh computers. Each respondent was individually seated behind a computer. The experimental task consisted of three parts. In order to ensure that there would be no difference between the conditions with regard to the amount of attention paid to the landscapes, respondents were first asked to closely examine each landscape and describe it in their own words. Next, respondents were asked to indicate their preferences by means of ten paired comparisons between all five landscapes. The landscape pairs were presented in a fixed order, with the four pairs containing the agrarian landscape presented first. Following the paired comparisons, respondents were asked to rate each landscape on several characteristics, including perceived beauty, degree of human influence, openness and flatness. Perceived beauty was measured on a 7-point scale ranging from 'not at all beautiful' to 'very beautiful'. Perceived degree of human influence was assessed by asking respondents to indicate, on a 5-point scale, how 'well-cared-for' the landscapes were. Perceived openness and flatness were also measured on 5-point scales. The last part of the experiment consisted of questions about demographic characteristics and manipulation checks. Inspection of the answers to these manipulation checks revealed that one cyclist assigned to the change condition had found it 'extremely difficult' to understand the experimental instructions. The data from this respondent were removed from the sample.

**Table 1**

*Mean Ratings (1-5) of the Five Landscapes on Degree of Human influence, Openness and Flatness, Standard deviations in Parentheses.*

Characteristic	Landscape				
	A	B	C	D	E
Human Influence	3.69 <sup>a</sup> (.70)	2.83 <sup>b</sup> (.87)	3.37 <sup>c</sup> (.79)	3.18 <sup>c</sup> (.76)	2.75 <sup>b</sup> (.89)
Openness	4.51 <sup>a</sup> (.58)	2.68 <sup>b</sup> (.71)	3.53 <sup>c</sup> (.66)	2.56 <sup>b</sup> (.79)	3.40 <sup>c</sup> (.72)
Flatness	4.65 <sup>a</sup> (.53)	3.92 <sup>b</sup> (.58)	2.33 <sup>c</sup> (.57)	3.56 <sup>d</sup> (.65)	2.66 <sup>c</sup> (.85)

Note. See Figures 1A-1E for depictions of the landscapes. Means with unequal superscripts differ per row at  $p < .01$ .

## Results

### Preliminary Analysis of Landscape Ratings

As can be seen in Table 1, ratings of the agrarian landscape (landscape A) confirm the description of this landscape as an open and flat landscape with a high degree of human influence. In addition, the finding that the swamp (landscape B) and the rough field (landscape E) were judged less human-influenced than the riverside landscape (landscape C) and the small lake (landscape D) supports the a-priori distinction of the natural landscapes into two unmanaged natural landscapes with a relatively low degree of human influence, and two managed natural landscapes with a relatively high degree of human influence. The swamp and the rough field did not differ systematically from the riverside landscape and the small lake with respect to the other two typical

characteristics of the agrarian landscape, i.e., openness and flatness.

### Perceived Landscape Beauty

On average, the four natural landscapes were judged significantly less beautiful when they were presented as planned changes ( $m = 5.20$ ) than when they were presented as existing landscapes ( $m = 5.47$ ),  $F(1,117) = 4.0, p < .05$ . To investigate the influences of landscape type and user perspective, respondents' beauty ratings for the four natural landscapes were subjected to a 2 (Context: Change versus No-Change) x 2 (Landscape Type: Managed versus Unmanaged) x 2 (Perspective: User versus Nonuser) MANOVA with repeated measures on the last factor. This analysis revealed that the effect of the change manipulation on perceived landscape beauty was qualified by a significant interaction with degree of human influence,  $F(1,115) = 3.14, p < .05$ , and by a marginally significant interaction with user perspective,  $F(1,115) = 3.33, p = .07$ . As can be seen in Table 2, the change manipulation only had a negative effect on perceived landscape beauty if landscapes were judged from the user perspective of a rural resident or a cyclist, and if natural landscapes had a low degree of human influence. Univariately, the change manipulation had significant negative effects on the cyclists' and rural residents' beauty ratings of both the swamp and the rough field, all  $ps < .05$ . No significant effects of the change manipulation on perceived beauty were predicted or found for the agrarian landscape, all  $ps > .43$ .

**Table 2**

*Perceived Beauty (Scale Range 1 - 7) of Managed and Unmanaged Natural Landscapes as a Function of Change Condition and User Perspectives, Standard Deviations in Parentheses*

	Managed Landscapes			Unmanaged Landscapes		
	Nonuser	Cyclist	Resident	Nonuser	Cyclist	Resident
No	5.50	5.73	5.73	5.08	5.23 <sup>a</sup>	5.58 <sup>a</sup>
Change	(.95)	(.66)	(.60)	(.99)	(.85)	(.69)
Change	5.70	5.50	5.75	5.03	4.47 <sup>b</sup>	4.73 <sup>b</sup>
	(.99)	(1.08)	(.80)	(1.16)	(1.05)	(1.33)

Note. Means with unequal superscripts differ per column at  $p < .01$ .

### Paired Comparisons

Relative preferences for the natural landscapes as compared to the agrarian landscape were not affected by the change manipulation, all  $ps > .21$ . For example, rural residents chose the agrarian landscape an average number of 1.2 times out of two comparisons with the swamp and the rough field in the no-change condition, against 1.3 times in the change condition. Thus, although the change manipulation reduced the beauty of natural landscapes with a low degree of cultivation, it did not lead to a rejection of these landscapes in favor of the existing, agrarian, landscape. Outcomes of paired preference did differ, however, as a function of judgmental perspective. On average, nonusers chose the agrarian landscape an average number of 1.0 times out of four paired comparisons with the natural landscapes, against 1.5 times for the cyclists and 2.0 times for the rural residents,  $F(2,113) = 5.58, p < .01$ .

### Discussion

The present research examined the influence of experimentally manipulated planned-change context on evaluations of natural landscapes. As predicted, planned-change context affected the perceived beauty of natural landscapes negatively, but only if two conditions were met. First, planned-change context only led to lower beauty ratings when planned changes were evaluated from a user perspective. As users are presumably more involved with the existing landscape, this finding suggests that resistance to change may occur only if people have a certain minimum level of involvement with the status quo. Second, planned-change context only led to

lower beauty ratings when planned changes involved the development of unmanaged natural landscapes with a low a degree of human influence. As the status quo landscape had a high degree of human influence, this finding suggests that resistance to change may occur only if planned changes represent a significant divergence from the status quo.

The negative effects of planned-change context on beauty ratings are consistent with an explanation of evaluations of planned changes in terms of risk perceptions (cf. Lopes, 1986). According to this explanation, planned changes are judged less beautiful because they are perceived as threatening alternatives to the status quo. Because the present research did not include measures of risk perceptions, a direct test of the risk perception explanation was not possible. However, the risk-perception explanation does offer a parsimonious account for the present findings. First, planned changes should be evaluated more negatively by those who are involved with the status quo, as these people are more threatened by the introduction of planned changes. Consistent with this prediction, only beauty ratings of respondents who judged the landscapes from a user perspective were affected by the change manipulation. Furthermore, planned changes should be evaluated more negatively if they imply a major change to the status quo. In line with this prediction, it was found that only the beauty ratings of unmanaged natural landscapes were negatively affected by planned-change context. This finding may be explained by the fact that unmanaged natural landscapes implied a greater threat to the cultivated existing landscape than more managed natural landscapes because the former involved a shift from the status quo to a different category of environmental perception and evaluation. Although the latter interpretation remains rather speculative, it is difficult to attribute these findings to other landscape characteristics, as it was found that the two natural landscapes that were affected by the change manipulation did not differ systematically from the other two natural landscapes with regard to other typical characteristics of the agrarian landscape, such as openness and flatness.

Although the present pattern of results is consistent with a risk-perception explanation, other aspects of planned changes may have contributed to the negative impact of planned-change context as well. First, several authors have pointed out that planned changes may invoke negative reactions because they interfere with people's desire for personal control over their environment (e.g., Sell and Zube, 1986; Winkel, 1981). Planned landscape changes are usually imposed by local authorities or other external agencies, and in many instances, individuals have little control over these changes. Generally, people find it very unpleasant when they have been deprived of control over their environment (e.g., Seligman, 1975; Vlek and Stallen, 1981). Thus, plans for nature development may invoke negative responses because such plans are at odds with people's desire to exert personal control over their environment. Although perceived uncontrollability may have played a role in negative effects of planned-change context found in the present study, it is difficult to explain the entire pattern of results in terms of perceived uncontrollability. In particular, the finding that only natural landscapes with a high degree of human influence were affected by the change context is difficult to explain in terms of perceived controllability. By systematically manipulating the perceived controllability of planned changes, future research may provide a better understanding of the role of perceived controllability in evaluations of planned changes.

Another aspect of planned changes that may have contributed to negative effects on perceived landscape beauty is the fact that labeling a landscape as a 'nature development plan' implies that the landscape did not evolve by itself, but was artificially developed by humans. It is well-known that implied human influence may negatively influence the perceived beauty of natural landscapes (Hodgson and Thayer, 1980). However, implied human influence cannot explain why beauty ratings of nonusers were not affected by planned-change context. Future research may provide more insight into the role of implied human influence in evaluations of planned changes by incorporating measures of respondents' perceptions of the naturalness of natural landscapes.

In the present research, there were strong indications that landscape preferences were influenced by pre-existing individual differences between user groups. This finding is consistent with previous findings documenting the importance of user-group differences in landscape preferences (Daniel & Boster, 1976; Kaplan & Herbert, 1987; Orland, 1988; see also Chapter 2, 4, and 5). Although a complete discussion of the user-group

differences found in the present study is beyond the scope of this article, the finding that rural residents displayed relatively high preferences for the agrarian landscape deserves some comment. Given their rural place of residence, rural residents were probably highly familiar with agrarian landscapes. Consequently, their high preference for the agrarian landscape may have reflected a positive effect of familiarity on landscape evaluations (cf. Dearden, 1984). However, because, in the present study, place of residence was confounded with other factors, such as experimental instructions and membership of a Rotary Club, explanations in terms of variables other than familiarity cannot be completely ruled out.

From a practical perspective, the present findings provide some empirical evidence for the popular belief that evaluations of planned changes may be partly context-induced. At the same time, however, the present findings show that planned-change context, in and of itself, did not cause a rejection of planned changes in favor of the status quo. The finding that planned-change context did not affect relative preferences for natural landscapes as compared to the agrarian landscape may have several causes. First, it is possible that the experimental manipulation was not strong enough to reverse pre-existing individual landscape preferences. In general, the level of threat experienced within the confines of a laboratory situation is probably well below the level of threat people experience when they are confronted with actual planned changes in their everyday living or recreational environment. Second, the task of comparing the landscapes in pairs may have been more difficult than the task of rating the landscapes on perceived beauty ratings. Beauty ratings involved the evaluation of landscapes on one single dimension, i.e., visual attractiveness, while the criteria for making paired comparisons were less well-defined. While making the paired comparisons, respondents may have focused on other aspects, such as fitness for use and economic or ecological values, besides visual attractiveness. There exists some evidence that people are more likely to correct for possible contextual influences when the evaluative task is complex than when the evaluative task is easy (Martin, Seta, & Crelia, 1990; see also Tesser & Martin, 1996). Thus, while making paired comparisons, respondents may have corrected for possible biasing influences of planned-change context.

The present findings represent an encouraging first step towards a better understanding of the role of context in the evaluation of planned changes. To further investigate the importance of contextual factors in the occurrence of 'resistance to change', laboratory research such as the present study should be combined with field experimentation. For example, by comparing evaluations of planned landscape changes of respondents living in a plan area with evaluations of the same planned changes of a comparable group of respondents living outside the plan area, one might obtain more insight into the impact of planned-change context in actual plan situations. This insight could be used to determine the external validity of effects of experimentally manipulated planned-change context. However, although field experiments hold the promise of stronger effects and greater realism, they present more difficulties in isolating specific contextual influences from influences of other variables. Therefore, the joint development of laboratory and field work may provide the best basis for the reliable, valid and useful measurement of public evaluations of planned landscape changes. In turn, the reliable measurement of public evaluations is an essential requirement for a fair weighing of scenic values against other important values, such as economic and ecological values.

Some time ago, Hodgson and Thayer (1980) concluded that human responses to landscapes cannot be predicted from landscape characteristics alone. At least some of the beauty perceived in landscapes derives from what the viewer 'knows' about these landscapes. The present research found evidence that one particular kind of knowledge about landscapes, namely knowledge about the planned-change status of landscapes, has a systematic and reliable influence on perceived landscape beauty. In demonstrating this, these results contribute to the understanding of people's reactions to environmental changes. Stated more broadly, the present research shows that the scientific study of landscape evaluation has much to gain from a consideration of the different kinds of knowledge about landscapes that people bring into their judgments.

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