

Environmental preference and design:
Psychological perspectives

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Themes for this lecture:

- Present a framework for decision making and for the use of visual preference data in planning and design: Kaplan and Kaplan’s Reasonable Person model
- Introduce a multidisciplinary model for environmental aesthetics
- Give some background and findings from the field of environmental aesthetics in a psychological perspective

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“Economic Man”/“Rational Man”
model

- Assumptions:
- Individuals possess always perfect knowledge
- Individuals act always to maximise their gain
- Problem: these assumptions about human nature are incorrect (Earl, 1983; Einhorn & Hogarth, 1985; Hernstein & Mazur, 1987)

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Reasonable Person Model (Kaplan & Kaplan, 1989)

- A psychologically more appropriate framework than the widely adopted Rational Man position
- A conceptual framework:
 - For environmental decision making in general
 - For the proper use of visual preference data in landscape planning and design

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4

Being “reasonable”

- Being constructive
- Being co-operative
- Being respectful of one another’s rights
- Etc...
- Not being rational in terms of maximising one’s gain of one single value does not mean that people are irrational !

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5

The three principles of the Reasonable Person Model

- People can be reasonable, depending upon the circumstances that surround them:
 - Reasonableness is not a trait, but the outcome of an interaction between person and situation
- People actively seek to understand their world, but often possess extremely limited information
- People’s needs are many and varied, and thus not reducible to any *single* unitary value:
 - we are not maximisers but “satisficers”

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6

Guidelines for obtaining public input according to the Reasonable Person Model

- Presented information and reactions called for must be compatible with human inclinations and capabilities.
- Needed information must be provided in such a *format* that people can achieve understanding effectively (visual information is well-suited)
- The procedure should *permit the expression of multiple needs*, and not concentrate all needs into one unitary value

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7

Classical aesthetics

- From Greek:
 - *aisthanesthai* 'to perceive'
 - *aistheta*, 'things perceptible'
- 'Knowledge from the senses' *i.e.* 'the study of perception'
- One the normative disciplines:
 - Ethics: goodness
 - Logic: truth
 - Aesthetics: beauty

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8

Modern aesthetics

- The philosopher Gottlieb Baumgarten (1714-62): aesthetics as 'the theory of the liberal arts ... the science of sensory cognition'
- Negative connotations associated with Oscar Wilde resulted in a narrow interest in art alone
 - Mid-twentieth century: not theory of beauty, only the theory of art.

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9

Problems of the philosophy of aesthetics

- Rigorous modern aesthetics cannot handle objects which have no author
- The aesthetic properties of nature are in large part ignored by present-day aesthetic theories

Experimental aesthetics

- Substantial agreement among subjects on aesthetical judgements
 - *de gustibus non est disputandum*: NOT confirmed by research

The twentieth century: A lack of interest in the underlying laws or principles of aesthetics

- Some reasons:
 - The failure of earlier attempts to discover aesthetic laws
 - The insistence that 'beauty' is an entirely subjective experience (*de gustibus...*)
 - The growing precision of scientific method which has led to an increasing isolation of the arts
 - The growth of the financial nexus in the fine art world
 - A general late twentieth-century desire to be free of restrictive doctrines

Some aesthetic concepts

- *Preference*
- *Discrimination, making judgements*
- *Sensory aesthetics*
 - Plesasurableness of sensations: sounds, colours, textures, and smells
- *Formal aesthetics*
 - The shapes, rhythms, complexities and sequences of the visual world
- *Symbolic aesthetics*
 - meanings of environments

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13

Some important concepts

■ **Nature**

- (from Latin *natura*: "that which is born")
 - common use: that part of reality which has not been influenced by human beings
 - "natural environment"
 - nature experience vs natural environment experience

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14

Landscape

- Classical use: ..."the totality of physiographic and cultural (man-made) phenomena which *meet the eye in a single view - a selected, framed section of the surroundings.*
 - *cultural landscape*
 - *agrarian landscape*
 - *natural landscape*

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15

"Environment"

- The aggregate of surrounding things, conditions, or influences
- Here: The *physical* environment

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16

Perception

- The experience of the world through the senses

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17

Porteous' Environmental Aesthetics

- Further the development of a new interdiscipline - Environmental Aesthetics
- Overview of a wide array of very disparate literatures
- A typological framework:
 - clusters relevant disciplines
 - emphasises linkages between them
 - relates work in the humanities and sciences to public activities and professional planning

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18

Porteous' Environmental Aesthetics

- Resulting from a combination of extensive personal reading and intuition.
- Takes into account the publicly stated goals of modern scientists:
 - rigour: scientific theory-building and testing
 - relevance: (here:) usefulness for the solving of current environmental problems

Porteous' model: Based on the attitudes and goals of scientists, professionals and the public

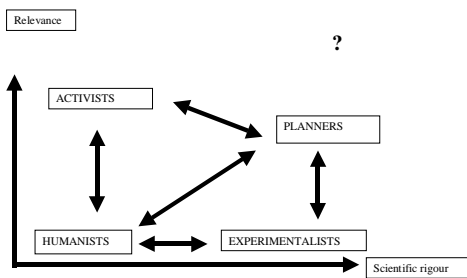
- Mitroff and Kilmann's (1978) fourfold typology of scientists:
 - Analytical Scientist (Sensing and Thinking)
 - currently dominating
 - Conceptual Theorist (Intuition and Thinking)
 - Conceptual Humanist (Intuition and Feeling)
 - Particular Humanist (Sensing and Feeling)

Four paradigms of Environmental Aesthetics

- Humanists:
 - Low immediate relevance and low scientific rigour
- Environmental activists:
 - Extremely high relevance
- Experimentalist social scientists:
 - Extreme rigour
- Planners:
 - moderate relevance and rigour

The four approaches are complimentary:

- Humanist: generates basic concepts
- Experimentalists: tests and refines concepts
- Activists: uses concepts to further specific causes
- Planners: evaluates inputs from the three above before undertaking action in the public domain.



Figur 1. Porteous' (1996) multidisciplinary model for four approaches to environmental aesthetics

Features of the typological framework

- Postulates necessary and essential interconnections among the four paradigms
- Normative overtones: calls for strong connections between academics (humanists and experimentalists), professionals (planners) and the public (activists)
- Emphasises the political aspects of environmental aesthetics (the activists)

A cognitive model: Kaplan & Kaplan's (1989) *preference model*

- Analyses of the *content* of scenes:
 - landscapes can usefully be categorised according to the balance between nature and human influence in them
- Spatial configurations:
 - degree of openness and spatial definition
- Two domains of crucial importance to information-processing:
 - *understanding/exploration*
 - *degree of inference*

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The Preference Model (Kaplan & Kaplan, 1989)

| | <i>Understanding</i> | <i>Exploration</i> |
|--|----------------------|--------------------|
| <ul style="list-style-type: none"> ■ <i>Direct</i> (two dimensions) | Coherence | Complexity |
| <ul style="list-style-type: none"> ■ <i>Inferred</i> (three dimensions) | Legibility | Mystery |

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Informational variables predicting landscape preference (adapted from Kaplan & Kaplan, 1989; Herzog, 1992)

- **Coherence:** How well the landscape in the photograph 'hangs together', how orderly it is.
- **Legibility:** How easy it would be to find your way in the landscape, to find out where you are at any given moment, or to find the way back to a certain point in the setting.
- **Complexity:** How heterogeneous or intricate the landscape in the photograph is, how many different elements there are, how much there is 'going on' in the photograph, how much there is to look at.
- **Mystery:** A 'promise' of learning more if one could 'enter into' the landscape.

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Perception - based variables predicting preference

- **Openness:** Amount of space perceivable by observing then photograph
- **Smoothness:** Uniformity and shortness of the surface/ground texture
- **Ease of Locomotion:** How easily one can move about without undue effort

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28

Assumptions associated with the Preference Model

- Cognition can involve categorisation and inference *without* conscious thought and metaphoric responses as a result of a schema
- Preference as a largely unconscious and automatic process

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29

Ulrich's psychoevolutionary model (Ulrich, 1983; Ulrich *et al.*, 1991)

- Affective responses as directly elicited by environmental features
- Use of physiological indices of arousal

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Nasar (1994): combining the preference model with concepts from urban design aesthetics

- Formal aesthetics: the *structure* of forms for their own sake
- Symbolic aesthetics: relating to the *content* of forms
-

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31

Criticism

- Saegert & Winkel (1990):
 - the *adaptation paradigm* leaves inexplicit the *transactional nature* of the processes and variables they employ
 - The person is only seen as a biological and psychological individual, not as a social agent

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32

Landscape perception studies: Two purposes

- *Description* of individuals' actual perception of the landscapes in question, as opposed to constructing norms for how they should be perceived.
- *Explaining* the observed patterns of preference in terms of a variety of predictors, such as environmental attributes, demography, environmental attitudes and values, specific experiences with types of landscapes and so on.

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33

Predictors of landscape preference

- Preference-derived Perceptual categories
 - descriptions of lay perceptions on the basis of content of scenes
- Environmental attributes
 - Formal aesthetical characteristics
 - Predictors of preference

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34

Preference-derived Perceptual categories

- In landscape preference, consensus, rather than divergence, seems to be the rule (cf Dearden, 1984).
- *Content* of scenes has consistently emerged as a major contributor to preference:
 - Most preferred:
 - scenes where human influence do not dominate the natural elements
 - scenes where nature dominate
 - Least preferred:
 - scenes with intrusions into the natural environment

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35

- Can aesthetical preferences be easily measured?

- Do they vary randomly?

- **On the basis of over 275 experiments, 12,000 stimuli, and 41,000 respondents Stamps (2000) argues that:**
- Beauty is easily measured as intensity of visual pleasure.
- There are valid principles which do apply to more than one situation.

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36

Empirical data on possible demographic effects in environmental preferences.

- Reanalyses of 40 earlier studies including 5301 respondents and 1001 scenes, with respondents coming from 21 different countries in Europe, North America, Asia and Australia
- Results:
 - For all demographic groups, the degree of consensus for visual environmental preferences was $r=.82$.
 - to claim that there is no such correlation, it would be necessary to submit data on over 100.000 stimuli which generated a correlation of $r= 0.0$

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37

Application of the model

- Single projects:
 - Intervention: simulations of the project
 - Control or baseline group would be a random sample of buildings in the neighbourhood.
 - Results would indicate whether the project would enhance, maintain, or diminish the visual quality of the neighbourhood.

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38

Applications...

- Several projects, for example architectural competitions:
 - Projects represented by simulations
 - Respondents: a random sample of the area's population,
 - Results: indicate whether any of the projects were better than any others.

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Design review processes

- Contrasts between projects as originally submitted to the process as compared to the same projects as modified by the process,
- Contrasts between a random sample of buildings which were or were not subjected to the process.

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40

- For design review, the only required information is how intensity of pleasure is influenced by physical features of projects.
- Ratings of pleasant/unpleasant are predicted by physical design features
- The public interest in environmental aesthetics has been very well defined as single preference ordering

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41

Norwegian landscape preference study (Strumse, 1996): Main research questions

- Do most people distinguish between traditional and modern agrarian landscapes in Western Norway?
- What are the most and least preferred landscapes?
- How should observed preference patterns for agrarian landscapes be explained?
 - as a function of characteristics of the environments themselves
 - as a function of individual or group characteristics
 - Both?
- Is it possible to discern between learned/cultural and innate/evolved influences on visual preferences?

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42

The visual stimuli

- 60 colour slides representing areas well documented with respect to earlier research (geography, ecology)

- 50% traditional agrarian landscapes
- 50% Modern agrarian landscape

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Questionnaires

- Visual preference rating sheet
- Larger questionnaire including questions about demographics, environmental concern and outdoor recreation activities
- *Rating sheets* for the judgments of eight environmental attributes

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Participants:

- Study 1: Visual preference rating and standard questionnaire
 - N= 198
 - male (n=72) and female (n=126)
 - landscape-related disciplines (n=94)
 - introductory courses in psychology (n=104)
 - mean age: 25.1 years (SD = 5.96, min. = 19 yrs, max. = 50 yrs)
- Study 2: Rating of all scenes on environmental attributes
- Participants: N= 8

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45

A priori ("expert"-) categories: Basis for environmental sampling

| Traditional | Modern |
|----------------------|----------------------|
| Built environment | Built environment |
| Mechanical equipment | Mechanical equipment |
| Activities | Activities |
| Dominating elements | Dominating elements |
| Form/colour | Form/colour |

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Results: Mean preference ratings

- Substantially higher preference for traditional agrarian landscapes than for their modern counterparts.
- Most preferred were traditional scenes containing human influence in balance with the natural elements.
- Modern scenes containing dominating human influence were among the least preferred.

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Results: Factoranalysis

- Seven distinct categories in peoples' perception of these landscapes
- Followed the traditional-modern distinction
- Content of scenes as the basis for categorisation, i.e.: nature - human influence, fields, farming activities etc.

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Preference-derived (n=198) perceptual categories in Western Norwegian agrarian landscapes. Descriptive statistics.

| Label | Description | # of items | Mean |
|----------------------|--|------------|------|
| FARMING | Persons doing manual labour or using machines, products of such activities, or reflections of activities associated with farming | 12 | 3.63 |
| OLD STRUCTURES | Old buildings or mechanical equipment embedded in a nature setting but also a nature scene, the ground covered with stone. | 9 | 4.43 |
| GREEN, GRASSY FIELDS | Modern mowed fields or meadows. | 9 | 3.14 |

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Preference-derived (n=198) perceptual categories in Western Norwegian agrarian landscapes. Descriptive statistics.

| Label | Description | # of items | Mean |
|---------------------------|---|------------|------|
| MODERN FARMING ELEMENTS | Silos, drainpipes and forest machines. | 6 | 1.66 |
| NEW DOMINATING STRUCTURES | Modern buildings and constructions. | 7 | 1.95 |
| FLOWERS | Flowers and colourful meadows, high in biological diversity | 4 | 4.34 |
| SPRUCE PLANTATIONS | Relatively dense spruce plantations. | 3 | 1.86 |

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Two obvious interpretations of the observed preference ratings

- There seem to be a general dislike for the intrusive style of human influence seen in modern agrarian landscapes, pushing the natural elements aside,
- There is a strong liking for the traditional style of human influence, presumably suggesting to the observer a more caring relation to nature.

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Environmental attributes

- Application of a number of environmental attributes in order to
 - (a) describe agrarian landscapes in western Norway, and
 - (b) predict preferences for the same landscapes.
- Three domains of attributes:
 - Informational variables
 - Perception-based variables
 - Perceived Age of landscape

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52

Perceived Age

- How old the elements in the photograph seem to be

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53

Results

- Highly preferred human-influenced landscapes:
 - high degrees of Age and Mystery.
- Highly preferred nature-dominated landscapes:
 - high degrees of Coherence, Openness, Smoothness and Ease of Locomotion

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Multiple regression analyses: testing the predictive power of environmental attributes

- Informational variables: most effective domain of preference predictors
- Other predictors:
 - Openness
 - Perceived Age

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55

Results

- Strong support to Kaplan & Kaplan's (1989) evolutionary preference model:
- All four informational variables are stat. sig. positive predictors of preference
- Attributes known to enhance preference are present to a markedly higher degree in traditional than in modern agrarian settings
- Some of these attributes seem to function differently in, respectively, human-influenced and nature-dominated settings

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56

Demographic differences in landscape preference

- General finding:
 - Few and small group differences
- Most important predictors of preference differences across landscape categories:
 - present population density
 - gender
 - organisation membership
 - expertise

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57

Demographic (group) differences in landscape preference

- Demographic differences clearest in the preferences for scenes depicting Farming Activities:
 - Residents of cities in Western Norw. lower pref. than other urban residents
 - Rural residents higher preferences than urban r.
 - Older subjects higher pref. than younger
 - Members higher than nonmembers
 - Urban experts higher pref. than urb. nonexp.

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58

Demographic (group) differences in landscape preference

- Preferences for Green Grassy Fields
 - Women higher than men
 - Nonexperts higher than experts
- Preferences for Modern Farming Elements
 - Urban residents higher than rural
- Preferences for New Dominating Structures
 - Urban residents higher than rural
- Preferences for Flowers
 - Women higher than men
 - Members higher than nonmembers

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59

Relevance of the study

- Practical implications:
 - Prevent negative outcomes in landscape planning and management, which often can traced back to a lack of knowledge about landscape perceptions of lay people and local residents
- Both practical and theoretically interest:
 - visual preference studies advance our knowledge about what characterise environments in which humans are likely to thrive
 - more knowledge about the nature of human perception and information processing

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60

Perceived values of agrarian landscapes in Eastern and Western Norway

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Theme of the paper

- Lay people's evaluations of a set of scenes from cultural landscapes where they live according to six criteria:
 - Visual preference
 - Conservation value
 - Cultural heritage/Cultural landscape value
 - Economic utilitarian value
 - Importance for everyday well-being
 - How typical each scene is for the landscape where one lives.
- Importance of theme:
 - Too little knowledge about the public perceptions of agrarian landscapes. Such knowledge is important for successful implementation measures aiming at an increase in the aesthetical and recreative value of agrarian landscapes, as well as for the evaluation of such measures.

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What we know about people's landscape preferences

- The content of scenes: a major contributor to landscape preference
 - Most preferred scenes are often those where human influence do not dominate the natural elements or where nature dominate
 - Least preferred scenes often represent intrusions into the natural environment

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Additional important factors explaining landscape preference

- Environmental attributes enhancing the processes of understanding and exploration
- Spatial information indicating how well one could function in the space represented
- Group differences in landscape preferences due to familiarity (how well one knows the landscape in question), cultural and ethnic variation, formal knowledge and expertise.

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64

Previous findings in Norway (Strumse, 1996, 1998, Strumse & Hauge, 1998)

- Strong dislike for modern agrarian landscapes, and an equally strong liking for traditional landscapes
- Positive association between support to environmental protection and preference for traditional, nature-dominated landscapes
- Positive relation between support to environmental protection and preference for farming activities
- Awareness of the aesthetical value of a landscape scene is related to the wish to protect it.
 - Positive associations between landscape preferences and evaluations of the importance of protecting cultural landscapes, natural landscapes, and species of plants and animals

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65

Are preferred environments also health promoting?

- Restorative or recreating effects of nature:
 - Exposure to natural environments resulted in reduced autonomic arousal and less selective attention (Laumann et al 2003)
 - Walking in natural environment provide measurable recovery and stress reduction as indicated by cardiovascular measures, emotional measures and task performance (Laumann et al, submitted)
- In the present study, health effects are treated only indirectly by looking at how participants evaluate the importance of each landscape scene for their everyday subjective well-being

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66

The effect of the physical environment on subjective well-being

- Very little research on the topic
- Reason for modest expectations with respect to *how much* social and environmental factors may contribute:
 - Subjective well being is particularly frequent in individuals who *generally* tend to judge their surroundings as good rather than bad

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67

Typicality of landscapes

- How typical a scene is perceived to be for where one lives is probably important for the same scene's importance for subjective well-being.
- A correspondence between surroundings and knowledge structure (Nasar, 1994): Moderate correspondence would probably lead to involvement or exploration because there is the suggestion that more information will be obtained through cognitive activity.

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68

The landscapes studied

- The area surrounding the town of Hamar in Central Eastern Norway: large and varied agricultural land, nature reserves and densely populated areas One of the most important agricultural districts in Norway
- The Inner Sogn region, Western Norway: Complex traditional cultural landscape. Stages, ranging from traditional practice to succession in marginal areas where fields and seminatural vegetation of meadows and pastures rapidly become invaded by woodland.

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69

Specific research questions

- Are nature-dominated and/or traditional landscapes generally more highly valued than other landscape types?
- Are landscape types which are perceived as typical of place of residence also perceived as more important for subjective well-being than other scenes?
- Are highly preferred landscape scenes more important for subjective well-being than less preferred landscapes?
- Is it possible to obtain support for the assumptions about biological and cultural modes for landscape experience?

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70

Method

- Mail-back survey:
 - Photo-survey: 6 different ratings of 32 color prints in a 4-page booklet (only 28 photos applied in the present analysis)
 - Standard Questionnaire

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71

Samples

- Randomly drawn from telephone directory of two defined areas.
- Whole sample:
 - 447 subjects, 204 men, 224 women (22 non-response), i.e. response rate of 44,7%
- Age: <19 - >70
- Western Norway sample: 241 subjects
- Eastern Norway sample: 196 subjects

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72

Participants were asked to rank scenes according to a criteria using the following response formats:

- Visual preference, ranked on a five-point scale with 1 = "Does not like at all" and 5= "Likes very much".
- Conservation value ranked on a five-point scale with 1 = "Not valuable at all" and 5= "Extremely valuable".
- Cultural heritage and cultural landscape value ranked on a five-point scale with 1 = "Not valuable at all" and 5= "Extremely valuable".
- Economic use value ranked on a five-point scale with 1 = "Not use value at all" and 5= "Extremely high use value".
- Importance for everyday subjective well-being ranked on a five-point scale with 1 = "Not important at all" and 5= "Extremely important".
- How typical the landscape shown is for the place in which each participant live, ranked on a five-point scale with 1 = "Not typical at all" and 5= "Extremely typical".

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73

Statistical analyses

- Frequency distributions, one-way analyses of variance and correlations were applied in order to identify central tendencies and bivariate relations.
- Identification of landscape dimensions was accomplished by means of *principal components analysis* (PCA).

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74

Results

- Participants did appear to perceive the landscapes according to general dimensions or categories
- These dimensions were valued differently
- The identified dimensions group themselves relatively clearly along the nature – human influence continuum
- Nature-dominated dimensions received the highest mean ratings both in terms of visual preference, conservation value, cultural heritage value and importance for subjective well-being
- Scenes containing cultivated fields received the highest mean ratings on economic use value: A necessary conflict between the landscape most people value and the landscapes that provide income?

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75

Results

- Indications of separate biological and cultural modes for landscape perception: Few between-group differences in evaluation of nature-dominated scenes, larger differences in evaluations of scenes dominated by built structures
- The more typical Eastern Norwegian scenes are perceived to be for where one lives, the more important are the same scenes for well-being
- Highly preferred landscapes are also important for well-being

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76

Applications of preference studies: Some examples

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77

1. Citizens' perception of a storm drain

- Purpose: How to make the drain more attractive to residents living along it
- Study focus: People's responses to potential changes to the drain: such changes could have major impact on their neighbourhood

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78

Method

- Standard questionnaire: Questions about possible changes to the drain
- Photoquestionnaire with two 5-point rating scales beneath each scene:
 - Ratings of similarity of participants' actual view of the waterway with the scene depicted in the picture,
 - Ratings of how much one would prefer the waterway near one's home to look like the scene in question.

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79

Findings of particular importance for landscape planning and design

- Proposals for change are easily perceived as threatening in preferred everyday natural environment
- When the environment is unattractive, familiarity might contribute to the acceptance of almost any proposed modifications
- Strong regional differences in the perceptions of problems and of the preferred alternatives: Different solutions for different portions of the storm drain.

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80

2. Public input to assist the design of a vest-pocket park

- Method:
 - Physical models of three different designs of the site, and a series of photographs from various directions
 - Participants rated the scenes on a 5-point scale in terms of how pleasing they would find it if the park was as pictured

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81

Results:

- Those who *worked* near the park:
 - highest in their preferences, and in particular for scenes showing opportunity for sitting in the park.
- Those who *lived* near the park,
 - Sensitive to elements in the scenes that might pose threatening situations
 - Openness was important

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82

3. Simulation of the location of a proposed nuclear power plant along New York's Hudson River

- Background:
 - Proposed location was the geographic center of inspiration for the Hudson River School of painters (19th century)
- Method:
 - Responses to photographs simulating the plant
 - Interviews and an analysis of the historical significance of the region
- Result:
 - For the first time in the history of the nuclear power industry: recommendation *against* the application to build a plant --*on the basis of aesthetic concerns.*

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83

Suggestions for application of visual preference data to landscape planning and design

- A way of mapping local residents' perceptions of the effects of restoration, or of simulations of restoration
- Information on landscape preferences would be of help in designing informational and educational material on landscapes in question
- Exploring farm environments for the future in simulation studies

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84

Stamps (2000): The aesthetics of the built environment: New methods in design review

- New methods assisting environmental decision makers by focusing on basic issues in design review

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85

Definition of design review

- *"a governmental function the purpose of which is to manage the physical development of a geographical area in a manner which reflects public determination of what that area should look like in the future." (Stamps, 2000,p. 3)*

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86

Conventional reasons why design review is not possible

- (a) beauty is subjective (in the eye of the beholder)
- (b) there are differences in taste between experts and the general public
- real environments cannot be simulated through pictures
- each situation is unique and so there are no general principles, and
- (e) beauty cannot be measured

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87

None of these reasons are valid

- On the basis of over 275 experiments, 12,000 stimuli, and 41,000 respondents **Stamps (2000) argues that:**
- Beauty is easily measured as intensity of visual pleasure.
- There are valid principles which do apply to more than one situation.

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88

Conventional design review mainly uses discretion

- Discretion: A personal judgement of taste based on inspection of a project and experience.
- US cities: 22% used reviewers' judgement without any guidelines, 21% only general principles, 13% only diagrams or drawings, only 20% had rules which were not subject to discretion.
- The empirical method has been far more effective for the purpose of predicting preferences for as-built projects.

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89

Contemporary design review use often vague ideas

- Examples:
 - *in context*
 - *in keeping*
 - *in harmony*
 - *appropriate*
 - *high standard*
 - *high quality*
 - *raising standards*
 - *protection of the environment*

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90

Problems in design review:

- **Vagueness**
 - The criterion of non-vagueness is a list of properties such that their presence or absence determines set membership.
 - One need to find discrete concepts which can be used instead of diffuse notions.
- **Use of tautologies** (contain no information and can be ignored)
- **Mixing purposes**
 - the purpose should be predicting future aesthetic effects
- **Confusing feelings with descriptions of physical objects**
 - terms such as "interesting", "overwhelming", or "beautiful" to describe the physical environment is not useful

Feelings and Features of Physical Environments.

- Feelings can be described in terms of intensities of pleasure, arousal and dominance
- Physical objects can be described in terms of materials and spatial relations
- Design review decisions need only a description of intensity of pleasure and a description of the object

Vague notions to physical concepts

- **Subjective measure of visual detail.**
- Door and window trim: Most important
- Texture: least important
- **Impression of complexity:**
 - Predicted by number of turns and symmetry in the silhouette

Vague notions to physical concepts

■ Character.

- Three components needed:
 - a definite region (block face),
 - A set of design features (style, number of stories...)
 - A critical frequency
- A feature is part of a block's character if the frequency of that feature in the block is higher than the **critical frequency**
- Results: a design feature would have to be present in 88% of the buildings before more than half of the respondents would describe the overall character of the block as having that feature

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94

The commons

- The land belonging to the community at large.
- Someplace where someone could actually stand
- All parts are connected ---there is only one commons

The visual commons

- The space bounded by the objects visible from publicly-accessible locations.
- Typically larger than the commons: we can see beyond where we stand.
- If they are visible from a publicly-accessible place, private spaces are part of the visual commons.

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95

Empirical data on possible demographic effects in environmental preferences.

- Reanalyses of 40 earlier studies including 5301 respondents and 1001 scenes, with respondents coming from 21 different countries in Europe, North America, Asia and Australia
- Results:
 - For all demographic groups, the degree of consensus for visual environmental preferences was $r=.82$.
 - to claim that there is no such correlation, it would be necessary to submit data on over 100.000 stimuli which generated a correlation of $r= 0.0$

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96

A Psychological Protocol (correct procedure) for Design Review

- Think of a design proposal as a change or an intervention in an existing state of affairs
 - Net effect of the change:
 - difference between the existing condition (the "before") and the condition following the intervention (the "after").
- Use measurements which have the same meanings over different applications

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97

Suitable measure: The standardised mean difference (*d*).

- Calculation of *d* requires three inputs:
 - two averages (μ_{after} and μ_{before})
 - an estimate of the population standard deviation (σ).
- The net aesthetic effect of an intervention is measured as:

■ EQ 1:
$$d = \frac{(\mu_{\text{after}} - \mu_{\text{before}})}{(\sigma)}$$

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98

Importance of random sampling

- For environmental aesthetics, a random protocol would be to compare a physical intervention against a random sample of existing environmental scenes in an intended area

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99

Interpreting D (the standardised mean difference)

- (Remember: one stimulus group consists of a random sample (of scenes), the another stimulus group consists of images of a proposed project)
- If d is negative, the net effect will be to diminish the visual amenity of the target area;
- If d is zero, the net effect will be to maintain the visual amenity of the target area
- If d is positive, the net effect will be to increase the visual amenity of the target area.

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100

Values of d corresponding to differences in visual images

- **More than a mountain:**
 - it is quite clear which is better and which is worse: the difference between a park and a factory (standardised contrast = 3.1).
- **Grossly perceptible:** When the d is less than 1 but above .5.
- **Large enough to be visible to the naked eye:** At the, still clear which is the better and which the worse ($d = .5$)
- **Small ($d = .2$):** he distinction between better and worse becomes difficult: is a 5/2 split in house styles better than a 2/5 split?
- **Realm of the molehills: ($d = 0$).** Example: a 4/3 split in house styles versus a 4/3 split.

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101

Summary of protocol

- Create a control group by selecting a random sample of existing buildings in the target region.
- Create simulations of the proposed project.
- Conduct a preference experiment
- Measure the aesthetic effect as a standardised mean difference between the control group and the intervention
- The aesthetic impact will be noticeably beneficial if $d > +0.2$, trivial if $d < 0.2$, and noticeably harmful if $d < -0.2$.

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102

Application of the model

- Single projects:
 - Intervention: simulations of the project
 - Control or baseline group would be a random sample of buildings in the neighbourhood.
 - Results would indicate whether the project would enhance, maintain, or diminish the visual quality of the neighbourhood.

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103

Applications...

- Several projects, for example architectural competitions:
 - Projects represented by simulations
 - Respondents: a random sample of the area's population,
 - Results: indicate whether any of the projects were better than any others.

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104

Design review processes

- Contrasts between projects as originally submitted to the process as compared to the same projects as modified by the process,
- Contrasts between a random sample of buildings which were or were not subjected to the process.

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105

The main points of the book:

- Clear concepts rather than in vague notions.
 - For physical objects, "clear concepts" means expressions only in terms of materials and spatial relationships.
 - For feelings, "clear concepts" means expression in terms of intensity of pleasure, intensity of arousal, and intensity and polarity of dominance
- For design review, the only required information is how intensity of pleasure is influenced by physical features of projects.
- Ratings of pleasant/unpleasant are predicted by physical design features.
- The public interest in environmental aesthetics has been very well defined as single preference ordering.

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106

Main points...

- The magnitude of aesthetic effects can be measured in terms of a standardised mean difference
- $$d = \frac{(\mu_{after} - \mu_{before})}{(\sigma)}$$
- Randomisation is needed in order to eliminate bias due to convenience, expectations, personal preference, disingeniousness, or other factors. Vague verbal evaluations such as "preventing harm to amenity", "keeping in keeping", or having a "significant effect" can all be expressed much more clearly in terms of whether d is harmful ($d < -2$), trivial ($|d| < 2$), or beneficial ($d > +2$).
- Use of scientific protocols will eliminate most potential challenges to the legitimacy of design review. The scientific protocol can be applied to many types of design review decisions,

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107
