



Original research article

Revealing lay people's perceptions of forest biodiversity value components and their application in valuation method



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ARTICLE INFO

Article history:

Received 21 March 2014

Received in revised form 2 July 2014

Accepted 3 July 2014

Available online 19 July 2014

Keywords:

Individual mental construct

Biodiversity

Qualitative method

Choice Experiment

Attribute definition

ABSTRACT

Valuation studies about environmental goods, e.g. biodiversity, often use characteristics and indicators that seem ecologically sound. But ecological value and public value are not necessarily the same. Therefore, combining ecological indicators with public knowledge and language in framing valuation studies may improve the consistency of outcomes. Using both qualitative and quantitative methods, we investigated lay people's mental constructs about biodiversity and attitudes to biodiversity management.

Applying a coding strategy for analysing data from individual interviews and group discussions revealed that 'diversity of animals and plants', 'natural appearance and dynamics of ecosystem', and 'peace and quietness' were the attributes of forest ecosystems most frequently mentioned by lay people. In addition, it was found that regardless of familiarity with the various ecological scientific terminologies, lay people had an intuitive understanding of ecological concepts such as biodiversity. The analyses demonstrated that individuals' perceptions and values of biodiversity could be framed in two interlinking categories: (i) as a good in itself, and (ii) its regulatory function. It was also revealed that individuals' attitudes towards forests and their biodiversity may be rooted in their mental constructs and can be useful in targeting policy and conservation management.

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1. Introduction

The aim of a Choice Experiment (CE) as a stated preference method in environmental valuation is to understand preferences and trade-offs within a particular population for a particular good/service/state (Coast et al., 2012). Therefore, the identification and characterisation of what is to be valued must be understood by respondents. CE enables consideration of a broad range of policy changes, and respondents must be able to make trade-offs between the attributes in question (Coast et al., 2012). The Lancaster (1966) theory behind CE assumes that individuals derive their utility from the characteristics of goods rather than from the goods themselves. Therefore, any technical or conceptual flaws in presentation of attributes or characteristics in the design of questionnaires may cause a bias. The qualitative techniques of focus group discussions, individual interviews, and other cognitive methods such as thinking aloud and drawing pictures, have been used to improve the awareness of researchers regarding respondents' perceptions, understanding and categorisation of environmental goods when they are answering questionnaires (Gobster, 1998; Fischer and Young, 2007). This has resulted in improved information statements (Powe et al., 2005; Levy and Kellstadt, 2012), but a persistent problem is achieving linkage between

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this improved knowledge of perceptions by researchers and the need for a reductionist and measurable description of the environmental attributes, as required in valuation exercises, management, and prioritisation. The aim of this study is to derive, from qualitative interviews, measurable attributes of biodiversity for a CE that align with perception of lay people and are relevant to management.

It has been argued that the public's lack of understanding regarding biodiversity issues is a barrier to their effective participation in valuation and management programmes (Spash and Hanley, 1995; Hunter and Brehm, 2003). In valuation studies researchers usually take into account the preferences of those respondents who, according to follow up questions, indicate a proper understanding of questions and discard the respondents who do not display the characteristics researchers are looking for and therefore answer inconsistently. Consequently what happens is that researchers measure the preferences of only those individuals who have above-average knowledge of the goods in question, e.g. forest biodiversity in our case.

Thus, securing attribute descriptions, scientifically, which reflect lay people's perceptions may alter this. An obvious critique is, if people have an objectively incorrect knowledge of the good—do we want to value this incorrect knowledge? The question is whether or not the incorrect knowledge arrives from the information provided to them. The answer therefore is, in our opinion, that although focus groups and exploration of the “lay people's mental constructs” are useful tools for building such an explanation of attributes, we need to ensure that the explanation is scientifically sound. In the current study we satisfied this by consulting with a group of scientists.¹

In the present study we focus on forest biodiversity and use the terms ‘biological diversity’ and ‘biodiversity’ interchangeably.

The article is structured as follows: first we present a literature review of studies using stated preference techniques for monetary valuation of forest biodiversity and identify the ways in which researchers have described biodiversity, e.g. using indicators such as number of endangered species and species richness. This is followed by a review of psychological studies of lay people's perceptions of biodiversity, in an attempt to present an overview of the various perceptions exhibited by the public as described in other studies to help to interpret our results. The methods section presents the qualitative analysis undertaken of lay people's perceptions and their mental constructs of forest biodiversity. The results section shows how individuals perceive the concept of “forest”, suggests some categories and definitions for future communication, and describes how individuals explain their attitude to and their main relation with forest biodiversity, and consequently with its management. The analysis is based on categorisations found in the literature. Beyond these outcomes regarding forest biodiversity, the results provide the possibility of identifying other important aspects of forest ecosystems from lay people's point of view which can be applied in CE. Then we discuss this integrated approach to understand the concept of forest biodiversity and other characteristics of forest ecosystems to be valued, and the way in which they could be presented to lay people.

1.1. Review of studies using Choice Experiment for valuation of biodiversity

According to Hanley et al. (2001) and Barkmann et al. (2008), insufficient attempts have been made in valuation studies to clarify how lay people perceive unfamiliar and complex terms like biodiversity or species and functions thereof. However, studies on environmental ethics and psychology have tried to clarify lay people's perceptions using qualitative methods. For example, Buijs et al. (2008) suggest that lay people use very deep and complex social representations of biodiversity to argue for particular approaches to biodiversity management. This refers to the situation that although in many cases they cannot explain what biodiversity is, they have some intuitive understanding or awareness of it.

From an ecological view point, Mace et al. (2012) distinguish between three categories of biodiversity: biodiversity as a good in itself, biodiversity as a regulator of ecosystems, and biodiversity as final ecosystem services. However, the authors do not provide any view of these categories for lay people, which is qualitatively based, and it can be questioned whether the categories are embedded in lay people's mental constructs about biodiversity concepts used in valuation studies.

A literature review was used to reveal how researchers have described the characteristics of biodiversity and the integration of the concept into CE. The web of Science was searched for studies, using the keywords (biodiversity* OR “biological diversity*”) AND (Choice Experiment*). From the search results, studies were selected based on their primary focus on valuation and the use of biological diversity (biodiversity) as an attribute in CE, i.e. excluding studies that employed CE, but did not include biodiversity as an attribute, or used biodiversity valuation, but not through CE. The search on Web of Science resulted in 125 studies and initial scanning showed that 55 of 130 were relevant according to the scope of our research. Fifty articles used species number as an/the indicator of biodiversity, and 30 out of the 50 focused on endangered species. Only five studies included both the number of species and the role of species diversity in the stability and resilience of ecosystems (Table A in the Appendix).

1.2. Concepts of nature and biodiversity in psychological studies

Several studies have found a deficiency in lay people's knowledge of scientific definitions (Spash and Hanley, 1995; Hunter and Brehm, 2003) and, as a result, have suggested better education of the public (Nisiforou and Charalambides,

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