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Intention to pay for the protection of threatened and endangered marine species: Implications for conservation program design

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ABSTRACT

We investigate motivations for people's intention to contribute towards increased protection of eight threatened and endangered marine species in the United States, using factor analysis and ordered response analysis applied to data from 7425 respondents to a national household survey conducted in 2010. We find that the strength of individuals' intention to contribute towards species conservation depends on how conservation programs are funded, which species are being targeted for conservation, individuals' knowledge of and prior interaction with these species, awareness of need, awareness of responsibility, altruism, environmental concern, and contextual forces. We argue that individuals who are predisposed to contribute to conservation are likely to be incentivized by messages that focus on charismatic species and reinforce altruistic motives, and ethical beliefs. Individuals with more fiscally conservative viewpoints are more likely to respond to messages about how conservation complements their political beliefs and improves economic conditions or their quality of life.

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1. Introduction

Determining what motivates individual members of the public to agree to pay towards species conservation is crucial for developing effective conservation programs. Although there is considerable literature on the dollar *amount* that people will pay for conservation programs (see Lew, 2015 for an overview of stated preference valuation studies focused on marine species), less focus has been placed on *why* individuals agree to pay towards conservation, and how this intention to contribute varies with the conservation objective and payment method (taxes versus direct cash contributions).

The decision to agree to pay towards conservation programs can be modeled as a two-part process: first, the individual decides whether or not they are inclined to contribute funds towards a conservation program (which we refer to as their *intention* to pay); and second, they decide what dollar amount they are willing to contribute (which is referred to as *willingness* to pay, WTP). We argue that the former decision is not a monetary decision. Rather, it is an assessment by the individual as to whether they should contribute towards the conservation program. It is an expression of the individual's attitudes and beliefs, and can be modeled as influenced by psychological, social, and institutional factors. The latter decision deals with the *amount of money* the individual is willing to contribute towards the conservation program, and is principally economically driven. Intention to pay is a necessary precursor to willingness to pay – if an individual is not supportive of a conservation program they will not make a monetary contribution to the program. In this paper, we focus only on the first part of this two-part decision process, i.e. how and why an individual decides they should (not) contribute towards a conservation program. We use a nationally-implemented household survey to

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determine what motivates people to agree that they would pay towards the conservation of eight different threatened and endangered (T&E) marine species in the United States. This information may be used to improve the effectiveness of marine species conservation programs.

Investigating people's intention to contribute to conservation is critical to conservation program design (Spash et al., 2009; Liebe et al., 2011). By focusing on how psychological, social and institutional factors impact people's behavior, the environmental sociology and psychology literature offer considerable insights that are often lacking from economic studies (e.g., Ajzen and Driver, 1992; Pouta and Rekola, 2001; Bernath and Roschewitz, 2008; Liebe et al., 2011). Accordingly, it has been argued that economic models should be augmented by social psychology theories to identify the pluralistic attitudes and values that underpin individuals' intention to pay towards conservation (e.g., Ajzen et al., 1996; Martín-López et al., 2007; Liebe et al., 2011). Understanding the determinants of people's intention to contribute to conservation programs is necessary to improve conservation policy design (Spash et al., 2009), communication, and outreach strategies (Pouta and Rekola, 2001). Incorporating social psychology theories into economic models also provides insights into whether individuals' behavioral intentions (i.e., whether or not they intend to pay towards species conservation) will result in actual behavioral change (i.e., actual conservation payments in practice).

In this paper we analyze individuals' level of agreement (on a five-point scale) with whether or not they intend to pay towards marine species conservation (*without presenting them with a dollar amount that they would be expected to pay*). We posited that this decision (or level of agreement) is akin to 'behavioral intentions', as defined by the Theory of Planned Behavior (TPB) (e.g., Luzar and Cossé, 1998; Martín-López et al., 2007; Bernath and Roschewitz, 2008). The TPB posits that people's intention to perform a given behavior ('behavioral intentions') can be predicted from their attitudes toward the behavior (whether the individual values the behavior positively or negatively) and subjective norms (perceived social pressure to engage in that behavior) (Ajzen, 1991).

In the case of species conservation, the existing literature suggests that people's attitudes depend on their basic values towards nature, the behavioral and physical characteristics of species, and past and present interactions with species (Martín-López et al., 2007). There is some evidence that people favor the conservation of vertebrate species over invertebrate and plant species, regardless of taxonomic uniqueness, rareness in terms of its distribution, or the role that the species plays in ecosystem functioning (Martín-López et al., 2007). The exception is people with higher levels of environmental knowledge or environmental concern, who are more likely to contribute to species conservation based on scientific considerations (Martín-López et al., 2007; Kotchen and Reiling, 2000). Behavioral intentions, as they relate to species conservation, likely depend on the species to be conserved and people's environmental knowledge and concern.

We also posited that perceived behavioral control is a significant determinant of individuals' intention to contribute to species conservation (Ajzen, 1991). Perceived behavioral control refers to the ease with which people can perform a behavior (whether they have the time, money, or skills to complete a task), as well as the perceived probability of successfully completing a task and external factors that are beyond the individual's control (see also Atkinson, 1964; Bandura, 1977, 1982). In the case of species conservation, we posited that perceived behavioral control may encompass the perceived effectiveness of proposed conservation actions and whether individuals have the finances to contribute to conservation programs.

Further, we used dilemma concern and trust in other people's cooperation (from the theory of public goods), theories of altruistic behavior, norm-activation models, and external or contextual forces to inform our analysis. Dilemma concern measures "the degree to which people perceive environmental protection as a social dilemma and follow strategies of conditional cooperation" (Liebe et al., 2011: 109). Trust in other people's cooperation posits that people are more likely to contribute to species conservation if they believe that others will also contribute (Liebe et al., 2011).

Theories of altruistic behavior suggest that people's intention to contribute towards species conservation will depend on their subjective obligation to pay for conservation (Andreoni, 1990). Similarly, Schwartz's (1977) norm-activation model suggests that awareness of need and awareness of responsibility generate a moral obligation to contribute to conservation. Awareness of need describes an individual's recognition that action must be taken to conserve the species. Awareness of responsibility refers to the individual's recognition that they are responsible for providing funds needed for species conservation. Finally, external or contextual forces (Stern, 2000) deal with the broad social, economic, and political context in which conservation behavior occurs, for example: monetary incentives or costs, the relative level of government spending on different public programs, and the availability of public policies that support conservation behavior (see also Cardenas and Lew, 2016).

Based on the above theories, we hypothesized that individuals' intention to contribute towards T&E marine species conservation would depend on a variety of factors: norms, beliefs, values, past experiences, levels of environmental knowledge and concern, which T&E species would be conserved, personal capabilities (including available resources), political opinions, and economic conditions. Only a few studies have directly addressed conservation of species – typically non-marine species (e.g., Martín-López et al., 2007; Ojea and Loureiro, 2007; Tisdell et al., 2007; Cardenas and Lew, 2016). We extend the existing literature by investigating individuals' intention to contribute towards increased protection of eight T&E marine species: the black abalone (*Haliotis cracherodii*); the Central California Coast Coho salmon (*Oncorhynchus kisutch*); elkhorn coral (*Acropora palmata*); the hawksbill sea turtle (*Eretmochelys imbricata*); the humpback whale (*Megaptera novaeangliae*); Johnson's seagrass (*Halophila johnsonii*); the Southern California steelhead (*Oncorhynchus mykiss*); and the Southern Resident killer whale (*Orcinus orca*).

We further hypothesized that individuals' intention to contribute to species conservation would depend on various socio-demographic characteristics (e.g., gender, age, education level, ethnicity, marital status), which have been found to be significant determinants of environmental behavior (e.g. Tarrant and Cordell, 1997; Poortinga et al., 2004). Finally, we posited that the strength of individuals' intention to contribute to species conservation would be mediated by the payment method (or "payment vehicle") – higher taxes versus higher prices for certain goods. To the best of our knowledge, by focusing on a single payment mechanism, other studies have not tested whether the payment vehicle significantly impacts the likelihood that people intend to contribute towards species conservation.

2. Materials and methods

2.1. Survey

Web-based surveys were carefully developed over the course of several years (2005–2010) using input derived from scientists, focus groups, and cognitive interviews. They were designed to