



Motivations matter: Behavioural determinants of preferences for remote and unfamiliar environmental goods



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ABSTRACT

Discrete choice experiments (DCE) are one of the main methods for the valuation of non-market environmental goods. However, concerns regarding the validity of choice responses obtained in such surveys remain, particularly in surveys dealing with environmental goods remote from and unfamiliar to respondents. This study assesses behavioural determinants of preferences for conservation benefits of a marine protected area on the Dogger Bank, a shallow sandbank in the southern North Sea in an attempt to assess construct validity of survey responses. The Theory of Planned Behavior (TPB) and the Norm Activation Model (NAM) are employed to empirically measure constructs that predict stated choices. The study finds that identified protest respondents score significantly lower on most TPB and NAM components than non-protesters. Results further show that components of both the TPB and the NAM robustly predict choice behaviour. The inclusion of the TPB components improves the predictive power of the estimation model more than the NAM components. In an additional latent class logit model, TPB and NAM components plausibly explain different patterns of WTP for conservation benefits of an offshore marine protected area. These findings support construct validity of stated choice data regarding the valuation of remote and unfamiliar environmental goods.

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1. Introduction

Discrete choice experiments (DCE) are an increasingly popular method for eliciting willingness to pay (WTP) for non-market environmental goods. DCEs are a stated preference technique in which respondents to a survey are asked to make choices between alternatives of different environmental programmes at different costs (Hanley et al., 1998; Adamowicz et al., 1998; Louviere et al., 2000; Kanninen, 2006). From respondents' stated choices the value they attach to the different attributes, by which these environmental programmes are described, can be inferred and expressed as their marginal WTP. These WTP estimates can be interpreted as indicators of the change in well-being respondents expect from a change in the provision of any of these choice attributes. In recent years, DCE alongside contingent valuation (Carson and Hanemann, 2005) have increasingly been used to value non-market environmental goods, including those that are remote from and unfamiliar to survey respondents.

Criticism of DCE, and stated preference techniques in general, has focused on the validity of responses. Validity of stated preference data, or more specifically construct validity, can be established by identifying

whether respondents' choices are internally consistent and whether the relationship between WTP and explanatory variables is consistent with that predicted by theory (Kling et al., 2012). Research in contingent valuation has tried to improve construct validity by understanding the underlying motivations behind respondents' WTP statements (e.g. Meyerhoff, 2006; Liebe et al., 2011; Rosenberger et al., 2012). Research into DCE is following suit.

Attitudes are often included in contingent valuation and DCE studies in an ad hoc way, for example, focusing on issues of general environmental concern (Milon and Scrogin, 2006), on the good to be valued in the study (e.g. Ahlheim et al., 2015) or represented by membership of an environmental group (e.g. Jobstovgt et al., 2014; Yao et al., 2014). They often fail to appreciate the full complexity of attitude development and its association with behaviour. Consequently, despite demonstrating a strong correlation with WTP, environmental attitudes alone have been shown to be poor predictors of behaviour (Meyerhoff, 2006; Ajzen and Fishbein, 2005, Kaiser et al., 1999). This lends support to Kahneman et al. (1993) who suggest that respondents may apply a contribution model rather than a purchase model when making WTP decisions. The environmental good in question is considered to be a cause worth supporting, rather than something an individual is willing to pay for. The size of the contribution reflects the perceived seriousness of the problem and might therefore be higher for smaller but more immediate changes than for larger-scale but more remote goods (Guagnano et al., 1994). In this interpretation,

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stated WTP or choices are merely an expression of ranking of importance or urgency rather than a quantitative metric of the expected utility change.

Understanding what determines WTP may be particularly relevant in the context of remote and unfamiliar goods where preferences may not be clearly held for the good to be valued in the survey (Bateman, 2011). This is of considerable importance when it comes to the marine environment and the valuation of the environmental goods that it provides. A major difficulty in marine valuation studies is that, unlike the valuation of terrestrial environmental goods, many respondents lack experience and knowledge regarding the good to be valued (Aanesen et al., 2015; Jobstvogt et al., 2014; McVittie and Moran, 2010). Attitude surveys have shown that the marine environment is regarded by many as remote and unfamiliar (Jefferson et al., 2014; Rose et al., 2008; Steel et al., 2005). Consequently concern exists about the validity of valuations derived from surveys on marine environmental goods (Hanley et al., 2015). The criticism is particularly strong when it comes to existence values, which are likely to be the dominant value category of offshore and deep sea environmental goods.

Using a DCE, this study values the ecological changes resulting from the implementation of a management plan for the Dogger Bank, a shallow sandbank located in the southern North Sea. The remoteness of the location and the likelihood that respondents have limited knowledge of the area raises questions over what determines the choices respondents make and their consequent WTP, as well as the validity of their responses. It also provides an opportunity to examine which model respondents' use when making their choices, the purchase or the contribution model. To investigate validity, two behavioural models are incorporated into the study: the Theory of Planned Behavior (Ajzen, 1991) and the Norm Activation Model (Schwartz, 1970, 1977). The aim of this study is, therefore, to explain the variation in preferences for a set of marine conservation benefits as expressed by respondents' stated choices by means of behavioural concepts originating in social psychology.

The Theory of Planned Behavior (TPB) acknowledges that behaviour (including ecological behaviour) is susceptible to a range of influences beyond an individual's control, including personal abilities and social constraints. Focusing on attitudes towards paying for the Dogger Bank management plan and these additional influences, the TPB is used to assess the motivations that lead survey respondents to state choices for different levels of conservation benefits provided by the sandbank ecosystem. Assuming that the WTP expressed through stated choices in a DCE is a behavioural intention, it is straightforward to apply components of the TPB as predictors of those stated choices. It is therefore hypothesised that this inclusion improves the predictive power of choice models. In contrast, the Norm Activation Model (NAM) can be used to assess to what extent stated choices are motivated by altruistic concerns. According to the economic theory expressed through the purchase model, the effect of the changes to be valued on other people, society as a whole, or future generations should not affect the level of stated WTP or the stated choices. If they do construct validity would be undermined. While both the NAM and the TPB have been employed to explain direct WTP statements in contingent valuation surveys (e.g. Liebe et al., 2011; Bernath and Roschewitz, 2008; Guagnano et al., 1994) and the TPB in a DCE relating to food-choice (Nocella et al., 2012), the application of TPB and NAM to predict stated choices in a DCE survey in the environmental field is still very rare (Kenter et al., 2014). The present study thus responds to the recent call for more research in this area (López-Mosquera et al., 2014).

The remainder of the paper is structured as follows. Section 2 introduces the TPB and the NAM, their components and their respective links to stated preference environmental valuation from which the research hypotheses are derived. Section 3 explains the methodological approach before Section 4 presents the results. Section 5 provides some discussion, and Section 6 concludes.

2. Behavioural Theories and the Elicitation of Environmental Preferences

2.1. The Theory of Planned Behavior (TPB)

The Theory of Planned Behavior (TPB) states that intentions to carry out a certain behaviour can be predicted by attitudes towards that particular behaviour, subjective norms and perceived behavioural control (Ajzen, 1991). The more positive an individual's attitude, subjective norm and perceived behavioural control, the greater the likelihood that the individual intends to carry out the behaviour when the opportunity arises. Based on the expectancy-value model (Fishbein, 1963) attitudes, subjective norms and perceived behavioural control are considered to be comprised of two components: beliefs and an evaluation of those beliefs (i.e. belief strength). Attitudes (ATT), subjective norms (SN) and perceived behavioural control (PBC) are considered latent variables that cannot be observed, but must be inferred from observed responses. These variables can be assessed both directly and indirectly. Direct measures focus on the global assessment of ATT, SN and PBC, while indirect measures focus on beliefs and their evaluation. Both can be used to predict behavioural intentions. Measurement of beliefs is thought to provide additional insight into why people hold certain attitudes, SN and PBC. As the objective of this study is not to explore these cognitive foundations, but to gain insights into individuals' choices, only direct measures are made.

There has been a growing interest in the use of the TPB in the field of stated preference valuation, mainly in contingent valuation surveys (López-Mosquera and Sánchez, 2012; López-Mosquera et al., 2014; Liebe et al., 2011; Spash et al., 2009; Bernath and Roschewitz, 2008; Meyerhoff, 2006; Ajzen et al., 2004; Werner et al., 2002; Pouta and Rekola, 2001; Luzar and Cossé, 1998; Ajzen and Driver, 1992). Ajzen and Driver (1992) find that all three TPB components correlate strongly with stated WTP a user fee for different outdoor leisure activities. This finding is partly confirmed by subsequent studies which find that attitudes and PBC influence WTP (Pouta and Rekola, 2001; Werner et al., 2002; Ajzen et al., 2004) and another set of studies which detect effects of attitude and subjective norms on WTP (Luzar and Cossé, 1998; Bernath and Roschewitz, 2008). Based on these results, Pouta and Rekola (2001) conclude that WTP statements can be interpreted as behavioural intentions with respect to contributing, but also constitute an attitudinal expression regarding the good or policy to be valued. Spash et al. (2009) include ethical statements and the three TPB components in a regression model of WTP for restoring biodiversity within a river catchment. They find that the inclusion of the TPB components extraordinarily improves explanatory power (adjusted R^2 increases from 0.23 to 0.48), with ATT, PBC and SN explaining the greatest part of the variance in WTP. Most of the above studies find an improvement in model fit when TPB components are included. Elsewhere, Bernath and Roschewitz (2008) include components of TPB to explain protest responses and WTP in a study valuing urban forests. They find that attitudes towards the payment vehicle and negative subjective norms increase the probability of a protest response.

Using structural equation modelling (SEM) Meyerhoff (2006) finds that all three TPB components influence stated WTP for improved river ecosystem benefits. His results demonstrate that only attitudes towards the behaviour (i.e. paying money) rather than attitudes towards the environmental good or general environmental attitudes directly influence behavioural intentions and the predictive power of the model. López-Mosquera and Sánchez (2012) apply SEM to test the explanatory power of the TPB and the norm-value-belief theory (Stern et al., 1999) for WTP for an urban park. They find that the components of both theories motivate respondents' intention to pay for conservation, although TPB provide greater explanatory power of WTP. López-Mosquera et al. (2014) further extend the TPB to show that moral and personal norms affect both the attitude component of the TPB and stated WTP.

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