The impact of group dynamics on the outcome of deliberative monetary valuation studies of ecosystem services

Summary. Deliberative monetary valuation (DMV) studies of ecosystem services promise to give respondents the opportunity to exchange opinions and knowledge before making value statements. However, under certain conditions, group dynamics may prevent small groups from effectively pooling the individual knowledge of their members. This article empirically addresses one specific aspect of group dynamics that may impact on the sharing of information among participants: the initial preference distribution in groups. Drawing on a DMV study of forest ecosystem services in West Saxony, Germany, it is shown that the initial preference distribution in groups influences both the diversity of arguments exchanged during group discussions and the content and construct validity of value statements. This suggests that future DMV studies should be conducted with groups with heterogeneous initial preferences as a failure to do so may lead to an ineffective sharing of information, ill-advised value statements and, hence, biased valuation outcomes.

1 Introduction

Deliberative monetary valuation (DMV) integrates stated preference methods with an interactive group setting. It promises to give respondents the opportunity to exchange opinions and knowledge before making preference statements regarding ecosystem services. This distinguishes DMV from conventional stated preference studies based on individual interviews, which are feared to leave respondents with insufficient knowledge to make well-informed decisions. It is argued that an effective exchange of information better enables respondents to discover their individual preferences with regard to complex, and often poorly understood, ecosystem services, hence improving the validity of value statements (Lienhoop and MacMillan 2007, MacMillan et al. 2002, 2006).

However, under certain conditions, group dynamics may prevent small groups from effectively pooling the individual knowledge of their members (Turner et al. 2010). Although this threat has been mentioned occasionally in research and review papers, quantitative evidence about the existence of adverse effects of group dynamics on the outcome of deliberative monetary valuation studies is currently lacking. This article addresses one specific aspect of group dynamics that may impact on the sharing of information among participants in a DMV study of ecosystem services: the initial preference distribution in groups. The initial distribution of individual preferences within a group describes the relative shares of group members with specific, prediscussion preferences. Based on a review of social psychology literature (e.g. Brodbeck et al. 2007), hypotheses about the specific effects of certain types of initial preference distributions on the outcome of DMV studies of ecosystem services are derived and tested. Accordingly, the objective of this study is to investigate the effects of the initial distribution of

individual preferences on (i) the number and types of arguments raised in discussions sessions, (ii) stated preferences, and (iii) preference certainty.

2 Study area and data collection

The analysis draws on a deliberative study of public preferences for afforestation in the Mulde watershed in West Saxony, Germany. West Saxony is one of the least densely afforested areas in Germany. A DMV study was conducted in February 2014 to elicit public preferences for afforestation-induced changes in the provision of different forest ecosystem services. Preference elicitation was conducted by means of a choice experiment with four generic attributes: landscape aesthetics, water purification, carbon sequestration and change in annual household expenses. The selection of these attributes was based on in-depth interviews with planning, nature conservation and forestry authorities as well as focus groups with members of the general public. Impacts of different afforestation scenarios on the provision levels of the investigated ecosystem services were obtained from a SWAT[1] model for water purification, and a dynamic vegetation model (LPJ-GUESS) for carbon storage (Seppelt, et al., 2013; Lehsten and Scott, 2014; Smith et al. 2008). A D-efficient fractional factorial main effects design was applied to reduce the number of choice tasks to a manageable level.

The choice experiment was conducted in a deliberative setting using the Market Stall approach to ensure that respondents have sufficient background information and the opportunity to discuss about afforestation in West Saxony. The group discussions were audio-recorded and transcribed. The transcribed discussions were then coded to enable a frequency analysis of the number and types of statements made by participants during group discussions. Additional information on respondents' socio-economic characteristics, attitudes and perceptions of the preference elicitation process was collected through structured questionnaires.

3 Results

Results of a frequency analysis of qualitative discussion data indicate a positive effect of initial preference heterogeneity on the diversity of arguments exchanged during group discussions. In particular, statements claiming that afforestation comes at the cost of losing fertile agricultural land and statements stressing the global nature of the carbon emission problem which limits the impact of regional increases in carbon sequestration through afforestation were made exclusively in groups with heterogeneous initial preferences.

Using generalized multinomial logit models in willingness-to-pay (WTP) space (Train and Weeks 2005; Fiebig et al. 2010), results show that, in line with the observed differences in discussion content between groups, the mean WTP for improved carbon sequestration decreased after discussion in groups with heterogeneous initial preferences while it increased in groups with homogeneous initial preferences. This suggests that initial preference heterogeneity improves the content validity of stated preferences as respondents in respective groups make their value

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[1] Soil and Water Assessment Tool.

statements on the basis of a more complete set of decision-relevant information. Furthermore, the estimation results indicate a positive effect of initial preference heterogeneity on the construct validity of stated preferences. While post-discussion choices made by members of groups with heterogeneous initial preferences were in line with expectations of standard economic theory, choices made by members of groups with homogeneous initial preferences violated these assumptions (i.e. costs of afforestation were disregarded). Contrary to discussion content and value statements, results show that self-perceived choice certainty of participants is not influenced by the initial distribution of preferences.

4 Conclusions

Overall, the outcome of this analysis suggests that DMV studies of ecosystem services are more effective in terms of generating a solid basis for decision-making for respondents when conducted with groups that exhibit heterogeneous initial preferences. Future DMV studies should therefore be conducted with groups with heterogeneous initial preferences as a failure to do so may compromise the content and construct validity of valuation outcomes and, hence, lead to ill-advised policy making. However, further research is needed to further improve our understanding of the complex effects of group dynamics on the outcome of DMV studies of ecosystem services.

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