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ANALYSIS

Valuing the non-market benefits of wild goose conservation: a comparison of interview and group-based approaches

Douglas C. Macmillan [a,*], Lorna Philip [b], Nick Hanley [c], Begona Alvarez-Farizo [c]

[a] *Department of Agriculture and Forestry, University of Aberdeen, MacRobert Building, 581 King Street, Aberdeen AB24 5UA, UK*
[b] *Department of Land Economy, University of Aberdeen, Aberdeen, UK*
[c] *Department of Economics, University of Glasgow, Glasgow, UK*

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Abstract

Wild geese graze on improved pastures and young cereal crops and hence can cause considerable damage to agriculture, particularly in areas close to roosting sites. This study uses contingent valuation (CV) to establish whether government compensation payments currently made to farmers represent 'value for money' by estimating the value placed on goose conservation by the general public. Benefit estimates from a conventional interview approach are compared with a group-based approach, called the 'Market Stall (MS)'. This involves two 1 h meetings held 1 week apart and differs from conventional interviews in that participants are given more time to consider their preferences and to discuss their WTP question with other household members. We argue that this type of group-based approach to environmental valuation offers important advantages over individual interview approaches, especially for unfamiliar and/or complex environmental goods.

Keywords: Market stall; Contingent valuation; Willingness to pay; Wild geese

1. Introduction and aims

Scotland is an important destination for migratory wild geese in the winter months. Islay, a small island on the Atlantic seaboard, is home to over 80% of the world population of the internationally endangered Greenland White-fronted Goose. In addition, large concentrations of non-endangered species such as the Icelandic Greylag Goose and the Pink-footed goose are found throughout eastern areas of the mainland.

Over the last 30 years goose numbers have expanded rapidly and this has brought conservation efforts into direct conflict with farmers. Wild geese graze on improved pastures and young cereal crops, causing considerable damage and financial losses to agriculture in areas close to reserves and

* Corresponding author. Tel.: +44-1224-274-128; fax: +44-1224-273-731
E-mail address: d.macmillan@abdn.ac.uk (D.C. Macmillan).

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other secure roosts. In order to alleviate this problem the government has proposed that farmers be compensated for goose damage in the most badly affected areas such as Islay.

Wild geese are valued by many sections of the population. Birdwatchers enjoy visiting goose reserves (a use value), while a broader range of people may simply take pleasure from knowing they exist (non-use value). Although monetary estimates of environmental benefits based on contingent valuation (CV) and other stated preference techniques are now widely available, policy-makers are not always convinced they represent a valid measure of WTP due to the sheer magnitude of the values generated and, to some extent the extensive use of personal interviews to collect WTP data for unfamiliar environmental issues.

The aim of this study is to compare two alternative WTP data collection methods for wild goose conservation: (i) a conventional CV survey based on personal interviews and (ii) a group-based approach called the 'Market Stall (MS)'. The MS approach involves two 1 h meetings held 1 week apart and hence differs from conventional interviews in that participants are given more time and information to consider the project, and are able to discuss their underlying preferences and WTP with other household members and friends. We argue that this type of group-based approach to environmental valuation offers important advantages over individual interview approaches, especially for unfamiliar and/or complex environmental goods.

In addition to comparing mean WTP, we also compare the two approaches with regard to the level of certainty individuals attach to their stated WTP and the extent to which variation in WTP can be predicted by relevant socio-economic variables. We also compare qualitative information about the validity of the valuation process based on conversations with both MS participants and interviewees following the CV exercise.

The remainder of the paper is structured as follows: Sections 2 and 3 outline how the MS approach can help overcome some of the limitations of interview-based valuation methods. Section 4 briefly describes the design of the valuation exercise for this case study, with results and discussion presented in Sections 5 and 6.

2. Problems with interview surveys

CV is conventionally applied through in-person interviews carried out by professionally trained staff[1]. Typically, this can involve anywhere between 100 and 1000 interviews, each one lasting between 10 and 30 min. The interview process normally takes place in the family home of the respondent or 'on site' (in the case of recreational visitors), and is conducted by a trained interviewer who provides information about the project or policy as laid out in the survey materials.

During the interview the respondent is expected to assimilate information about an environmental project (which they may not have any prior knowledge of), search their memory for other pertinent information, integrate this into a judgement about their WTP based on their preferences and income, and communicate this judgement to the interviewer (Hanemann, 1994). For decisions involving unfamiliar and/or complex environmental policies such as wild goose conservation, especially where non-use values are being sought, this standard process places considerably greater demands on the consumer than most market transactions.

In the context of CV surveys, particularly those concerned with unfamiliar environmental goods, personal interviews would appear to face some potentially serious limitations. First, with perhaps as little as 5 min spent on the valuation question, the respondent has little time to think carefully about the project, research their underlying preferences, form and then state a WTP value. Second, many respondents are unlikely to receive information that is suited to their individual needs (cognitive ability, existing knowledge, etc.). In CV surveys, the aim is to provide information that can be understood by the majority of potential re-

[1] The influential NOAA report (NOAA, 1993) recommended this approach rather than mail or telephone surveys.

spondents, without being too simplistic. The level of information required to make a decision will vary from individual to individual, hence standardised information sets, no matter how well designed, will unavoidably run the risk of leaving some respondents either unconvinced by the oversimplistic nature of the questionnaire (information underload) or confused (information overload). A number of studies have shown that the effort required in CV surveys is beyond the cognitive abilities of some respondents and can lead to WTP values being based on fairly superficial cues or simple cognitive heuristics (Ajzen et al., 1996; Blamey, 1998). Less attention has been directed at the effect of information underload, but it is conceivable that oversimplified information could generate protest or perhaps flippant responses.

Third, the social context established by an interview situation is highly unusual for economic decision-making, and can intimidate some respondents to the extent that their answers may not reflect their actual preferences. For example, some interviewees may opt for a 'quick escape strategy' such as 'yeah-saying' or 'protesting' to terminate the interview quickly (Clark et al., 2000). Others may wish to have more time to consider or discuss their preferences. Brouwer et al. (1999) for example, found for the majority of participants in a CV survey about a flood alleviation project, that their understanding of the questionnaire and the WTP question in particular, would have been improved if they had been able to discuss the issues beforehand. Finally, whilst individual survey questionnaires provide quantitative data on attitudes, behaviour and WTP, they provide little in the way of in-depth information on context, values and perceptions.

3. The market stall (MS) approach

The MS approach has evolved out of recent experience with Citizen Juries (CJ) in environmental decision-making. CJ are small groups of citizens, usually around 12 in number, drawn from the relevant population to discuss a particular issue over 2 or 3 days (Coote and Lenaghan, 1997). The jury members, who are selected to be 'symbolically representative' of this population, hear witnesses present evidence on the issue, question these witnesses, and (usually through break-out groups), decide on an agreed preferred course of action (Kenyon et al., 2001).

In an early conceptual paper on CJ, Brown et al. (1995a,b) suggested that they could be used to come up with monetary estimates of natural resource damages or an estimate of what constitutes 'an acceptable cost'. However, in practice WTP amounts have not usually been sought, as individual valuations can be quite contrary to the jury's perceptions of what is important in terms of project appraisal. For example, the jury may wish to emphasise the need to assess the project under a multiplicity of criteria rather than a single WTP measure or may consider social well-being to be rather more important than individual well-being.

The MS approach is an attempt to combine the desirable features of group techniques such as CJ with the particular requirements of economic valuation and cost-benefit analysis. MS differs from CJ in that it explicitly combines aspects of participatory methods, but with the primary intention of producing WTP estimates. The MS approach involves between five and ten participants attending two group meetings spaced approximately 1 week apart. The first meeting (MS1) is primarily concerned with the presentation of relevant information (about the proposed project) described in an 'Information Folder', and a detailed explanation of the contingent market and payment vehicle. Participants are given the opportunity to discuss any aspect of the project and to question the moderator. A 'Question and Answer Sheet' at the back of the folder is also provided to help clarify issues such as the use of taxation as an appropriate funding method. The group meeting concludes with a WTP question, which respondents answer confidentially in writing.

During the week-long interval between the two group meetings, participants are asked to complete a daily diary in which to record their thoughts and questions about (in this case) goose conservation and any relevant activities such as watching nature programmes or visiting bird reserves. At the second group meeting (MS2) participants are

given the opportunity to ask questions and to discuss any unresolved issues concerning the project. The WTP question is then re-administered to participants. A de-briefing exercise can be carried out to establish the extent to which participants understood the approach as a means of establishing the values they place on goose conservation.

In comparison with the interview approach to CV, the MS approach provides a very different decision-making environment. In particular, it attempts to address three important limitations of conventional interviews: (1) it provides participants with more time and information to determine their WTP; (2) participants can benefit from an informal setting where in-depth discussions with the moderator and other group members can take place; and (3) the week-long interval between the two meetings provides the opportunity for participants to re-evaluate their WTP following further thought, information searching, and crucially for household economic decisions, discussions with family members and/or friends. In addition, more detailed deliberations can be facilitated to provide the decision-maker with a richer and more complete picture of peoples' perceptions of, and reactions to, the environmental issue than is possible with CV surveys (Crosby, 1998; Kenyon and Hanley, 2001).

4. Design and implementation of the case study

The CV method was used to elicit WTP for both the individual interview and MS approaches. The design and content of the CV questionnaire, guided by six focus groups held in different locations throughout Scotland, followed a standard four-section format and was identical for both the MS and personal interview groups.

Section 1. General questions about the environment and attitudes to wildlife conservation.
Section 2. Description of the conservation and management of wild geese and the problems they create for farmers.
Section 3. Description of the payment method (increase in general taxation over the next 10 years) and market context; and a WTP question.
Section 4. Validation questions (socio-economic, behavioural and attitudinal).

WTP was elicited using a payment card approach with eight bid levels drawn from a randomised distribution of results from an open-ended WTP pilot study. Each of the eight bids was read out to respondents in a random order to avoid problems with anchoring and sequencing. Respondents were able to indicate the degree of certainty that they attached to their response. Five responses to each payment level were, therefore, possible: Definitely Pay (DP); Probably Pay (PP); Not Sure (NS); Probably Not Pay (PNP); and Definitely Not Pay (DNP). This payment format is increasing; popular as the data can be analysed either as lower bound estimates of 'open-ended' WTP or as polychotomous choice data (Welsh and Poe, 1998). It also provides some information with which to investigate respondent uncertainty across collection mode. Four different payment cards were used for the interview sample but only one (Payment Card D) was used in the MS due to the relatively small sample size. The sampling design is described in Table 1.

(Payment Card D bid levels were: £0.75; 5, 9, 12, 22, 33, 108, and 220. The payment card format is replicated in Appendix A).

A market research company implemented the interview-based questionnaire. Interviews took place in homes throughout Scotland using a sampling frame based on quotas for age, income, and sex. In total, 251 interviews were completed. Following the survey a small number of individuals participated in a debriefing exercise over the phone within 1 week of completing the questionnaire.

A total of 52 members of the general public, divided into eight groups of between four and eight people attended the MS1. Recruitment using the same quota sampling approach as in the survey took place in four separate locations. A handful of people did not return for the MS2, of which all, with the exception of one individual who had left the area on business, completed the diary and

Table 1
Sample design for the interview survey and MS

Payment card used	Number of respondents			
	Interview survey		MS	
	All species (Project B)	Endangered species only (Project A)	All species (Project B)	Endangered species only (Project A)
A	34	29	*	*
B	32	34	*	*
C	28	31	*	*
D	32	31	26	26
Sub-total	126	125	26	26
Total	251		52	

second payment card either over the phone, or by returning the forms in the post.

Both meetings concluded with the same WTP question format used in the interviews, with one procedural difference: MS respondents were asked to write down their responses and place their answers in a sealed envelope rather than respond verbally. This was done to afford the participants with some degree of confidentiality. MS participants were also asked to complete the same set of basic questions about socioeconomic status and attitudes to various environmental issues that were contained in the interview survey.

5. Results

The sub-samples were first tested to establish if there were any significant differences between the in-person and MS participants in terms of their socioeconomic status. No significant differences were found in terms of income, household size and age. Table 2 describes the frequency of response to the eight payment levels broken down into the five possible response categories. Significant differences were found between MS participants and the interviewed sample (at the 1% level) and between MS1 and MS2 (at the 5% level) based on the Pearson χ^2-test. Respondents who were interviewed were most certain about their WTP, with a higher proportion of people in the definite categories (DP and DNP) than in either MS1 or MS2. MS1 participants were least certain overall.

For simplicity, the remainder of the analysis focuses on the two categories of positive WTP: the maximum amount on the payment card that the participant states they would DP and PP. The former is a popular interpretation of payment card responses, as it provides policy-makers with 'conservative' estimates of WTP. To avoid any payment card effects affecting the comparison between the interview survey and the MS, we report only results from interviewees who were given the same payment card as in the MS (Payment Card D).

Figure 1 describes the frequency of WTP amounts that people were certain they would pay DP. As expected the distribution is skewed toward the lower bid amounts, especially zero. In MS1 and MS2, WTP approximates a demand function for a normal good, with the number of people being prepared to pay declining as the bid amount increases. In the interview sample, moderate to high WTP values are more frequent.

Table 3 describes mean WTP for MS1, MS2 and the interviewed sample, averaged across both management scenarios. In almost all payment categories, mean WTP was higher for the interviewees than for either MS1 or MS2 participants. Statistically significant differences exist (based on an independent sample t-test) at the 5% level for both the DP and PP categories (MS2 only). WTP was significantly higher in MS1 than in MS2 in the PP category at the 5% level (based on a paired sample t-test), but no significant difference was found in the DP category.

Table 2
Frequency of responses to offered payment level

	MS1	MS2	Interviews	Total
Intention to pay...				
DP	66 (17%)	71 (18%)	134 (33%)	271 (23%)
PP	67 (17%)	45 (11%)	44 (11%)	156 (13%)
NS	49 (13%)	44 (11%)	29 (7%)	122 (10%)
PNP	59 (15%)	56 (14%)	27 (7%)	142 (12%)
DNP	151 (38%)	184 (46%)	174 (42%)	509 (42%)
Total number of WTP responses (number of participants)	392 (49)	400 (50)	408 (51)	1200 (150)

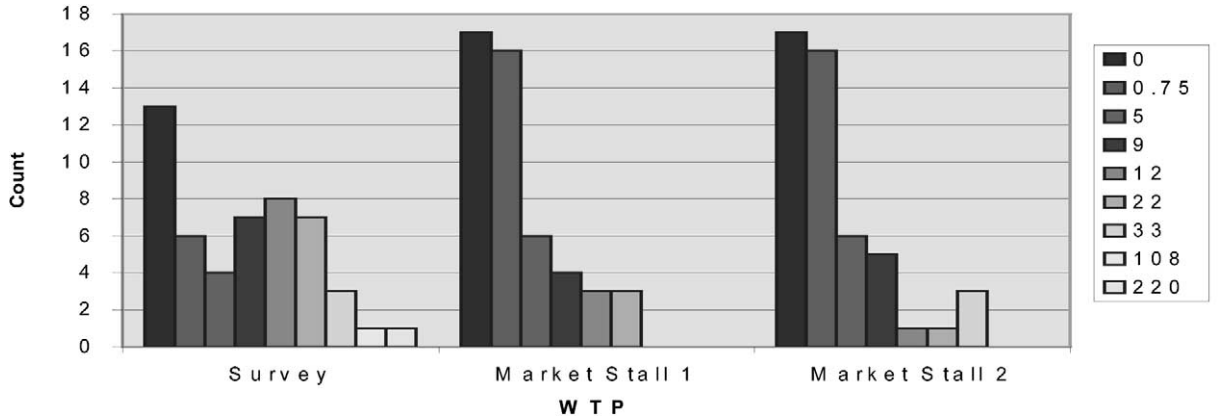

Fig. 1. Frequency distribution of WTP amounts based on 'definitely would pay category for interview survey, MS1 and MS2.

The comparison of means masks the extent to which MS participants revised their WTP in the interval between the two meetings. In the DP category, for example, where mean WTP only increased from £3.67 to 4.49 between MS1 and MS2, 37% of participants changed the maximum amount they would pay (20% upwards, 17% downwards) with a correlation co-efficient of 0.591 (significant at the 1% level).

Table 3
Mean WTP (£/household per year) for MS1, MS2, and interviewed sample (significant difference between MS1 and MS2 1%$^{\xi\xi\xi}$; 5%$^{\xi\xi}$; 10%$^{\xi}$; between MS1 and interview survey: 1%***; 5%**; 10%*; and between MS2 and interview survey 1%$^{\#\#\#}$; 5%$^{\#\#}$; 10%$^{\#}$)

	MS1	MS2	Interviews
Intention to pay...			
DP			
Mean	3.673**	4.490$^{\#\#}$	15.290** $^{\#\#}$
S.E.	(0.852)	(1.215)	(4.817)
N	49	50	51
PP			
Mean	12.832$^{\xi}$	8.786$^{\xi}$ $^{\#\#}$	23.020$^{\#\#}$
S.E.	(3.076)	(2.372)	(6.227)
N	49	50	51

The validity of WTP estimates can be investigated by regression analysis to determine the extent to which WTP can be satisfactorily explained by socioeconomic and attitudinal variables. The dependant variable used was DP and the independent variables are given in Table 4. As the dependant variable is censored at zero and at £220 (the highest bid amount), a double-censored Tobit estimator was used. Table 5 describes the fitted models for the interviewee and MS data.

For both the MS and interview data sets the covariates influence WTP in a manner consistent with a priori expectations. However, the MS2 data produces a superior model with statistically sig-

Table 4
Covariates used in the regression analysis

Covariate name	Description
Wildlife	Priority attached to wildlife as a part of overall government policy (1, very high; 5, very low)
Geese	Priority attached to geese as a part of conservation policy (1, very high; 5, very low)
Member	Member of an environmental organisation (1, member; 0, non-member)
Income	Income category 1–8 (1, lowest; 8, highest)
Household	Number of people currently in household
Interviewer	Interviewer used in the individual interview survey (dummy variable)
Group	MS group (dummy variable)

nificant relationships established between WTP and Household (household size) at the 1% level, Wildlife and Member (5% level), and Geese (10% level). By contrast, Wildlife (5% level) is the only significant covariate in the interview sample. Adjusted R^2-values from a similar OLS regression procedure were estimated as 0.365 for the MS2 sample, and 0.173 for the interview sample, indicating that more of the variation in WTP could be explained by socioeconomic variables. Method specific effects such as 'interviewer' and 'group' were tested for but were not statistically related to mean WTP. In other words, no detectable interviewer effect was present in the interviews sample, and no detectable effect was found in the MS sample according to which group people were in.

6. Discussion and conclusions

As noted above, mean household WTP varied depending on the project described and, to a much greater extent, on the method of survey implementation. MS estimates were consistently lower than equivalent WTP measures for the interviewed sample: overall, they were 3.5 times lower than the interview estimates. Although we cannot state whether the MS approach has generated a more accurate estimate of actual WTP, we know from studies that have compared actual WTP with hypothetical CV WTP, that the latter usually exceeds the former by a factor of between 2 and 10 (e.g. Champ et al., 1997; Duffield and Patterson, 1992; Navrud and Veisten, 1996). Hence, it is possible that MS estimates of WTP are closer to actual WTP than interview-based estimates. MS based values also performed better in the bid curve analysis. We also found that the distribution of WTP bids conformed more closely to prior expectations for a normal good in the MS.

One explanation for this divergence in mean WTP could be the time available to make a decision. In the MS, participants have 1–2 h at each meeting to consider their preferences for the project and to form a value. They also had 1 week-

Table 5
Regression estimates for MS2 and the interviewed sample

Significant variables at 10% level	Coefficient	S.E.	*t*	Probability value
MS2				
Constant	−2.186	4.237	−0.516	0.6059
Wildlife	−1.350	0.634	−2.129	0.0333
Geese	−1.918	1.037	−1.850	0.0644
Member	7.817	3.916	−1.996	0.0459
Household	4.030	1.500	2.686	0.0072
Sigma	8.499	1.106	7.684	0.0000
Main survey				
Constant	−3.568	22.610	−0.158	0.8746
Wildlife	17.376	5.758	3.018	0.0025
Sigma	37.922	4.705	8.060	0.0000

long interval to consider the issue further. By contrast, interview respondents had only one brief opportunity to evaluate their WTP. There is strong evidence that participants used this time to re-evaluate their WTP, with 37% of the MS sample changing their mind during the week-long interval between meetings. This finding is supported by other research that suggests that additional time does result in respondents revising their WTP. For example, Whittington et al. (1992) found that respondents who were given the same CV questionnaire a day later revised their bids downwards. Also Kealy et al. (1990) and Loomis (1990) found a relatively low correlation co-efficient (0.5–0.7) between WTP in test–retest surveys. In the Kealy study the same survey was repeated 2 weeks apart, whereas the Loomis survey was repeated following an interval of 9 months. (Fluctuations in WTP in the latter study could, therefore, be explained by changes in income, preferences etc.).

Evidence from the MS discussions and from the completed diaries suggests that many people took advantage of the break between sessions to re-evaluate their household WTP by researching their preferences and considering budgetary implications. For example, one MS participant stated that his WTP fell after watching a programme about endangered tigers in India, which he considered in retrospect to be of more concern to him and his family than wild geese. Above all, the opportunity to consult with family members and friends, and gathering further information, was remarked upon. Family discussions were considered to be very important to many participants and a number emphasised the discussions they had with their children, who tended to have a more positive attitude towards goose conservation than their parents did.

Another important aspect of increasing the time available to make a decision is the opportunity it gave to gather more information. According to diary evidence, many participants spent some time enhancing their understanding and knowledge of the goose issue (e.g. by visiting the library or the local bird reserve, and scanning books and newspapers). In addition, MS participants were able to reread and absorb the information described in the Information Folder and talk to other people to enhance their information levels. Numerous studies have shown the impact of information on WTP (e.g. Munro and Hanley, 1999; Stephenson and Taylor, 1988), particularly where unfamiliar environmental goods are concerned.

Although the importance of time and information are recognised as important by CV researchers, the conventional interview approach imposes considerable restrictions on respondents. First, during the interview there is little time to describe, explain or enrich the information set given to respondents. Some of the respondents in the interview CV sample who participated in the debriefing exercise expressed a sense of frustration with the survey. For example, several respondents expressed disquiet about the very limited time they had to digest the information and to discuss it. One woman was interviewed just after returning home from dinner with friends, and did not concentrate because her friends were waiting on her. Another felt that the information given was oversimplified and had subsequently visited her local library to find out more.

Second, interviewees were much more certain of their WTP than MS participants. While a greater degree of certainty about WTP would be welcomed by decision-makers, a more negative interpretation of this result is that people are unwilling to express uncertainty to the interviewer. For example, one interviewee, during debriefing, mentioned that they had not used the 'uncertain' WTP categories because they did not wish to appear undecided to the interviewer for the fear of prolonging the interview. Alternatively, it could be that MS discussions tended to encourage more uncertainty about the WTP. Although we have no evidence for this, it is clearly an area for further research.

However, there are several other issues concerning the MS approach that deserve to be investigated before firm conclusions can be drawn about its reliability. First, being a group-based approach, there is the risk that 'group norms' develop which might influence reported individual WTP. For example, certain participants may not wish to disagree with the rest of the group, or may be overly influenced by a dominant person within the group. Polarisation may also occur, whereby an

individual may adopt a more extreme position than they would otherwise have done to distinguish themselves from the other participants (Isenberg, 1986). Feedback from individual participants after the MS suggested that this was not the case, but more investigation is warranted.

There may be greater opportunity to think and act strategically in the MS. For example, participants may use additional time and information to calculate a 'fair' donation rather than their maximum WTP. Participants could also potentially overestimate WTP in order to increase the probability of the environmental good being provided. However, direct evidence for strategic thinking was confirmed by only one participant in the MS session, who stated that they were willing to pay was based on what they considered to be a fair amount for everyone to pay. This is consistent with the findings of Whittington et al. (1992), who also found little evidence for strategic behaviour in a 'time to think' study. However, it is clear that the MS does offer the potential for strategic bidding and appropriate checks and protocols to minimise the risk of it occurring are essential.

Clearly the role of the moderator is very important in the MS and she/he must be highly trained in group discussion techniques and have a detailed knowledge of the environmental project. The moderator also has to be proactive and encourage the discussion along appropriate lines, for example by countering any tendencies toward 'strategising' but without unduly influencing the WTP of participants for the project.

If aggregation to the population level is required, then the small sample size involved in the MS sessions is an obvious disadvantage compared with interviews. Although it may not be cost-effective to increase the sample size involved in a MS exercise to those of surveys, representativeness of the MS sample could be improved by using sophisticated quota sampling methods (for example, see Harrison and Lesley, 1996). Statistical precision could also be enhanced by increasing individual group sizes (if this can be achieved without any negative effects on the quality of the discussion sessions). In applications where aggregation of WTP to the population level is not a primary objective, the MS approach has considerable potential both as a research tool and as a decision-support mechanism. In research it could be used as a means of testing for information effects on WTP, as a cost-effective method for obtaining marginal WTP estimates for scope effects (e.g. marginal changes in the supply of the environmental good), as a means of calibrating WTP from conventional interview surveys, and as a cost-effective approach to establishing how WTP varies between special interest groups (e.g. bird-watchers, fishermen, tourists etc).

Based on the findings presented here several other areas appear to be worth further research. First it would be interesting to compare a group and individual approach. In the latter, the participant would be given the same amount of time and information to come to a decision about their WTP as in the group approach, but they would not be able to participate in a group discussion. This comparison would provide evidence about the role of group discourse. Second, in the MS people were able to respond to each bid in secret (the ballot box approach), but in the in-person survey, the respondent had to respond verbally to the interviewer. It would be worth testing for any ballot box effect in future research.

Overall, our findings suggest that there is evidence that moving to a group-based survey mode could enhance CV in several ways. First, information becomes more useful if misunderstandings and gaps can be resolved. Second, discussion of an issue helps people learn what they want to know in order to make a rational decision. Participants also benefit from an informal setting where in-depth discussions with the moderator and other group members can take place. Finally, the week-long interval between the two meetings provides the opportunity for participants to re-evaluate their WTP following further thought, information searching, and crucially for household economic decisions, discussions with family members and/or friends.

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Appendix A: Payment question

Would you support this new project to increase the population of all four goose species by 10%?

Yes

No

Unsure

Please explain your answer here.

Imagine that the additional costs of the project resulted in your household having to pay more tax each year for the next 10 years. I would like you to think about how much your household would be prepared to pay.

For each payment level that is read out to you below, please indicate (by a tick) which statement best describes your response. Before answering please consider what you can afford. Also please assume that all tax revenue will be spent on only on this project.

	Tax level 1	Tax level 2	Tax level 3	Tax level 4	Tax level 5	Tax level 6	Tax level 7	Tax level 8
Definitely would pay this amount								
Probably would pay this amount								
NS								
Probably would not pay this amount								
Definitely would not pay this amount								

Use the space below to describe what influenced your decision.

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