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Contingent Valuation: Comparing Participant Performance in Group-Based Approaches and Personal Interviews

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ABSTRACT

This paper reports a Contingent Valuation application to estimate the non-market costs and benefits of hydro scheme developments in an Icelandic wilderness area. A deliberative group-based approach, called Market Stall, is compared to a control group consisting of conventional in-person interviews, in order to investigate flaws of Contingent Valuation, such as poor validity and protest responses. Perceived property rights suggested the use of willingness-to-accept in compensation for wilderness loss and willingness-to-pay for hydro scheme benefits. The study is novel as it applies participant behaviour observation to gain insights into the shortcomings of conventional data collection modes. Main drawbacks with in-person interviews were found to be low motivation, standardised information and time pressure which hindered individuals from carefully considering their preferences. Market Stall performed better in the study: welfare estimates were more easily explained by socio-economic variables, the non-response rate was lower, and respondents were more engaged. Our research findings also suggest that participant behaviour can be used to supplement conventional validity tests.

KEYWORDS

Contingent valuation, preference construction, Market Stall, wilderness, motivation

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1. INTRODUCTION

In theory, Contingent Valuation (CV) respondents are expected to consider and answer the willingness to pay (WTP) question in a way that coincides with economic theory. That is, they are required to make a trade-off between their budget constraint and their preferences for the good. As long as a respondent is familiar with the commodity to be valued, this trade-off should be relatively straightforward because preferences are simply retrieved from an existing preference set (Schkade and Payne, 1994). However, the application of CV is most required for public goods, which are complex and/or unfamiliar, and it has been questioned whether respondents are able to answer the WTP question when their preferences are not fully defined (e.g. Fischhoff et al., 1980; Slovic, 1995 and Svedsäter, 2003).

A number of research studies have revealed that respondents fail to make this crucial trade-off and take a number of other considerations into account when responding to the WTP or willingness-to-accept (WTA) question. Examples include the purchase of moral satisfaction, protesting, symbolic responses to environmental issues, strategic bidding and non-responses to the payment question (see Kahneman and Knetsch, 1992; Schkade and Payne, 1994; Clark et al., 2000 and Spash, 2000). All these response types undermine the validity of WTP results as they provide false signals about respondents' preferences, and suggest that respondents may not have defined preferences for environmental goods. While some critics argue that these problems arise because values are incommensurable (e.g. Trainor, 2006), Whitehead et al. (1995) suggest that future research is required to properly assess the accuracy of WTP for complex and/or unfamiliar environmental changes.

Given the complex nature of the valuation task, for which preferences may need to be constructed, a number of researchers suggest a deliberative or interactive approach is used to assist participants to rationalise the valuation process and help attain a sufficiently high level of motivation to complete the valuation task (Cherry et al., 2003; Burgess et al., 2000; Ward, 1999; Sagoff, 1998 and Gregory et al., 1993). Furthermore, Cherry et al. (2003) suggest that people adjust their behaviour to eliminate inconsistent choices when arbitrage is involved in the decision-making environment. Gregory et al. (1993) advocate that CV study designers 'should function not as archaeologist carefully uncovering what is there, but as architects, working to build a defensible expression of value' (p. 179).

The aim of this study is to elicit thoughtful and informed economic trade-offs and to assess the potential for using observations of participant behaviour as a means of enriching the validity and accuracy of CV. The study examines a group-based deliberative approach, called Market Stall (MS), in comparison with conventional in-person CV interviews with regard to participant motivation and preference construction. Several indicators are used to investigate validity of

the valuation process: statistical tests of validity of WTP/WTA value estimates, the ability to formulate an open-ended WTP or WTA bid, observed participant motivation during the exercise, as well as participants' attitudes towards the valuation exercise.[1]

While a range of authors have looked at motivations behind WTP amounts (see Cooper et al., 2004; Kotchen and Reiling, 2000; O'Neill and Spash, 2000; Spash, 2000; Spash, 1997 and Knetsch, 1994) hardly any attention has been directed towards motivation toward participating in CV surveys. This study is novel in a sense that positive or negative motivation regarding the exercise might be an important supplement to conventional validity testing. Furthermore, as opposed to other group-based CV research, this study keeps the amount of information and time constant in order to test for discussion effects. A valuation study on the costs and benefits of proposed hydro scheme developments in a wilderness area in Iceland is used as a case study to explore the potential advantages of group discussions in the valuation of complex goods.

The remainder of the paper is organised as follows: Section 2 discusses the limitations of conventional survey methods used for CV in terms of preference construction and describes the MS approach. Section 3 describes why motivation is necessary in CV and how participant behaviour was examined. In Section 4, the design of the valuation study is outlined. Results and discussions are presented in Section 5 and 6.

2. PREFERENCE CONSTRUCTION AND MOTIVATION IN CONVENTIONAL INTERVIEWS AND DELIBERATIVE APPROACHES

A number of CV studies have provided evidence that preferences are labile and sensitive to task and context factors, that is, preferences may vary depending on the decision-making environment in which they are elicited (e.g. Desvousges et al., 1993 and Macdonald and McKenney, 1996). These findings have led psychologists to assume that preferences for environmental goods may not pre-exist in people's minds and instead need to be constructed (Fischhoff et al., 1980; Slovic, 1995; Ajzen et al., 1996; Sudgen, 1999 and Shapansky et al., 2003). If this is the case, answering a WTP or WTA question is a demanding task that requires a considerable amount of motivation and cognitive effort. According to Tourangeau (1984) respondents may become demotivated at any stage in the preference construction process required for the elicitation question and may engage in heuristics or satisficing by looking at cues that point to an answer that seems acceptable and requires little mental effort (see Dillman, 1978; Krosnick, 1991; Hanemann, 1994; Rekola et al., 2000 and Krosnick et al., 2002).

In CV, when faced with valuing an unfamiliar and/or complex public good, motivation is especially important as participants are expected to actively search for information in their memories or use new information conveyed to them in

order to make an informed purchase decision. Normally, respondents become demotivated when the perceived benefits of participating in a survey exceed the costs such as time, inconvenience, mental effort and embarrassment. In CV respondents' benefits are few and intangible, e.g. being part of a carefully selected sample and interest in one's views (Dillman, 1978). Furthermore, in a CV interview, the full costs of participating are often not revealed until during the interview, when participants realise the amount of information they are expected to process and the mental effort required to answer the payment question. Hence, motivation that was high initially may decline or even disappear. If a certain level of motivation is to be maintained throughout the CV exercise, an appropriate decision-making environment for this highly cognitive task is required. One of the prime tasks for CV is therefore to trigger sufficient respondent motivation to consider the hypothetical trade-off, by adjusting the task to suit a wide range of individual abilities, decreasing task difficulty, and finding an appropriate decision-making environment in social terms.

While Mitchell and Carson (1989) and the National Oceanic and Atmospheric Administration (NOAA) panel commissioned to test the reliability of CV (NOAA, 1993), strongly advocate in-person interviews as the best data collection mode, recent literature suggests that one-shot in-person interviews may not necessarily be suited for CV (MacMillan et al., 2002; Blamey, 1998; Crocker et al., 1998 and Whittington et al. 1992). These authors specify three major drawbacks of this data collection mode. Firstly, the time required for cognitively processing and comprehending information about an environmental change, researching preferences and stating these in monetary terms, while taking one's budget constraint into account, is limited, with perhaps only a couple of minutes spent on the crucial and demanding WTP or WTA question. Secondly, information about the environmental good is standardised and limited, and may not provide sufficient background knowledge to enable respondents to decide on their preferences. Thirdly, the social context created by the interview situation differs from real markets: being approached by a stranger and taking a household decision in isolation is not common for complicated purchases. While in-person interviews enable researchers to obtain a representative sample, they do not provide much scope for preference construction when the good is unfamiliar or complex and preferences may not exist in peoples minds. As a consequence the costs of participating (mental effort) may be relatively high for some respondents and lead to limited motivation. Furthermore, according to Crocker et al. (1998) the valuation problem needs to be well-structured in order to enable people to state meaningful values. This requires financial incentives, sufficient participant experience and elimination of biased preconceived views.

One new approach that enables and encourages participants to give well-considered answers is to conduct the CV exercise in form of a deliberative group-based approach, called MS. This data collection mode aims to mitigate some of the problems associated with conventional data collection modes, and

meets better the needs of individuals. MS involves a group meeting with 7–12 participants lasting between 1 and 1.5 hours. During the meeting participants are presented with relevant information on the environmental change under investigation, and asked to read an information folder with detailed descriptions, the hypothetical market, and the payment vehicle. The main feature of the MS exercise is a discussion about the provision of environmental change among group members and the moderator. At the end of the meeting participants state their WTP and WTA bids anonymously in written form (MacMillan et al., 2002). A financial incentive (€ 20–25) given to each participant compensates for the costs of participating in the MS exercise.

The MS approach evolved as a hybrid approach from methods in two different disciplines: it is based on economic valuation and the theory of consumer choice and deliberative approaches known from political decision making. The latter approaches (e.g. citizens' juries) have a number of features that economic valuation via MS can benefit from: information held by group members with differing backgrounds and experience can be shared in discussions, and the exposition of participants to a wide range of perspectives, opinions, arguments, ideas and understandings generates more information and can lead to better understanding (Burgess et al., 1988; Niemeyer and Spash, 2001; Aldred, 2002 and Wilson and Howarth, 2002). These advantages are particularly important for complex and unfamiliar environmental issues where participants have a demand for information and deliberation (MacMillan et al., 2006). In principle the MS approach can also bridge the divide between consumer based approaches and political based approaches (Wilson and Howarth, 2002; Niemeyer and Spash, 2001; Ward, 1999; Sagoff, 1998 and Brown et al., 1995) by explicitly investigating issues relating to future generations and wealth distribution.

In comparison to in-person interviews, MS provides a different decision-making environment:

- Participants are provided with a range of simple and more detailed information, provided in an information folder and through deliberation with other group members.
- Participants have more time to research their preferences.
- Participants benefit from an informal social context.

All of these may reduce the costs and enhance the benefits of participating, and hence help participants to consider carefully how much they value the environmental good in question. Furthermore, the approach makes sense when comparing preference construction in the hypothetical context with preference construction in real markets. For real purchase decisions, individuals make a decision in response to information, advice, suggestions, experience of others, as well as over time (Schiffman and Kanuk, 1991 and Sagoff, 1998). The interac-

tion with other people, as encouraged in MS, therefore presents an environment that seems to better meet the needs of consumers.

3. DESIGN AND IMPLEMENTATION OF THE STUDY

The design of the questionnaire and the information folder was guided by three focus groups and a pilot survey. The format for MS participants and the interview control group was identical and included the following sections:

1) Description of the environmental goods and services provided by wilderness and hydro schemes, as well as hydro scheme impacts.
2) Description of the hypothetical market and the payment vehicle (increase or decrease in household expenses) and elicitation of WTP or WTA.
3) Validation questions about respondents' environmental attitudes and socio-economic characteristics.
4) Behaviour coding and debrief questions to investigate participant motivation.

This section describes the survey and elaborates on how the challenges described in Section 2 were tackled.

3.1. Definition of the wilderness area and hydro scheme proposals

The description of the hydro scheme proposals and the environmental assets in the wilderness area is a crucial component of the CV survey because it informs respondents of what they are purchasing or being compensated for. A considerable effort was spent on describing the complex and sometimes uncertain impacts of the hydro scheme on the wilderness area in an information folder, using literary descriptions, pictures and maps. The information folder was arranged in the following way. Firstly, positive impacts on rural economy and migration, and non-market benefits in terms of recreational opportunities were listed, to ensure that all these factors were taken into account in the respondents' decisions. Secondly, wilderness assets were split into four main groups: flora, fauna, geological features and cultural heritage. In each category, the species or features were described and information was provided on their rarity and the potential impacts of hydro schemes.

Most hydro scheme impacts are complex, and there is considerable uncertainty about actual effects. An attempt was made to list all major impacts in a way that is easily comprehensible, although this sometimes involved making assumptions and simplifications. For participants who were keen on learning more about the issue, a 'Question and Answer' sheet was provided at the back

of the information folder to clarify issues regarding wilderness assets, hydro schemes, the payment vehicle and reasons for payment/compensation.

3.2. Description of the hypothetical market

Focus groups revealed that the development of hydro schemes would generate a considerable number of project losers, that is, those who prefer wilderness, and a smaller but significant proportion of gainers, that is, people who would value the non-market benefits created by hydro schemes, such as recreational benefits related to the reservoirs and easier access to the wilderness on new roads. The hypothetical market therefore had to be designed in a way that allowed participants to engage in a monetary transaction that reflected their individual perspective.

A detailed investigation into perceived property rights in the focus group discussions revealed that that the majority of participants assumed they are currently entitled to wilderness. It was therefore concluded that CV respondents would agree with an entitlement structure that is consistent with Compensating Surplus welfare measures, that is WTA in compensation to relinquish wilderness assets and WTP to obtain the benefits associated with the hydro schemes. A realistic hypothetical market context was considered to be one based on government policy that focuses on the development of three hydro schemes in the wilderness area.

A considerable effort was made to decide on a plausible payment method that would be appropriate with regards to the credibility of the hypothetical market, as well as minimise potential biases and protest responses. Focus group discussions revealed that tax seemed an unpopular payment method among participants, and there was a general opinion that the general public should not have to pay. Hence, it was decided to use an increase or decrease in household expenses due to changes in electricity bills, VAT and prices of certain goods in order to elicit maximum WTP for hydro schemes and minimum WTA compensation. Using positive and negative bids was considered to be realistic as there is uncertainty regarding the impact of the hydro scheme developments on overall household expenditure. The listing of many different ways of saving or paying was also considered to counter potential objections to one particular payment method. A payment card consisting of five negative bids (WTA) and five positive bids (WTP) to which each respondent had to agree or disagree was used. The payment card ranged from -14,000 krona to 13,500 krona.[2] This was followed by an open-ended question to elicit people's maximum WTP and minimum WTA (see Appendix 2).

3.3. Validation questions

CV surveys investigate the validity of WTP and WTA bids by incorporating into the questionnaire validation questions which can be used to examine whether expected relationships exist between WTP and WTA and independent variables. The questionnaire contained a number of validation questions that help to interpret WTP and WTA estimates. These involved socio-economic and behavioural indicators, such as membership in environmental groups and touring clubs, preferred outdoor activities, age, household income, views towards the environment and preferences regarding the future management of the wilderness area (see Appendix 1). The open-ended question was followed up by a question asking respondents to explain their WTP or WTA bid. Qualitative data obtained with this question was carefully analysed in order to identify responses influenced by strategic bidding or protesting. Protest responses were considered to be WTP bids that do not reflect genuine valuations, e.g. people state a zero response because they think they should not have to pay or object to the payment vehicle.

3.4. Behaviour coding and debrief questions

Behaviour coding was used during the MS meetings and interviews to determine whether respondents have sufficient motivation to engage in preference construction and the trade-off decision. The method applied a range of codes to the behaviour of each participant while the interview and MS occured. Although behaviour coding is an established psychological method in human observation (Bakeman, 2000), it has not been used to detect motivation in CV surveys. An 'engaged' respondent, who states a carefully considered WTP or WTA estimate is expected to carefully read the information set, search for more information at home, think it over and invest time to elaborate on the given and already existing information, and is attentive and co-operative. However, according to Krosnick et al. (2002) not all participants behave as desired, and often we do not know whether questionnaire answers are based on real preferences and comprehension of the subject. Hence, other means of determining the accuracy of WTP and WTA estimates are required. Participant behaviour was carefully examined during the pilot survey in order to determine behaviour categories to be used in the behaviour coding exercise. Examples of categories that may reflect or cause some sort of 'disengagement' and de-motivation include 'information overload', interruption by mobile phones, desire to terminate the interview quickly due to boredom or inconvenient timing, and perceived time pressure in answering the WTP or WTA question.[3] The classificiation of a respondent as 'disengaged' relied both on statements by the participants and on a subjective appraisal of observed behaviour by the interviewer/moderator. The signs of 'disengagement' were counted manually during and after the interview and MS.

In addition to the behaviour coding exercise, a number of debrief questions were asked at the end of the valuation exercise to investigate respondents'

views towards participating in the MS meeting and the interview, respectively. Specifically, these were aimed at examining the perceived information load and the level of confusion and interest the exercise provoked. Unlike a previous comparison between MS and interviews by MacMillan et al. (2002), the design of this study kept all factors apart from discussion constant between both data collection modes.

4. RESULTS

Six MS meetings and in-person interviews were carried out by the authors between June and September 2002. MS participants were recruited via e-mail, the telephone directory and word-of-mouth. Sixty-five out of 82 recruited participants agreed to participate in one of the MS meetings, and 53 of these actually showed up, resulting in a response rate of 65%. While the MS meetings were run at the University of Iceland, interview respondents were approached in waiting areas at the domestic airport and in various public parks. These locations were chosen because people were considered to be under little time pressure and likely to participate. In total, 62 interviews were completed out of 191 approached individuals, achieving a response rate of 32%. High refusal rates are not unusual for interview approaches but are rarely recorded, despite having a potentially significant impact in terms of self-selection bias.

Both samples were representative of the population that is affected by the environmental change. This was ensured by using quota sampling for the recruitment of MS and interview participants. A t-test shows that the MS sample and the interview control group are identical in terms of socio-economic characteristics and environmental attitudes, including age, gender, income and membership in environmental groups. In total 29.2% of the sample were in favour of hydro schemes, 53.1% were against and 17.7% were unsure about their views towards the hydro scheme proposals. Prior to estimating mean WTP and WTA peoples' explanations regarding their bid were carefully checked to identify protest motives. Overall, the protest rate totals 3.8% in MS and 16.1% in the interview control group. Table 1 reports peoples' preferences in terms of open-ended WTP and WTA estimates.[4] For both WTA and WTP, means are

TABLE 1. Mean and median WTA and WTP in Market Stall and interviews (in Icelandic krona)

	WTP (n=31)			**WTA (n=49)**		
	Mean	Std. error	Median	Mean	Std. error	Median
Market Stall	21,326	6,160	12,500	780,107	472,851	50,000
Interviews	6,377	2,001	4,000	86,328	41,069	25,500

higher in MS than in interviews. An independent samples t-test provides evidence for this divergence from a statistical point of view (significance 2-tailed 0.09 and 0.03 respectively).

In order to test the validity of open-ended WTA and WTP estimates, multiple linear regressions were run on the MS and interview data set. The dependent variable used was open-ended bids and the independent variables are reported in Table 2.[5] WTA estimates were transformed into a natural logarithm to achieve a closer approximation of a normal distribution. Zero values were changed into a small positive number (0.5), so that a natural logarithm could be taken. Table 3 describes the regression models for MS and interview data. The R^2-values show clearly that WTA is better explained by the MS data. Adjusted R^2 in the MS regression model amounts 0.525 in comparison to 0.030 in the interview model. Furthermore, based on a F-test, the MS model is significant as opposed to the interview control group: In MS, there is evidence at the 0.1% level that some of the independent variables explain WTA, whereas there is no evidence for a relationship between the dependent variable and the independent variables in the interview control group. The variables which exert a significant influence on WTA obtained in the MS group were INCOME (1% level) and STRENGTH OF PREF (1% level). Results from a stepwise regression procedure suggest that the variable INCOME generates an adjusted R^2 of 0.25 but by including STRENGTH OF PREF the adjusted R^2 increases to 0.49.

Overall, our results provide evidence in support of the proposition that the MS approach generates more valid WTA estimates than the interview control group and show that WTA estimates can measure the intended construct. Many studies fail to establish significant models to explain WTP or WTA, and according to Mitchell and Carson (1989) adjusted R^2 merely needs to reach a minimum of 0.15. This research shows that considerable improvements in terms of validity can be achieved in the way CV is administered.

TABLE 2. Coding and mean values for the independent variables used in the regression model

Independent Variable	**Coding**	**Mean**
ENV. GROUP (Membership in environmental group)	1=yes 2=no	1.84
INCOME (Household income in kr/month)	1=<100,000 up to 10=>500,000	6.35
STRENGTH OF PREF. (Dummy: Participant holds strong views toward the hydro scheme issue)	1=yes 2=no	1.56
OUTDOOR (Number of outdoor interests)	0= no interests 8= eight interests	3.69

TABLE 3. Regression estimates for WTA data

Variables	**Coefficient B**	**t**	**Sig.**
Market Stall (n=22) Adj. R^2: 0.525 F: 7.089 Sig.: 0.001			
Constant		2.71	0.01
Env. Groups	0.33	1.82	0.09
Outdoor	0.06	0.43	0.67
Income	0.79	4.77	0.00
Strength of pref	-0.69	-3.83	0.00
Interview control group (n=24) Adj. R^2: 0.030 F: 1.185 Sig.: 0.348			
Constant	4.40	0.00	
Env. Groups	-0.32	-0.33	0.75
Outdoor	0.20	0.91	0.37
Income	-2.87	-0.19	0.86
Strength of pref	-1.24	-1.46	0.16

The behaviour coding exercise suggests that MS group members were more motivated to participate in the CV exercise than interview respondents. The participant observation shows that only three (5.7%) MS participants were classified as 'disengaged', whereas a total of 29 (46.8%) of interview respondents showed some form of 'disengaged' behaviour during the interview. A chi-square test, provides evidence at the 0.1% level that MS participants are more motivated than interview respondents. While this finding suggests that the MS environment is beneficial as to triggering motivation, it may also explain why estimates obtained in the interview control group have poorer explanatory power.

A number of participants failed to answer the open-ended question, because they were unsure about their preferences, were unable to decide on a WTP or WTA amount, were protesters, or had lexicographic preferences.[6] Table 4 reveals that MS produced far fewer non-responses to the elicitation question than the interview control group, and according to a chi-square test this difference is significant at the 10% level (asymptotic significance 2-sided 0.09). An examination of the type of people who managed to state an open-ended bid reveals that these participants were not under time pressure, did not find the exercise confusing, thought that the amount of information provided was 'just right'

and were classified as 'engaged' (asymptotic significance 2-sided 0.07, 0.001, 0.01 and 0.01, respectively). In MS, proportionally more respondents had the above characteristics as compared to the interview sample. This is an interesting result, as it questions the suitability of the decision-making environment during in-person interviews.

TABLE 4. Responses and non-responses to the OE question in MS and interviews

	Market Stall (n=53)		**Interview (n= 62)**	
	N	%	N	%
Response	41	77.4	39	62.9
Non-response	12	22.6	23	37.1

The debrief questions aimed at investigating peoples' attitudes towards the exercise, especially with regards to interest, comprehension and information load. According to Table 5, 58% of the MS participants found the exercise interesting and understood everything, 40% considered it interesting but demanding, nobody regarded it 'too demanding', whereas 2% thought it was boring and a waste of time. In comparison, the same percentage of interview respondents found the exercise interesting and comprehensible (58%). Fewer found it interesting but demanding (17%) but 13% of interview respondents believed the exercise was 'too demanding'. The percentage of those regarding it boring and a waste of time was 2%. Overall, slightly more MS participants were interested in the exercise than interview respondents. Results from chi-square test might explain what type of people were less likely to find the exercise too demanding. Again, these were people who perceived no time constraint (asymptotic significance 2-sided 0.01) and people who found the amount of information 'just right' (asymptotic significance 2-sided 0.07).

TABLE 5. Level of interest and confusion in the exercise

	Market Stall (n=53)		**Interviews (n=62)**	
	N	%	N	%
Interesting and understood	31	58%	36	58%
Interesting but demanding	21	40%	17	27%
Too demanding	0	0%	8	13%
Boring and waste of time	1	2%	1	2%

Both MS participants and interview respondents were provided with the same amount of information regarded *a priori* as being necessary to make an informed decision about the complex hydro scheme issue. In order to test whether the information level was optimal and suited for both data collection

modes, participants were asked about their views towards the information load. According to their answers about 30% of MS participants and about 10% of the interview sample perceived an information underload, whereas an information overload was perceived by no participants in the MS but 37% of interview respondents. Seventy-one percent of the MS members and 53% of the control group were happy with the amount of information ('just right').

According to chi-square tests MS has a significantly higher percentage of participants perceiving an information underload at the 1% level (asymptotic significance 0.01), while interviews have a higher percentage of respondents perceiving an information overload. There is also evidence at the 5% level that more MS participants found the amount of information 'just right' as compared to interview respondents. These findings are in line with the participant observation, which revealed that a considerable number of interview respondents only leafed through the information folder and seemed to be overstrained, whereas the MS environment seemed to encourage participants to carefully read through the folder. As information was adjusted to individual needs through discussion in the MS, the majority were happy with the amount of information received. However, it is interesting to note also that a substantial minority of participants desire more detailed information before making up their mind.

Furthermore, we investigated what type of respondents considered the information load to be 'just right'. According to chi-square tests, these are participants who had strong views (asymptotic significance 2-sided 0.01), were interested in and understood the exercise (asymptotic significance 2-sided 0.05) and who were 'engaged' (asymptotic significance 2-sided 0.02). Statistical evidence as to what type of respondent perceived an information underload is very limited. The only significant result shows that people who were not under time pressure during the interview seemed likely to find the information too limited (asymptotic significance 2-sided 0.10).

5. DISCUSSION AND CONCLUSION

Theories and findings from psychology and survey method research suggest that the MS approach should provide many of the necessary underlying conditions for preference construction and the generation of reliable estimates of WTP or WTA. It would appear that the opportunity to discuss and deliberate and the potential to adjust information to suit individual needs are important features of the MS approach and may explain why MS respondents seemed to better tackle the elicitation task in this study.

In this study we are not able to compare WTP and WTA estimates obtained in MS with real contributions or compensation claims. Hence, we cannot verify if MS estimates are closer to actual WTP or WTA. However, we found some evidence that MS participants provided well-considered responses to the payment

question. In addition to a superior R^2 statistic, which is the conventional validity test for CV, 'engaged' behaviour detected in the behaviour coding exercise also suggests more truthful WTP and WTA reporting and hence greater validity. One explanation for the high proportion of 'disengaged' interview respondents might be that the interview did not provide all features considered essential for preference construction. Despite efforts to provide a relaxed interview environment in locations where respondents are unlikely to be under time pressure, many respondents felt they had too little time to process the information, were uncomfortable with this sort of exercise in front of a stranger, or believed the interview came at an inconvenient time. Hence, the set-up and location of CV exercises, as well as the level of coercion, seems to play a role in respondents' performance. This is consistent with assumptions from psychology and consumer research, which suggest that people need time to think about all the relevant attributes associated with a complex good and to decide how much they care about each: spontaneously forming an opinion is difficult in the time provided in conventional CV (Fischhoff and Furby, 1988 and Schiffman and Kanuk, 1991). Additional time and the social context in MS certainly seem to be beneficial to preference construction and a careful consideration of WTP or WTA. This is backed by the finding that none of the MS participants perceived an 'information overload' and fewer gave a 'non-response' to the elicitation question in comparison to the interview sample. Also, participants who were satisfied with the amount of information they received were more likely to be engaged and interested in the exercise.

As mentioned above, mean estimates varied depending on the data collection mode used with MS WTA and WTP estimates being significantly higher than estimates obtained in the interview control group. One explanation for this divergence could be information effects: while a number of interview respondents quickly leafed through the information folder, MS participants carefully read all information during the meeting and received additional information during the discussion. This finding is also in line with a number of other studies that show an increase in WTP in response to more information (e.g. Pope and Jones, 1990; Whitehead et al., 1995; Samples et al., 1986 and Kenyon and Hanley, 2000). However, our finding is different from MacMillan et al. (2002) who report lower mean WTP in MS than in in-person interviews. An explanation might be that the environmental change in our study was more complex and unfamiliar and hence the 'less informed' interview respondents may have been more conservative. In the study by MacMillan et al. people were more knowledgeable about the environmental good (wild geese) and hence were more confident about their answers. A further notion stated by MacMillan et al. is that MS respondents took the exercise more seriously and considered their budget constraints more carefully.

While we cannot draw firm conclusions about the impact of motivation in WTP studies, this research clearly suggests that differences in motivation

level are important when assessing data collection mode. This study shows that participants who were classified as 'engaged' were more likely to answer the open-ended question and were satisfied with the amount of information. A number of psychologists and survey methodologists have provided evidence that 'engaged' respondents put more effort in giving valid answers (e.g. Cannell and Fowler, 1963 and Dijkstra and Van der Zouwen, 1982). Harris et al. (1989) state that 'the best situation [...] is one where respondents experience a state of optimal arousal and their motivation to provide accurate values is high' (p. 224). The MS engages people better than interviews because the benefits of participating are relatively higher and the costs relatively lower. Principal benefits in this context are (1) participants are given a monetary incentive, (2) trust between the participants and the moderator and (3) the importance attached to participants' views was constantly reinforced by discussions with the moderator and other group members. Costs are mental effort, inconvenient timing and an awkward and unusual social context. This claim is supported by the relatively high number of participants who stated that they enjoyed the meeting and would be happy to participate in future studies.

Although MS provides a promising tool for CV data collection, it is questionable whether it can act as a full substitute for conventional survey methods. The prime drawbacks of the MS approach are the time and costs associated with its implementation. Hence, relative to conventional surveys, only small sample sizes are affordable and complete representativeness cannot be assured. Although Harrison and Lesley (1996) suggest that sophisticated quota sampling can greatly improve the representativeness of small samples, the relatively small sample may not be sufficient for calculating precise estimates of mean WTP/WTA for aggregation to the population level. However, aggregation of mean estimates over large populations is not always the objective of CV, and where estimates are needed from small and homogeneous populations, such as special interest groups, mean and aggregate values obtained from MS provide useful and accurate information.

Furthermore, the nature of recruitment for MS has been criticised because it runs the risk that participants are favourably disposed to environmental issues and hence statistical representation could be jeopardised (Rippe and Schaber, 1999). However, our response to this is that the monetary incentive (€ 25) helps select people who are less interested in the topic, and hence MS may be even less affected by self-selection bias than for example mail surveys. In-person interviews are considered to capture a wider range of respondents with different interest levels but studies based on interviews rarely report the number or percentage of people who refuse to participate. Nevertheless, there is clearly a problem with using small sample sizes for making generalisations for a population (O'Neill, 2001). Niemeyer and Spash (2001) suggest that deliberative approaches are feasible at a local policy context but less suited for decisions at a wider geographical scale.

A further area of concern is the influence of dominant participants on other group members. Clearly, this might be problematic for the elicitation of individual preferences and lead to biased attitudes and hence biased WTP or WTA towards an environmental issue. While an experienced moderator should be able to eliminate such effects by discrediting incorrect arguments stated by dominant participants, some of the influences caused by group interaction cannot be controlled. Further research is required to investigate the effects of group norms.

While critics point at difficulties regarding statistical representativeness of small sample sizes, there are also major concerns in connection with the lack of representation of non-humans and future generations in CV research, which are considered to be important prerequisites for political representativeness. According to O'Neill (2001), small deliberative institutions may help to achieve political representativeness in the CV context. Further research is required to investigate how, and if, these political aspects of decision making can be reflected in individual WTP as elicited in the MS and other CV-type approaches. Indeed we would argue that the development of effective hybrid approaches that attempt to do this should be a priority for future research.

NOTES

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[1] WTP estimates are valid and accurate when respondents will actually pay the amount they say they would pay (Garrod and Willis, 1999). The concept of validity is problematic given that actual WTP is not usually observed and hence a broader interpretation of validity is typically used in CV including regression analysis, cross study comparisons for comparable environmental goods. In our view, active participant engagement in the valuation task is an additional prerequisite for the elicitation of valid estimates.

[2] 1000 Icelandic krona are equivalent to 11.4 EUR

[3] Time pressure may occur due to the restrictive nature of some data collection modes and is not necessarily induced by lacking engagement or motivation. Since time pressure is not desirable in the preference construction process it was decided to include it in the 'disengagement' class.

[4] Open-ended estimates are considered more accurate in this study given that a relatively high number of WTP and WTA responses exceeded the payment card range: the analysis therefore focuses on open-ended data.

[5] No significant regression model was obtained for the WTP data. We explain this with the relatively small number of WTP observations, as this violates assumptions on the number of observations needed for a given number of independent variables in regression analyses (Backhaus et al., 2000).

[6] Lexicographic preferences tend to be present among individuals who have ethical concerns about the environment and therefore refuse to trade off changes in the provision of wilderness assets with changes in income. Lexicographic answers may also serve as a decision-making heuristic when the trade-off is either too complex, time to think is limited or when participants are poorly informed (Rekola et al., 2000, Spash and Hanley, 1995, Harris et al., 1989, and Slovic et al., 1988). Lexicographic motives were identified by looking at the qualitative answers stated by participants to explain their WTP or WTA decision.

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APPENDIX 1: QUESTIONNAIRE (MARKET STALL)*

Q 1: General attitudes to the environment

Programmes about the environment are often on TV and radio. Please indicate which statement most accurately reflects your views about these programmes. *Please tick one box only.*

	I make a special effort to watch/listen
	I watch/listen to them when I can
	I watch/listen if there is nothing better on
	I hardly ever watch/listen to them

Q 2: Priorities for government spending

The government spends tax payers' money to pay for different things. Please rank your priorities for government spending using a scale from 1–5 (1= top priority and 5 = lowest priority). *Please enter number 1–5 in each box.*

	Health
	Environment & countryside
	Regional development
	Education
	Reducing crime

Q 3: Priorities for government spending on the environment

Please indicate the importance you place on government spending on the following environmental programmes.

	Tick box				
	+	**+**	**+/–**	**–**	**–**
Action to protect fish stocks					
Action to reforest Iceland					
Action to stop desertification					
Action to protect wilderness					
Action to clean the coastline					

* translated from the Icelandic

Q 4: Wilderness area north of Vatnajökull

Which of the following statements applies to you? *Please tick one box only.*

	I have visited the highlands north of Vatnajökull
	I have visited the highlands, but not this area
	I have never been to the highlands
	I have never heard about the area

Q 5: Membership of environmental groups

Are you a member of any of the following environmental groups or touring clubs? *Please tick all boxes that apply.*

	Ferðafélag Íslands
	Íslenski Alpaklúbburinn
	Náttúruverndarsamtök Íslands
	Landvernd
	Other _____
	None

Q 6: Outdoor recreation

Which kind of outdoor activities have you participated in within the last year? *Please tick all boxes that apply.*

	Recreational walking
	Hill-walking
	Mountain biking
	Horse riding
	Camping
	Bird-watching
	Fishing
	Hunting
	Jeep driving
	Other:_____
	None

Q 7: Your age

What is your approximate age?

❑ younger than 16
❑ 16–25
❑ 26–35
❑ 36–45
❑ 46–55
❑ 56–65
❑ 66–75
❑ 75–84
❑ older than 85

Q 8: Household income

What is your household's approximate income per month before tax? (Please remember that all replies are treated in the strictest confidence)

	less than 100,000 kr.		300,000–350,000 kr.
	100,000–150,000 kr.		350,000–400,000 kr.
	150,000–200,000 kr		400,000–450,000 kr.
	200,000–250,000 kr.		450,000–500,000 kr.
	250,000–300,000 kr.		more than 500,000 kr.

APPENDIX 2. HYPOTHETICAL MARKET AND WTP/WTA ELICITATION

Future management of the wilderness area

Current plans suggest the utilisation of three rivers for hydropower generation. It would be possible to achieve economic development and job creation in other ways (e.g. eco-tourism, small-scale development, research institutes, business parks and forestry in East Iceland) which would protect the wilderness area. Despite of this, hydro schemes are the management option that is most likely to be approved.

Hydro schemes would affect the environment, but would also have impacts on the fiscal policy, the economy, and hence all Icelandic citizens.

Economists have not yet assessed whether government expenditure for the three hydro schemes would be less or more than gained revenue. This means, there will be either a rise or a fall in prices for consumer goods, VAT, electricity rates, income tax etc. In consequence, hydro schemes would have implications on your household finances. You could either save or you could pay.

I am now going to read out different levels to you that could be either an *annual* increase or decrease in your household's expenses. For each level, please tick on the enclosed sheet whether you would support the three hydro schemes.[1]

	Krona									
	-2,500	+700	+3,000	-7,000	-1,000	+13,500	-500	+6,000	-14,000	+1,500
Agree										
Disagree										

[1] As the range of payment levels on the payment card may affect respondents' true preferences, it was decided to 'hide' the bid range by reading each level out one by one. The order of bids was random to avoid that respondents make assumptions about the remaining bid levels or the highest bid. The bid order was rotated between MS groups and interview respondents.

Are you in favour of the three hydro schemes?

- ❑ Yes — go to box **A**
- ❑ No — go to box **B**
- ❑ Not sure

A

What is the **most** increase in your household's **annual** expenses in the next 10 years that you would tolerate due to the three hydro schemes?

Please keep in mind
- ***what you can afford***
- ***that if you and others are not prepared to pay the hydro schemes might not be created.***

_____kr.

Please explain your answer.

_____
_____
_____
_____

B

What is the **least** decrease in your household's **annual** expenses that you would accept to make up for the disadvantages of the three hydro schemes?

Please keep in mind that the total saving to your household would be limited and therefore has to be realistic.

_____kr.

Please explain your answer.

_____
_____
_____
_____