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Testing the Effect of a Short Cheap Talk Script in Choice Experiments

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Abstract

The application of stated preference methods rests on the assumption that respondents act rationally and that their demand for the non-market good on the hypothetical market is equal to what their real demand would be. Previous studies have shown that this is not the case and this gap is known as hypothetical bias. The present paper attempts to frame the description of the hypothetical market so as to induce more "true market behaviour" in the respondents by including a short Cheap Talk script. The script informs respondents that in similar studies using stated preference methods, people have a tendency to overestimate how much they are willing to pay compared to their actual (true) willingness to pay. Applying a two-split sample approach to a Choice Experiment study focusing on preferences for reducing visual disamenities from offshore wind farms, the Cheap Talk script is found to be a preference mover, but does not affect preferences significantly. Significant effects are found when relating the effect of the Cheap Talk script to the cost levels of the alternatives, in that female respondents are found to choose higher cost alternatives less frequently when presented with the Cheap Talk script, while male respondents are not affected.

JEL Codes: C10, C51, C90

Key words: Cheap Talk, Stated Preferences, Choice Experiment, Hypothetical Bias, Gender

1. Introduction

Economic analysis of policies or specific projects often runs into the problem that policy/project related impacts have an influence on the supply of non-markets goods. If the latent demand for the non-market goods is not complimentary to the demand for one or several markets goods, an economic assessment impact (i.e. change in the supply) can only be elicited by directly asking the relevant population about their preferences for the change in the supply by carrying out a survey using Stated Preference Methods (SPM).

The application of SPM rests on the assumption that the respondents act rationally and that their demand for the non-market good on the hypothetical market is equal to their real demand. However, tests of SPM such as the Contingent Valuation Method (CVM) and Choice Experiments (CE) suggest that hypothetical demand exceeds real demand. This is also known as hypothetical bias. (List and Gallet 2001; Little and Berrens 2004; Murphy et al. 2005a). Focusing solely on CE, hypothetical bias also seems to be significant (Alfness & Steine 2005; List et al. 2006; Johansson-Stenmann & Svedsätter 2008; Taylor et al. 2007; Ready et al. 2010).

In order to reduce hypothetical bias, Cummings & Taylor (1999) proposed and found a new type of reminder known as "Cheap Talk" (CT). However, in subsequent studies carried out using CVM and CE, the effectiveness of CT has proven to be ambiguous (Aadland and Caplan 2006; List 2001; Lusk 2003; Barrage and Lee 2010; Brown et al. 2003; List et al. 2006).

The number of SPM and especially CE studies in environmental and health economics carried out in Denmark has increased considerably the previous 4-5 years. To the authors' knowledge, Ladenburg and Dubgaard (2007) and Kjær et al. (2005) were the first studies in Denmark that apply a CT script in studies focusing on the visual impacts from offshore wind farms and demand for dentist services, respectively. Since then CT has been applied in a significant number of studies[1]. However, in contrast to frequent use of CT, the present study and the study by Kjær et al. (2005) are the only studies that actually test if CT affects the stated preferences in a Danish valuation setting.

[1] For more studies see Ladenburg and Olsen (2008), Ladenburg and Olsen (2010a), Olsen (2009), Bonnichsen and Ladenburg (2009), Ladenburg (2010) and Mørkbak et al. (2010)

In this paper we test the effect of short CT in the scenario description prior to the choice sets. Applying a two split sample approach, we find that the CT is a preference mover in the sense that it reduces the WTP for moving offshore wind farms to larger distances from the coast. However the effect is not significant. In contrast to these results, we find that female respondents appear to be influenced be the CT, whilst male respondents are not. However, female preferences are only affected when asked to choose between alternative locations of offshore wind farms with high levels of associated costs (700 or 1,400 DKK).

The paper is structured as follows: First we give a short introduction to economic valuation using SPM. This is followed by a short review of the problem of hypothetical bias and empirical results regarding the use of CT to mitigate the bias. Next the study design is presented, followed by hypotheses, the econometric setup, results, discussion and a conclusion.

2. Economic valuation using stated preference surveys

Economic valuation of non-market goods such as the environment and public services was introduced in the 1940's by Ciriacy-Wantrup (1947) and Hotelling (Mitchell & Carson 1989). The proposed *valuation methods* – CVM and the Travel Cost Method (TCM) – distinguished themselves from the previously used *pricing methods* by being based on a latent demand (i.e. consumer preferences and behaviour) rather than on market prices (Hanley & Spash 1993; Hanemann 1995). Significant progress has occurred within the field of environmental economic valuation during the past decades, and a variety of methods – each with their advantages and disadvantages – are now available. Broadly speaking, valuation methods can be divided into two groups – SPM and and Revealed Preference Methods (RPM). The distinction between RPM and SPM is made on account of the origin of the data. RPM are based on data derived from observed (i.e. actual) behaviour, and SPM are based on data derived from stated (i.e. hypothetical) behaviour (Freeman 1993; Mitchell & Carson 1989).

2.1 Stated Preference Methods

Within the class of SPM CVM is the most widely used (Batemann & Willis 1999). CE however, has become increasingly popular during the recent years (Bennett & Blamey 2001).

The Contingent Valuation Method

In CVM the aggregate value of a change in the supply or quality of a non-market good is estimated holistically, by presenting the individual with a precise description/scenario of the hypothetical good and the relevant change in the supply. Based on information regarding the rules of provision, present and future access to the good and method of payment, the individual is asked to state his/her valuation of the good (Mitchell & Carson 1989).

Choice Experiments

CE builds on the theory proposed by Lancaster (1966). Lancaster (1966) proposes that it is not goods *per se*, but rather the bundle of characteristics that they consist of, that give utility to the consumer. Consequently, demand for goods is derived from the demand for the characteristics that the good consists of (Lancaster 1966; Rosen 1974).

Accordingly, CE focus on how preferences for goods or services are constructed, the goal being to identify the utility that individuals derive from the different attributes which compose the good or service in question (Bennett & Adamowicz 2001). This is accomplished by presenting respondents with a set of alternatives (A_i). The alternatives define the good or service in terms of their key attributes (a_{ij}), and different alternatives are described by varying levels of the attributes. By examining the trade-offs between attributes/attribute levels, that are implicit in the choices made by respondents, it is possible to derive an estimate of the utility associated with the different attributes. If one of the attributes is measured in monetary units (i.e. costs), it is possible to derive estimates of respondents' WTP for the other attributes from the marginal rate of substitution between the monetary attribute and the other attributes (Louviere et al. 2000).

3. Hypothetical bias

The application of SPM rest on the assumption that the respondents act rationally and that their demand for the non-market good on the hypothetical market is equal to their real demand had the good been available under circumstance similar to the ones on the hypothetical market. However, the numerous applications and tests of SPM such as in CVM and CE studies suggest that hypothetical demand is not identical to real demand. This discrepancy between stated and real preferences is also known as hypothetical bias. List and Gallet (2001) conducted a meta-analysis on studies comparing real and hypothetical preferences. Based on 29 studies they find that on an average level, values estimated from hypothetical preferences were three times larger than the corresponding values based on real preferences. The results are supported by two other meta-analysis studies, which find that the ratio between hypothetical and real demand (hypothetical biases) range between 2.6 (Murphy et al. 2005a) and 3 (Little and Berrens 2004). The above mentioned studies primarily include CVM-like experiments. However, even when focusing specifically on individual studies testing for hypothetical biases using CE, hypothetical bias seems to prevail.

In steak preference study Lusk and Schroeder (2004) find that the propensity to buy any steak was significantly larger on the hypothetical market compared to the real market. However the preferences for the steak attributes were similar in the real and hypothetical treatment. Focusing on both a public good (donation to purchase IT equipment) and private good (sports card) List et al. (2006) also find differences in hypothetical and real preferences. In another private and public good study hypothetical bias was found among the opt-in choices (the choice of a policy alternative with a payment/positive costs) (Taylor et al. 2007). Johansson-Stenmann and Svedsätter (2007) find that hypothetical donations to different wildlife programs were significantly higher than real donations. In another donation CE experiment Broadbent et al. (2008) also find that hypothetical donation levels exceeds real. Finally, Ready et al. (2010) find that the hypothetical demand for wildlife rehabilitation exceeds the real demand threefold.

However, not all studies containing tests for hypothetical bias shows that the bias exists. Bennett and Blamey (2001) compare stated preferences for toilet paper attributes and compare real preferences obtained from scanner data. In terms of estimating the market shares of the different products, they find that the hypothetical preferences perform quite well compared to the real data[2]. As in the Johansson-Stenmann and Svedsätter (2007) study, Carlsson and Martinsson (2001) test hypothetical bias in a donation to a wildlife program setup. In their study the respondent initially stated their hypothetical preferences and subsequently stated their real preferences (within-sample test) and do not find differences in hypothetical and real marginal WTP for the different programmes. In a study on preferences for participation in a green energy program, Cameron et al. (2002) do not find a significant bias Finally Broadbent et al. (2008) find evidence of hypothetical

[2] Ideally, a test in terms of WTP should have been applied. However, due to the low variation in the real products compositions, this was not possible.

bias, when asking people state the preferences for riparian forest restoration. For a more theoretical discussion of the origin of hypothetical bias in CE, see Ladenburg and Olsen (2010a).

3.1 Mitigation of hypothetical bias

One of the initially proposed reasons for the observed differences in real and hypothetical WTP was that the respondent, when stating their hypothetical WTP, might not feel constrained by their own/household budget. In an attempt to address this issue, a specific budget reminder in the scenario description was tested in Loomis et al. (1994), where the reminder turned out to be ineffective. With similar reasoning, it was also proposed that the respondents might not take into account possible budgetary substitutes when stating their WTP, thereby overstating the value of the good in focus. If the respondents perceive the good to be unique or do not take into account that the money spent could have been spent on other (substitute) goods, this would naturally lead to hypothetical WTP being larger than real WTP if the non-market good in focus has relevant substitutes. However, as in the case of the budget reminder, a substitute reminder did not have the expected effect on the WTP (Loomis et al. 1994, Neill 1995)[3].

In an attempt to find a framing of the description of the hypothetical market that would induce more "true market behaviour" among the respondents, Cummings & Taylor (1999) were the first to propose a new type of reminder known as "Cheap Talk" (CT). The CT was tested in a CVM-like setup including four different types of public goods. Instead of focusing the reminder on the economic theory constraints as in the budget and substitute reminders, Cummings and Taylor's (1999) CT script worked by informing the respondent that people in these kinds of surveys have a tendency to overestimate how much they are willing to pay compared to their actual (true) WTP, and for this reason the researcher thinks this might occur and an example of the level of hypothetical bias. In other words, the potential hypothetical bias is explicitly described to respondents, and they are thus reminded to take this into account, when stating their preferences in terms of WTP. Using a three split sample (real payments, hypothetical payments and hypothetical payments with CT) hypothetical biases was established for three of the four goods. In these cases CT was tested in an independent and hypothetical treatment and found to remove the hypothetical bias.

[3] Despite of the apparent lack of effect, several researchers still recommend including these reminders in stated preference surveys (Bateman et al. 2002). A recent study finds that a substitute and income reminder jointly with a short CT reduce hypothetical demand (Whitehead and Cherry 2007).

However, the effect of CT has been tested extensively in subsequent CVM studies, and the results here are more ambiguous. Aadland and Caplan (2006), List (2001), Lusk (2003) and Barrage and Lee (2010) find that CT only influences the preferences of specific sub-groups such as inexperienced respondents and female respondents. Samnaliev et al. (2003), Nayga et al. (2006) and Blumenschein et al. (2008) find that CT does not effectively reduce WTP. Aadland and Caplan (2006) and Carlsson and Martinsson (2006) find that the CT actually increases WTP. In addition Morrison and Brown (2009) even find that CT has a too strong influence on the stated preference, so that hypothetical WTP is significantly over-calibrated. Furthermore, the effectiveness of CT has been found to be sensitive to the bid range applied. Brown et al. (2003) and Murphy et al. (2005b) find that CT only has an effect on the respondents who are presented with bid levels in the higher end of the bid range in dichotomous choice and referendum surveys. However, both of these studies find that hypothetical bias is present across the entire bid range applied and not just the higher end. This implies that CT fails to eliminate hypothetical bias at the lower end of the bid range.

Related to this line of research, Murphy et al. (2005b: 337) comment that: "…*it is likely that a number of factors affect hypothetical bias and therefore no single technique will be the magic bullet that eliminates this bias*".

Despite the ambiguous results, it has now become more or less standard practice to include CT in CVM surveys. The number of studies testing CT in CE is fewer and the results of the effectiveness of the CT are also mixed, but this practice has also been widely adopted in CE surveys. More specifically, Carlsson et al. (2005) and List et al. (2006) both use relatively short CT scripts in CE surveys and find evidence that CT reduces hypothetical bias to some extent. However, in List et al. (2006) CT seems to decrease the internal consistency of respondents' preferences. In Carlsson et al. (2005) 7 out of 10 attributes were valued significantly lesser by respondents provided with a CT script than those not provided with one. In a more recent study, Carlsson et al. (2008) find CT to be ineffective in a CE survey[4]. Finally, Ladenburg and Olsen (2010a) find an indication that the effect of the CT in a CE has diminishing effects (over the six choice set each respondent evaluates) on the total economic value associated with re-establishing a stream in urban Copenhagen.

[4] See Ladenburg and Olsen (2010a) for a more detailed discussion of CT and its potential limitations in CE.

In a Danish setting, a CT script has previously been tested in a health economic CE study on the demand for dental services (Kjær et al. 2005). The study was carried out in 2004 and focused on the demand for opening hours, distance to the dentist, whether the dentist is part of a dentist centre, has x-ray facilities, has painless anaesthesia and the price of a routine check-up. Except for the marginal WTP for the x-ray facilities, the applied CT did not significantly affect the marginal WTP for the other attributes and the preference structure in general.

Compared to Kjær et al. (2005), the present paper addresses the impact of the CT in a more non-market setup. More specifically, the CT is tested in a setup in which the respondents are asked to state their preferences for a good that they have little experience with in at least two dimensions. The first dimension relates to the good itself, where in the present study it is visual impacts from offshore wind farms. Many of the respondents might only have seen an offshore wind farm a few times (if ever) and therefore might be uncertain regarding the quality of different levels of visual impacts. Secondly the respondents are expected not to have made any actual purchase of different qualities of the good. In the Kjær et al (2005) study, the good is a market good (dental services), which most if not all of the respondents are expected to have experiences with in *both* of the above mentioned dimensions. This is a noticeable difference in the setup, as CT if found to be ineffective among experienced respondents (List 2001; Barrage and Lee 2010) even though they are hypothetically biased. Finally, it is worth mentioning the difference in the private good (Kjær et al. 2005) and public good (this study) characteristics framework, which the CT is tested in.

The present study therefore sheds new light on how preferences are influenced by CT in a Danish context.

4. Study design

The analysis of the effect of a short CT is based on an internet survey, with two randomised samples of respondents from a nationwide internet panel consisting of approximately 17,000 people concerning the preferences for reducing the visual impacts from offshore wind farms[5]. The survey was carried out in July 2006. The test of the CT was carried out using a two split sample design, in

[5] Though the topic is the same as in Ladenburg and Dubgaard (2007; 2009), the two studies are quite different in the setup. See Ladenburg (2009) for a comparison.

which one half of the respondents were presented to a scenario description not including a CT (NON-CT sample) and another sample in which the scenario description included a CT (CT sample). All other aspects of the questionnaire were kept identical for the two samples. The CT script is presented below.

"Please pay attention to that the annual cost is the amount your household will have to pay if the chosen alternative was to be implemented. Previous willingness to pay studies have demonstrated that people seem to overrate how much they are willing to pay. Therefore, consider thoroughly how the annual extra costs will affect your budget, so that you are *completely* certain that you *actually* are willing to pay the annual costs associated with the alternative that you choose"

Initially, the desired sample size was set to 350 respondents in each sample. To obtain these numbers 619 and 623 respondents in the CT and NON-CT samples were emailed a questionnaire. Of these 355 and 386 completed the questionnaire, respectively. Removing protest answers (see next page), the effective sample sizes are 338 and 367 respondents which gives an effective response rate of 54.6 percent and 58.9 percent.

In the survey, each respondent was given 6 choice sets, which was represented by a status quo alternative (offshore wind farms located at 8 km and with no extra costs to the household) and two hypothetical wind farm locations. In the hypothetical alternatives, the offshore wind farms could be located at 12, 18 and 50 km, representing reduction in the visual impacts compared to 8 km, where a wind farm located at 50 km would not be visible from the coast. As a payment vehicle, an annual fixed increase in the household electricity bill was used. The annual increase could take the values 100, 400, 700 and 1400 Danish Kroner (DKK) per household per year. With 3 hypothetical distances and 4 prices, a total of 12 (3×4) alternatives were constructed (full factorial design). Following Kuhfeld (2005), the alternatives were blocked in choice sets so that there would be a minimum overlap in attributes within each choice set, minimum correlation and maximum level balance. As the example choice set presented below illustrates, each location of the wind farms were visualised for each alternative[6].

[6] Please note that in the original survey the visualizations were larger to give the respondents a better feeling of the visual impacts. Each choice set thus covered an area on the computer screen equivalent to an entire A4 page.

Alternative 1	Distance to the Coast. 8 km	Increase in costs 0 DKK

Alternative 2	Distance to the Coast. 12 km	Increase in costs 400 DKK.

Alternative 3	Distance to the Coast. 50 km	Increase in costs 1400 DKK

I prefer	Alternative 1 ( )	Alternative 2 ( )	Alternative 3 ( )

Figure 1 Choice Set Example

Besides the visualisations in the choice sets, the respondents were also provided with a map, showing the location of exiting offshore wind farms and the expected location of the future offshore wind farms which in total would have a capacity of 3600 MW.

All respondents who choose the status quo alternative were given a follow-up question in order to get a deeper understanding of the preferences governing the serial choice of the status quo alternative (i.e. no preferences for reducing the visual disamenities). Respondents answering that their primary reason was them preferring the wind turbines to be located at a larger distance but did not want to pay a higher electricity bill were classified as protest zero bidders, as were those respondents stating that they could not relate to paying a higher electricity bill. The reason for classifying these respondents as protesters is that their primary reason for choosing the status quo alternative was due to the setup of the survey and not their preferences as such. To reduce protest bias in the stated preferences, all protest respondents were excluded from the analysis. For a more detailed presentation of protest zero bidders see Meyerhoff and Liebe (2008) or Bonnichsen and Ladenburg (2009).

4.1 Hypotheses

The CT is applied to reduce the hypothetical demand for reduction in the visual disamenities from offshore wind farms. Accordingly, the following main hypothesis is set up.

$H1_0$: Preferences are independent of the treatment.

The rejection of $H1_0$ would suggest that preferences are influenced by the CT. Rejection of the hypothesis will make it relevant to test the direction of the influence.

$H2_0$: The CT reduces WTP.

Following Ladenburg and Olsen (2008, 2010b), Ladenburg (2010) and Barrage and Lee (2010), we also test if male and female respondents are stimulated differently by the CT, i.e. gender specific effects. Consequently, we define the following hypothesis.

$H3_0$: Preference independence is not conditional on gender.

Rejection of the hypothesis would suggest that female and male respondents process the CT differently, and that the effect of the CT is gender specific.

5. Choice and Econometric framework

5.1 Random Utility Model

Assuming utility-maximising behaviour of the individual, the choices made are analysed using the Random Utility Model (RUM) (McFadden 1974). The RUM states that the true but ultimately unobservable utility U for individual n conditional on choice i can be broken down into two components, an observable systematic component V and the unobservable random component, the error term ε:

$$U_{ni} = V_{ni}(x_{ni}, S_n, \beta) + \varepsilon_{ni},$$

where the observable component V_{ni} is a function of the attributes of the alternatives x_{ni}, characteristics of the individuals S_n and a set of unknown preference parameters β. The observable component V_{ni} is assumed to be a linear function:

$$V_{ni} = ASC + \beta x_{ni},$$

where β denotes a vector of preference parameters associated with an attribute, x_{ni} a vector of attributes of alternative i and ASC denotes an alternative specific constant. In the present application the ASC is labelled ASC23. The variable thus represents the joint utility of moving offshore to larger distances than 8 km, all things else being equal (alternative 2 and 3). Assuming a specific parametric distribution of the error term allows a probabilistic analysis of individual choice behaviour:

$$P_{ni} = Prob\left(V_{ni} + \varepsilon_{ni} \geq V_{nj} + \varepsilon_{nj}\right) \forall i, j \in C, j \neq i,$$

where P_{ni} is the probability that individual n's utility is maximised by choosing alternative i from choice set C. The researcher chooses the distribution of the error term and different distributions result in models with different properties (Ben-Akiva and Lerman 1985).

5.2 Deriving Estimates of Willingness to Pay

The focus of attention, when testing the CT, is the potential difference in preferences/WTP for reducing the visual disamenities from offshore wind farms. When a respondent chooses an alternative he/she is making a trade-off between the distance to the coast of the offshore wind farms and an annual fixed increase in the household electricity bill and thus the respondent's preferences are implicitly revealed. By including a monetary attribute it is possible to estimate WTP for the non-monetary attributes, i.e. the distance of the offshore wind farm to the coast. This is done by scaling the coefficient of interest with the coefficient representing the marginal utility of price and multiplying with -1 (Louviere et al. 2000):

$$WTP_x = -\frac{\beta_x}{\beta_{price}},$$

where β_x is the coefficient of the attribute of interest and β_{price} is the price coefficient.

5.3 Econometric Specifications

The parametric analysis applies Random Parameter Logit (RPL)[7]. The model relies on McFadden's RUM (McFadden 1974) described earlier. Recall that utility U is broken down into two components, an observable systematic component V and the error term ε, such that:

$$U_{ni} = V_{ni} + \varepsilon_{ni},$$

where $V_{ni} = ASC + \beta x_{ni}$.

If the error terms are assumed to be independently and identically Gumbel distributed, then this results in a conditional logit specification for the probability of individual n choosing alternative i:

$$P_{ni} = \frac{e^{\beta x_{ni}}}{\sum_{j \in C} e^{\beta x_{nj}}},$$

[7] With the applied model specification in which the alternative specific constant for the status quo is estimated to have a mean of zero and to be standard normal distribution in the sample, the model can also be called an Error Component Random Parameter Logit model.

where the error term and the *ASC* are left out for simplicity. The CL model imposes several restrictive assumptions in that it does not allow for random taste variation, for unrestricted substitution patterns and for correlation in unobserved factors over time (Train 2003). The model also suffers from having to adhere to the restrictive independence of irrelevant alternatives (IIA) property.

Random Parameter Logit

The RPL specification allows for taste heterogeneity in preferences by specifying some or all attribute coefficients as random reflecting the heterogeneity of individuals' preferences. The model also does not exhibit the restrictive IIA property and it allows for correlation in unobserved utility over alternatives and time (Train 2003; Hensher and Greene 2003). The specification can be generalised to allow for panel structure (repeated choices by the same respondent) of CE data. In other words, the RPL model allows for the utility coefficients to vary over respondents, but remain constant over choice occasions for each respondent (Train 2003). Here individual *n*'s true utility for the *i*th alternative in choice situation *t* can be written as:

$$U_{nit} = \beta_n x_{nit} + \varepsilon_{nit},$$

where β_n denotes individual specific random parameters and the characteristics of the individuals are left out for simplicity. The model is specified with the price coefficient being fixed and all other coefficients being normally distributed. Assuming that the error term is still Gumbel distributed, following Train (2003) the probability of observing a sequence of alternatives *i* chosen by individual *n* can be written:

$$P_{n\mathbf{i}} = \int \left(\prod_{t=1}^{T} \left[\frac{e^{\beta_n x_{ni_t t}}}{\sum_{j \in C} e^{\beta_n x_{njt}}} \right] \right) \phi\,(\beta | b, W) d\beta,$$

where $\phi(\beta|b, W)$ is the normal density with mean *b* and covariance *W* and $\mathbf{i}$ is a sequence of alternatives, one for each choice occasion, $\mathbf{i} = \{i_1, \ldots, i_T\}$. In this way, the utility coefficients vary over individuals but are constant over *T* choice occasions for each individual.

As mentioned, the models used for estimation all include an ASC coding for alternative two and three. It is included in order to capture the systematic effect of the choosing a non status quo alternative relatively to the SQ (Scarpa et al. 2005). In the RPL specification the parameter controlling for the distance to the shore and the ASC23 are set as random parameters with a normal distribution. In both cases, this accounts for people possibly holding negative or positive preferences for reducing the visual disamenities from offshore wind farms and for alternatives two and three (Meyerhoff and Liebe 2009; Boxall et al. 2009; Bonnichsen and Ladenburg 2010).

6. Results

6.1 Comparison of sample characteristics

Setting up an experiment as in the present study and testing and claiming to have found/not found an effect requires first of all that the respondents in the two experimental samples are not significantly different. In Table 1, the characteristics of the respondents in the CT and NON-CT samples are compared.

Table 1 Comparison of respondent characteristics between samples.

	Sample				Sample		
	CT	**NON -CT**	**χ^2-test**		**CT**	**NON -CT**	**χ^2-test**
Gender				Visible windmills on land from residence or summer residence			
Male	168	187	0.74				
Female	170	180					
Age				Yes	76	88	0.64
16-24	49	55		No	262	279	
25-34	53	57		Visible windmills on sea from residence or summer residence			
35-44	64	64	0.95				
45-54	72	82					
55-64	60	72		Yes	16	19	0.79
≥65	40	37		No	322	348	
Household gross income/year (DKK)				Frequency of visits to the beach in the summer			
< 200.000	45	64		Weekly or more often	101	136	
200.000-399.999	87	97		1-3 times a month	134	140	
400.000-599.999	80	92	0.39	Every second month	52	43	0.28
≥ 600.000	95	85		Every six months	28	24	
Not available	31	29		Almost never	22	21	
Education				Do not know	1	3	
Primary/high school	49	41		Frequency of visits to the beach in the winter			
Vocational	22	18					
Upper vocational	54	62		Weekly or more often	32	38	
Short academic (<3 years)	45	49	0.62	1-3 times a month	79	108	
Middle academic (3-4 years)	89	98		Every second month	85	85	0.38
Long academic (>4 years	60	68		Every six months	56	49	
Other	19	31		Almost never	85	84	
				Do not know	1	3	
N	338	367			338	367	

Testing the differences in the characteristics of the respondents in the samples, suggests that is cannot be rejected that the respondents on average are similar. Accordingly, a difference in preferences between the two samples can with a higher level of certainty be ascribed to the effect of the CT.

6.2 Parametric analysis of the effect of the Cheap Talk

In Table 2 the results from the parametric analysis of the effect of the CT are presented. The effect of the CT is tested with two model specifications. The first model is a linear model, assuming that the marginal benefits of moving an offshore wind farm an additional km away from the coast is constant. Besides the variable controlling for the distance of the offshore wind farm from the coast (DISTANCE) the model also includes an alternative specific constant (ASC23), which captures the overall preferences for reducing the visual disamenities by moving the future offshore wind farms further away from the coast than 8 km.

The second model is a dummy specified model. The model entails two dummy variables controlling for locating offshore wind farms at 18 km (DISTANCE 18 km) and 50 km (DISTANCE 50 km) from the coast. As in the linear model, the dummy model also includes an alternative specific constant controlling for alternative 2 and 3 (ASC23). Accordingly, ASC23 is a dummy variable controlling for the preferences for moving offshore wind farms beyond 8 km from the coast, i.e. at 12, 18 or 50 km from the coast. Consequently, the parameters, $\beta_{DISTANCE\ 18\ km}$ and $\beta_{DISTANCE\ 50\ km}$ are estimated relatively to the ASC23 parameter and not to a location at 8 km. By including the two DISTANCE 18 km and DISTANCE 50 km dummy variables, this means that $\beta_{DISTANCE\ 18\ km}$ and $\beta_{DISTANCE\ 18\ km}$ should be interpreted as the stated utility the respondents gain by locating an offshore wind farm at 18 km and 50 km from the shore relative to a location at 12 km[8].

[8] A dummy model in which the ASC23 is dropped and replaced with a dummy variable controlling for wind farms at 12 km, has also been tested. However, compared to the present model (which via the ASC23 controls for the overall preferences for reducing the visual disamenity from offshore wind farm, i.e. are people on the market or not), the tested model has a lower log-likelihood value at the point of model convergence. The results from this model regression are available from the authors upon request.

Table 2 Random Parameter Logit Models

	CT sample		NON-CT sample	
	Linear Model Coefficient [Stand Error]	Dummy Model Coefficient [Stand Error]	Linear Model Coefficient [Stand Error]	Dummy Model Coefficient [Stand Error]
Parameters				
Distance (km)				
All	0.01428*** [0.00274]	-	0.01387*** [0.00266]	-
Male	0.01517*** [0.00344]	-	0.01513*** [0.00387]	-
Female	0.01196* [0.00532]	-	0.01276*** [0.00361]	-
Distance 18 km				
All		0.20304^{NS} [0.16088]		0.50733** [0.15403]
Male		0.15547^{NS} [0.23790]		0.61466** [0.22385]
Female		0.24061^{NS} [0.22350]		0.41160† [0.21092]
Distance 50 km				
All		0.70284*** [0.11842]		0.77744*** [0.11857]
Male		0.72318*** [0.15150]		0.87822*** [0.17894]
Female		0.62062** [0.22038]		0.69477*** [015374]
ASC23				
All	0.32306^{NS} [0.30498]	0.43984^{NS} [0.33780]	0.42452^{NS} [0.29653]	0.45525^{NS} [0.32675]
Male	0.33138 ^{NS} [0.42712]	0.51734^{NS} [0.47135]	0.61732^{NS} [0.45048]	0.64595^{NS} [0.50455]
Female	0.49278 ^{NS} [0.45242]	0.55849^{NS} [0.50333]	0.27119^{NS} [0.39028]	0.27979^{NS} [0.42613]
COST (DKK/year)				
All	-0.00238*** [0.00014]	-0.00299$^{** *}$ [0.00020]	-0.00211*** [0.00012]	-0.00276*** [0.00018]
Male	-0.00184*** [0.00015]	-0.00244*** [0.00022]	-0.00198*** [0.00016]	-0.00271*** [0.00025]
Female	-0.00344*** [0.00028]	-0.00403*** [0.00039]	-0.00227*** [0.00018]	-0.00282*** [0.00025]
Standard deviation				
Distance (km)				
All	0.01133^{NS} [0.00852]	-	0.01556* [0.00636]	-
Male	0.00022^{NS} [0.01026]	-	0.02034** [0.00758]	-
Female	0.03247*** [0.00898]	-	0.00660^{NS} [0.01804]	-
Distance 18 km				
All	-	1,59256*** [0.20718]	-	1.63353*** [0.19591]
Male	-	1.82942*** [0.29949]	-	1.77699*** [0.28544]
Female	-	1.29601*** [0.33128]	-	1.48375*** [0.27353]
Distance 50 km				
All	-	0.49281^{NS} [0.31369]	-	0.74626** [0.23376]
Male	-	0.00038^{NS} [0.53177]	-	0.99876** [0.31122]
Female	-	1.29699*** [0.33875]	-	0.25135^{NS} [0.79564]
ASC23				
All	4.80641*** [0.39793]	5.29641*** [0.45036]	4.84794*** [0.39258]	5.38113*** [0.44871]
Male	4.74801*** [0.56039]	5.18643*** [0.61717]	5.26438*** [0.61849]	5.92254*** [0.70977]
Female	5.00559*** [0.59040]	5.53423*** [0.67835]	4.47971*** [0.49975]	4.83274*** [0.55048]
$N_{respondents}$	338;168;170	338;168;170	367;187;180	367;187;180
LL(0)	-2,228; -1,107; -1,121	-2,228; -1,107; -1,121	-2,419, -1,233, -1,187	-2,419, -1,233, -1,187
LL(b)	-1,275; -678; -581	-1,252; -659; -576	-1,438, -730, -705	-1,400; -706; -691
Pseudo-R^2	0.428; 0.388; 0.482		0.405, 0.407, 0.406	

^{NS} indicates no significance, * significance at 95% level, ** at 99% level and *** at 99.9% level.

Generally (across samples and models) the respondents have expressed significant preferences for moving offshore wind farms further away from the coast (β_{DISTANCE}, $\beta_{\text{DISTANCE 18 km}}$ and $\beta_{\text{DISTANCE 50 km}}$ are all greater than zero) and negative preference for an increase in the annual electricity bill ($\beta_{\text{COST}}<0$). With regard to the alternative specific constant, the estimate for ASC23 is positive in both models, which suggests that the respondents on average have preferences for reducing the visual disamenities from offshore wind farms located at 8 km. However, β_{ASC23} is not significant. If we move on to the estimated standard deviations, the unobserved heterogeneity in the preferences appear to be relatively identical between the two samples, though the level of significance differ somewhat. In the NON-CT sample (Linear Model), the estimated standard deviation for the DISTANCE variable is significant, whilst insignificant in the CT sample. In the dummy model, the estimated standard deviation for the DISTANCE 50 km parameter is not significant in the CT sample, but significant in the NON-CT sample. However, t-tests do not reject equal standard deviations between the two samples.

With regard to the estimated standard deviation for the alternative specific constant coding for alternative 2 and 3, they are numerically large and strongly significant. This suggests that the preferences for locating the wind farms at 8 km from the coast (and not paying) are very heterogeneous in both samples.

If we take a closer look at the estimated parameters for the distances variables in the CT and NON-CT samples, it does not seem that the preferences are influenced by the CT script in the Linear Model. In the Dummy Model, the estimated parameters for the DISTANCE 18 km variable in the CT sample appears to be nearly half the size of the same variable in the NON-CT sample. This indicates that the respondents in the CT sample have weaker preferences for locating the offshore wind farms at 18 km (relative to a location at 12 km) compared to the respondents in the NON-CT sample. The difference in parameters does not seem as strong in the case for the DISTANCE 50 km variable. Focusing on the COST estimate, β_{COST}, it seems to be numerically larger in the CT sample (in both models) compared to the estimate in the NON-CT sample. In economic terms this suggests that the respondents in the CT sample are more sensitive to electricity bill increases and therefore are willing to pay less for reducing the visual disamenities from the offshore wind farms.

If we move on to the gender specific models, the above mentioned findings are somewhat different. In the case of the COST estimate, the variable is numerically larger for male respondents in the CT sample compared to the estimate in the NON-CT sample. For female respondents, the opposite is the case. Moving on to the distance variables, the results from the main model prevails.

However, due to potential scaling differences, it is important to remember that the estimates might not be directly comparable (Swait and Louviere 1993). A direct preference comparison can be made by examining the estimated level of WTP for the variables (and the respective estimated variance in the WTP) controlling for the distance to the shore of offshore wind farms in the Linear and Dummy Models. This is shown in Table 3 below.

Table 3 Comparison of Estimated Marginal WTP/household/year in DKK

	CT sample	NON-CT sample	
	WTP [95% CI][a]	WTP [95% CI][a]	Δ WTP[b] [Stand Error]
Linear Model			
Distance (linear per km)			
All	6.00*** [3.66-8.33]	6.56*** [4.01-9.11]	-0.57NS [1.76]
Male	8.25*** [4.48-12.02]	7.63*** [3.68-11.58]	0.62NS [2.78]
Female	3.48* [0.40-6.56]	5.61** [2.39-8.83]	-2.13NS [2.27]
ALT23			
All	136NS [-113-385]	201NS [-71-483]	-65NS [188]
Male	80NS [-272-632]	311NS [-129-752]	-231NS [322]
Female	143NS [-111-397]	119NS [-214-453]	-24NS [214]
Dummy Model			
Distance 18 km			
All	68NS [-38-174]	184** [73-294]	116NS [78]
Male	64NS [-128-255]	227** [64-391]	164NS [128]
Female	60NS [-50-169]	146NS [-2-294]	68NS [94]
Distance 50 km			
All	235*** [157-313]	282*** [196-367]	47NS [59]
Male	296*** [174-418]	325*** [193-456]	29NS [91]
Female	154** [-38-174]	246*** [137-355]	92NS [78]
ASC			
All	147NS [-72-366]	165NS [-64-394]	18NS [162]
Male	211NS [-162-584]	239NS [-123-601]	27NS [265]
Female	139NS [-102-380]	99NS [-194-393]	-40NS [194]
ASC23 + Distance 18 km			
All	215NS [-14-444]	349**[109-589]	134NS [169]
Male	275NS [-121-671]	466*[88-844]	191NS [279]
Female	198NS [-48-445]	245NS[-60-550]	47NS [200]
ASC23 + Distance 50 km			
All	382** [164-600]	446*** [217-676]	64NS [161]
Male	507** [-121-671]	563** [198-929]	56NS [265]
Female	293* [47-539]	346* [56-635]	53NS [194]
LR-test statistics			
Linear Model (df)	3.53(5)NS,c 2.93(5)NS,c 9.92(6)NS,d		
Dummy Model (df)	6.34(7)NS,c 6.07(5)NS,c 8,89(8)NS,d		

NS indicates no significance, * significance at 95% level, ** at 99% level and *** at 99.9% level.

[a] 95% confidence intervals are estimated using the Delta Method in accordance with Greene (2008) and Hanemann and Kanninen (1999).

[b] An asymptotic t-test of the significance of the differences in WTP. NS indicates no significant difference in WTP.

[c] The estimated scale parameter is insignificant

[d] The estimated scale parameter is significant

In the Linear Model, the respondents in the NON-CT sample are on average willing to pay 6.56 DKK for each additional km the offshore wind farms are moved further than 8 km from the coast[9] compared to 6.00 DKK in the CT sample. This difference is not significant. Looking at the WTP for the ASC23, which all things being equal gives information on whether the respondent is indifferent between having the offshore wind farms at 8 km compared to a location further out (12, 18 and 50 km), the respondents in the NON-CT sample are willing to pay approximately 201 DKK compared to 136 DKK in the CT sample[10]. Again, the respondents in the CT sample seem to have a lower WTP (approximately 33 percent lower) but the difference in the WTP (65 DKK) is not significant. Similar conclusions can be drawn from the Dummy Model. The WTP for moving an offshore wind farm from 12 to 18 km ($WTP_{DISTANCE\ 18\ km}$) is 68 DKK, and 184 DKK for the CT and NON-CT samples, respectively. Despite a difference in WTP of nearly 200 percent, it remains insignificant. Similar results are evident in the case of the WTP for moving an offshore wind farm from 8 to 12 km (WTP_{ASC23}), 12 to 50 km ($WTP_{DISTANCE\ 50\ km}$), 8 to 18 km ($WTP_{ASC23+\ DISTANCE\ 18\ km}$) and 8 to 50 km ($WTP_{ASC23+\ DISTANCE\ 50\ km}$).

Accordingly, hypotheses H1 and H2 are rejected. These results are confirmed in the LR-test of equality in preferences shown at the bottom of Table 3, where insignificant test statistics of 3.53 and 6.34 for the Linear Model and Dummy Model, respectively, show that it cannot be rejected that the overall preferences can be considered as equal in the two samples.

6.2.1 Male respondents

In the Linear Model the male respondents are willing to pay 8.25 DKK and 7.63 DKK for each additional km the wind farms are moved beyond 8 km in the CT and NON-CT samples, respectively. The difference (0.62 DKK) is far from being significant. The WTPs for reducing the visual impacts from the wind farms at 8 km all things being equal (ASC23) seem to be quite different. In the CT sample the male respondents are willing to pay 80 DKK compared to 311 DKK in the NON-CT sample. Despite a 70 percent larger WTP in the NON-CT sample, the difference is not significant. In the Dummy Model, the male respondents in the CT sample have much lower level of WTP for locating offshore wind farms at 18 km compared to a location at 12 km ($WTP_{DISTANCE\ 18\ km}$). More specifically, the WTP is 64 DKK compared to 227 DKK in the NON-CT

[9] As the applied distances in the survey are between 8 and 50 km, the marginal WTP in theory only applies in this range.
[10] It should be noted that neither for the two WTP estimates are significant.

sample. However, despite the WTP in the NON-CT sample being more than three times higher than in the CT sample, the difference is insignificant. The $WTP_{DISTANCE\ 50\ km}$ and WTP_{ASC23} are also smaller in the CT sample compared to the NON-CT sample, though the difference is below 10 percent. Together with an insignificant LR-test of equality in preferences, the CT does not seem to influence preferences. Accordingly, H1 and H2 are also rejected on a male gender specific level.

6.2.2 Female respondents

If we direct the focus towards the preferences of the female respondents, they have higher WTP in the NON-CT sample, when compared to the female respondents in the CT sample. Starting with the Linear Model, they are willing to pay 3.48 DKK and 5.61 DKK per additional km the wind farms are moved beyond 8 km in the CT and NON-CT samples, respectively. The WTP is thus approximately 60 percent higher in the NON-CT sample. However, the difference of 2.13 DKK is not significant. The WTPs for the alternative specific constant are 143 DKK and 119 DKK in the CT and NON-CT samples, respectively. The difference is not significant. In the Dummy Model, there appears to be more evident preference differences when evaluated at the "face value", though again not significant. More specifically, even though the WTP for locating the wind farms at 18 and 50 km compared to a location at 12 km is between 60-160 percent higher in the NON-CT sample, equality of WTPs cannot be rejected on conventional levels of significance. Accordingly, H1 and H2 are as in the previously two reported models, rejected. This is supported by the LR-test of equality in preferences. The tests statistics of 9.92 and 8.89 with 5 and 7 variables and a significant scale parameter (1.35 in both models), are shown to be insignificant.

6.3 Non-parametric analysis of the effect of the Cheap Talk on different bid levels

The above analysis indicated that when looking at the effect of the CT on preferences, no statistically significant effects can be detected in terms of WTP and overall preferences. However, as suggested by the literature, the effect of the CT might not be present for the entire price vector, even though the hypothetical bias is present at all price levels. Brown et al. (2003) and Murphy et al. (2005b) find that CT has an effect only on the respondents, who are presented with bid levels in the higher end of the bid range in dichotomous choice and referendum CVM surveys. Inspired by these findings we carry out a test of whether the CT only influences preferences in the high end of the applied prices. In the present study, the choice sets entail prices levels at 0, 100, 400, 700 and 1,400 DKK per household per year.

These relations between the costs of the alternative and the frequency of choice are explored in the following three figures, where Figure 2 shows all respondents, Figure 3 male respondents and Figure 3 female respondents. In the figures the cumulative probability of choosing an alternative with the 5 applied price levels (0, 100, 400, 700 and 1400 DKK) are reported for the CT and NON-CT samples.

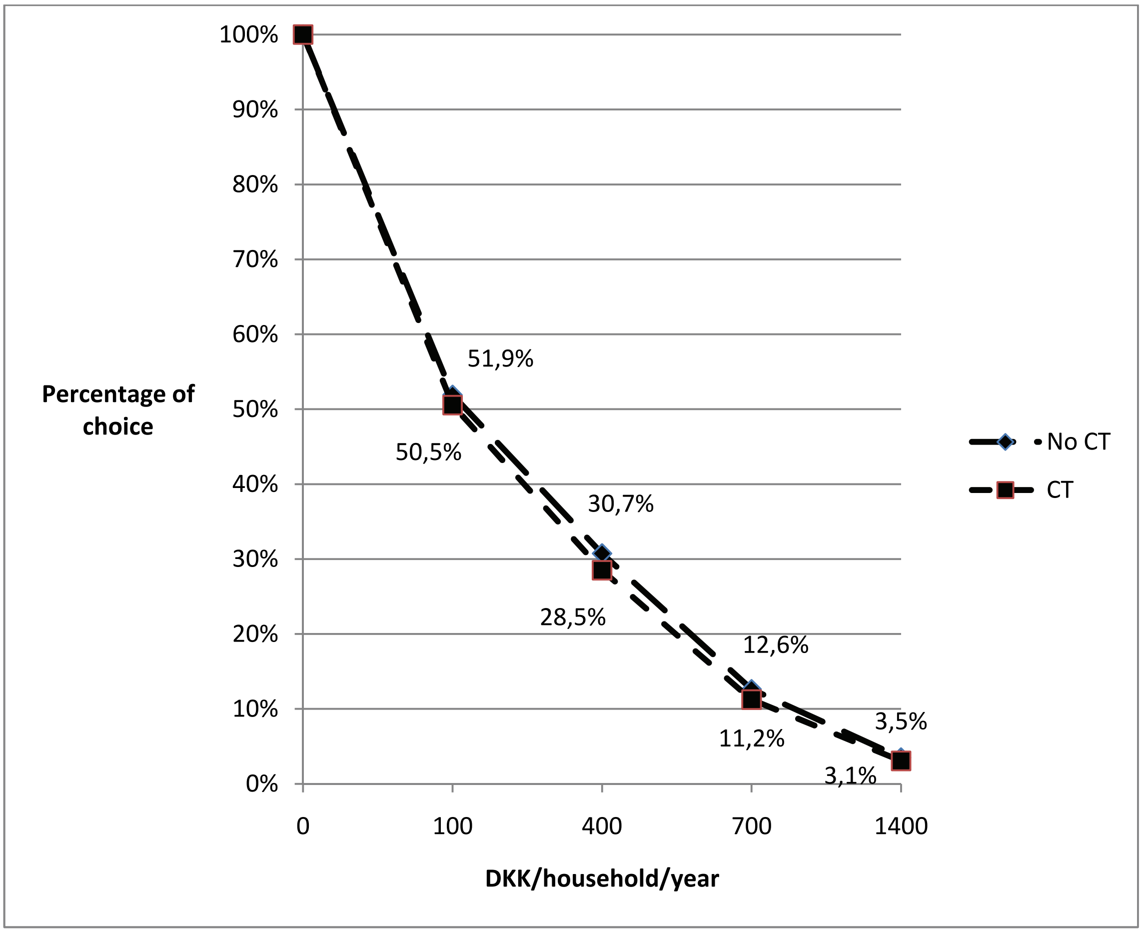

Figure 2 Cumulative probability function of choosing an alternative; all respondents

Figure 2 shows that the “demand curves” for representing the CT and NON-CT samples seem to be overlapping and the reported levels of cumulative choice frequencies are relatively close for all cost levels. A Chi-square test for identical distribution for all price levels and for each individual price level, respectively are insignificant on a 95 percent level of confidence.

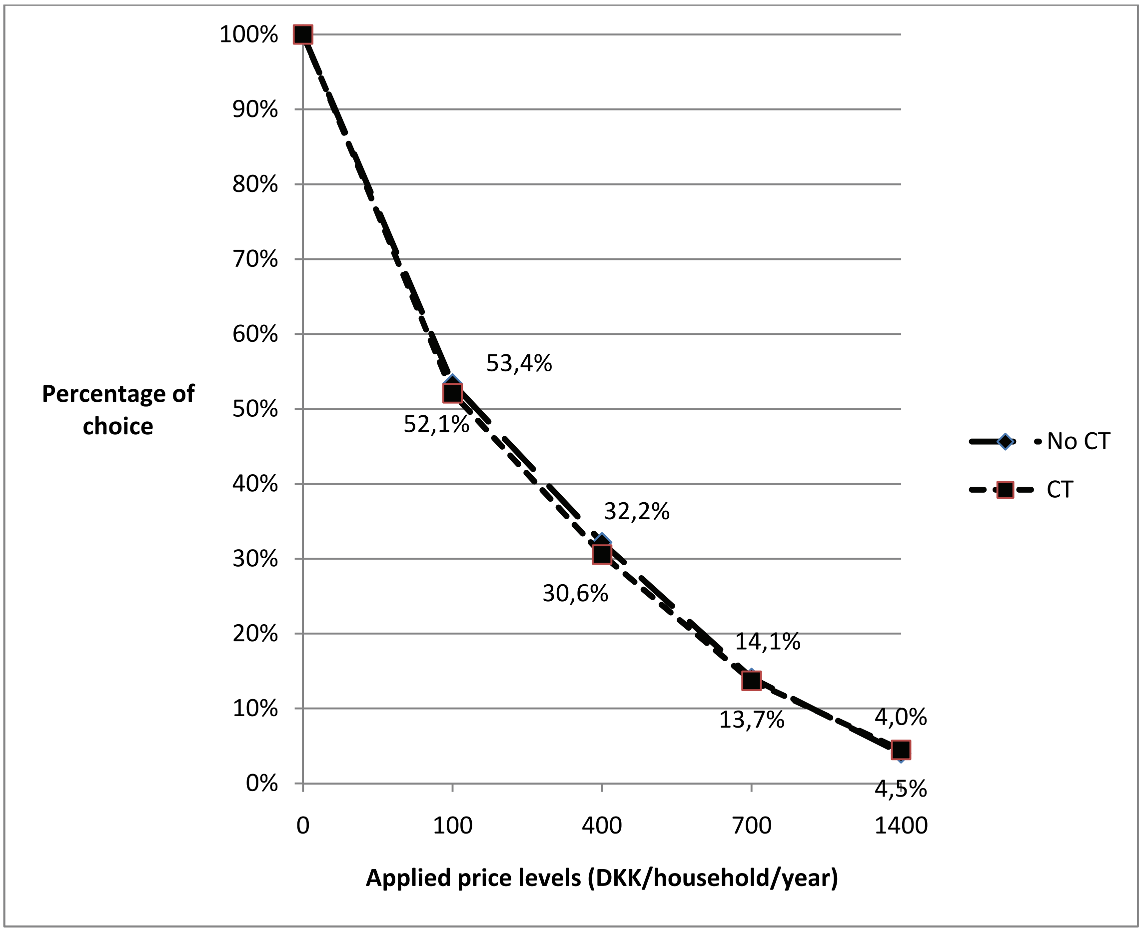

Figure 3 Cumulative probability function of choosing an alternative; male respondents

Looking at the comparison of choice and price frequencies for male respondents, the results from the analysis including all respondents are even stronger. The two "demand curves" are very close to being identical. A Chi-square test of equal choice distributions confirms this, as they are far from being insignificant on a 95 percent level of confidence.

Interestingly, the results are quite different for female respondents. The cumulative demand curve is presented below.

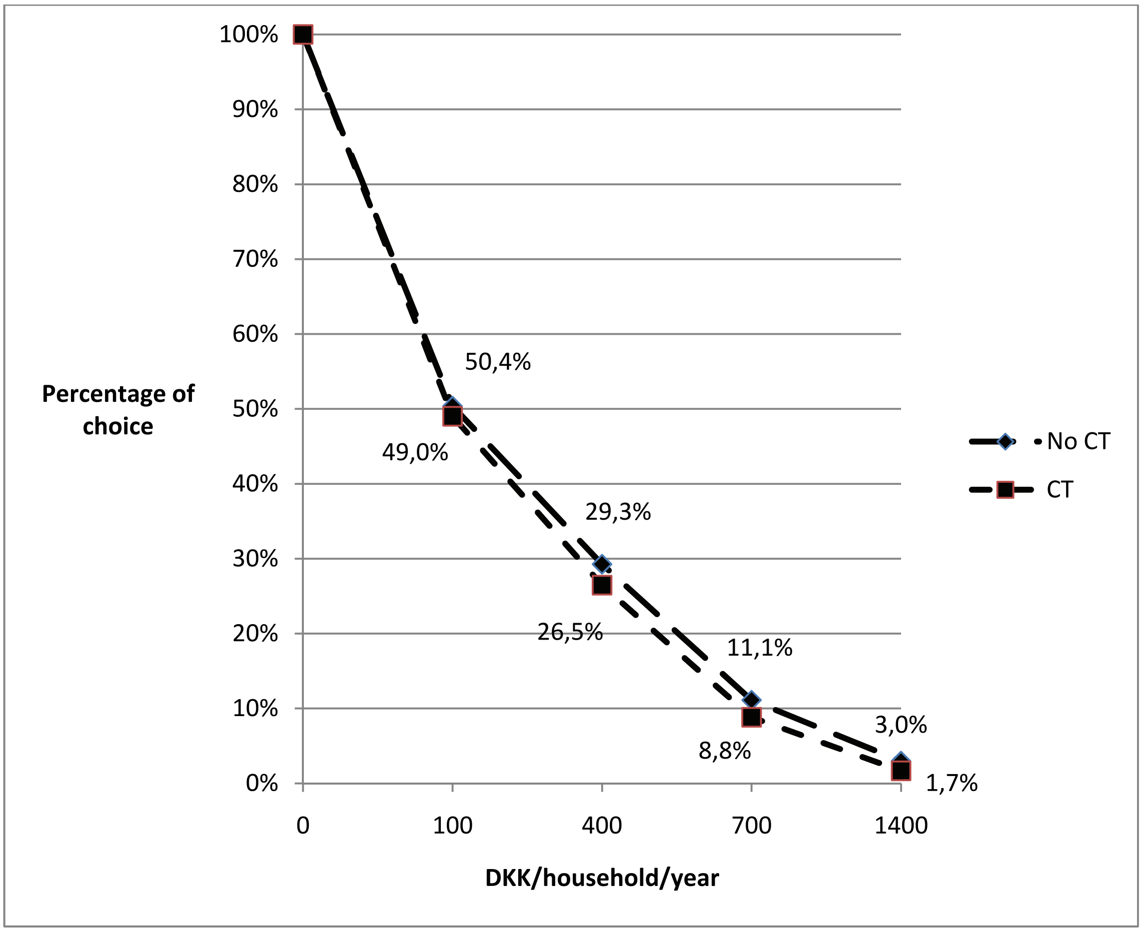

Figure 4 Cumulative probability function of choosing an alternative; female respondents

As the demand curves suggest, the female respondents, who were given a CT, have chosen alternatives with a price of 1,400 DKK less often when compared to the female respondents who did not get a CT. More specifically, the female respondents in the CT sample have chosen a 1,400 DKK alternative in 1.7 percent of the total number of choices compared to 3 percent in the NON-CT sample. This difference is significant on a 95 percent level of confidence. As the figure indicates, the choice frequencies also seem to be different with regards to costs at 400 and 700 DKK/household/year. Individually, they are not significant. However, jointly with 1,400 DKK, 700 DKK is borderline significant on a 95 percent level of confidence. This suggests that it is at only at costs level of 700 and 1,400 DKK that the CT has an effect on the female respondents.

Accordingly, the CT does have an effect, but it is gender specific and only applies for the higher end of the price vector, i.e. 700 and 1,400 DKK.

7. Discussion

The present study makes several contributions to the existing literature. First of all, from an international perspective, it is the first study that establishes a link between the effectiveness of the CT and the specific cost levels in CE. The results thus support the lack of effectiveness in the lower bid range in previous CVM studies (Brown et al. 2003; Murphy et al. 2005b). Secondly, the significant gender specific effect supports a growing literature with a specific focus in gender differences in information processing in SP surveys (Ladenburg and Olsen 2010b). In this relation, the study jointly with Barrage and Lee (2010) and Ladenburg et al. (2007) suggests that female respondents are more sensitive to hypothetical bias mitigation measures. Finally, despite the lack of overall significant effect on the preferences, the capability of the CT to "move" WTP to a lower level appears to be present.

7.1 Gender specific effects

As found in the analysis, female respondents seem to be sensitive to the CT information, whilst male respondents are not. In the following subsections arguments supporting this observed effect are discussed.

7.1.1 Information processing differences

Differences in how male and female act as leaders (Eagly and Johnson 1990; Eagly et al. 1992; 1995), how they communicate (Eagly and Carli 1981) and in relation to aggressive behaviour, (Eagly and Steffen 1986) have had the attention of research psychologists in many years. In more economically orientated fields, such as marketing research, the topic of gender differences has also received much attention. In this connection Meyers-Levy (1989) establishes the "selective hypothesis" to explain observed gender differences in cognitive human expressions.

The central point in the hypothesis is that male and female respondent process information differently. Males seem to base their judgement on a subset, schema or an overall message theme of the available information and are categorised as *selective information processors.* Females, on the other hand, make an effort to assimilate all of the available information before making a judgement (Meyers-Levy and Tybout 1989). In this sense, female respondents are *comprehensive information processors*.

In relation to the information put forward in the CT, this suggests that men effectively base their judgements on only a subset of the available information, whereas women generally try to comprehend all of the available information before making their judgements. In the light of the observed female sensitivity toward the CT, this suggests that males and females have processed the CT information differently. Consequently, they might put different emphasis on the content of the CT script and have related the content to the applied cost range. This is supported by Meyers-Levy and Sternthal (1991) who find that differences in responses can be caused by the nature or the context of the enclosed information. Females are found to have a lower threshold for elaborating on enclosed information compared to males. Accordingly, the threshold capacity of the information in the CT might only have triggered an information process response among female respondents.

The selective hypothesis is in line with the work of Gilligan (1982) who finds that women generally think about and act on moral dilemmas in a more inclusive manner when compared to men. Building on this, Cadsby and Maynes (1998) argue that females are more likely to respond to context than men. Brown and Taylor (2000) argue that women are more likely to respond to the *market* context used in SP surveys, which relies heavily on the defined hypothetical market setup, i.e. information. In this sense, women might also respond better to the extra scenario information, which the CT in principle is.

Following this line of arguments, the observed gender specific effects could also be caused by male respondents, in the extreme case, simply not having read the CT script at all.

7.1.2 Conformity effects

Another explanation for the observed gender differences could be the nature and wording of the CT script. Following Ladenburg and Olsen (2010a) the CT applied in the present study is different from the initially proposed CT by Cummings and Taylor (1999) on at least two levels. First of all, Cummings and Taylor's (1999) script is much longer compared to the script in this study. Secondly, the script by Cummings and Taylor (1999) gives explicit instructions on how the respondents (in their survey) themselves should choose. In this study, the CT only gives information on how other respondents seems to overstate their hypothetical demand. As argued by Ladenburg and Olsen (2010a), the effectiveness of the CT applied in the present study thereby becomes conditional on the respondent perceiving the reported behaviour of others as inappropriate and, as a consequence, choosing to conform to the opposite behaviour, i.e. a kind of reversed conformity.

Though the type of conformity cannot be directly compared to the traditional test of herding behaviour, in which the individuals adapt/falsify their effective preferences to the consensus positions of their social groups (Anderson and Holt, 1997), the information (signal) of what others do have shown to subsequently influence preferences. In Frey and Meyer (2004) the contribution of 2,500 randomly selected students to two social funds was found to be sensitive to information given to the students about whether the average student behaviour was high or a low contribution level. Though their results only were unidirectional (respondents were only influenced by information of the high rates of contribution) their results suggest that the signal of cooperation is strong. In relation to only female respondents being affected by the CT script, Frey and Meyer (2004) find evidence that conforming behaviour is heterogeneous in their sample. Only respondents who are uncertain about their decision seem to be influenced the proposed action of others. In the present survey the respondents were asked about how certain they were of their stated preference when choosing the preferred alternative in each of the six choice sets. An ordered logit analysis controlling for background characteristics and an ordering effect finds that male respondents are significantly more certain compared to female respondent and are thus in line with the findings of Frey and Meyer (2004). These results are available from the authors upon request.

Carlsson et al. (2008) carry out a test, which is more line with the present study. In a CE, they test and find that the demand for coffee products is sensitive to the claimed level of green consumerism is in society. Interestingly, they find that only female respondents conform to information on the proportion of other consumers that choose coffee made of 100 percent ecological beans[11]. In the context that the CT works via reversed conformity, the results from the present survey are in line with Carlsson et al. (2008).

7.2 Price vector sensitivity

The results from the analysis strongly suggest that the female respondents are only sensitive with regard to the two highest costs levels in the CE, i.e. 700 and 1,400 DKK per household per year.

[11] Actually male respondents react negatively to the conformity information.

Though previously found in CVM studies, this is the first study to establish this relation in CE[12]. These results thus suggest that female respondents only find it necessary to take the CT into account when faced with relatively high cost alternatives. When faced with lower cost alternatives, this is apparently not an issue. Accordingly, one interpretation of the results is that the female respondents only perceive hypothetical bias to be related to choosing a high cost alternative and not low cost alternatives. Consequently, they might disregard the CT information when faced with relatively low cost attributes.

In a conformity framework, another interpretation could be that the female respondents on a less conscious level perceive the cost of conformity, i.e. self-denial cost (Klick and Parisi 2008) to be a decreasing function of the alternatives' cost levels. In that case, the benefits of conforming to the CT script would naturally be dependent on the costs. A change in conforming behaviour would then take place around the cost threshold at which the costs of conforming is equal to the benefits of conforming. In the present analysis this threshold seems to be in the region of 400 to 700 DKK per household per year[13].

7.3 Gender specific Hypothetical Bias

A comment should be put forward in relation to that male and female respondents might not be equally hypothetically biased. If male respondents are not biased and female respondents are, this could explain the observed differences. Hypothetical biases have not been tested in the present paper, however when looking at the literature, both male and female respondents seem to be biased, though differences in the level of bias still persist. In Barrage and Lee (2010) both males and females are prone to hypothetical bias. Interestingly, when testing a CT, Barrage and Lee (2010) also find that female are influenced by an applied CT and adjust their preference so that they are in line with the real preference. Males are not influenced by the CT but remain biased. In a study by Emhke et al. (2008) they generally find that male and female respondents are biased differently. Interestingly, they also find that the gender differences are culturally related, and thus is not a

[12] In Ladenburg et al. (2007) another type of entreaty, an Opt-Out Reminder (OOR), aimed at reducing hypothetical bias is tested. In the paper the authors find that the OOR affects all price levels, except from the lowest level. The applied costs levels are 50, 100, 200, 400, 700 and 1,100 DKK per household per year.

[13] In the same framework these results are supported by Shang and Croson (2007) and Alpizar et al. (2008). In two independent public good donation experiments they find that the signals of what other people have contributed needs to be of a certain magnitude in order to have an influence on level of individual donation. Accordingly, assuming that the benefits of conforming is a function of the cues of other people's behaviour, the difference between self-denial costs and the benefits might be too little for small cue signals to influence behaviour significantly.

universal phenomenon. Finally in Brown and Taylor (2000) they find that male respondents exhibit a three times stronger hypothetical bias compared to female respondents. Accordingly, based on these empirical findings, it is questionable if the lack of effect of the CT on male respondents can be explained by male respondents not being hypothetically biased in the sample without the CT.

7.4 Economic implications of WTP movements

As found in Table 3, the CT seems to have an ability to "move" WTP for reducing the visual disamenities from offshore wind farms to a lower level. This is particularly the case for the Dummy Model. Though these differences are not significant on a WTP level, they still deserve to be elaborated upon in an economic application context. Imagine a policy planner, such as the Danish Energy Authority aiming at identifying a set of offshore wind farm locations, which are optimal from a welfare economic point of view. One of the parameters that enter the economic welfare analysis is the external costs of visual disamenities.

In this case, cost optimality is obtained when the marginal benefits (MB) of reducing the visual impacts are equal to the marginal cost (MC) of doing so. To obtain an estimate of the benefits, a CE study is carried out as in the NON-CT sample. Let us for simplicity assume that the elicited preferences are representative for the Danish population. Based on the estimated level of WTP this gives the marginal benefit curve labelled NON-CT (MB_NON-CT) in Figure 5. As shown, the marginal benefits of moving an offshore wind farm an additional km away from the coast drops from 41.25 DKK/km between 8 to 12 km, 30.75 DKK/km between 12 and 18 km and 3.00 DKK/km between 18 and 50 km. This indicates that when locating an offshore wind farm an additional km from the coast (compared to a location at 8 km) the marginal benefits of locating offshore wind farms in the a distance interval from 8 to 18 km are close to being the same.

However, had the CE survey been carried out using a CT as in the CT sample, the marginal benefits are much more sensitive to the distance as illustrated by the benefit curve labelled MB_CT. In this case marginal benefits drops from 37.75 DKK/km between 8-12 km and to 11.25 DKK/km between 12 and 18 km. The marginal benefit of locating the wind farms in the range 18-50 km is 5.20 DKK/km

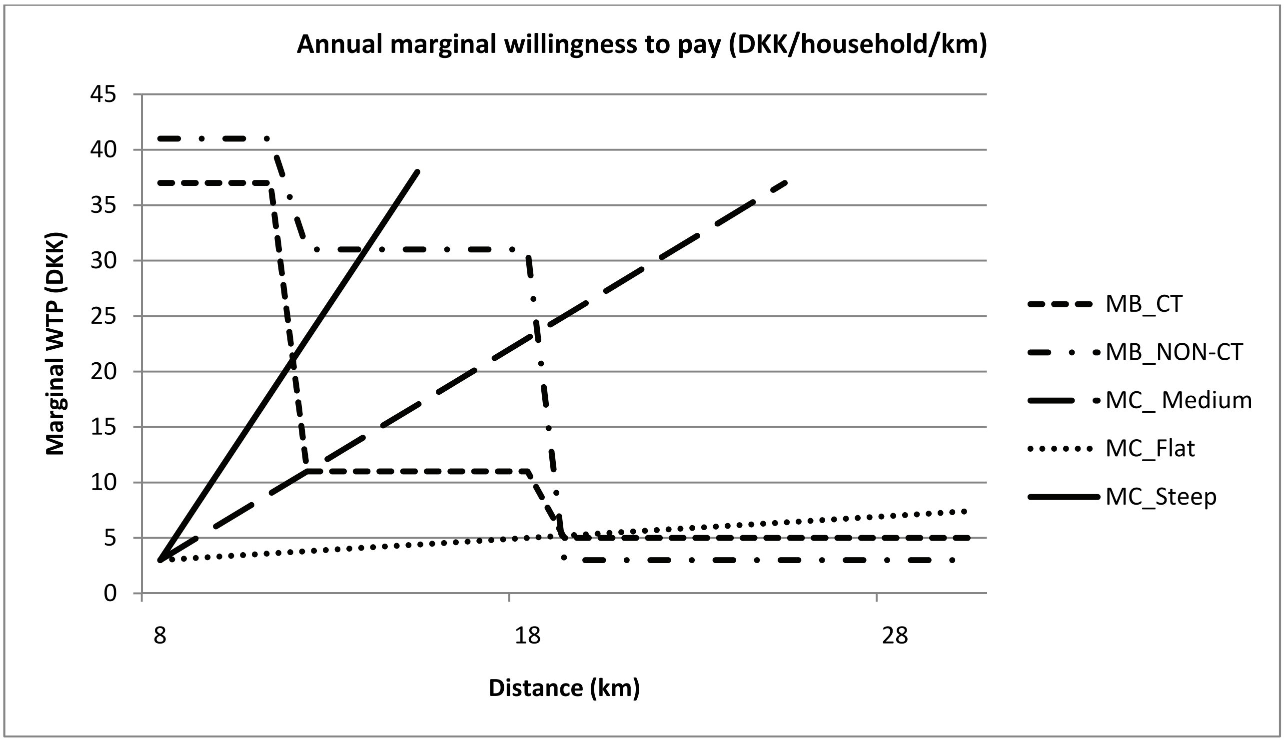

Figure 5 Comparison of the optimal distance using three marginal cost scenarios and marginal benefits with and without a CT

As illustrated in Figure 5 the policy implications of including a CT or not in the CE survey strongly depends on the location of the marginal cost functions. If the marginal cost function is relatively flat, the optimal distance (OD) appears to be less sensitive to the use of a CT, compared to the situation where marginal cost is steeper. More specifically, conditional on a flat marginal cost curve (MC_Flat), the optimal distance is around 18 km independently of whether the marginal benefit curve is estimated using a CT or not. If MC is medium steep (MC_Medium), OD_{CT} =12 km and $OD_{NON\text{-}CT}$ =18 km. Finally, if MC is steep (MC_Steep), OD_{CT} =11 and $OD_{NON\text{-}CT}$ =13-14 km.

The examples and the conclusions put forward above are naturally conditional on the choice of marginal cost function and the relatively "rough" marginal benefit curves. However, this does not change the point we want to make clear, i.e. the if a CT has been applied, the optimal location might be much closer to the shore compared to had a CE without a CT been applied. This seems particularly evident in the case of a medium steep marginal cost curve. So despite that the CT does not have a significant influence on the estimated levels of WTP for moving offshore wind farms, it might have a strong impact on the optimal level of visual disamenity abatement from offshore wind farms and therefore "move" the optimal location towards shore.

8. Conclusion

In an attempt to reduce and hopefully eliminate the gap between hypothetical and real demand, i.e. hypothetical bias in stated preference surveys, a script called a Cheap Talk script has previously been tested and found to be effective. In the present paper we test the effect of a much shorter Cheap Talk script in a stated preference study focusing on the willingness to pay for reducing the visual impacts from offshore wind farms. Applying a Random Parameter Logit model we only find the CT script to be a preference mover, but not to affect preferences significantly. Controlling for potential gender effects does not change this finding. However, we do find significant effects of the CT when relating the effect of the CT to the cost levels of the alternatives. More specifically, we find that the CT seems to make female respondents choose alternative with costs of 700 or 1,400 DKK less frequently when given the CT. We argue that this might be due to differences in information processing and conformity between male and female respondents.

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