A PILOT STUDY INTO THE PERCEPTION OF UNRELIABILITY OF TRAVEL TIMES USING IN-DEPTH INTERVIEWS

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Significance

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ABSTRACT

Transport investments normally reduce travel times, but may also reduce unreliability. Conventional time gains can be evaluated in cost benefit analysis using standard values of time. For valuing reliability gains, however, no standard measures are readily available. The Dutch Ministry of Transport has commissioned a project to design a Stated Preference methodology. Reliability is a complex "academic" concept and it may be difficult to present and explain it to respondents. Therefore, a pilot study using in-depth face-to-face interviews has been carried out, in which various SP choice designs have been presented to the participants.

1 Introduction

In The Netherlands, travel time benefits resulting from transport investments are assessed in a cost-benefit analysis (CBA), using standard values of time for the conversion of time into money units. But transport investments can also reduce the unreliability of travel times. For valuing such travel time reliability benefits, new empirical research in The Netherlands is required.

Significance (since 1 January 2007; in 2006: RAND Europe), the VU University Amsterdam and John Bates have carried out a design project for the Netherlands Ministry of Transport, under contract to the AVV Transport Research Centre and the KiM Netherlands Institute for Transport Policy Analysis.

The objectives and requirements of the project were:

> *To design and test a methodology for measuring the value to society of travel time benefits and travel time reliability benefits in The Netherlands by empirical research. The resulting values are meant to be used in CBA using the so-called "OEI-guidelines" (CPB and NEI, 2000). The resulting values of unreliability (VoRs) should be compatible with existing transport models. The design of the survey should be such that the outcomes for the value of time*

can be compared against the outcomes of the previous Dutch national value of time surveys

Subsequent work, including the main fieldwork and analysis of the interview data (including estimation of discrete choice models) will be organised later, in the form of a separate project.

The *first* phase within the design project was a scoping phase ('preparation phase'), in which, in consultation with AVV, KiM, the Netherlands Bureau for Economic Policy Analysis (CPB) and other international experts, decisions were taken on which modes and transport market segments to include in the subsequent stated preference surveys and analysis, based on the expected relevance and costs. In the *second* phase , face-to-face interviews were carried out with 30 travellers to test the understanding of and preferences for different ways of presenting unreliability in SP surveys (e.g. clock-face, bar chart, several ways of phrasing it). In the *third* phase pilot interviews were held to test the questionnaires and to check whether respondents understood the experiments. This was a real pilot, to test not only the correct flow and understanding of the questionnaires but also to obtain sufficient information for initial model estimation to check whether the attribute levels presented were the right ones.

This paper will mainly deal with the second and third phase. The structure is as follows. In chapter 2, the interview questionnaires and the eight presentation formats for unreliability are described, together with the recruitment process. In chapter 3 the outcomes of the tests of the different formats for presenting unreliability to respondents are presented. We give our general impressions and formulate a final preference for one of the eight presentation formats. The set-up and the results of the full pilot interviews are discussed in chapter 4. Finally, chapter 5 gives the conclusions from this project. The Appendix includes – as an example - the complete eight formats used in the face-to-face interviews for car non-scheduled trips (translated from Dutch).

2 Design of the face-to-face interviews

2.1 Motivation and objectives

It is widely accepted that travel time reliability is an important factor in travellers' decision-making and the benefit of reliability improvement has to be taken into account in current cost and benefit analysis (CBA) frameworks. Nevertheless, reliability is – unlike factors such as time and costs – not straightforward to specify for a general audience. Therefore, the issue of how to present the reliability information effectively and clearly to the respondents becomes crucial in value of reliability (VoR) stated preference (SP) surveys. We carried out a literature study in the scoping phase of the project and we found that there is little consensus about the preferred reliability presentation format in the literature, though quite some work has already been done in the area of valuing reliability. Different presentation formats have their own strengths and weaknesses, and may therefore be preferred on different criteria. The research team was not able to find any systematic evidence (by literature study and by consulting the experts in this area) that respondents would prefer or better understand certain presentation formats over other ones. Therefore, 30 face-to-face

interviews were organized to fill this gap in present knowledge. The objectives of the face-to-face interviews were as follows:

- Test the respondents' understanding of different reliability presentation formats;
- Investigate the respondents' impressions of these presentation formats in several aspects, e.g., clearness, ease of understanding, and visual appearance attractiveness;
- Collect the respondents' preferences on the presentation formats from several aspects In the analyses of these interviews, we paid special attention to the effect of education, to see if all respondents can understand the questions and especially the presentation of unreliability.

2.2 Description of interview questionnaire

If the timing (departure and/or arrival times) of the trip is important for the traveller, this trip is called a 'scheduled trip'. On the other hand, the trip is called 'non-scheduled' if the trip timing is less relevant to the traveller. The interview starts with some brief screening questions, where we can distinguish four types of trip for the interviewees:

1. Car non-scheduled trips (CN): travelling by car as a driver without scheduling consideration (i.e., trip timing is not important);
2. Car scheduled trips (CS): travelling by car as a driver with scheduling consideration (i.e., trip timing is important);
3. Public transport non-scheduled trips (PN): travelling by public transport without scheduling consideration;
4. Public transport scheduled trips (PS): travelling by public transport with scheduling consideration.

After the screening questions, the interviewer would ask the interviewee to imagine that a certain type of trip was to be considered during the whole interview. The rest of the interview questionnaire is set up as follows:

Table 1 Face-to-face interview setup

Section	Content
I	General information of the reliability perception
II	Test questions for the reliability presentation format
III	General impression of the reliability presentation format
IV	Preference of the reliability presentation format
V	Individual socio-demographics

2.3 *Presentation formats tested*

In the selection process of the presentation format, the starting point was the list of reliability SP studies in the Start Memorandum of the study (available from the authors on request). According to Hamer et al. (2005), a series of possible travel times (or arrival times) is recommended to describe the travel time unreliability in the current Dutch VoR SP survey. Thus, we only tested the formats that are presented by a series of possible travel times, and discarded the formats using different types of definition of travel time reliability (e.g, Hensher, 2001; Tseng et al. 2005; Bhat and Sardesai, 2006).

In Black and Towriss, 1993, (cited from Bates et al., 2001 and Small et al., 1999), it was suggested that people could interpret a 5-point (compared with 10-point) distribution of travel times reasonably well. The research team also agreed with this point, and found that 5-point distribution of travel times were relatively more widely used than other ones (Small et al., 1995,;Small et al., 1999 and Hollander, 2005). Consequently, we adjusted all the tested presentation formats in such a way that in every format reliability is presented as a distribution of 5 possible travel times.

We selected eight presentation formats, namely Format A to H, to be tested. A brief description of these formats is as follows.

- *Format A*: the verbal description (without any graph) of 5 possible travel times in 5 different lines. This format is adopted from Small et al., 1999.
- *Format B*: the clock-face presentation of 5 possible travel times. This presentation format is the variant of the one in Bates et al., 2001, where there are 10 possible travel times in the clock-face circle.
- *Format C*: 5 'bars' present 5 possible travel times. The lower end of the bar gives the departure time and the top end of the bar gives the arrival time. Travel time duration is therefore implied by the length of the bar. This presentation format was used by Hollander, 2005.
- *Format D*: Format D is similar to Format C. The only difference is that the sequence of the 5 possible travel times is ordered by the lengths in Format C, while the sequence is randomized in Format D.
- *Format E*: histogram of the travel times distributions. The horizontal axis represents the travel time/arrival time, and the vertical axis represents the percentage of trips. This format is used by Copley et al., 2002.
- *Format F*: Format F is similar to Format E. The only difference between these two is that Format E uses *percentage* (xx%) to represent the likelihood of certain travel time, while Format F uses *frequency* (x out of 5 trips) to represent the same information.
- *Format G*: Format G is a new format. In this format, we show some possible travel time/arrival time intervals and the associated frequencies to the respondents. The consideration here is that these possible arrival time intervals are closer to what the reality is, and may be more representative for the concept of unreliability.
- *Format H*: Format H is a combined version of Format A and G. The 5 possible travel time/arrival time intervals are shown in 5 different lines.

The eight presentation formats are given in Appendix A for the car non-scheduled (CN) trips.

2.4 Recruitment and interview process

The 30 interviewees were recruited from the personal network of Vrije Universiteit Amsterdam, such as relatives and friends. To enhance the credibility of the interview outcomes, we paid special attention to selecting the representative interviewees in every education level as well as in the types of trips (CS, CN, PS, and PN) they made. All the interviews were done during October - November 2006. An interview usually took 40-60 minutes, while a few took more than one hour. The respondent was compensated by 15 Euros as a reward for participating.

3 Results from the face-to-face interviews

The number of interviews was 30 in total, with 8 respondents in CN, 10 respondents in CS, 3 respondents in PN, and 9 respondents in PS versions. In the following subsections, we will present the results according to the questions sequence in the questionnaire. Frequency tables are presented for each question. In particular, we will focus on the group of lower educated people.

3.1 General information of the reliability perception:

Before giving any description or explanation of unreliability (uncertainty) of travel time to the interviewees, we tried to ask the respondents how they describe the unreliability/uncertainty of travel time, and how they think of uncertainty in practice.

Table 2 QI_1. Can you indicate which factors you consider in practice for accounting for unreliability of travel time? (you can choose for more than one option)

	Lower education **Freq.**	**Higher education** **Freq.**	**All samples** **Freq.**
Average travel time	11	10	21
Maximum travel time	4	7	11
Minimum travel time	1	8	9
Probability	2	9	11
Don't know	0	0	0
Other	0	1	1
Total	18	35	53

Table 3 QI_2. How complicated do you find it to think about uncertainty of travel times?

	Lower education Freq.	Higher education Freq.	All samples Freq.
Not at all complicated	5	5	10
A bit complicated	3	10	13
Complicated	4	3	7
Total	12	18	30

Note: Complicated" in this paper comprises reasonably/considerably/very complicated in the questionnaire. Same for other concepts like "helpful"

As expected, 'average travel time' got more votes than the other elements. The elements of maximum/minimum travel time and probability accounted for around equal share of the choices. In principle, average travel time, maximum and minimum travel times, and probability are the four most important factors that the travellers would think of to describe the travel time uncertainty in practice. It is interesting to note that higher educated people tend to think more of 'probability' than lower educated people.

Next, the interviewers would give some description and explanation for the uncertainty of travel time. In particular, a dice- throwing example was given to the respondents to help them to think of the unpredictability of travel times and the probability associated with the realization of a certain travel time event. Opinions were then probed about the complexity and helpfulness of this example. From these, it can be concluded that it is useful to keep a text like this in the main questionnaire.

Table 4 QI_3. How complicated do you find the description of uncertainty of travel times in the text (throwing dice example)?

	Lower education Freq.	Higher education Freq.	All samples Freq.
Not at all complicated	2	4	6
A bit complicated	6	9	15
Complicated	4	5	9
Total	12	18	30

Table 5 QI_4. How helpful do you find the example of throwing a dice in the text?

	Lower education Freq.	Higher education Freq.	All samples Freq.
Not at all helpful	2	5	7
A bit helpful	2	4	6
Helpful	8	9	17
Total	12	18	30

3.2 Test questions for reliability formats

The main objective of this face-to-face interview was to test which reliability presentation format is best understood by the respondents and to see how the respondents interpret these presentations. This section will discuss these two issues.

The test questions were designed to check to what extent the respondents have the "correct" perception of reliability, i.e., the same as expected by researchers, for each format. To prevent people getting familiar with the numerical example, and basing answers on previous formats, we varied the attributes (time, cost, and reliability) levels across these eight presentation formats. Furthermore, we randomized the order of showing the formats, to reduce the possible learning or fatigue effect. In other words, formats A to H were shown in different sequences to different respondents. The results of the test questions are summarized for scheduled and non-scheduled trips versions separately.

3.2.1 Non-scheduled trips

There are two test questions for the non-scheduled trip interviewees (versions of CN+PN = 11 respondents). To compare respondents' ability of understanding the eight formats, we computed the score rate – defined as the percentage of correct answers given by the respondents – for each format. Tables 6 and 7 summarize the results of these two test questions.

Table 6 QII_3. The travel time for trip 1 is more uncertain than trip 2

Format	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**
Correct answer	**No**	**Yes**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**
Lower education								
Score rate (%)	**100**	**100**	**100**	**80**	**80**	**100**	**100**	**100**
Higher education								
Score rate (%)	**83**	**66**	**66**	**83**	**66**	**83**	**50,**	**83**
All respondents								
Score rate (%)	**90**	**81**	**81**	**81**	**72**	**90**	**72**	**90**

Note: Score rate is defined as the percentage of correct answer given by the respondents.

Note: Here, "more uncertain" can be interpreted either by a larger standard deviation of travel time or a wider range between maximum and minimum travel times (amount of uncertain time). In this interview experiment, we deliberately assigned the reliability level (a series of five possible travel times) in such a way that a more unreliable alternative has larger standard deviation as well as larger uncertain time (difference between maximum and minimum travel times).

Table 7 QII_4. With trip 1, I arrive, on average, earlier than with trip 2

Format	A	B	C	D	E	F	G	H
Correct answer	Yes	No	Yes/No	Yes/No	Yes	No	No	Yes
Lower education								
Score rate	80	100	-	-	80	60	100	100
Higher education								
Score rate	83	83	-	-	83	66	83	83
All respondents								
Score rate	81	90	-	-	81	63	90	90

Note: Since the two alternatives in Format C and D have the same average travel time, there is no correct answer for these two formats.

Though the sample size is rather small, the score rates of lower education people are satisfactory, and in many cases they are even higher than the ones for higher education people.

3.2.2 Scheduled trips

There are four test questions for the interviews with scheduled trips (versions of CS+PS = 19 respondents). The results are summarized as follows.

Table 8 QII_1. With trip 1, I have a greater probability of arriving earlier than I want than trip 2

Format	A	B	C	D	E	F	G	H
Correct answer	No	Yes	Yes	No	Yes	No	Yes/No	Yes/No
Lower education								
Score rate	85	71	100	71	71	71		-
Higher education								
Score rate	100	50	91	83	83	83	-	-
All respondents								
Score rate	94	57	94	78	78	78	-	-

Table 9 QII_2. With trip 1, I have a greater probability of arriving later than I want than trip 2

Format	A	B	C	D	E	F	G	H
Correct answer	Yes/No	No	No	Yes	No	Yes	Yes/No	Yes/No
Lower education								
Score rate	-	85	100	71	71	57	-	-
Higher education								
Score rate	-	58	91	91	75	58	-	-
All respondents								
Score rate	-	68	94	84	73	57	-	-

Table 10 QII_3. The travel time for trip 1 is more uncertain than trip 2

Format	A	B	C	D	E	F	G	H
Correct answer	No	Yes	Yes	No	Yes	No	Yes	No
Lower education								
Score rate	57	42	28	42	28	42	42	71
Higher education								
Score rate	100	66	50	83	66	83	50	83
All respondents								
Score rate	84	57	42	68	52	68	47	78

Table 11 QII_4. With trip 1, I arrive, on average, earlier than with trip 2

Format	A	B	C	D	E	F	G	H
Correct answer	No	Yes	Yes	No	Yes	No	Yes/No	Yes/No
Lower education								
Score rate	85	85	100	71	85	85	-	-
Higher education								
Score rate	83	50	83	91	83	91	-	-
All respondents								
Score rate	84	63	89	84	84	89	-	-

The score rates of test question QII_3 (Table 10) are generally lower than the other question, especially for the lower educated people. One reason could be that the respondents did not know how to interpret 'uncertainty' exactly and these respondents just gave up in answering this question (the non-response rate is higher in this question). Another possible reason is that the 5 possible travel times are shown together with 5 resulting possible arrival times in the format, so people may be inclined to link the uncertainty to the level of lateness (though the arriving probability question was asked in QII_2).

The score rates of Format B are relatively lower than the other formats for these test questions. As for the level of education is concerned, we do not find out any strong evidence that lower education people have lower score rates.

3.3 *General impression of reliability presentation formats*

In interview Section III, we asked the interviewees to indicate how they perceived the levels of clearness or difficulty in each presentation format. This is described by five different indicators:

- Clearness of the presentation of reliability
- Ease of making choice between two alternatives/trips
- Ease of considering all information/attributes
- Attractiveness of the visual appearance
- Ease of answering the test questions in Section 3.2.

To make the answers more comparable between formats, we assign scores to different levels of understanding (or difficulty). Thus, we can rank these eight presentation formats according to the average scores they get in the questions. Here we use 1 for 'very unclear', 2 for 'unclear', 3 for 'not very clear', 4 for 'clear', and 5 for 'very clear'. A format with higher score will therefore be more preferred.

Figure 1 below summarizes the average scores (the average of 30 respondents) in these eight formats based on these five indicators.

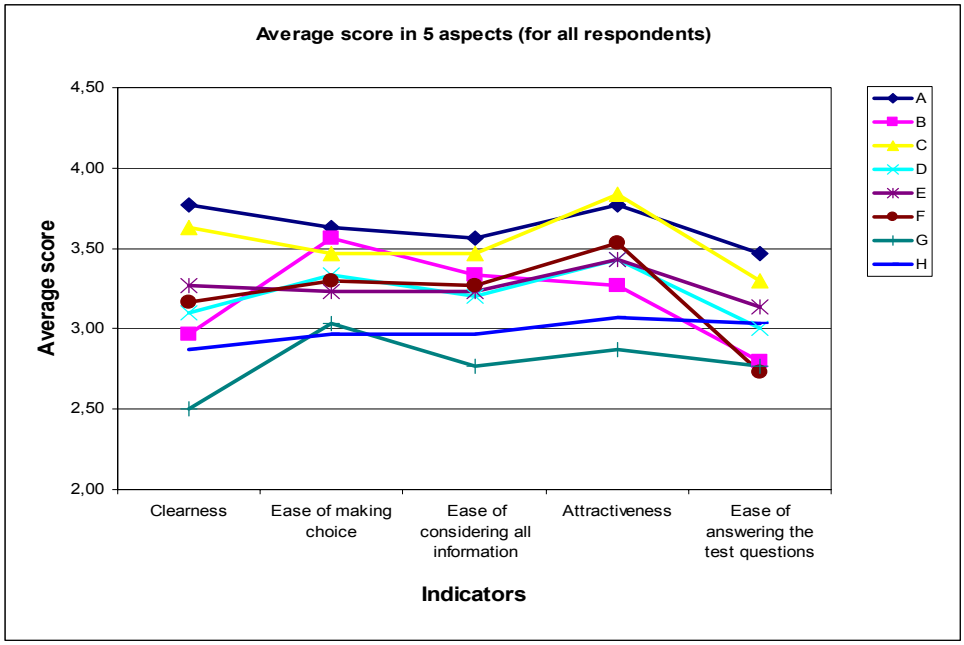

Figure 1 The average scores of 5 indicators for Format A to H: all respondents

In general, Format A is ranked first in most cases. The next is Format C, which also performs well in the scores, and the score differences between Format A and C are small in many cases. It is obvious that Format G and H are among the worst for most of the cases. Since the reliability information given in these two formats are more complex (showing the travel time intervals rather than some certain travel times), the respondents seem to have much more difficulty in reading them.

3.4 Preference of reliability presentation formats

In interview Section IV, we showed all eight presentation formats once more to the interviewees. The interviewers placed these eight formats on the desk (randomly), and then asked the interviewees to indicate once again their preferences on the format, according to the five indicators discussed in Section 3.3 (clearness of the presentation; ease of making choice between two alternatives; ease of considering all information in the alternatives; visual appearance attractiveness; ease of answering the test questions).

The respondents indicated both the most preferred and the least preferred format according to these five aspects. The results of the choice frequency are shown graphically in Figure 2 to Figure 6. Here we combine the most and the least preferred format into one graph. Thus, the positive part of the vertical axis represents the frequency that the format is chosen as favourite format; while the negative part represents the frequency that it is chosen as the least preferred format.

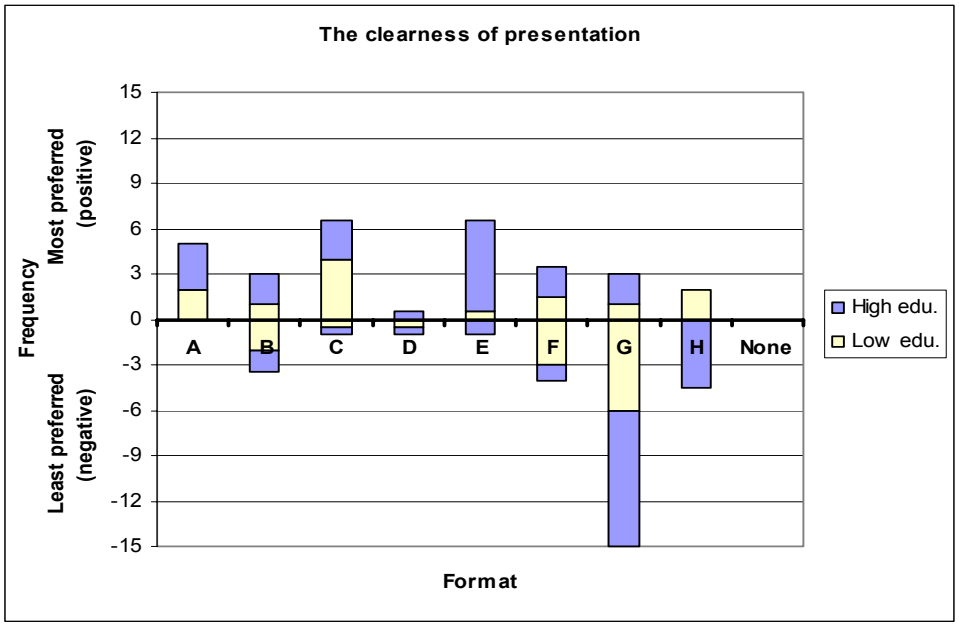

Figure 2 The frequency of the clearness of the format

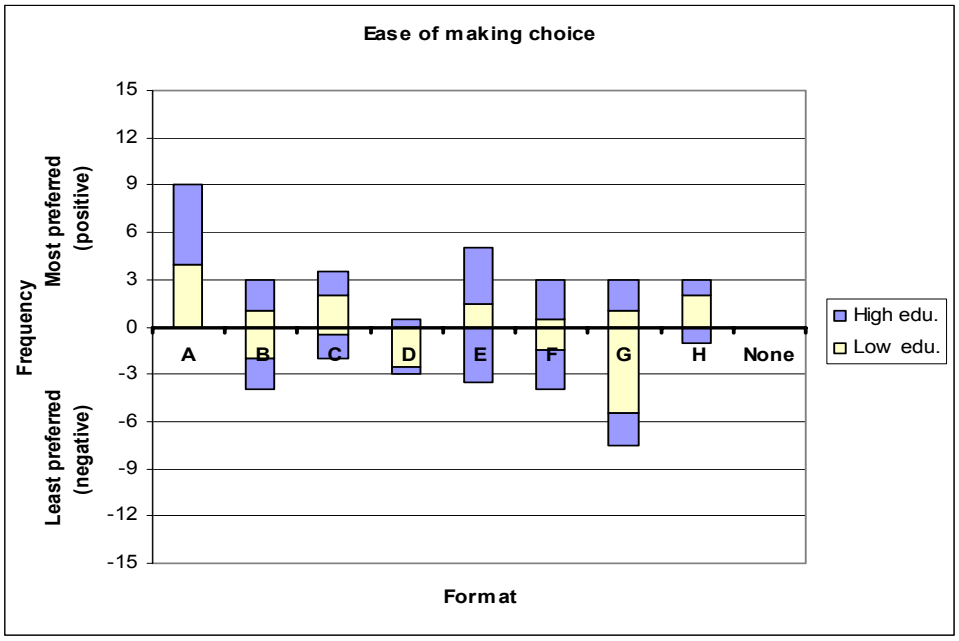

Figure 3 The frequency of the ease of the format in making choice

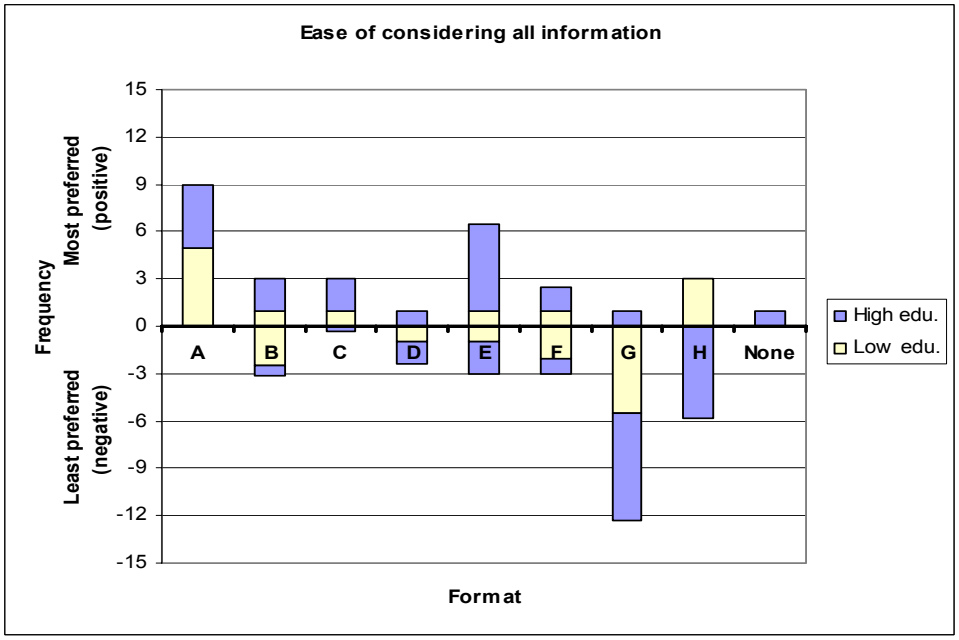

Figure 4 The frequency of the ease of the format in considering all information

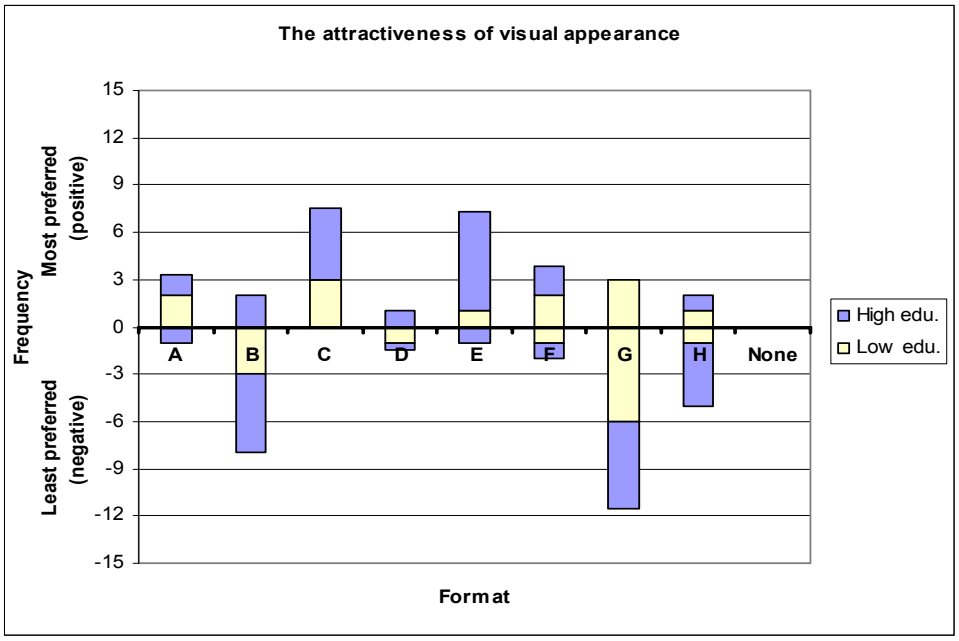

Figure 5 The frequency of the format in the visual appearance attractiveness

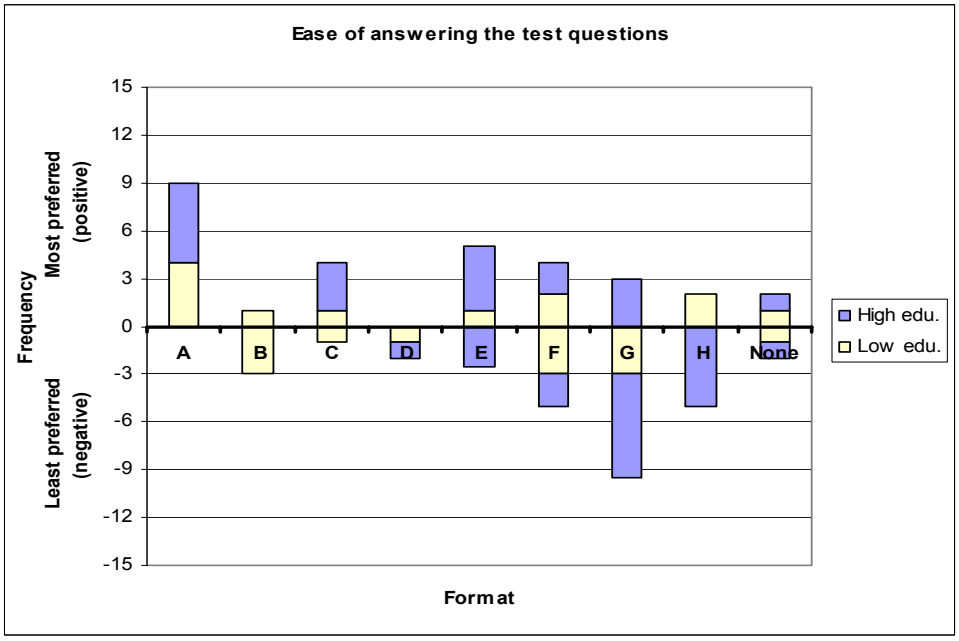

Figure 6 The frequency of the format in the ease of answering the test questions

From these results we can conclude that the preferences of these respondents are quite diverse. None of the formats is favoured (most) by more than half of the respondents in every situation (clear/easy/attractive…etc.). Nevertheless, Format A performs well consistently, compared to the other formats, and scores relatively high on criteria that are more likely to directly affect the quality of responses for repetitive SP questions (ease of making choice, ease of considering all information, ease of answering test questions).

4 The pilot to test the full surveys

The objectives of the pilot interviews were to test the full survey design and to finalize the survey design based on the results from the tests. Four different segment questionnaires, car, public transport, freight transport, and recreational navigation, were tested. For each of these 4 segments, 20 self-completion paper questionnaires, and 4 face-to-face interviews were planned. These additional face-to-face interviews were mainly carried out to check whether the phrasing and presentation of attribute were properly understood by the respondents. In this paper, we will not deal with the pilots for freight and recreational navigation.

Since the pilot was done using paper-based questionnaire, it was essential to have a separate recruitment questionnaire first, to collect some information on a respondent's recent trip that is in scope. This information was then used to customize the main questionnaire (e.g., to set the base level for the attributes, and the changes relative to this reference level), and the main questionnaire was mailed to the recruited respondent. As in the Phase 2 face-to-face interviews, to encourage respondents to participate in the pilot, we provided a reward of 10 or 15 Euros.

For car drivers, the respondents were mainly recruited during the morning peak from parking garages in the Amsterdam metropolitan area. For public transport users, the recruitment took place in the shopping centre and train stations around the Amsterdam Bijlmer/Arena area and Almere, and it was done between 10 am and 3 pm. In the end, we successfully recruited 24 car drivers and 25 public transport travellers who were willing to participate in the main survey in the next stage. For the face-to-face interviews in car and public transport, we then contacted the respondents from the previous face-to-face interviews.

All in all, we found it harder than anticipated to recruit respondents for this study, despite the fact that compensation of 10 and 15 Euros was offered. We attribute this, at least in part, to the fact that people may feel overloaded with questionnaires, and possibly requests by other people [e.g. charity collectors] while on the street. It is clear that a low response rate may cause all sorts of biases, in particular if it is correlated with the value of time. We therefore advise seriously considering the use of an existing household/consumer panel, or at least a professional market research firm for the recruitment, when doing the formal questionnaire. It may prove cheaper in the end, and also may give more possibilities of stratifying the sample.

In this pilot we did a few face-to-face interviews, but most pilot interviews were carried out with printed mailback questionnaires that read in answers from a recruitment interview. Over and above the SP questions, each questionnaire also contained three sets of 'check' questions that were intended to check whether the respondent understood the concept of reliability in the format that was presented to them. This included questions as to which alternative (in the view of the respondent) had the highest reliability, or had the highest probability of arriving on or before a certain time. In addition, one of the choice pairs contained a "dominant" alternative (i.e. an alternative that is superior in all aspects and, therefore, logically should be chosen), as in the earlier face-to-face interviews.

The average correct response to the check questions (about 55%) appears to be much lower than during the face-to-face interviews that were held to test the presentation of the reliability attribute. This might be due to the fact that most of the interviews in the pilot were mail-back questionnaires, so the amount of time taken to

understand the concept of reliability might have been less. However, those respondents in the pilot that *did* a face-to-face interview did not answer these check questions any more correctly than the mail-back respondents.

Space constraints prevent us from presenting detailed results of this pilot. In brief, the outcomes of the pilot were used to estimate discrete choice models, which for passenger transport (car, public transport, recreational navigation) gave quite acceptable results (VoTs and VoRs in plausible ranges), given the small sample sizes, and confirm that the design works well. On the basis of the pilot we therefore expect that the passenger surveys, in combination with the proposed sample sizes and interview methods, will provide data that will allow estimation of models with significant VoTs and VoRs.

5 Conclusion

In the *face-to-face interviews*, we first collected the information of respondents' perception about travel time unreliability. We then examined several reliability presentation formats that have been used in previous empirical studies. To have a thorough assessment of these presentation formats, we not only asked questions about the respondents' subjective preferences, but also asked questions that can be tested objectively to see if these respondents perceived the unreliability as expected. The interview results were analyzed separately for lower and higher educated people.

In conclusion, we recommend using the verbal description, Format A, to represent the travel time reliability in the VoR SP experiment. In many indicators of the interviews, Format A is favoured by most (a relatively high proportion) of the respondents. Furthermore, respondents' preference for Format A is rather consistent between lower and higher educated people. Histograms with unequal probabilities (Formats E and F) are less encouraged by the research team, since we find that some people have difficulty in reading the probability from the graph, especially lower educated people. It is also interesting to note that the preferences between Format C & D are quite varied in some cases. Since Format C & D are quite similar in the way of presenting reliability information, we would expect that the preferences of these two formats would be comparable. For this reason, though Format C is ranked second in many cases, we would not recommend this format highly here, and feel a second thought will be needed if Format C is to be considered seriously.

The objective of the *pilot Interviews* was to test the full survey design based on the results from the face-to-face tests. We found it harder than anticipated to recruit respondents for this study, despite the fact that a compensation of 10 and 15 Euros was offered. People may feel overloaded with questionnaires, and possibly requests by other people [e.g. charity collectors] while on the street. We therefore advise seriously considering the use of an existing panel, or at least a professional market research firm for the recruitment, when doing the formal questionnaire.

The average correct response to the check questions was much lower than during the face-to-face interviews that were held to test the presentation of the reliability attribute. This might be due to the fact that most of the interviews in the pilot were mail-back questionnaires, so the amount of time taken to understand the concept of reliability might have been less. However, respondents in the pilot that did a face-to-

face interview did not answer these check questions more correctly than the mail-back respondents. So, this remains a point of concern.

The outcomes of the pilot were used to estimate discrete choice models, which gave quite acceptable results (VoTs and VoRs in plausible ranges), given the small sample sizes, and confirm that the design works well.

Provided that the recruitment is done by a professional market agency and/or by using a panel, we expect that the passenger surveys in the forthcoming main study will supply data that will allow estimation of models with significant VoTs and VoRs.

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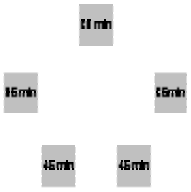
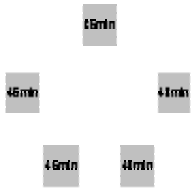
Appendix: Reliability presentation formats for car non-scheduled trips

In this version we show you the 5 possible travel times below each other.
Imagine that you want to travel by car to a shopping centre. You can choose from two trips A and B. Which one would you choose?

Trip A	*Trip B*
Mean travel time: **40 min**	Mean travel time: **41 min**
You have an equal probability of each of these 5 travel times: **35 min** **40 min** **40 min** **40 min** **45 min**	You have an equal probability of each of these 5 travel times: **30 min** **35 min** **45 min** **45 min** **50 min**
Cost: **€ 3,80**	Cost: **€ 2,80**

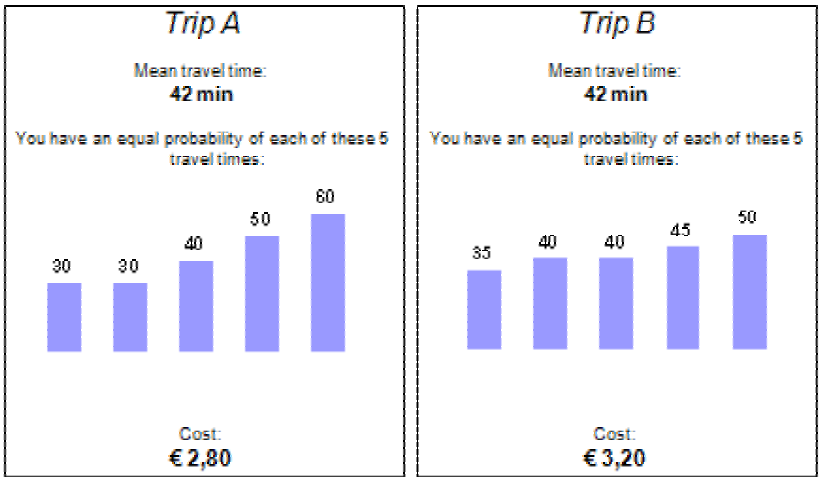
A

In this version we show you the 5 possible travel times as points on a circle.
Imagine that you want to travel by car to a shopping centre. You can choose from two trips A and B. Which one would you choose?

Trip A	*Trip B*
Mean travel time: **44 min**	Mean travel time: **41 min**
You have an equal probability of each of these 5 travel times: 	You have an equal probability of each of these 5 travel times: 
Cost: **€ 2,80**	Cost: **€ 3,60**

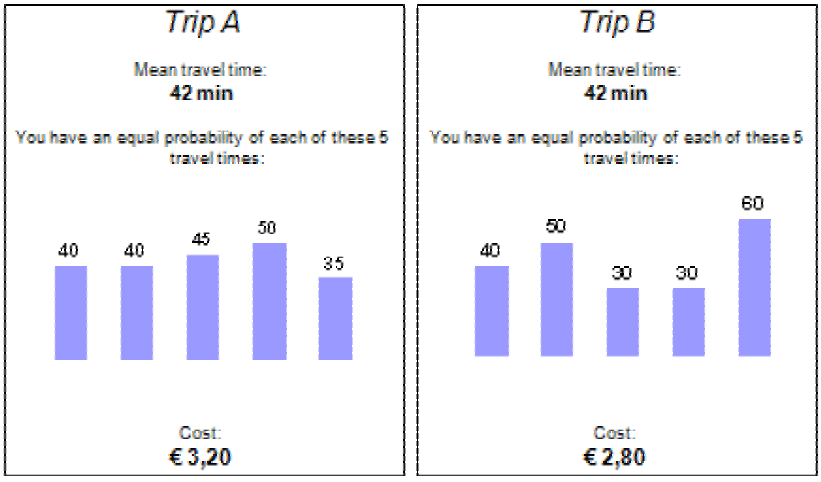
B

In this version the 5 possible travel times are illustrated by the height of the bars.
Imagine that you want to travel by car to a shopping centre. You can choose from two trips A and B. Which one would you choose?



C

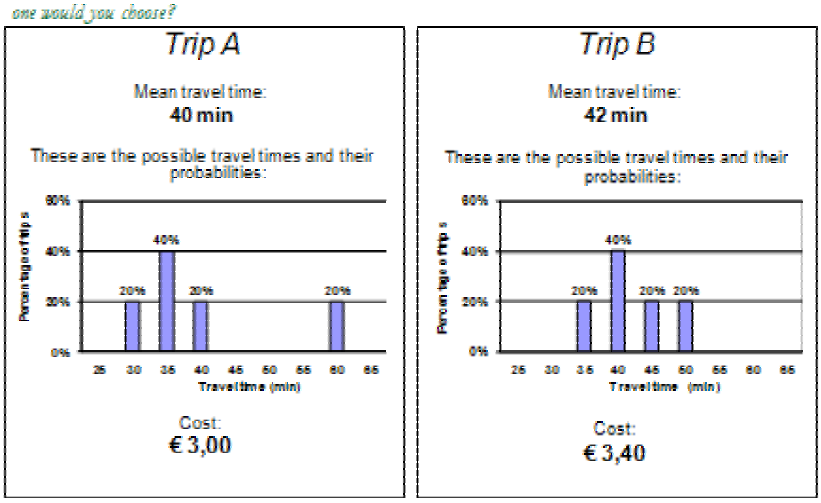
In this version the 5 possible travel times are illustrated by the height of the bars.
Imagine that you want to travel by car to a shopping centre. You can choose from two trips A and B. Which one would you choose?



D

In this version the 5 possible travel times are illustrated by the height of the bars. (probabilities as percentage).

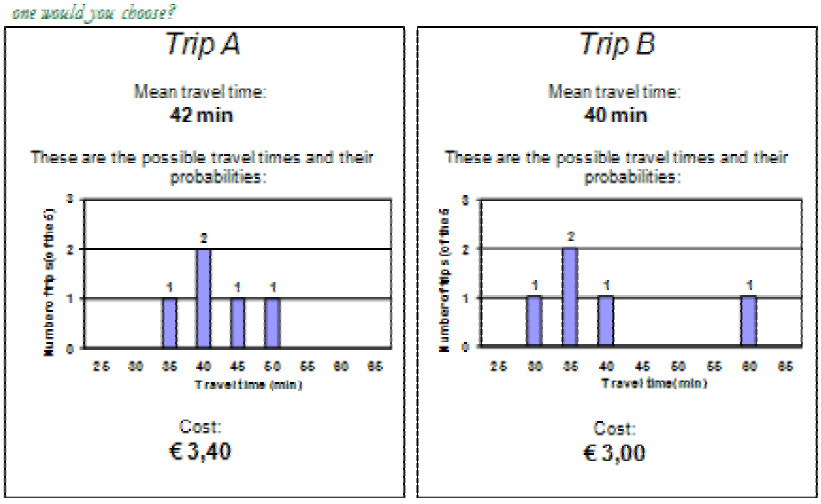
Imagine that you want to travel by car to a shopping centre. You can choose from two trips A and B. Which one would you choose?



E

In this version the 5 possible travel times are illustrated by the height of the bars. (probabilities as number of times out of 5)).

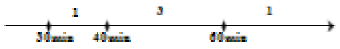
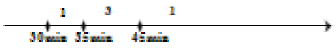
Imagine that you want to travel by car to a shopping centre. You can choose from two trips A and B. Which one would you choose?



F

In this version we show in words and along a time axis how large the probabilities of certain travel times are (as number of trips of the five). The travel times are, thus, not precise, but within certain limits

Imagine that you want to travel by car to a shopping centre. You can choose from two trips A and B. Which one would you choose?

Trip A	Trip B
Usual travel time: **50 min**	Usual travel time: **40 min**
These are the possible travel times and their probabilities:	These are the possible travel times and their probabilities:
Travel time / **Probability** 30 – 40 min / 1 of the 5 trips 40 – 60 min / 3 of the 5 trips More than 60 min / 1 of the 5 trips	**Travel time** / **Probability** 30 – 35 min / 1 of the 5 trips 35 – 45 min / 3 of the 5 trips More than 45 min / 1 of the 5 trips
	
Cost: **€ 2,40**	Cost: **€ 3,60**

G

In this version we show in words how large the probabilities of certain travel times are (as number of trips of the five). The travel times are, thus, not precise, but within certain limits

Imagine that you want to travel by car to a shopping centre. You can choose from two trips A and B. Which one would you choose?

Trip A	Trip B
Usual travel time: **40 min**	Usual travel time: **45 min**
You have an equal probability of each of these 5 travel times:	You have an equal probability of each of these 5 travel times:
Travel time 30 – 35 min 35 – 40 min 40 – 45 min 45 – 50 min More than 50 min	**Travel time** 30 – 40 min 40 – 45 min 45 – 50 min 50 – 65 min More than 65 min
Cost: **€ 3,40**	Cost: **€ 2,80**

H