



SCARR
Social Contexts
and Responses to Risk

**Preference, value and attitude in the context of
some familiar and unfamiliar goods:
The preliminary results of a survey.**

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This is a preliminary draft so, please, do not quote.



■ Introduction

Governments face a dilemma in deciding how to allocate scarce public funds to reduce risks to health and safety in the face of a wide range of competing demands. The ideal is to allocate funds as closely as possible in line with the preferences and values of citizens; but eliciting preferences, and determining the value to the individual of each of the benefits at issue, is problematic. Individuals are required to evaluate benefits that are unfamiliar, and where evaluations involve dealing with notions of probability, risk and uncertainty that are not a well-rehearsed part of everyday decision-making. There is now a substantial body of evidence to suggest that the results of surveys are affected by the particular elicitation methods used and the contexts in which questions are asked: for example, whether respondents are asked open-ended or closed-ended questions; and whether potential benefits are presented separately or alongside one another (see Bateman et al, 2002, especially chapters 8 and 12).

To fix ideas, consider a case where the individual is asked about three possible personal risk reductions: a 5% reduction in the risk of being involved in a road accident; a 5% reduction in the risk of their home being burgled; and a 10% reduction in the risk of their home being burgled. Key questions for policy-makers and economic theorists are as follows:

- Can the individual rank these options according to their preferences and assign a monetary value to each of the benefits?
- Are the monetary values assigned to benefits consistent with (i) the position of each benefit in the preference ranking, and (ii) the scale of benefits?
- And is it the case that the preference ranking, and the values assigned to benefits, are stable regardless of the contexts in which those benefits appear?

According to conventional economic models, in order to generate a coherent representation of the wishes of citizens, the responses to these questions must all be positive. Yet the results of surveys designed to elicit values for reducing risks to health and safety exhibit patterns that depart from the requirements of those models and thereby pose serious problems for policymakers and for conventional theories of rational choice. This paper reports the preliminary results of a survey designed to explore some of those patterns and how they may vary as the subject matter changes from familiar private goods involving little or no uncertainty through to less familiar public goods involving risk. At issue for the wider project of which the current investigation is one part are the limits of individual decision-making, and whether in the light of the evidence it makes sense for health and safety policy to be constructed on the basis of the preferences and monetary values elicited through surveys.

■ Methodology

Semi-structured face-to-face interviews are being conducted at the University of East Anglia with a sample of people from the Norwich area controlled for age, sex and socio-economic status. Interviews are of approximately 40 minutes' duration, and both quantitative and qualitative data is being collected with a view to understanding the thought processes involved in responding to questions about choice and value ¹.

The interview is divided into five main parts where each part comprises a set of items and a series of questions relating to those items. These sets are as follows:

Set 1 (6 items):

- Mars Bar
- 1 bottle of Muscadet white wine
- battery-operated smoke detector
- disposable camera
- 300gm pack of Continental chocolates
- box of scented tea-lights.

Set 2 (12 items):

- £1 in cash
- £5 in cash
- £10 in cash
- £10 Boots voucher
- £10 donation to Oxfam made by us on your behalf
- 1 bottle of Muscadet white wine
- 3 bottles of Muscadet white wine
- battery-operated smoke detector
- 100gm pack of Continental chocolates
- 300gm pack of Continental chocolates
- decorated mug
- portable radio

¹ The survey is ongoing at the time of writing with 27 interviews having been conducted so far. Thus, the results reported here are provisional and offered as food for thought. Comments on the methodology are welcome. A copy of the interview schedule is available on request from the authors.

items are on display in front of the respondent during the interview, and any price labels attached to items are removed beforehand.

For each set of items, the respondent is presented with a set of cards in random order where each card represents an item, for example:

1 bottle of Muscadet white wine

The respondent's first task is to rank the items according to their preferences by aligning the cards on a template with their most preferred item at the top down to their least preferred item at the bottom. Respondents are then asked to assign a monetary value to some of the items.

To encourage respondents to think carefully about every item in the set, an incentive is built in to the questions pertaining to Set 2. Respondents are told that once they have responded to these questions, the cards will be shuffled and placed face down, and the respondent invited to pick two cards at random. The respondent will then take home whichever of the two items they placed highest in their ranking.

Multiples of some items are included in order to test for the sensitivity of valuations to the magnitude or 'scope' of the benefit. Most economic models would predict that assigned values will be roughly proportionate to the size of benefits². For example, if a respondent assigns a value of £2 to the 100gm

² However, this is an area of some disagreement, as we discuss below.

pack of chocolates, one would expect to observe a value of £6 assigned to the 300gm pack of chocolates.

Overlapping pairs of goods appear across the sets in order to test for the consistency of preferences and values in the context of different lists of items. Under conventional economic models, the context in which goods appear (or the way in which questions are ‘framed’) has no influence either on the preference ranking or on the values assigned. Moreover, values should correspond to preferences. So, for example, a respondent who states that they prefer item X to item Y will always place X higher than Y in their ranking regardless of the set of items in which X and Y appear; and the value they assign to X will be higher than the value assigned to Y. As a further test of the influence of context on value, for Set 4, respondents are randomly divided into two groups. The items facing Group A include two ‘low’ cash sums (£5 and £10), whereas the items facing Group B include two ‘high’ cash sums (£50 and £100). Since values are assumed to be independent of context, there should be no significant difference between the values assigned to items by Group A and the values assigned by Group B, that is, there is no ‘anchoring’ effect with arbitrary clues to the value of an item being provided by one or more other items in a set ³.

³ We are not yet in a position to test for the influence of arbitrary anchors on assigned values. However, Ariely *et al* (2003) found that valuations of a number of consumer products were strongly influenced by arbitrary anchors leading to a pattern of valuations (described as *coherent arbitrariness*) that give the illusion of order as if valuations are informed by stable underlying preferences. Thus, significantly, this ‘anomaly’ is not restricted to non-market goods.

■ Results

Given that data collection is at an early stage, we report only on those results that are already flagging problems for a preference-based approach to health and safety policy, and where we feel we are beginning to gain some insight to the sources of problems.

Can people assign a monetary value to a reduction in risk?

Once respondents have ranked the items in each of Sets 1 to 4 according to their preferences, they are asked to determine the value to them in monetary terms of two of the risk reduction items in Set 4: the 5%, and then the 10%, reduction in the risk of burglary. They are also asked to determine the value to them of six of the items in Set 5: the 300gm, and then the 100gm, packs of chocolates; the £10, and then the £20, donations to Oxfam; and each of the prize draw tickets. Respondents are asked to value Set 5 items after Set 4 items to avoid the valuations of non-market goods being contaminated by the valuations assigned to more familiar private goods, that is, to deflect the argument that respondents may have been ‘trained’. The valuation question takes the form:

“What sum of money that you could take home with you is as good as [...]? Feel free to say ‘nothing’ if the item is of no value to you.”

Respondents had little or no difficulty in assigning monetary values to familiar private goods (see Tables 1 and 2 in the Appendices), with several respondents indicating that they were taking into account what they thought might be the market price of a good. Consider the two packs of chocolates.

The values assigned to the 100gm pack range from £0 to £5, with a mean of £1.66 and a standard deviation of 1.13. And the values assigned to the 300gm pack range from £0 to £10.50, with a mean of £3.81 and a standard deviation of 2.43⁴.

In contrast, almost all respondents expressed difficulty in assigning monetary values to the two risk reduction items. Here, of course, there are no readily accessible market prices that might be considered salient to the task. Most respondents (20 = 74%) were eventually able to determine the value to them in monetary terms of both risk reductions, and two respondents were at least able to determine broad bands within which they felt the values they assigned to the risk reductions must lie (see Tables 3 and 4). Some of these 22 respondents turned to the cost of household insurance, or to the monetary value of their household contents, for clues to the value to them of the risk reduction; and some reached their valuations by determining the amount of money they would have to spend to achieve the same reduction in risk, for example, the cost of extra window locks or door locks, or a proportion of the cost of a household alarm system. The values assigned to the 5% reduction in risk range from £0 to £10,000, with a mean of 1890.73 and a standard deviation of 3468.23. And the values assigned to the 10% reduction in risk range from £8 to £20,000, with a mean of 3271.81 and a standard deviation of 6111.15.

⁴ In fact, the market price of the chocolates is £2.00 per 100gms.

Five respondents either refused, or felt wholly unable, to assign a monetary value to one or both risk reduction items. For these respondents, the problem was not that they didn't value a reduction in the risk of their home being burgled. Instead, all five indicated that a sum of money would fail to encapsulate the value to them of an improvement in personal safety and security, for example:

"But other things are involved."

"I can't put a figure on it."

"It's the psychological effect."

Indeed, some respondents indicated that to express the value of the good in monetary form is to *devalue* it. Moreover, several of those respondents who were able to determine a monetary value felt the need to qualify their responses in similar terms, for example:

"But I don't think I could put a price on my home being burgled."

"It's the intrusion – it's very difficult to put a monetary value on that."

"It's a silly question: it's an emotional thing."

The comments made by respondents suggest that, with regard to a reduction in the risk of one's home being burgled, money is not the only - and, possibly, not the most appropriate - measure of value since it may well underestimate the value of the two items to the individual. This observation is suggestive of recent criticisms in the literature on the contingent valuation approach to utility valuations in which people are asked to report their willingness to pay (WTP) or willingness to accept (WTA) for non-market goods. For goods of this kind, a key issue is *what* exactly is being measured. In this spirit, Kahneman and

Sugden (2005) suggest that contingent valuation responses may be measuring *attitudes* rather than *preferences*. They point out that these are different entities entailing different logics: preferences are about states of the world, whereas attitudes are about events in the mind. They argue that for goods that people have no experience or expectation of actually buying, responses tend to express *affective attitudes* and that these are susceptible to framing and context effects that sit uneasily with the theory of preference. Thus, as the comments of several of our respondents suggest, when burglary is mentioned, people tend to have an immediate emotional response: they imagine (or may even recall the experience of) the fear and horror of discovering that the sanctity of their home has been violated. Part of the problem for respondents in giving coherent expression to an emotional response of this kind is that there is no standard, or modulus, against which to measure the intensity of the response; as Kahneman and Sugden point out, each person must construct their own. Under these conditions, it is not surprising that there is more variability in the values assigned to risk reductions than in the values assigned to the more familiar packs of chocolates. Moreover, if it is indeed the case that it is attitudes rather than preferences that are informing the values assigned to risk reductions, then there is no reason to believe that the translation of an affective attitude into an amount of money is underpinned by a well-behaved preference ordering as conventional models would assume; preferences are simply not a part of the picture.

Is the preference ranking stable regardless of the context in which benefits appear?

This question can be addressed by examining overlapping pairs of items across Sets 1 to 4. For example, a single bottle of Muscadet and a 300gm pack of chocolates feature in both Set 1 and Set 2. There are 24 such overlapping pairs involving tangible private goods, cash sums and donations to charity. For the consistency requirement of standard models to be satisfied, the respondent's ranking of each item in a pair relative to the other must be the same in both sets.

Of the 27 respondents, 12 are perfectly consistent in their preference ordering across sets. The other 15 respondents vary in the frequency with which they are inconsistent (see Table 5), with 9 respondents being inconsistent once or twice and 6 respondents being inconsistent four or more times.

Just one overlapping pair of items is immune to inconsistency: unsurprisingly, this is the pair comprising the £5 and £10 cash sums that feature in Sets 3 and 4. For the most part, there is no discernible pattern to inconsistencies. But, curiously, overlapping pairs featuring the portable radio, the £10 cash sum and the £10 donation to Oxfam do give rise to 'clusters' of inconsistency: the pairs consisting of the £10 cash sum and the radio, and the £10 donation to Oxfam and the radio, each attract five respondents to be inconsistent; and

the pair consisting of the £10 cash sum and the £10 donation to Oxfam attracts four respondents to be inconsistent^{5 6}.

It is frequently argued that many of the problems that attach to contingent valuation arise because of the nature of the goods, the thought being that people are more competent when it comes to evaluating familiar private goods than they are in the case of public goods. The presence of probabilities is understood to exacerbate people's difficulties. The risk reduction items do not feature in any of the overlapping pairs and so at this stage of the project we are unable to make a comparison. However, the results so far do suggest that the consistency requirement cannot be relied upon completely when private goods are presented in different contexts. Even for relatively ordinary private goods, there may be a degree of uncertainty about preferences such that the orderings between goods of similar value may be liable to vary somewhat from one question to the next.

Are the monetary values assigned to benefits consistent with the position of each benefit in the preference ranking?

This question can be addressed by examining, first, the position in the preference ordering of a good relative to a given cash sum, and then the

⁵ It may be that more can be said about these inconsistencies at a later date when there are more observations and further analysis has taken place. Respondents are also being asked about the *strength* of their preferences and how *confident* they are that they would give the same preference ordering again if the exercise was to be repeated on several occasions. This data has yet to be analysed, but it may be that inconsistencies arise when preferences are weak and/or confidence is low.

⁶ A complication arising in the interpretation of data is that the Asian tsunami disaster occurred in the middle of the period in which interviews were conducted giving a high profile to the giving of charitable donations. Thus, respondents interviewed in January may be more sensitive to the value of charitable donations than those interviewed in November and December.

value assigned to that good. If a respondent states that they prefer the cash sum to the good, one would expect the respondent to assign a value to the good that is less than the cash sum if the consistency requirement is to be satisfied. Of course, the numbers of respondents to date is limited, but we report on what we have so far.

In the case of the 5% reduction in the chance of burglary and the £20 cash sum, the values assigned by 15 respondents are perfectly consistent with the preference ordering; two respondents rank the £20 cash sum higher/lower than the risk reduction but then assign a value of £20 to the risk reduction which would suggest indifference between the two items; and the values of four respondents are wholly inconsistent with the preference ordering (see Table 6). (Six respondents are unable to assign a value.)

In the case of the 10% reduction in the chance of burglary and the £20 cash sum, the values assigned by 15 respondents are perfectly consistent with the preference ordering; one respondent ranks the £20 higher than the risk reduction but then assigns a value of £20 to the risk reduction which would suggest indifference between the items; and the values of five respondents are wholly inconsistent with the preference ordering. (Six respondents are unable to assign a value.)

4 respondents are inconsistent with respect to both risk reductions and, for some of these respondents, the extent of the inconsistency is marked, for example, one respondent states that they prefer the £20 to both the 5% and

the 10% risk reductions, but then assigns values of £10,000 and £20,000, respectively, to these benefits.

In the case of the 300gm pack of chocolates and the £5 cash sum, the values assigned by 17 respondents are perfectly consistent with the preference ordering; 7 respondents rank the £5 higher or lower than the chocolates but then assign a value of £5 to the chocolates which would suggest indifference between the items; and the values of just two respondents are wholly inconsistent with the preference ordering. (There is a missing value for one respondent.) Thus, in this respect, it would seem that people are more consistent with regard to preferences and values in the case of familiar private goods than they are in the case of the non-market goods ⁷.

Are the monetary values assigned to benefits consistent with the scope of benefits?

Three goods allow us to address this question; these are the chocolates (100gm and 300gm packs), the donations to Oxfam (of £10 and £20), and the reductions in the chance of burglary (of 5% and 10%). The data are still limited at this stage of the survey – especially with half a dozen respondents unable or unwilling to assign money values to the risk reductions – and we

⁷ Respondents are not given the opportunity to express any indifference between goods. Thus, where a respondent expresses a preference for one good over another, but then the values assigned to those same goods indicate indifference, this might be considered a less serious infringement of the consistency requirement, reflecting little more than an inclination to express values in round numbers. It might then be argued that, in the face of the relatively large number of respondents who behave in this way with respect to the chocolates, this amplifies the strength of our tentative conclusion, i.e. that people may be more consistent with regard to familiar private goods than with regard to non-market goods.

stress the provisional nature of any patterns to date. Nevertheless, we report what we have and comment briefly.

In the case of the chocolates, four respondents are perfectly sensitive to scope, and there is a discrepancy of only a few pence for two respondents. But there are discrepancies of between 50 pence and £10 for 21 respondents. In the case of the donations to Oxfam, 17 respondents are perfectly sensitive to scope; there are discrepancies of between £1 and £10 for 9 respondents; and one respondent felt unable to provide a valuation. And in the case of the risk reductions, 9 respondents are perfectly sensitive to scope; there are discrepancies of between £5 and £10,000 for 11 respondents; but there are no observations for 7 respondents.

One possible interpretation of this is that in cases such as the donation where a sum of money is specified as part of the good, the cue is so strong that the majority of respondents pick up on it. The information on risk reduction, although numeric, is less likely to induce as much conformity. And while the quantity information about the chocolates is also numeric, it may be that respondents are influenced to some degree by the convention that prices of larger packs entail some discount for 'buying in bulk'⁸.

What we also notice when looking at the frequencies of values as reported in Tables 1 to 4 is that in the case of the chocolates the distributions tend to be

⁸ When the value assigned to the large pack of chocolates is compared with three times the value assigned to the small pack of chocolates, there is a discrepancy of £1 or less for 12 respondents (or 14 if one includes the two respondents whose valuations deviate by just a few pence).

reasonably symmetrical, with no great differences between means and medians: a pattern which plausibly reflects the way in which tastes for chocolate may vary between individuals. By contrast, the values for reducing risks of burglary display the pattern common in many contingent valuation studies, whereby a minority of respondents give very high – some might think, implausibly high – values, so that in both cases the means are more than ten times their respective medians. Thus although those means, and the within-respondent values, seem to show reasonable sensitivity to scope overall, questions must be asked about whether this reflects a desire to appear consistent of the ‘coherent arbitrariness’ kind discussed by Ariely et al (2003) rather than estimates that would hold up if respondents had thought through the issues carefully and were actually faced with the prospect of parting with the kinds of sums they stated.

The issues surrounding the sensitivity of monetary values to the scope of benefits is one that we are pursuing in this and other parts of the project with a view to determining how far any insensitivity is particular to the domain of public goods or is more widespread. Certainly, the literature offers many examples of so-called scope problems, or ‘embedding effects’ (Kahneman and Knetsch, 1992). For example, Desvougues *et al* (1993) and Schkade and Payne (1994) both find that respondents’ willingness to pay to protect migratory waterfowl is similar regardless of whether policy intervention results in saving 2,000 birds or 200,000 birds. It can be argued that some insensitivity to scope is consistent with economic theory to the extent that the marginal value of an extra unit of a good might be expected to decline (the principle of

diminishing marginal rate of substitution). However, it is not clear that the evidence of surveys supports this interpretation of scope insensitivity and, hence, how policy-makers should respond where it arises (Frederick and Fischhoff, 1997).

Concluding remarks

Clearly, no statistical significance can be accorded to our results so far since interviews are at an early stage. We therefore restrict ourselves to a brief commentary on the central direction of our project.

The literature is replete with evidence of the problems posed by surveys designed to elicit people's preferences and values for health and safety benefits. At the same time, government agencies urgently require standardised methods of collecting people's views, and firm theoretical grounds for implementing one policy rather than another, if the best possible use is to be made of public funds. It may be that, ultimately, approaches grounded in the assumption of a well-behaved preference ordering are displaced as alternative approaches drawing on different theoretical protocols emerge. Yet to move forward, with or without the contingent valuation method, calls for a deeper understanding of the processes and limits of decision-making; it is this thought that provides the primary motivation for our study. As the evidence of this and many other surveys demonstrates, people do have strong feelings about risks to health and safety, and the policies that can reduce those risks. It is just that the judgments people reach can sit uneasily with conventional economic models and they can pose difficulties for

quantification and aggregation. However, it has to be emphasized in this regard that, as Kahneman, Ritov and Schkade (1999) point out, measures of WTP in contingent valuation are *not* necessarily useless: they do measure something, and a better understanding of what that 'something' is may well provide the route to sounder policy.

Introductory economics texts frequently point to the role of money as *the* unit of account when we want to measure and record economic value. While money may satisfy this function in the context of familiar private goods, when it comes to less familiar public goods, money performs less well. Thus, when people are asked to provide a summary measure of the value to them of a reduction in risk, a major problem would appear to be that money fails to provide either the most coherent or the only expression of value. At best, it would seem that money can give some measure of the material benefits of the risk reduction; at worst, money inadequately articulates the emotional and/or psychological dimensions of well-being - which, for many people, are important, if not the most important, components of value in the context of health and safety policy. This being the case, the concept of *affective attitude* is potentially more helpful than the concept of *preference* in understanding how social scientists might make the connection between the emotional/psychological impact on people's lives of particular health and safety policies and some summary measure of the value of those policies. Accordingly, we focus at this stage of our project on gaining insights to the decision-making process. Of particular interest are the limits of decision-making, or the point at which 'preferences' that broadly conform with standard

economic models may give way to responses which are influenced by other considerations as people move from more familiar private goods to less familiar public goods. We hope to have more to say on this topic as the project develops.



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■ APPENDICES

Table 1: 100gm pack of chocolates: range and frequency of values.

Value	Frequency
£5.00	1
£4.00	1
£3.00	1
£2.99	1
£2.50	1
£2.00	7
£1.65	1
£1.50	3
£1.00	6
£0.50	2
£0.30	1
£0.00	2

$$n = 27 \quad \bar{x} = 1.66 \quad \sigma_n = 1.13$$

Table 2: 300gm pack of chocolates: range and frequency of values.

Value	Frequency
£10.50	1
£10.00	1
£6.00	1
£5.00	7
£4.99	1
£4.50	1
£4.00	2
£3.00	2
£2.50	2
£2.00	5
£1.00	3
£0.00	1

$$n = 27 \quad \bar{x} = 3.81 \quad \sigma_n = 2.43$$

Table 3: a 5% reduction in the chance of your home being burgled: range and frequency of values.

Value	Frequency
£10,000	3
£4,500	1
£2,500	1
£699	1
£500	2
£300	1
£200	1
£175	1
£100	2
£50	1
£30	1
£20	2
£7.50	1
£4	1
£0	2

$n = 21$ $\bar{x} = 1890.73$ $\sigma_n = 3468.23$
(excludes 4 refusals and 2 bands)

Table 4: a 10% reduction in the chance of your home being burgled: range and frequency of values.

Value	Frequency
£20,000	2
£10,000	1
£9,000	1
£5,000	1
£1,000	2
£600	1
£500	2
£300	1
£200	2
£150	1
£100	1
£50	1
£40	1
£30	1
£20	1
£10	1
£8	1

$n = 21$ $\bar{x} = 3271.81$ $\sigma_n = 6111.15$
(excludes 4 refusals and 2 bands)

Table 5: The frequency of inconsistencies across preference orderings.

No. of inconsistencies	No. of respondents
1	4
2	5
4	2
5	2
6	1
7	1

Table 6: Monetary values and the position of goods in the preference ordering.

	Perfectly consistent responses	Preference followed by indifference	Wholly inconsistent responses	No value assigned
5% reduction in chance of burglary:	15	2	4	6
10% reduction in chance of burglary:	15	1	5	6
300gm pack of chocolates:	17	7	2	1