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Risk Management in Everyday Insurance Decisions:
Evidence from a Process Tracing Study

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Abstract

This study examined the applicability of Huber's (1997) model of risk management to a real world consumer insurance decision, namely whether to insure a recently purchased item against possible mechanical breakdown in the future. Huber argued that decision makers manage the risks of negative outcomes by applying one or more defusing operators. Respondents in this study asked for whatever information they felt necessary to decide whether to take out an extended warranty on two consumer products of differing values. We found support for most aspects of the model, particularly in relation to risk defusing operators, but also identified some respondents who could not easily be accommodated within it, i.e. those who perceived risk, but did not seem prepared to take any action. We also found evidence for recognition primed insurance decisions. The results are interpreted from a bounded rationality perspective.

1. Introduction

When someone buys a consumer product they face the risk that the product may fail, leaving them inconvenienced and possibly out of pocket, as they pay to have the item repaired. The focus of this research is to explore how people think about and act to manage future risks of product failure, at the point of purchase. In an interview setting, respondents were asked to choose a new washing machine, and a second hand car, and then to decide whether to take insurance in the form of an extended warranty to give protection against breakdown after the initial guarantee had expired. The study was designed to examine three issues. First, to describe risk management strategies within a bounded rationality perspective, and more specifically, to assess the extent to which Huber's (1997) theory of risk management can be used to model real world risky decisions involving product warranty insurance. Second, to investigate the role of key variables associated with risk management strategies, such as cost of insurance, previous experience and risk perception. Finally, to identify the kind of information people seek in a context where they are not presented with it, but have to search for it.

A traditional way of investigating insurance decisions would be to frame them within a lottery paradigm, and ask people to make choices between scenarios varying in losses and outcome probabilities. However a major problem with this is that outcome probabilities are very clearly specified (well defined) whereas most real life risks are vague or ambiguous (ill defined). One research strategy designed to overcome the limitations of the traditional paradigm, is to gradually extend experimental lottery studies to incorporate the source of uncertainty (ill versus well defined) as an independent variable. This evolutionary strategy has developed over the last 15 years with the now extensive body of research on the effects of ambiguity

on choice (Camerer and Weber, 1992; Hogarth and Kunreuther, 1995; Tversky and Fox, 1995).

An alternative reaction to the limitations of the experimental lottery is exemplified by the naturalistic decision making (NDM) school of thought (Klein, Orasanu, Calderwood and Zsombok, 1993). This more radical research strategy argues that the approach taken in experimental psychology and behavioural economics is rigorous but not relevant to real life decision making. They argue that the way forward is to only study real-life decisions and this requires giving up some rigour to achieve relevance. Unlike many in the NDM movement we feel that simulations using realistic choice alternatives can yield valid insights into how people deal with real life. The use of such simulations has enabled us to develop a process tracing method suitable for the study of economic decisions made by ordinary citizens. This involves a synthesis of interview methods used by NDM researchers and an information search monitoring method developed by Huber, Wider and Huber (1997). By allowing people to actively seek information in a supportive interview context our method identifies the information people perceive as important to their financial decisions and risk management. Our interview setting is not intended to be realistic, in that respondents do not actually make a financial commitment, and conditions are not identical to those faced in an actual retail environment. A supportive researcher who offers to provide information on request is clearly different from a retail environment, where information may be proffered in a more 'hard sell' mode, or the customer is left to find information out for themselves. An important advantage of our method is that all respondents are treated in a consistent manner, unlike in actual retail environments,

and therefore we could gain more consistent information about what people would choose to do, when the variable of sales technique was controlled.

Previous research on insurance

According to the Expected Utility (EU) model (von Neumann and Morgenstern, 1947) people buy insurance because it has greater expected utility than does not buying insurance. However, Kunreuther et al's (1978) field study of the purchase of flood and earthquake insurance concluded that the EU model is an inadequate description of the choice process in relation to insurance purchases, and this view was further confirmed in a series of laboratory studies (see also Kunreuther, 1996). More recently, Johnson, Hershey, Meszaros and Kunreuther (1993) showed that the framing manipulations in their experimental study of insurance purchase could lead consumers to make choices that violated basic laws of probability and value, and that similar choice patterns also occurred in real life insurance decisions. Connor (1996) in a study of framing effects in relation to insurance decisions, suggested that the attraction of insurance cannot be explained solely by risk reduction or by EU theory. His results strongly suggested that it was also the investment aspect of insurance which causes non-EU attraction i.e. 'that people may place extra value on the reversal of something bad when the reversal is caused by a prior investment or precautionary measure' (p. 42). Finally, other research has found that people prefer insurance to other methods of risk management, even if those other methods are identical in terms of expected utility (Schoemaker and Kunreuther, 1979; Hershey and Schoemaker, 1980).

Expected Utility theory, then, does not seem to wholly explain why people purchase insurance; background knowledge and real life information are increasingly being recognised as important variables, and this is reflected in recent research. For example, Hogarth and Kunreuther (1995) in a study of warranty purchase, commented that people have to make real world decisions while lacking relevant information about probabilities and outcomes; they refer to this as decision making under ignorance, rather than under risk and uncertainty. By varying the amount of information about probabilities and losses that people were given (from precise to none), Hogarth and Kunreuther (1995) found that people behaved differently according to the information they had on probabilities, and that economic cost-benefit models did not yield good accounts of respondents' decisions. Under conditions of ignorance, i.e. when no information was given, there was a greater probability of warranty purchase than when precise details of probabilities and costs were supplied. In many situations it is very difficult for a decision maker to access all the information needed to make a rational choice: he or she is usually faced with an ill-defined risk problem. One of the major objectives of our study is to identify the types of information which people seek in an ill-defined naturalistic task, and more specifically how insurance options are evaluated. In order to do this we present respondents with a minimal description of the insurance decision problem and encourage them to request any information they need to make their choice.

A bounded rationality perspective

Simon (1957) introduced the notion of 'bounded rationality' which takes account of the limited cognitive abilities of humans to carry out the calculations

necessary (even if they could access the relevant information) to realistically assess the degree of risk which they face. The decision maker therefore operates within a very much simplified model of the world, and one in which prior personal experience carries much weight. Huber et al (1997) comment that one of the main differences between real world decisions and gambles is that in real world decisions, background knowledge plays an important role, for example, in finding out which alternatives exist, what consequences they have, or how the decision maker can avoid a negative outcome. The importance of memory and prior experience in decision making has also been emphasised by Weber, Goldstein and Barlas (1995). Klein, Calderwood and McGregor (1989) have used the term 'recognition primed decision' to account for some expert decision making. One of their major findings was that experts' ability to make decisions appears to depend on their skill at recognising situations as typical and familiar, and in many aspects of everyday life consumers have also developed such skills.

Huber (1997) has developed a bounded rationality model of decision making in real world risky situations, using evidence gained from scenario-based risky decision tasks. He hypothesized that the decision maker constructs a relatively simple mental representation of the situation and the alternatives, whereby a risk is either perceived or not. The sub-process risk management is then activated if uncertainty about negative outcomes which may result from the choice of a specific alternative is perceived. Once some form of risk is detected, the decision maker attempts to solve the problem by employing one or more defusing operator. The defusing operators employed will depend upon the task, but Huber suggested the following.

1. Precautions involve actions taken in advance of negative consequences which buffer their impact, for example, buying insurance.
2. Control actions are attempts to reduce the probability of the negative event by exerting control over relevant variables.
3. Introduction of a new alternative to defuse the risk, the aim being to keep the positive but avoid the negative aspects.
4. Worst case plans are attempts to neutralise negative outcomes after the critical event has occurred, and do not require immediate action. They can often be identified by the phrase 'If this happens I can always...' or 'At worst, I can ...' (Huber, 1997, p.153).
5. Long term plans become relevant when the same decision situation is expected to occur again later. They may have been made some time in the past to deal with problems of a certain type, of which the present decision may be an example.

Huber (1997) argued that unlike in gamble tasks, people may only become interested in the precise probability of an event's occurrence when none of the defusing operators above result in a satisfactory outcome. In the tasks they used, they found that only a minority of respondents requested any probability information and no one was interested in precise probability. Huber claims that such evidence questions the validity of models which postulate a central role for subjective probabilities in real world risky decisions. Another of our objectives in this study was to explore whether people use their prior experience and background knowledge to manage the risk of product failure, and, linked to Huber's work, to examine the degree of interest in probability of product breakdown.

In conclusion, both studies of insurance and of other scenario-based real world risky decisions suggest that the Expected Utility model is an inadequate description of choice processes involving risk in the real world. Huber's (1997) model seems to provide a promising alternative conception of risk management in real world risky decisions.

2. Method

Design

The data used in this study were obtained as part of a larger study designed to evaluate new process tracing methods for the study of naturalistic risky decisions.

Full descriptions of the method can be found in Ranyard, Williamson, Cuthbert and Hill (1999) and in Williamson, Ranyard and Cuthbert (in press).

The basic method was based upon Huber et al's (1997) Active Information Search (AIS) procedure, in which respondents were given a basic written minimal description of a risky decision scenario, and their task was then to ask as many questions as they wished to enable them to make decisions. Respondents' questions about the various options were responded to orally, rather than in written form by the interviewer who took the role of a helpful consultant, but one who only gave the specific information requested. This procedure resulted in protocols consisting of respondents' questions and comments, and the replies given by the researcher. The content, order and organisation of protocol sequences could then be used as evidence of respondents' evaluation strategies. Finally, post-decision summaries which required respondents to summarise in their own words how they reached their final decisions were included for all respondents.

As discussed earlier, there are differences between this situation and a real situation – in a real situation there would be many more choices of washers and cars, and this in itself may have affected the decisions. However in order to keep the task manageable (as people also had several other decisions to make) we had asked people to imagine that they had narrowed their choice to a final three – probably a reasonable consideration set for most people’s decisions, given the number of variables which need to be considered. We do acknowledge that because none of the washers/cars may have been considered in reality, this may have affected the desire to insure or not. Nevertheless, respondents became very engaged in these tasks and the risk management strategies identified by this approach are likely to transfer to real decision contexts.

Decision Scenarios

Respondents were asked to complete two tasks, each involving four decisions, only the first and last of which will be considered in this paper. In both tasks (the purchase of a new washing machine, and a second-hand car) respondents had to (a) choose among three products, (b) choose which form of credit to pay with and (c) decide whether to insure their credit repayments. Finally they had to decide whether to take out an extended warranty (a form of insurance against product failure) on their chosen product. All respondents completed both the car and washing machine tasks, with the order of completion counterbalanced to control for order effects. For the car task, respondents were told that a six-month warranty was included in the purchase price of the car, but that they could, for a further sum, insure their chosen car against breakdown for another two years. An actual mechanical breakdown policy was used

in order to answer respondents' questions. For the washer task, respondents were told that the manufacturer's warranty would cover their chosen washer for the first twelve months, but that they could then choose to take an extended warranty to cover mechanical breakdown for another two or four years; again an actual policy was used to answer respondents' questions. A price manipulation was also included here; half the respondents were given the actual price of the warranties, and the rest received a price which was half that of the actual price. Note that respondents had to ask for price information, along with anything else they wanted to know, and not everyone did ask about price.

Respondents

An opportunity sample of 96 adults was recruited for the study; full time students, and those who had no experience of using credit were excluded. The advantage in using such an opportunity sample is obvious – they were relatively easy to find and keen to participate. The limitations of such a sample are acknowledged however, and it is possible that potential bias could have been introduced by the use of such a method. However, a wide range of socio-economic and employment groups were represented in the sample, including manual, semi skilled and professional occupations. A variety of means were used for recruitment, including advertisements in local public places, and more direct face to face recruitment. Respondents were paid for their participation. The sample consisted of 42 males and 54 females in the following age categories: 18 – 24, 5 respondents; 25 – 44, 57 respondents; 45 – 64, 32 respondents; 65+, 2 respondents.

Procedure

Respondents were interviewed individually, in a quiet location, often in college premises, but sometimes in the respondent's home or place of work. Interruptions and distractions were kept to a minimum. Respondents were given a brief orientation as to the aims of the study, were assured of anonymity, and advised of their right to withdraw at any time. Permission was sought to tape record the protocols. In practice no respondent withdrew, or refused permission to tape the interview. Respondents then completed both decision scenarios (car and washer tasks) as outlined earlier. After each task, respondents completed a questionnaire relating to the choices they had just made. This allowed them to rate the attractiveness of the various options they had been given, and to rate their confidence in their final decisions. They also completed a general questionnaire, which asked for demographic details and details of previous experiences of credit and insurance. Respondents were advised that they could leave any section blank, if they did not wish to complete it. At the end of the interview, respondents were given the opportunity to ask for more information about the study (which most did), were paid and thanked for their participation. Each tape recorded interview was then transcribed in full, with the relevant sections used in the qualitative analysis. Due to technical difficulties, one respondent's interview was unusable and their data was not included in further analysis.

3. Results

Both quantitative (questionnaire) and qualitative (protocol) data was collected and analysed in order to explore respondents' extended warranty decisions. However,

an initial analysis was undertaken on respondents' car and washer choices, in order to look for possible links between product choice and perceived need for a warranty. We then looked at prior experience of product breakdown and warranties, to assess the extent to which these factors might have some effect on decisions. Finally we classified respondents according to their risk management strategies, and looked for evidence of Huber's (1997) defusing operators.

Product choice and risk management

The questions which respondents asked about the products should indicate the extent to which they were concerned with their reliability. Table 1 summarises the range and quantity of questions asked about the various products. Much information about reliability of the cars and washing machines was available (in the form of Which reports etc.), although because the method used allowed respondents to formulate their own questions, not everyone asked about this. In relation to the washer 18 % of the questions concerned reliability in some direct sense, although there were other questions which might also be seen as assessing reliability in some way, for example those about the particular manufacturer, or about number of programs – a commonly expressed view was that the more programs there were, the more chance there was of something going wrong. In relation to the car, there were less direct questions about reliability; however many of the questions could be seen as trying to assess reliability in more indirect ways – asking about the service history, number of previous owners, accidents, garage reports etc. The questions asked by respondents about the products, then, confirm that the risk of product failure was a significant concern at the point of purchase.

Table 1 here

Effects of previous experience on extended warranty decisions

In a questionnaire administered after the task had been completed respondents were asked about their previous real life experience of extended warranties. From this the following categories were derived: (1) those who had not previously taken out an extended warranty; (2) those who had taken out an extended warranty previously but had not made a claim on the policy; (3) those who had taken out this form of insurance previously and had made a successful claim. The percentages of respondents falling into each of the above categories who agreed to take out the extended warranty on the washer or car purchase are shown in Table 2. For both products, respondents who had previous experience of extended warranties were more likely to take out the warranty again in this simulation task than those who had no such experience; however, this relationship was significant for the washer task only.

Table 2 here

In order to examine the effects of recent breakdown experience on extended warranty decisions respondents were asked if their car or washing machine had needed a costly repair (defined as costing more than £50) in the last twelve months. Twenty eight percent of respondents who owned a car indicated that such a repair had been necessary compared with 19% for washer owners. Of those whose washers had broken down, 76% took the extended warranty compared with 52% of respondents without this breakdown experience ($\chi^2 = 3.35$, $df = 1$, $p = 0.07$). For the car task, 46% of respondents with recent breakdown experience took the warranty compared with 41% of respondents without this kind of breakdown experience ($\chi^2 = 0.15$, $df = 1$, $p >$

.05). Thus, the relationship between respondents' recent breakdown experience and their decision to take out the extended warranty was almost significant for the washer task although this was not the case for the car.

In summary then, experience of recent product breakdown had a marginal effect in relation to the washer task, though the number of respondents involved in this analysis was small. However, there was some indication that people who had taken warranties in the past would be more likely to do so again in the future, particularly if a successful claim had been made.

Perceived Risk of Breakdown and Warranty Choice

We then examined whether respondents who decided to take out a warranty perceived a greater risk of product breakdown than those who did not. Risk perception was addressed by a number of questions contained in the post-choice questionnaire. For the car task respondents were asked to estimate the probability of their chosen car breaking down in the next 3 years (0% - 100%), the likelihood that this would be a major repair (defined as costing £300 or more), and the likelihood of this repair being covered by the warranty (on a 1-9 scale where 1 signified 'very unlikely', 5 'fairly likely' and 9 'very likely').

Breakdown probability estimates were equal for respondents who chose the warranty (40%). However, respondents who chose the warranty thought it was more likely that the breakdown costs would be more than £300, compared to those who rejected it (Median 4.5 versus 3, $z = -2.49$, $p = 0.01$). They were also more likely to think that any breakdown costs would be covered by the warranty (Median 6 versus 4, $z = -4.14$, $p < 0.001$). Hence, whilst respondents who chose the warranty did not give

higher estimates of breakdown probability per se, they did believe that there was a higher probability that the repairs would cost more than £300, and had more confidence that the repairs would be covered by the warranty.

In relation to the washing machine task, respondents were asked about the probability of their chosen machine breaking down in the next 3 and 5 years (0% – 100%). These time limits corresponded with the period of guarantee available to the respondents (i.e. one year manufacturer's warranty plus 2 or 4 year extended warranty). In this case, breakdown probability estimates were significantly higher for respondents who chose to take out the extended warranty compared to those who did not. The median estimates for the 3 year period were 24% and 20% respectively ($z = -3.31$, $p = 0.001$), and for the 5 year period 60% and 40% ($z = -4.17$, $p < 0.001$).

In summary then, for the car task there were no differences in perceived likelihood of breakdown between warranty and non-warranty takers, but warranty takers were more pessimistic about the likely cost of repairs, and more optimistic that the warranty would cover the cost of repairs. In relation to the washer task, there were differences in perceived likelihood of breakdown between warranty and non-warranty takers, with the warranty takers being significantly more pessimistic – this finding was borne out in the protocols, described in a later section.

Warranty information and risk management.

The questions which respondents asked about the warranty were classified into five main categories, and their incidence within the protocols is presented in Table 3. About 20% of respondents asked no questions at all about the extended warranty policies offered. Nearly all of these decided against insurance. Of the respondents

who did ask questions about the insurance, a large majority wanted to know the financial cost, whilst a substantial proportion wanted to know more about the terms and conditions of the insurance cover. These were by far the most common types of questions for both products, and appear to be the most important factors influencing respondents' insurance evaluations. In addition, some respondents asked about the duration of the warranty period and some asked whether the full cost of the insurance had to be paid at the time of purchase or whether it could be added to their finance agreement. Finally, a small number of respondents sought information concerning the manufacturer's own warranty, the insurer's underwriter and the claims procedure.

Table 3 here

The influence of cost on warranty decisions was further examined by manipulating the cost information given to respondents. As explained earlier, respondents had been randomly divided into two groups, one group being told the actual cost, and the other being told a cost half that of the actual cost. The effects of cost on respondents' willingness to take out the warranty could then be examined. Within the subset of respondents who asked for the cost (just over 70% for each task) there was a significant correlation between the cost of the warranty supplied and the decision to take it, for both the washer (Pearson's $r = 0.27$, $n = 70$, $p < .05$), and for the car (Pearson's $r = 0.43$, $n = 68$, $p < .01$).

Risk management strategies

An analysis of the protocols and post decision summaries sought to determine how respondents dealt with the risk of product failure, and their reasoning in relation to the purchase of extended warranty insurance. Table 4 classifies respondents into those who took the warranty, those who denied any existence of risk, those who rejected the

warranty and seemed to accept the risk, and those who proposed some alternative means of defusing it. The entire set of protocols and summaries was coded independently by two coders, and intercoder reliability was found to be satisfactory; any disagreements were resolved by discussion.

Table 4 here

Many respondents opted to take out at least one of the warranty policies offered in the decision scenarios. Over half of the respondents opted to take the warranty on the washing machine (a new item) whereas less (two fifths) decided to buy the warranty on the car (a second hand item). There was a significant correlation between buying the washer warranty, and the car warranty (Pearson's $r = .24$, $p < .05$, $n=95$).

Only a tiny proportion denied that any risk existed, indicating that the possibility of risk of product failure is well established in consumers' minds. A substantial proportion of respondents rejected the insurance, and proposed no further action. However there were also a reasonable number of respondents, particularly in relation to the car, who had thought through an alternative course of action should their chosen product break down.

Accepting versus rejecting the warranty

Reasons for taking or rejecting the warranty were reasonably straightforward to code, and inter-rater reliability was very high. Table 5 shows the frequency of main reasons cited for making each of these decisions, and some verbatim examples are included below. Only the main or first reason mentioned by each respondent is included in the tables, though some people mentioned more than one. A small number

of respondents gave responses which did not fit into these categories, or were otherwise unclassifiable.

Table 5 here

Reasons to accept the warranty

- 1) Previous experience: this includes explanations which referred to either not having taken a warranty in the past, and regretting it, or having taken it, and having cause to use it, so the decision is to take it again.

‘Well it’s just from previous experience with cars, I’ve bought cars in the past and had bad luck with them, and not got the extended warranty so I mean in the future that’s one thing I would definitely do’. (Resp. 8)

- 2) Unreliability of the product: refers to the likelihood of the chosen washer or car breaking down – many in this group assumed this was a foregone conclusion.

This confirms the high estimates of perceived likelihood of breakdown reported earlier. Note that the brand new washing machine was perceived as even more likely to be unreliable than the second hand car.

‘I’d insure against breakdown, because no matter how good it is, it can still break down’. (Resp. 30)

- 3) Expense of parts and labour: there was a perception that parts and labour were very expensive if they had to be paid for individually, and that over the course of a warranty, one would be likely to ‘break even’.

‘It’s five years, it seems quite a good deal because parts and labour in particular are enormous, and these things are likely to break down in years four and five’. (Resp. 27)

- 4) Reasonable cost: this was commented on more often in relation to the car, and all those who commented on the reasonable cost were those who had been given the cheaper price.

‘It seems quite reasonable really if anything goes wrong....it’s a good price.’

(Resp. 51)

- 5) Peace of mind: a self explanatory reason concerned with not having to worry if things went wrong, as the problem would be taken care of.

‘I would take out the warranty to put my mind at rest’. (Resp 95)

Reasons to reject the warranty

- 1) Previous experience: this was again one of two types. Some respondents had taken a warranty in the past, and then not needed it and so perceived it as a waste of money.

‘I don’t want the warranty, we bought one last time and never had to use it.’

(Resp 50) Others had not taken warranties and not needed them, and felt that the same would happen again.

- 2) Reliability of the product: in contrast to the gloomy outlook of the warranty taking group, these respondents said that they had chosen the most expensive, most reliable or ‘best’ product, and therefore there was no need for a warranty.

‘I’m buying what I consider to be the top of the range machine, so buying mechanical breakdown insurance would seem to be counterproductive.’

(Resp. 45)

- 3) Warranties expensive: there was a perception that warranties were very expensive, and often did not cover certain items, and were in fact a ‘bit of a con’.

‘I think that warranties are extremely dodgy, normally things that break down in cars are never covered by them anyway. I think they’re a good way of garages making money’. (Resp. 1)

- 4) Pay for own repairs: these respondents said they would prefer to accept the risk, and pay for repairs as and when they became necessary.

‘I would prefer to take the risk of paying for it to be fixed, if it went, broke down, and I could end up paying more, but I would prefer to do that.’ (Resp. 46)

Defusing operators

The other main category of decision – to reject the warranty but to propose some other course of action proved more difficult to code. These defusing operators were discussed earlier, deriving from Huber (1997) and included long term plans, worst case plans, new alternatives, and those designed to reduce the probability of the negative event. Intercoder reliability in the categorisation of defusing operators was fairly low to begin with (Cohen’s kappa = 0.48). An examination of coder disagreements revealed that most of these were in the categorisation of new alternatives and long term plans. Both of these categories involve respondents bringing in their own new ideas to deal with the risk, however the main difference is that long term plans have a temporal component and make plans for the future. However, the two coders had difficulty agreeing on the application of this distinction. Indeed when these two categories were merged to form just one category, intercoder reliability increased to a Cohen’s kappa of 0.75. Hence, it was decided that these two categories should be merged to form one category, long term plans/new alternatives.

The final coding of this category can be seen in Table 6, and some verbatim examples are included in Table 7.

Table 6 here

Some task differences in the use of defusing operators were found in that they were more common for the car than for the washer task; this is linked to the fact that more respondents opted to take the washer warranty, thus leaving less who needed to consider other options. There were also differences in the type of defusing operators employed. For the car task, new alternatives/ long term plans were named by four respondents, whereas only one respondent named this category for the washer task. Worst case plans were the most common defusing operator for the car (20 respondents) and the washer (15 respondents). In relation to the car, these included using savings to pay for any breakdown costs , utilising separate parts guarantees, knowing a good garage or repair man, including friends or family. For the washer task several claimed that they knew a repair man who could repair the broken washer for a reasonable cost. For the car task, 7 respondents used defusing operators designed to control (reduce) the probability of the negative event. These included having the car inspected prior to purchase, avoiding long journeys, not keeping the vehicle for a long time, and regular servicing. In contrast, for the washer task, only one respondent named a defusing operator designed to reduce the probability of the negative event which was to use the machine sensibly and not overload it.

Table 7 here

Recognition Primed Decisions

The protocol evidence in relation to both accepting and rejecting the warranty suggested that respondents' decision making was influenced by their previous

experience of making insurance decisions in similar circumstances which also confirmed questionnaire data reported earlier. These decisions can in some senses be seen as a form of Recognition Primed Decisions (Klein et al,1989). The following text contains some examples of the Recognition Primed Decisions (RPD's) employed by respondents, which illustrate both positive and negative orientations towards the offered warranties.

'.....on previous experience, all electrical goods.....I always take extended warranties' (Resp. 80); 'I've always taken it out, I've never actually had to use it, but I've always taken it on' (Resp. 68); 'I've always had an extended warranty with a washer and other, you know electrical equipment' (Resp. 53); '(It's) never been my preference to do so.....because it's quite expensive over a period of time' (Resp. 45); 'I always say no because you know, you've already paid for something' (Resp 86). Hence for many respondents insurance decisions were made with reference to their previous related insurance decisions. This type of strategy is useful in cutting down the amount of information processing the respondent has to carry out in real world risky decision situations. Reference to a heuristic, in this case related to their policy on insurance, allows their insurance choices to be made with minimal effort and information processing. Respondents appear to make 'fast track' decisions by making reference to previous similar decisions.

In summary, the protocol data has provided much valuable evidence about respondents' risk management strategies in relation to insurance choices.

Additionally, in relation to the role played by previous experience in insurance decisions, there was evidence of Recognition Primed Decisions in the data.

4. Discussion

This study has attempted: (1) to identify the information people want when they are deciding whether to insure against product failure at the time of purchase; (2) to describe their risk management strategies from a bounded rationality perspective, in particular with respect to Huber's (1997) model; and (3) to examine the role of some key variables which might be associated with insurance decisions.

When choosing a product, reliability information was assessed by some respondents in a direct sense, by asking for probability of breakdown, but these questions were in the minority, echoing Huber et al's (1997) findings that respondents were not particularly interested in precise probabilities if they were not directly supplied. However, some questions, such as the number of previous owners for a car, could be interpreted as trying to assess reliability in more indirect ways. Such questions indicate how people actively explore the possibility of product failure at the time of purchase. When deciding whether to take out extended warranty insurance, respondents mainly asked about the cost and the terms and conditions of the policies, as might be expected. A significant minority of respondents asked no questions at all about the insurance. The role of requested and non-requested insurance information in the risk management process is discussed further below.

Many authors, including Kunreuther et al (1978; Kunreuther, 1996) and Huber et al (1997) noted the limitations of Expected Utility (EU) theory in explaining decisions made in the face of risk in the real world. Analysis of the protocols and the questionnaires revealed a pattern of responding which was fairly consistent with an alternative, bounded rationality account: Huber's (1997) model of the risk

management process. However, the basic form of the model could not account for some aspects of the results.

Both EU theory and Huber's model assume that insurance taking should be influenced by perceptions of the probability of the negative event. The difference between them is that the former assumes that the precise probability is important, whereas the latter assumes only that, if the probability is perceived to be above a risk detection threshold, then a risk management process is activated. A positive relationship was found between perceived probability of breakdown and tendency to accept the insurance for the washer task, but not for the car. The reasons for the absence of a relationship in the car task may be that more of those rejecting the car warranty managed the risk using alternative defusing operators.

Johnson et al (1996) demonstrated that the availability of a negative outcome in a person's mind may lead to a distortion of its perceived probability of occurrence, which in turn may increase the inclination to buy insurance. We found some evidence for this in that respondents who had experienced mechanical breakdown in the last year were more likely to accept the extended warranty.

The questionnaire data showed that, for both products, median estimates of the probability of product failure were high, over 40%. Furthermore, the verbal protocols showed that for both products, the vast majority of respondents acknowledged that there was a risk of mechanical breakdown within the extended warranty period. Huber et al's (1997) analysis would predict that such respondents would all seek to defuse the risk in some way. In fact, our verbal protocol analysis classified nearly all of them into three groups, only two of which actively applied a defusing operator.

Insurance as a precaution

One group, a substantial proportion of respondents, agreed to take out the insurance offered. Huber (1997) described buying insurance as a defusing operator defined as a precaution: an action taken at the time of decision which should buffer the impact of the negative event if it occurs. Several findings indicated how people decided whether to take insurance and what factors influenced them. First, for the car task the questionnaire data showed that, compared to those not taking out the insurance, those accepting it believed that the costs associated with product breakdown would be higher. The cost of repairs was also mentioned quite often in the protocol data as a reason for taking the insurance. Second, as would be expected, the cost of the policy was associated with the insurance decision, and was frequently mentioned as a reason for both accepting and rejecting the insurance. Therefore, it seems that respondents often weighed the likely cost of not taking insure against the cost of taking it.

One aspect of the cost of the insurance policies is rather puzzling. Respondents were much more inclined to take a warranty on the brand new item, than on the second hand item, even though the latter was the greater financial investment. In addition, as a proportion of the cost of the item purchased, the extended warranty on the washer was significantly more expensive than that on the car. However, the absolute cost of the washer warranty was lower, and in addition, the cost was often framed as a small additional sum integrated into a monthly credit repayment. As Johnson et al (1996) found, the way the cost of insurance is framed can have a significant effect on its acceptability.

In addition to the costs of policies and repairs, other considerations clearly played a role. Respondents' previous experience of extended warranties influenced their willingness to take out the insurance policies in these tasks, in that those who had taken warranties in the past were more likely to take them again in this study. The correlation observed between purchase of car and washer warranties provides some evidence of the existence of habitual 'warranty takers' and 'non-warranty takers' within this sample. This is consistent with the use of the Recognition Primed Decision strategy referred to earlier – people who habitually take (or don't take) warranties essentially have no decision to make on each occasion when they buy a consumer product. Some respondents may have been influenced by recent publicity of reports which have concluded that extended warranties often do not represent value for money (e.g. Office of Fair Trading, 1996).

Although some respondents used a recognition-primed 'accept insurance' heuristic and asked few or no questions, others attempted to evaluate the policy before accepting it, as described above in relation to cost. In addition to cost, people sought information about terms and conditions; those taking insurance believed that the policy was more likely to cover the breakdown (for the car task). One of the main determinants of whether a defusing operator is selected is likely to be the person's beliefs regarding its probable effectiveness. For some respondents the information they received about terms and conditions reassured them about the effectiveness of the extended warranties as defusing operators, but others were not reassured. Lack of trust in insurance sellers was evident in many of our respondents, as illustrated earlier. This has also been reported in recent studies of the UK insurance market (Whyte et al, 1998).

Accepting the risk

A second group of respondents who perceived the risk (quite substantial in number) turned down the insurance and said that they would rather accept or bear the risk associated with the purchase than pay for the extended warranty. This finding is not readily interpreted within Huber's (1997) model. It is possible that, especially in the context of moderate financial risks, the mere detection of the probability of a loss may not be sufficient to trigger risk management activity. Much of the literature on risk uses the concept of an acceptable, rather than a detectable risk. This suggests that a revision to Huber's model may be useful, with a significant probability threshold replacing the detection threshold. However, it would be necessary to develop a means of independently measuring such a threshold if the model were to retain any predictive power. In addition, a significant loss threshold may be a useful concept in the context of moderate risks: a significant risk could be defined as one which exceeds both the significant probability and loss thresholds.

A second reason that some people appeared not to manage the risk even though they acknowledged it is that our simulation method may have failed to identify some risk defusing activity. The absence of evidence of information processing in verbal protocols cannot be taken as evidence that the processing did not take place. It seems plausible that long-term plans may not have been mentioned by respondents, even though they had made them. For example, many respondents may have had savings as a buffer against unexpected losses, but few of them mentioned this. Finally, it may be that some respondents did engage in risk management activity but failed to identify an effective risk-defusing operator. For example, they may have rejected the insurance but not actually been able to construct a satisfactory worst-case plan

during the course of the interview. Both of these reasons point to some of the limitations of the conversation-based process tracing method used in this study, and to some important issues for further research.

Alternative defusing operators

The remaining group of respondents rejecting the insurance behaved in a manner consistent with Huber's (1997) model. This group also perceived the risk, but had thought of alternative means of dealing with it, rather than either taking the insurance, or bearing the risk. Alternative defusing operators included long term plans/new alternatives, methods designed to control or reduce the probability of the negative event and worst case plans. It was difficult to differentiate between long term plans and new alternatives in the coding of the protocols because the temporal aspects of long term planning were difficult to identify unambiguously. In any event, the incidence of long term plans was low in this study. Nevertheless, as discussed earlier, the role of long term plans in everyday consumer risk management is an important issue for future research. Defusing the risk by attempting to control the probability of mechanical breakdown was also mentioned rather infrequently. Huber (1997) has found that the frequency of use of different categories of defusing operator is very much context-dependent. One factor underlying this is that in different contexts people's beliefs concerning the effectiveness of alternative defusing operators are likely to vary substantially. In the case of product breakdown, it is likely that most consumers believe it to be largely outside their control and therefore do not seek to reduce its probability. Worst case planning was the most common defusing operator, where the respondent had a plan of action in mind if the worst happened, but was not

prepared to invest time, effort or money at the point of purchase to avert risk. Further research is needed to identify conditions under which people prefer worst case planning to defusing operators involving prior costs.

5. Concluding remarks

Hogarth and Kunreuther (1995) used controlled conditions to investigate the effect of probability and monetary information on warranty decisions. They described the condition of not being presented with this information as decision making under ignorance, and were able to show that under such conditions people were more likely to take out warranty insurance. In contrast, our simulation method allowed our respondents to control their level of ignorance (or knowledge) by asking as many questions as they wanted. Some of them, about 20%, asked no questions at all about the warranties, thereby remaining ignorant in Hogarth and Kunreuther's sense. Unlike Hogarth and Kunreuther's respondents however, many of this group rejected the warranty. We would argue that the verbal protocols show that most of our respondents, including the above group, were far from ignorant. The protocols show that they brought to a realistic warranty choice problem a rich and extensive knowledge base. Some respondents used this knowledge base to apply a fast Recognition Primed Decision heuristic, while others were more deliberate in their decision making.

We observed that most of those who asked for information wanted to know the precise cost of the insurance policy. There was extensive evidence in the protocols of quantitative thinking with respect to warranty costs which were often weighed against breakdown costs. In contrast most respondents did not seem to think quantitatively

about probability of breakdown; they did not seek precise probability information, although they clearly were concerned with the possibility of breakdown. Such qualitative thinking with respect to outcome probabilities was evident in the protocols, and this is consistent with threshold models previously advanced by Kunreuther et al (1978; Kunreuther, 1996) and Huber (1997).

We have quite consciously and explicitly adopted a descriptive research strategy in this study. Despite the obvious limitations of a simulation method (we cannot for example simulate the emotions associated with buying expensive and desirable consumer products), we have been able to describe important aspects of information search and decision strategies not revealed by more traditional experimental methods. Furthermore because our respondents were highly engaged in decision tasks using realistic information we can be reasonably confident that our findings generalise to real life consumer risk management.

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Table 1

Percentage of respondents asking questions about various aspects of the washing machine and the car (N=95).

Washer		Car	
Aspect	Percent	Aspect	Percent
Cost	72	Cost	60
Spin Speed	45	Previous Owners	56
Number of programs	26	Service History	36
Type of programs	19	Accidents	25
Type of machine*	24	Garage report	24
Maximum load	20	M.O.T.	22
Reliability	18	Fuel consumption	19
Water consumption	10	Reliability	5
Country of origin	9	Company car	4
Wash times	8		
Manufacturer	4		

* Type of machine refers to whether it was a washer only or a washer/dryer.

Table 2

The percentage of respondents taking out extended warranties according to their previous experience of this type of insurance

Extended warranty experience	Washer task	Car task
No Experience (n=28)	32	32
Yes – With no claim (n=40)	60	43
Yes – With successful claim (n=27)	70	56
χ^2 (2, N = 95)	8.88**	3.08

** p < .01

Table 3

Percentage of questions asked by respondents (N=95) about aspects of the extended warranty.

Aspect	Washer task	Car task
Cost	73	72
Terms & Conditions	44	56
Duration	22	23
Payment	14	19
Insurer	4	2
Initial warranty	7	5
Procedure	8	9

Note: In relation to the washer warranty, 18 respondents asked no questions at all, and in relation to the car warranty, 17 asked no questions.

Table 4

The percentage (rounded up) of respondents employing each risk management strategy for the extended warranty decision

Strategy	Washer task	Car task
Take Insurance	55	41
Deny Risk	1	1
Accept Risk/Reject Insurance	27	31
Alternative defusing operator	17	26
Unclear	0	1

Notes: (1) Cohen's kappa = .83 for classification of protocols into these categories.

(2) Those in the defusing operator category have also rejected the insurance, but are proposing an alternative strategy for dealing with the risk.

Table 5

The number of respondents citing each reason as their main reason to accept or reject the warranty (N = 95)

<u>Reason</u>	Washer task	Car task
<u>Accept Warranty</u>		
Previous experience	7	5
Unreliability	16	8
Expense of parts and labour	12	6
Reasonable price	2	9
Peace of mind	10	8
<u>Reject Warranty</u>		
Previous Experience	6	6
Reliability	9	4
Too expensive	7	12
Pay as you go	4	3

Table 6

The number of alternative defusing operators named by respondents for the warranty decision.

Defusing operator	Washer task	Car task
Long term plans/ New alternatives	1	4
Worst case plans	15	20
Control probability of negative event	1	7
Total	17	31

Note: Some respondents proposed more than one defusing operator.

Table 7Examples from respondents' protocols of alternative defusing operators

Long term plans/new alternatives

'Yes, I wouldn't consider that [extended warranty] at all – I could put that towards another washing machine'. (Resp. 42)

'I'd pay money into an account every month, instead of paying for the warranty, that would build up to the warranty amount over the year.' (Resp. 88)

Worst case plans

'I know a few people who know things about cars, so if anything was to go wrong I'd be ok.' (Resp. 64)

'I have a certain amount of mechanical knowledge and would try to repair the machine myself. Or if I couldn't do I would have one or two people I've used in the past for repairs. So that's the route I'd go down if something went wrong.' (Resp. 44)

'£480 over two years is about £20 a month, I can't see this car having that many problems. Anyway I can afford to pay a fair whack if something major went wrong with it'. (Resp. 2)

'If anything does go wrong, I've got a friend who actually used to work for [names electrical superstore] and I would just call him out'. (Resp. 95)

Control probability of negative event

'I would get it serviced regularly and hopefully wouldn't need the warranty'. (Resp. 46)

'If I don't overload it, and use it sensibly, do the usual things to keep it running reasonably.... I shouldn't need the warranty'. (Resp. 73)

'I would take a mechanic with me to look the car over, and anyway I get it serviced every year which covers quite a lot of things'. (Resp. 79)
