choice rules they use as well as according to normal psychographic criteria. Simplifications may have to be made to make this procedure workable; for example, it might be necessary to look at how well single rules, rather than sequences of rules, predicted choices, so that some consumers might approximate more closely to one rule than to others. The researcher could then employ the methodology developed by Bruno and Wildt (1975) for discovering predictive complementarities between rival heuristics that seem to fit rival market segments in different degrees. The suggestion that economists should bear in mind that consumers make up their minds in different ways, depending on the contexts and on the workable information-processing strategies they have evolved, does not carry the implication that economists should cease trying to anticipate patterns of choice. It is a suggestion that should open up the possibility of improved predictions.

8 Rules for Evaluating Uncertain Prospects

8.1 INTRODUCTION

If a person’s expectation-forming processes admit that an action scheme is an uncertain prospect in respect of a particular dichotomous or scalar characteristic, she is admitting that its selection has rival sets of possible implications attached to it in respect of this characteristic. In the event, only one set of implications will come about and this set may be one which is neither precisely defined (it may not be clear what has actually happened) nor one which the consumer has thought of as possible for the characteristic in question. Rules for dealing with uncertain prospects must somehow deal with the mutual exclusivity amongst those sets of implications that the consumer does not reject as totally unbelievable prospects. It would be natural to expect these rules to be variants on the rules considered in the previous chapter, for those rules were also devices for dealing with rivalry amongst sets of implications. Thus one might expect neoclassical theorists to want to assume that consumers somehow ‘weigh together’ the implications of rival outcomes for a characteristic, just as these economists assume consumers weigh up overall scores for the various characteristics a scheme might contain. Similarly, one might expect an economist like myself to prefer to think of consumers as if they subjected a scheme’s set of rival possibilities to a non-compensatory ‘mould of tolerance’ test, each individual possibility for a characteristic being treated rather as if it were a characteristic in its own right. In fact, this is precisely what one finds in the literature—though it is noteworthy that almost all the literature on choice under uncertainty is concerned with single-characteristic outcomes (for example, bets concerning gains and losses in terms only of money).

Like Chapter 7, this chapter explores first the most-commonly-
proposed choice rules and then gradually departs further and further from them in the light of points of criticism that are raised. Once again, I do not intend to propose that in practice any one rule is always employed by consumers.

8.2 The Expected Utility Rule and Some Recent Variants

In Chapter 5, I argued that it would be most logical for decision makers to think about possible outcomes not in a probabilistic manner but in relation to the ease or difficulty they have in disbelieving them. However, the vast bulk of the literature on choice under uncertainty is set in a probabilistic framework, and in section 5.4.1 noted possible lines of thought by which a set of potential surprise conjectures might be recodified in probabilistic terms. In this section, let us presume that such a recodification has indeed been undertaken by the consumer, who has attached fractional probability weights to each rival outcome she associates with a scheme in respect of the characteristic in question. These weights sum to unity and their sizes reflect the extent of the difficulty the consumer has in dismissing them as possible outcomes. The question at issue is then: how does she rate the scheme as a prospect in respect of this characteristic dimension?

Following Von Neumann and Morgenstern (1947), most economists would argue that the consumer should be thought of as working out on overall rating by multiplying each ‘probable’ score on the characteristic scale by its respective ‘probability’ rating, and then adding all of these subtotals together. The score thus obtained might be equal to that obtained on the same dimension by another scheme for which no uncertainty was perceived. If so, and if the consumer were, other things equal, indifferent between the two schemes, an orthodox theorist would describe her as ‘risk neutral’, and would expect her to adopt this attitude consistently. However, if the consumer rated the ‘risky’ scheme as more (or less) desirable, other things equal, than a ‘certain’ scheme with an identical score, then she would be described as a ‘risk lover’ (or ‘risk averter’). Where the consumer is not risk neutral between identical total scores that are underlain by differing risk factors, it might be inferred either that she is employing a subsidiary rule for comparing similar scores with different risk connotations, or that she is employing a subsidiary procedure for scaling gains or losses down or up prior to the aggregation process. (Orthodox theorists have to need to mention such subsidiary rules being employed as means for coping with uncertainty, since they just assume choosers have utility functions that are shaped according to their love of, or aversion to, risks.)

This ‘subjective expected utility’ (SEU) approach has been subject to extensive empirical investigation (for an excellent review of this literature see Schoemaker, 1982); consumers’ attitudes to risk are revealed in betting experiments that present them with well-defined probable outcomes and associated odds. Unfortunately, many of the subjects in these experiments do not behave as if they have well-behaved utility functions of the kind assumed in simple SEU theory. It seems that subjects are commonly risk averse for gains (for example, they will often value a 60 per cent chance of winning $100 above a 30 per cent chance of winning $200) but are risk lovers when it comes to trying to avoid losses (for example, they will often value a 30 per cent risk of losing $200 above a 60 per cent risk of losing $100). It also seems that, even when odds are precisely known, people give small probabilities higher ratings than one would expect, given the first finding: as Maithal (1982, p. 211) notes, ‘large majorities accept a one-in-a-thousand chance to win five thousand dollars rather than take a sure five dollars, and they reject a one-in-a-thousand chance to lose five thousand dollars, preferring to lose a sure five dollars’. These and other findings led some theorists to conclude that, if one is usefully to suggest thinking about consumers dealing in an aggregating manner with uncertain outcomes, one needs to suggest a rather more complex aggregation formula. I have room only for brief discussions of two of these recent variations on the traditional theme: namely, prospect theory and regret theory.

The central idea in prospect theory, proposed by Kahneman and Tversky (1979), is that when faced with an uncertain prospect, an individual works out its overall value with reference to some fixed point, such as where she stands right now in respect of the characteristic (for example, her present wealth). Changes in this reference point can alter the relative values she places on
proposed choice rules and then gradually departs further and further from them in the light of points of criticism that are raised. Once again, I do not intend to propose that in practice any one rule is always employed by consumers.

8.2 THE EXPECTED UTILITY RULE AND SOME RECENT VARIANTS

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particular options, whereas in SEU theory this will not happen. Prospect theory then assumes that the decision maker’s cognitive processes will edit according to a variety of principles, the probability scores used in the adding-up process. The editing procedures means that, relative to the chosen reference point, the decision weights (that is, the edited probabilities) are twisted in a concave manner for gains and a convex manner for losses. This idea is consistent with the observed tendency for people to make apparently risk-seeking choices when trying to avoid losses and risk-averse choices when faced with rival ‘probable’ gains, while the concavity and convexity either side of the reference point accords well with the tendency people have to see the difference between 0 and 100 as much greater than the difference between 1000 and 1100. Kahneman and Tversky (1979, p. 279) further argue that the editing process involves loss values of particular amounts falling off faster, relative to the reference point, than gain values of identical amounts increase, since ‘the aggravation that one experiences in losing a sum of money appears to be greater than the pleasure associated with gaining the same amount’.

Although prospect theory accommodates evidence from betting experiments that causes problems for SEU theory, Loewenstein and Sugden (1982, p. 817) have criticised it for its ‘complex and somewhat ad hoc array of assumptions’ (only some of which are mentioned in the previous paragraph). Instead, they have proposed the much more straightforward regret theory, which is also consistent with Kahneman and Tversky’s anti-SEU empirical findings. This theory rests, according to its proponents (1982, p. 820), ‘on two fundamental assumptions: first, that many people experience the sensations which we call regret and rejoicing; and second, that in making decisions under uncertainty, they try to anticipate and take account of these sensations’. Loewenstein and Sugden have in mind the type of consumer who recognises that if a poor outcome arises, she will feel disappointed not merely because of its low score in terms of the characteristic scale in question. The consumer will anticipate feeling further aggravated to the extent that she can see she could have avoided letting herself in for this outcome by selecting some other option at the time of her choice. Such an anticipation—that she will be ‘kicking herself’ on discovering ‘what might have been’—will make her revise downwards her valuations of conceivably avoidable poor outcomes, the more so the more regret she would expect to feel if they eventuated. On the other hand, such a consumer may anticipate feeling she would have some cause to rejoice if a good outcome—which she would have ‘missed out on by playing safe’—actually eventuates and demonstrates the quality of her judgemental skills. If so, her valuation of a good result of a gamble would be higher than that implied by multiplying its characteristic score by its probability of occurrence. If these adjustments of expected utilities with reference to anticipated feelings of regret and rejoicing are not made according to a linear function of the distances of imagined outcomes from ‘what might have been’, the decision maker may well end up making valuations of rival strategy pairings that would clash with the transitivity assumption of SEU theory. Changes in the list of options that might have been chosen will clearly affect feelings of prospective rejoicing and regret associated with probable outcomes of any particular choice. Again this contrasts with SEU theory but has something of a similarity to the reference point aspect of prospect theory.

Regret theory is still in its early stages of development and investigation, but the fundamental idea behind it has a certain appeal here, given my attempts to understand consumer motivation in terms of ideas from PCT. Sugden and Loewenstein are placing at the centre of their theory the decision maker’s skill in anticipating events. The results of a choice have implications for the chooser beyond those which are directly contingent on the level of attainment—for example, a host of negative implications may arise from a general failure of property prices to rise, but it will be far more ‘soul-destroying’ to have purchased one of the few properties that fails to appreciate in value at a time when house prices generally rise. In the light of the discussions in Chapter 6 concerning implications, one might suggest that there is an even easier way of incorporating this aspect of choice in the formation of expected values. Instead of suggesting that a consumer takes each of a scheme’s ‘probable’ scores on the characteristic scales and multiplies them according to their respective probability and regret/rejoicing factors to compute their expected values, it would seem much more intuitive to say simply that the expected value a consumer places on a particular outcome may depend on the net implications she attaches to it, times its probability rating.
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Expected values thus obtained for each of a scheme’s probable outcomes on the characteristic scale could then be aggregated to obtain the scheme’s total score for that characteristic, just as in SEU theory.

The fact that the recent ideas of Kahneman and Tversky, and of Loomes and Sugden, appear to be consistent with betting experiments that call into question the postulates of SEU theory does not mean we need not examine other possible procedures for dealing with uncertain prospects. It is noteworthy that the betting experiments deal with (usually hypothetical) simple, pairwise choices with a one-dimensional outcome. Subjects in such experiments are not being tested to see whether in practice they behave as if they compute and then aggregate several, or quite a few, expected values for each scheme to obtain its rating in respect of dimensions where its performance is an uncertain prospect. In reality, one may be able to envisage quite a few sequels to a choice in respect of a particular dimension, which may vary considerably in the extent to which they seem open to disbelief (though see section 5.5). Aggregating this information could prove a very demanding task, particularly if anticipated feelings of regret and rejoicing had also to be dealt with. Quite separate from this issue of informational complexity is the question of whether or not a decision maker will consider it to be rational to aggregate all, or even some, of the scores of rival outcomes that might be the sequel to a particular choice. These considerations have led several theorists to make a variety of proposals which depart significantly from the ones just considered.

8.3 ‘SAFETY FIRST’

John Blatt’s (1983, pp. 253–7) recent criticism of SEU theory calls into question the idea that probabilities of very poor attainments can always, in principle, be swamped by suitably large and seemingly probable prospects of good attainments. To illustrate his contention, Blatt considers an illegal gamble, importing heroin into Singapore, which will result in a death sentence if one is discovered, but which otherwise is very profitable. He then argues that, although it is rare for a would-be criminal to be deterred by a one-in-a-million chance of ‘being hanged on the gallows’, most such people are deterred:

when they reckon that the probability $p$ of hanging is too high; that is, once $p$ becomes large enough (larger than some $p_{	ext{max}}$), then no amount of money $m$ will induce them to take the gamble. For some people, $p_{	ext{max}}$ may be 0.2. For others, the gamble is still accepted (given sufficiently large incentive $m$) for $p$ up to 0.9; even more reckless ones might be induced to gamble with their lives even when $p$ is as large as 0.99. But sooner or later, the probability of survival, $1 - p$, becomes too small for the game to be worth the candle (Blatt, 1983, p. 254, emphasis added).

Such behaviour violates the first axiom of formal SEU theory, for it denies that ‘everything has its price’; no amount of money in prospect can make the would-be criminal take the chance, if the prospect of being hanged is unacceptable. The clear implication is that a fully additive view of choice under uncertainty may be unrealistic, so Blatt (1983, pp. 279–82), following Roy (1952), proposes a two-stage approach: first, exclude projects with an excessive probability of disaster; second (and there he adheres to the additive methodology), rank non-excluded projects in terms of their expected returns calculated by a weighted averaging technique. This approach is clearly akin to a characteristic filtering/additive differences hybrid procedure of the kind discussed in section 7.7, except that it all takes place with respect to a single characteristic outcome scale. The procedures discussed in section 8.5 take Blatt’s approach much further, for they are wholly non-additive within individual choice dimensions. Before we consider these, however, it is appropriate to examine Shackle’s non-probabilistic analysis.

8.4 PROCEDURES THAT COMPARTMENTALISE GAINS AND LOSSES

Shackle (1949, 1955, 1958, 1979) has questioned the rationality of adding together mutually exclusive expected values that might be the sequel to a particular choice. He argues that as someone considers the possibility that the sequel to a particular choice may be a dismal failure, she will not expect to have her feelings of disappointment reduced by the thought that things might have
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turned out much better. A failure is a failure and in many cases there is no (or at least no low-cost) way of repeating an experiment to see whether, sometimes, it succeeds: put a foot wrong now in your choice of lifestyle or in many of its component activities and you may have to suffer the consequences hereafter. And even when people can expect to have another try at something following an initial disappointment, they are often difficult to console with soothing remarks about ‘another time’—as Shackle (1955, p. 65) puts it, ‘we live in the present moment’. That is to say, although people often run parts of their lives according to methodologies that make it difficult to decide when their experiments have failed (see sections 6.5 and 6.6), they often run other parts of their lives according to methodologies that categorise things as crucial experiments when they need not be, and consequently they end up ‘jumping to conclusions’. Shackle applies a similar line of argument in respect of successful outcomes: the gloss is not removed from one’s success by the thought that things might have turned out much worse, and success is not dulled the more so by the thought that things might have turned out much, much worse. If, in the event, things are successful, thinking about what could have happened instead will not change the level of attainments on the characteristic axis in question. Possible outcomes are conceptually separate rivals and, in Shackle’s way of thinking, it makes no sense to add them up.

As well as voicing these philosophical concerns, Shackle argues that in practice people do not add together all of each scheme’s rival outcome/potential surprise ratings. Rather, he argues that their minds focus on particular pairs of attention-stealing pairs of gains and losses, either side of a reference point which he calls a ‘neutral outcome’ (which he (1958, p. 48) defines as ‘a hypothetical outcome whose realisation would leave the decision maker feeling neither better nor worse off than he does at present’). The ability of a hypothetical outcome to attract the consumer’s attention will depend on a combination of two things: (1) how far distant it is from the neutral outcome (large potential gains or losses will be much more attention arresting than small ones—an idea which is clearly compatible with my suggestion that the consumer is choosing with a view to the possible number of constructive and destructive implications her action might have for her expectation-forming system); and (2) how difficult it seems to disbelieve (outcomes that are easily dismissed as seeming ‘practically impossible’ will be less able to capture a person’s attention, other things equal, than ones in whose way seem to lie few obstacles). The pair of potential outcomes upon which the consumer’s attention is fixed for a particular scheme in respect of the characteristic in question is called ‘primary focus outcomes’; they will not, in Shackle’s own analysis, normally be identical for each scheme. Focus gains and focus losses will often be associated with different degrees of potential surprise for a single scheme of action as well as between rival schemes. This possibility is illustrated in Figure 8.1. The neutral outcome is labelled $A_\infty$ (I would prefer the term ‘neutral aspiration’). Potential surprise curves for two schemes, $YY$ and $ZZ$, are shown as bold lines. The other curves on the figure are indifference curves that represent what Shackle calls an ‘ascendency function’, in other words, the ranking of potential surprise/gain and potential surprise/loss combinations in the order of their ability to attract the consumer’s attention. The attention-attracting power of a

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**Figure 8.1: Focus outcomes for a pair of options in respect of a single characteristic**
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![Figure 8.1: Focus outcomes for a pair of options in respect of a single characteristic](image-url)
possible outcome increases as we move away to the bottom-right or bottom-left of the diagram from the point of intersection between the maximum surprise line and the line linking it in a perpendicular manner to $A_N$. The most attention-attracting outcomes are those where potential surprise curves are tangential to these ‘ascendancy’ indifference curves (or ‘isascendancy lines’).

The next stage of the consumer’s problem is somehow to compare these rival pairings and rank them. In Shackle’s theory this involves the consumer in converting each of the primary focus outcomes into ‘standardised focus outcomes’. His idea is that we should think of the decision maker as shifting her focus from the primary focus outcomes to hypothetical outcomes that are similarly attention arresting but which would not be a cause for surprise. These are found on Figure 8.1 by following each of the isascendancy lines to which the potential surprise curves are tangential, until one comes to the ‘unsurprising in prospect’ line at the bottom of the diagram. Scheme YY has $Y_T$ as its standardised focus loss and $Y_L$ as its standardised focus gain. Scheme ZZ’s standardised focus loss and gain are, respectively, $Z_L$ and $Z_T$. These standardised focus outcomes are then supposed to be examined in relation to the consumer’s ‘gambler preference map’, and are ranked according to gambler indifference curves upon which they are located. Figure 8.2 illustrates a gambler preference map upon which the standardised focus outcomes for YY and ZZ have been located. The origin on this diagram is the neutral outcome the consumer has in mind, and all points on the indifference curve that passes through the origin are seen by her to be as attractive as an unsurprising neutral outcome is in prospect. Indifference curves rise in ranking as one moves towards the top-left corner of the diagram. In the case drawn, the consumer ranks both gambles above an unsurprising prospect of staying where she is (an outcome which, in practice, she may not imagine in respect of any of the options on her agenda). She also ranks scheme ZZ below scheme YY, though with rather flatter gambler indifference curves this would not have been the case.

It should be evident from this description of Shackle’s theory that the consumer’s computational task is in one respect eased by comparison with SEU theory; she focuses on only two of a possibly wide range of each scheme’s imagined outcomes. However, what follows the ‘primary focusing’ is by no means simple (I can recall finding Shackle’s precise description very hard to grasp the first time I encountered his theory). Indeed, it looks decidedly neoclassical in its use of indifference curves, although one could take these as conveniently smooth approximations to the consumer’s underlying mental ordering procedures. The most curious thing, however, is that despite Shackle’s philosophical arguments about it being inappropriate to weigh together rival possibilities, the Shacklean consumer ultimately (on the gambler preference map) does effectively weigh gains and losses (albeit only one of each for each scheme) together. They are only kept in distinct mental compartments for part of the story, and while Shackle does not call a scheme’s location on the consumer’s gambler preference map its ‘overall expected value’, the fact that it is a single point formed from a gain and a loss does without doubt imply an aggregation of rival values.

As Ford (1983, Chapter 4) has noted, Shackle’s ascendancy
possible outcome increases as we move away to the bottom-right or bottom-left of the diagram from the point of intersection between the maximum surprise line and the line linking it in a perpendicular manner to $A_N$. The most attention-attracting outcomes are those where potential surprise curves are tangential to these 'ascendancy' indifference curves (or 'isoascendancy lines').

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As Ford (1983, Chapter 4) has noted, Shackle's ascendancy
function and gambler preference map ideas have been called into question by a number of economists. The difficulty, and it is one with which Ford cannot see reason to disagree, concerns the need for the gambler preference map. Characteristic outcome/potential surprise configurations do not attract the attention simply by virtue of their distance from the neutral outcome the difficulty the consumer has in disbelieving them. Rather, they demand attention to an extent that is dependent on the consumer's willingness to take chances, a willingness that is rooted in her set of judgemental procedures for coping with such situations. In other words, the consumer's stance with respect to taking chances will determine which two points on a potential surprise curve she will find most worthy of attention—if indeed she does focus on only two points. Her 'gambler preferences' are already embodied in the ascendency function. To have both the ascendency function and the gambler preference map seems to involve a double testing of schemes according to the consumer's stance towards taking chances. However, if we discard the gambler preference map, the question of how to rank rival schemes seems to remain unanswered.

One obvious possible way of getting by without the gambler preference map is to argue that precisely how attention arresting a particular primary focus outcome is to the consumer is a direct function of the implications she attaches to it. If so, we are not a cardinalist basis for the indifference curves in Shackle's ascendency function. We might then envisage the consumer as ranking schemes according to their net (implicational) primary focus outcomes. Net standardised focus scores would not have to be calculated, for they would be ex hypothesi identical to the net primary focus scores (see Ford, 1983, p. 106). In fact, although his work lacks the 'implicational' perspective I have incorporated from PCP, Shackle does formally define his ascendency function in cardinalist terms. But, when other theorists have proposed using the ascendency function directly to rank rival schemes, Shackle has continued to assert that his more complex view is valid; he sees his ascendency function not as a ranking device but as a theoretical construct that encapsulates how a consumer reduces complex conjectures to manageable pieces of information (that is, the pairs of gains and losses that make her stop and think); the role of the gambler preference map is to encapsulate how the consumer comes to rank the pairings that make her stop and think. From my own, 'implicational' standpoint, I feel inclined to side with Shackle's critics on this issue and discard the gambler preference map. My reasoning is as follows: a consumer's attitudes to gambling are personal constructs (which may differ from subsystem to subsystem) to which she may attach certain general implications; for example, the more of a gambler she construes herself to be, the less worrying she may find a low potential surprise rating for a particular possible loss, or a high potential surprise rating for a particular possible gain. Thus the implications she potentially attaches to a particular point on a potential surprise curve may depend not merely upon the characteristic output in question but also, given her view of risk taking in this area, upon its potential surprise rating. The ascendency function would therefore seem to embody her 'gambler preferences'.

Ford (1983, Chapter 5) wishes to amend Shackle's analysis even more by discarding the ascendency function as well as the gambler preference map. Ford is disturbed by the idea that rational decision makers might focus their attention in the manner implied by Shackle's ascendency function, for how can it be rational to discard some of the information one has at one's disposal, prior to reaching a decision? As Shackle (1961, pp. 176–7) sees it, the focusing process does involve the consumer in scanning all the information, and it is only after the ascendency function has done its work that part of the available information is left aside. Ford finds this argument of Shackle's unacceptable and he argues instead that 'if all the information at the disposal of the individual is to be utilised then there is no escaping the fact that an index has to be found through which the quintessence of an action scheme can be portrayed' (1983, p. 156). However, Ford approves of Shackle's idea that, during the process of making up their minds, people keep potential gains and losses—their hopes and fears—in separate mental compartments. His own proposal is something that he sees as combining Shackle's work with the additive, non-focusing approach of SEU theory. He suggests that decision makers first recodify potential surprise conjectures into a probabilistic form, to compute expected values for each possible outcome. Second, he assumes that, for each scheme, decision makers aggregate separately gain values and loss values on either side of the neutral outcome. Finally, they
function and gambler preference maps have been called into question by a number of economists. The difficulty, and it is one with which Ford cannot see reason to disagree, concerns the need for the gambler preference map. Characteristic outcome/potential surprise configurations do not attract the attention simply by virtue of their distance from the neutral outcome; the difficulty the consumer has in disbelieving them. Rather, they demand attention to an extent that is dependent on the consumer's willingness to take chances, a willingness that is rooted in her set of judgemental procedures for coping with such situations. In other words, the consumer's stance with respect to taking chances will determine which two points on a potential surprise curve she will find most worthy of attention—if indeed she does focus on only two points. Her 'gambler preferences' are already embodied in the ascendency function. To have both the ascendency function and the gambler preference map seems to involve a double testing of schemes according to the consumer's stance towards taking chances. However, if we discard the gambler preference map, the question of how to rank rival schemes seems to remain unanswered.

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combine the utilities they attach to these overall gain and loss values into a single index from which rankings can be inferred. The end result of all this looks hardly different from that implied by the procedures of SEU theory: as Hey (1984, p. 206) remarks, 'what is this other than the expected value of some (utility) function of the prospect's payoffs? As such, it is open to questions similar to those raised at the end of section 8.2.

8.5 MOULDS OF TOLERANCE FOR UNCERTAIN PROSPECTS

If the 'Fordian' and 'net primary focus outcomes' amendments to Shackle's model seem unlikely to be employed by those decision makers who, for philosophical or computational reasons, wish to avoid adding ratings of rival gains and losses, we need to uncover other procedures by which they might be able to rank or select schemes in situations where overlaps amongst potential surprise curves makes their relative orderings far from obvious. In an early constructive critique of Shackle's work, Carter (1954, p. 59) argued that people might employ one of the following, very simple rules when they are not immediately able to reach unequivocal conclusions:

One is to look for a third course of action which can beat the other two.... Another is to delay action, if that is possible.... A third possibility is to do both the actions...; this is surely the origin of hedging. A fourth is to trust to chance, to toss a coin.

It will be observed that these rules may generate solutions to the problem of choice under uncertainty without any need for reference to ascendency functions and gambler preference maps. The first is clearly an example of problemistic search, whereas the fourth is reminiscent of Kornai's (1971) approach to conjunctive choices (see section 7.6). The third may frequently be ruled out due to indivisibilities, but the second seems eminently plausible, should the first fail.

Carter's rules are simple, but they look to me more like the kinds of procedures people will keep in reserve for those occasions on which other procedures leave them with indeterminate con-

clusions and a dilemma of a rather different kind from that discussed in section 7.6 (in that section, uncertainty centred on which combinations of characteristics would be appropriate choices, not on how to rank or select uncertain prospects in relation to a single-characteristic scale). From the standpoint of satisfying theory, one would expect the decision maker to be concerned, in the first instance, to discover which schemes look like being good enough gambles in respect of characteristics where their potential performances are open to doubt. If a consumer is employing a characteristic filtering procedure, it would seem likely that she might naturally think of employing one or both of the following two procedures whenever it is unclear whether a scheme will, in the event, pass an aspirational test she has set. If she is cautious and/or if there are many options available to her, she might adopt the rule of excluding schemes whose least-bad imagined outcomes fell short of her aspiration level (her neutral outcome/aspiration), and if no scheme survived this test she could employ the subsidiary procedure of choosing the least-bad failure. (In the case of Figure 8.1, this would mean that YY ranked above ZZ.) But she might recognise that this rule could be prone to result in needlessly poor outcomes. Therefore, she might adopt the alternative procedure of setting specifications for 'satisfactory gambles' and allowing through any schemes that could meet these, even if they were schemes that had some believable prospects that fell short of her aspiration; the schemes that survived such a test would thus be those upon which she felt a chance might be worth taking in respect of the characteristic in question. (My original (1983c, pp. 102–3) analysis mixes together these two possibilities in a way that I now regard as too demanding.) The question that naturally follows in relation to this second procedure is, 'what kind of specifications may a consumer set up as constituting a satisfactory gamble?'

In seeking to answer this question I find it useful to begin by considering a gamble in respect of a characteristic that the consumer sees as strictly dichotomous. Her aspiration is to be at one particular pole of the construct but it is not clear to her whether, if she selected a particular course of action, it would take her there. The potential surprise curve for such an option in respect of this construct must clearly comprise only two points, one potential surprise rating for each of the construct's poles.
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One scenario we need to consider is where the consumer is presently open-minded and believes either outcome is perfectly possible; neither outcome would surprise her in the slightest if she chose the scheme. On the gainside, things look as good as they possibly could for this scheme in respect of this construct, so her attention is naturally directed at the seemingly perfectly possible downside outcome. This latter outcome she hopes to avoid, but recognises that she may not succeed in doing so if she selects the scheme. Any rule which demands that this counter-desired outcome should look at all surprising in prospect is going to class this scheme as an unsatisfactory gamble, even though the decision maker thinks that, if she chooses the scheme, it is perfectly possible for things to turn out just as she hopes in respect of this construct. This somewhat peculiar result makes it difficult for me to believe that such a rule would be very common in this situation. Rather, I would suggest we should not be surprised to find the consumer simply considering, in the light of her higher-level judgemental rules, whether or not she could live with the (not) implications of a downside outcome. If she judges that such an outcome would be unbearable, then she will reject any scheme of action in respect of which she can imagine no obstacles to both of the possible outcomes for the construct in question. If all of the options she has in mind fail such a test, then this context cannot play a decisive role in the choice process and matters are referred to the next characteristic filter.

An alternative 'dichotomous' scenario would involve a situation where the consumer allows her degree of disbelief in one polar possibility to affect the degree of disbelief she assigns to its polar rival. For example, consider a woman thinking about using alternative contraception technologies that could leave her either pregnant or pregnancy-free (and which, one might note, will vary in respect of scalar characteristics such as convenience of use or extent of side-effects). If she would be exceedingly surprised to find herself pregnant if she used technique A, then she would be hardly surprised at all to find herself avoiding pregnancy; whereas if she anticipated feeling relatively little surprise at finding herself pregnant if she used the statistically less reliable technique B, then she would be quite surprised to find herself escaping pregnancy. With these kinds of conjectures, neither outcome seems perfectly possible and it is easier to imagine the consumer using a decision rule which works with reference to her assignments of potential surprise.

The logic of this second situation seems to be that the consumer only needs to focus her attention on one pole of the dichotomous construct in question (in this case, either on 'get pregnant' or on 'escape pregnancy'). This is because the 'either/or' nature of the rival possible outcomes means that the implications of ending up at one pole are simply the reverse of those she has attached to ending up at the other pole. The situation contrasts with that for scalar constructs and outcome possibilities either side of an aspiration level, decision rules for which I will consider later in this section. In the scalar case the problem is that when a particular outcome eventuates, one of its implications is that more than one rival set of implications has failed to arise: by definition, a range of alternative possibilities, each of which has its own set of implications, has been precluded. From the Shackleian standpoint, it would make little sense to say that the reverse of the eventuating set of implications is to be inferred from some kind of weighted average of these forgone implications.

For whichever pole of the construct the consumer chose to focus upon she could set herself a threshold of tolerable potential surprise, within whose boundary her uncertain conjectures would have to fall. One would expect the height of the threshold to be correlated with the implications the consumer had associated with the outcome in question. In the case of desired outcomes, the height of the threshold would be taken by its distance from maximum potential surprise, whereas for counter desired outcomes the height of the threshold would be taken by its distance from minimum potential surprise. This is because one would prefer not to be surprised by good outcomes and prefer to be surprised by bad outcomes. Thus the consumer in our example either might ask herself, according to her own standards of tolerance, 'if I choose this method of contraception, does it look sufficiently potentially unsurprising (likely) that I'll escape getting pregnant?'; or she might ask herself, 'if I choose this method of contraception, does pregnancy look sufficiently potentially surprising (unlikely) for me?' But she would have no obvious need to ask herself both questions. If no schemes seemed satisfactory gambles, the consumer could employ the subsidiary rule of
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selecting the least bad failure. Where several schemes tied as least bad, the rule could be to allow the tied schemes on to the next characteristic filter.

The analysis just outlined can be extended in two ways to cover uncertainty in respect of scalar constructs. One way is undemanding in information-processing terms and has an obvious parallel with Shackle's focusing ideas—which means that it would seem irrational to Professor Ford; the other way is rather more complicated but does not presume the consumer engages in any focusing. The former I call the 'two-point adequacy test' and the latter may be called the 'loss-gain potential surprise curve test'.

![Diagram of potential surprise curves]

**Figure 8.3: A 'two point test' filter for rival potential surprise curves**

The 'two-point test' idea is most easily understood with the aid of Figure 8.3. Once again, we have potential surprise curves for two schemes, YY and ZZ. The neutral outcome $A_N$ may be taken to represent the consumer's target for this characteristic. Any potential surprise curve whose left-most portion hits the maximum potential surprise line at or to the right of $A_N$ has passed this characteristic filter test even if it is recognised to be an uncertain prospect. For schemes that do not pass in this simple manner, the consumer has a second, two-point test. Such schemes must seem sufficiently likely not to produce a result as bad as $A_L$, her loss-avoidance aspiration for this characteristic. The test of whether they seem sufficiently likely not to produce such a bad result is the ability of their potential surprise curves to avoid coming into the region that is left of and below the boundary defined by $A_L$ and by $S_{AL}$, which is the consumer's minimum tolerable surprise threshold for her loss-avoidance aspiration. Schemes must also seem sufficiently likely to produce a result at least as good as $A_G$, the consumer's gain-avoidance level for this characteristic. They fail this part of the test if their potential surprise curves do not cut the unbroken lines that are perpendicular both to $A_G$ and to $S_{AG}$, which is the consumer's maximum tolerable surprise threshold for her gain-avoidance.

In the case of the schemes shown in Figure 8.3, neither scheme passes both tests. ZZ passes the gain aspiration test, but looks altogether too likely to produce an outcome equal to the loss-avoidance aspiration. On the other hand, YY passes the loss-avoidance test but seems insufficiently promising in respect of the consumer's gain aspiration. The consumer must then discover which is the least unsatisfactory gamble. In doing so, she could ask herself which of the tests she regards it as more important for a scheme to pass (and if no schemes have passed either test she could employ the subsidiary procedures discussed in relation to simple dichotomous constructs): if she attaches more importance to passing the loss-avoidance test, YY will win; if she attaches more importance to finding a scheme that will pass the gain-avoidance test, ZZ will win. Without a knowledge of this consumer's way of organising her ideas, we cannot judge which scheme she would prefer. We should also note that the consumer might instead employ one of the procedures suggested by Carter (though tossing a coin is difficult to use if there are more than two schemes between which to choose).

The 'two-point test' idea just described is without doubt open to Fordian objections, in that the consumer does look only at a pair of 'gambler aspiration levels' once she has found that a scheme seems in doubt in respect of her neutral aspiration for the characteristic under consideration; she does discard information
selecting the least bad failure. Where several schemes tied as least bad, the rule could be to allow the tied schemes on to the next characteristic filter.

The analysis just outlined can be extended in two ways to cover uncertainty in respect of scalar constructs. One way is demanding in information-processing terms and has an obvious parallel with Shackle's focusing ideas—which means that it would seem irrational to Professor Ford; the other way is rather more complicated but does not presume the consumer engages in any focusing. The former I call the 'two-point adequacy test' and the latter may be called the 'loss-gain potential surprise curve test'.

![Potential surprise curves](image)

Figure 8.3: A 'two point test' filter for rival potential surprise curves

The 'two-point test' idea is most easily understood with the aid of Figure 8.3. Once again, we have potential surprise curves for two schemes, YY and ZZ. The neutral outcome $A_N$ may be taken to represent the consumer's target for this characteristic. Any potential surprise curve whose left-most portion hits the maximum potential surprise line at or to the right of $A_N$ has passed this characteristic filter test even if it is recognised to be an uncertain prospect. For schemes that do not pass in this simple manner, the consumer has a second, two-point test. Such schemes must seem sufficiently likely not to produce a result as bad as $A_L$, the consumer's minimum tolerable surprise threshold for this characteristic. The test of whether they seem sufficiently likely not to produce such a bad result is the ability of their potential surprise curves to avoid coming into the region that is left of and below the boundary defined by $A_L$ and by $S_{AL}$, which is the consumer's minimum tolerable surprise threshold for her loss-avoidance aspiration. Schemes must also seem sufficiently likely to produce a result at least as good as $A_G$, the consumer's gain-aspiration level for this characteristic. They fail this part of the test if their potential surprise curves do not cut the unbroken lines that are perpendicular both to $A_G$ and to $S_{AG}$, which is the consumer's maximum tolerable surprise threshold for her gain-aspiration.

In the case of the schemes shown in Figure 8.3, neither scheme passes both tests. ZZ passes the gain aspiration test, but looks altogether too likely to produce an outcome equal to the loss-avoidance aspiration. On the other hand, YY passes the loss-avoidance test but seems insufficiently promising in respect of the consumer's gain aspiration. The consumer must then discover which is the least unsatisfactory gamble. In doing so, she could ask herself which of the tests she regards as more important for a scheme to pass (and if no schemes have passed either test she could employ the subsidiary procedures discussed in relation to simple dichotomous constructs): if she attaches more importance to passing the loss-avoidance test, YY will win, if she attaches more importance to finding a scheme that will pass the gain-aspiration test, ZZ will win. Without a knowledge of this consumer's way of organising her ideas, we cannot judge which scheme she would prefer. We should also note that the consumer might instead employ one of the procedures suggested by Carter (though tossing a coin is difficult to use if there are more than two schemes between which to choose).

The 'two-point test' idea just described is without doubt open to Fordian objections, in that the consumer does look only at a pair of 'gambler aspiration levels' once she has found that a scheme seems in doubt in respect of her neutral aspiration for the characteristic under consideration: she does discard information
in trying to reach her decision in a manageable way. Recognition of the dangers of doing this may make the consumer try to employ a ‘tolerable loss–gain surprise curve test’ (an idea that Shackle himself first suggested in a personal communication to me—see Earl, 1983c, p. 107). The idea here is that, for each possible outcome on the characteristic scale under consideration, the consumer sets a target: for maximum tolerable potential surprise for outcomes in excess of her neutral aspiration, and for minimum tolerable potential surprise for outcomes less than her neutral aspiration. Hence, instead of a pair of gambler adequacy tests, we may have as many tests as there are points making up the potential surprise curves. Such a set of tests could be depicted graphically as a curve defining the boundaries within which satisfactory potential surprise curves could move. For possible outcomes less than the neutral aspiration, a potential surprise curve could only be deemed satisfactory if it never passed to the left of the test boundary; whereas for possible outcomes in excess of the neutral outcome, a scheme seen as a gamble would only seem satisfactory if its potential surprise curve always passed to the right of the test boundary. One would expect that, the greater the possible loss, the less plausible the consumer would have to find it for it to seem acceptable as a prospect; whereas, the greater the possible gain, the less demanding a test of plausibility a potential surprise curve would have to satisfy. (In other words, near disasters would have to look pretty incredible in prospect, but fairly small prospective gains would have to have little seemingly standing in their way.)

Such a set of gambler adequacy tests could be thought of as defining the consumer’s mould of tolerance for schemes that do not seem to be guaranteed to meet her neutral aspiration for the characteristic in question. To be acceptable in that dimension, a perceived gamble must pass all the relevant tests; a scheme which seems excessively likely to produce a particular loss will not be let through by virtue of its apparent ability (if it has one) to offer a more than necessarily plausible prospect of an outcome in excess of the neutral aspiration. However, if the consumer can find no schemes which fit the mould of tolerance or promise to meet her neutral aspiration, she may judge which is the least-unsatisfactory option in respect of the particular characteristic scale by seeing which one passes the most gambling tests in a priority order.

Where two or more schemes tie on this basis, the best scheme is the one which comes closest to passing the next-highest-ranking gambling test, in terms of its degree of potential surprise for that particular outcome.

The parallels should be obvious between the procedures I have just outlined and the characteristic filtering procedures discussed, for multicharacteristic choices, in the previous chapter: their intolerance may look irrational from the standpoint of orthodox analysis, and yet they do not involve the decision maker in adding up rival outcomes in a manner that is either philosophically questionable or which assumes an excessively implausible ability to process information. Evidently, the more difficult the consumer finds it to think in terms of scalar possibilities, the more her mould of tolerance for a particular characteristic scale will tend to collapse to the two-point test filter, or even to a strictly dichotomous way of looking at things. However, the fewer the possibilities with which she tries to deal, the less computationally imperative it will be for her to adhere to a Shacklean philosophy and avoid adding together a scheme’s rival possibilities as a means towards reaching a decision about whether or not to select it.

8.6 RULES FOR WHEN ‘WE SIMPLY DO NOT KNOW’

The decision-making procedures discussed so far in this chapter all presume that the consumer is not in a worrying situation where she feels she ‘hasn’t a clue’ and ‘simply does not know’. All of these procedures break down if the consumer cannot assign degrees of disbelief, or ‘probabilities’, to rival potential outcomes in respect of pertinent scalar or dichotomous construct axes. If such situations arise, what can consumers do to try to predict and control events? To avoid anxiety they need some kind of ‘recipe for success’.

Experience as an examiner of undergraduate students operating in one of life’s brutal environments (see my comments in section 9.6 on laboratory experimentation in economic psychology) is most instructive in respect of the kinds of procedures people employ when they feel they lack knowledge or the ability to store and process it. When they set out for the examination hall, many
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Lifestyle Economics

of the examinees will have taken precautions such as the following:

1. see what 'their stars' have to offer in the way of advice;
2. make sure they get out of bed from 'the right side';
3. make sure that they have not forgotten the 'lucky mascot' that accompanied them on their past successes;
4. desperately spend many hours not in revision but in attempting to spot, on the basis of past 'patterns', the questions that will eventuate, even though their examiners may assure them that they select topics at random from amongst the topics on the syllabus.

The stakes may be high, but the preparatory procedures are likely to be essentially superstitious in nature; the examinees rely on beliefs that certain events are causally linked even though they would be hard pushed to explain precisely how. One might hope that people would grow out of such 'unscientific' modes of behaviour once they have graduated (and graduate they often will, even after 'wasting' their time on 'question spotting' and so on). But Giblin and Dakin (1984) have recently argued most persuasively that, in the turbulent and unpredictable world of business:

management's enchantment with the magical rites of long-range planning, forecasting, and several other future-oriented techniques is a manifestation of anxiety-relieving superstitious behaviour, and ... forecasting and planning have the same function that magical rites have. Anthropologists and psychologists have long argued that magical rites and superstitious behaviour serve very important functions: they make the world seem more deterministic and give us confidence in our ability to cope, they unite the managerial tribe, and they induce us to take action, at least when the omens are favourable (1984, p. 125).

Maital (1982, p. 230) has come to a similar conclusion concerning the means by which people seek to arrange their savings in portfolios of securities which trade in that most random of markets, the stock market. The idea that people use superstition as a device for facing up to unpredictable events may seem highly unscientific, and to run at odds with the 'man the scientist' theme that pervades this book. However, we should take note of Feyerabend's (1975) study of how academic scientists behave in practice: they are much more sloppy and willing to jump to questionable inferences of causation than they typically claim to be, and it is far from obvious where one should draw the dividing line between science, storytelling and magic or mythology.

Having followed superstitious preparatory procedures and having tried to force random events into predictable patterns, the student, like any other decision maker, may find that, in the event, she does indeed 'not have a clue' about what her examiners expect of some parts of the questions they have laid before her. Among the procedures she will employ for dealing with this source of anxiety are:

1. flee from the examination hall at the first possible opportunity;
2. attempt to copy the answers of her peers at nearby desks;
3. write down absolutely anything that comes into her head that seems even vaguely related to the questions that she attempts (a practice that can produce a script which looks for all the world as if it has been produced by someone suffering from thought-disordered schizophrenia);
4. attempt questions despite knowing nothing about certain parts of them, and answer as if these parts did not exist at all (often after having impulsively chosen the questions in the belief that she will be able to remember pertinent material before running out of time);
5. hedge what she says in her answers with a non-committal approach;
6. answer multiple-choice questions with random guesses, or according to some deterministic procedure that relates her ignorance-based selections to her confident answers (for example, 'the last two were definitely option (4) answers: they wouldn't have set three in a row...');
7. sit and wait for inspiration.

Most of these procedures should not appear surprising in the light of earlier sections: (1) and (4) are foreshadowed in section 4.4, while the procedure of ignoring things about which we know nothing was also mentioned by Keynes (1937) in his discussion of the problem of decision making when 'we simply do not know'; (3) fits in with section 6.5; (5), (6) and (7) are basically variations on the ideas of Carter, listed at the start of section 8.5, though of course (5), the hedging approach, is a consistent theme in this book. Procedure (2) is, one hopes, fairly rarely employed in examinations, but in life generally it may be exceedingly wide-
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spread. Keynes certainly gave great emphasis to the role of crowd behaviour in his (1937) article: after discussing how people ignore phenomena they cannot anticipate with any confidence, he suggested that they often choose in conformity with the majority, in the belief that others are better informed than themselves. To the extent that people who recognise their own ignorance copy the behaviour of those whom they see as good judges, firms would do well to identify the kind of people who are used as reference points by the others, and then concentrate their selling efforts upon shaping the behaviour of these opinion leaders or producing goods and services that will be acceptable to them. Market research may therefore need to encompass not merely consumer psychology but also sociological inquiries to uncover the structures of the community and cultural networks within which people attempt to predict and control events (see Marris, 1964, Chapter 4).

8.7 CONCLUSION

After presenting many chapters outlining the challenges and complexities of the decision problems that face consumer, I must doubtless have disappointed many non-specialist readers of this chapter by informing them what they knew all along: consumers will often try to avoid taking chances with things that they see as ‘too risky’ on the down side and/or ‘insufficiently attractive’ on the gain side, or that they will often use superstitions and pretty crude rules of thumb in order to deal with situations into which they lack much insight. For this, I apologise. However, what may seem altogether familiar to lay readers may none the less disturb economists brought up according to the principles of SEU theory—particularly since I have not asserted that any one rule will have universal currency amongst decision makers or in respect of all the diverse situations that any one consumer may confront. All the variously shaped rules considered in this chapter could belong to the set of judgemental procedures that a consumer might try to employ to cope with life. But this is not to say that all consumers include all of them in their repertoires or that all consumers would find them equally easy to employ in ‘similar’ situations. Nor is it to say that these are the only procedures some people might employ sometimes when they perceive uncertainty; I would not be at all surprised to find that there are others. Such an admission may seem shocking to economists used to assuming that decision makers behave ‘as if’ they have well-defined preference orderings over all possible states of the world and that they can attach probabilities to these states. If so, they might do well to pause and consider how they themselves have come to favour one particular tentatively proposed theory of choice under uncertainty—namely SEU theory—over all others.
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