The Framing of Decisions and the Psychology of Choice

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Explanations and predictions of people's choices, in everyday life as well as in the social sciences, are often founded on the assumption of human rationality. The definition of rationality has been much debated, but there is general agreement that rational choices should satisfy some elementary requirements of consistency and coherence. In this article we describe decision problems in which people systematically violate the requirements of consistency and coherence, and we trace these violations to the psychological principles that govern the perception of decision problems and the evaluation of options.

Summary. The psychological principles that govern the perception of decision problems and the evaluation of probabilities and outcomes produce predictable shifts of preference when the same problem is framed in different ways. Reversals of preference are demonstrated in choices regarding monetary outcomes, both hypothetical and real, and in questions pertaining to the loss of human lives. The effects of frames on preferences are compared to the effects of perspectives on perceptual appearance. The dependence of preferences on the formulation of decision problems is a significant concern for the theory of rational choice.

A decision problem is defined by the acts or options among which one must choose, the possible outcomes or consequences of these acts, and the contingencies or conditional probabilities that relate outcomes to acts. We use the term "decision frame" to refer to the decision-maker's conception of the acts, outcomes, and contingencies associated with a particular choice. The frame that a decision-maker adopts is controlled partly by the formulation of the problem and partly by the norms, habits, and personal characteristics of the decision-maker.

It is often possible to frame a given decision problem in more than one way. Alternative frames for a decision problem may be compared to alternative perspectives on a visual scene. Veridical perception requires that the perceived relative height of two neighboring mountains, say, should not reverse with changes of vantage point. Similarly, rational choice requires that the preference between options should not reverse with changes of frame. Because of imperfections of human perception and decision, however, changes of perspective often reverse the relative apparent size of objects and the relative desirability of options.

We have obtained systematic reversals of preference by variations in the framing of acts, contingencies, or outcomes. These effects have been observed in a variety of problems and in the choices of different groups of respondents. Here we present selected illustrations of preference reversals, with data obtained from students at Stanford University and at the University of British Columbia who answered brief questionnaires in a classroom setting. The total number of respondents for each problem is denoted by N, and the percentage who chose each option is indicated in brackets.

The effect of variations in framing is illustrated in problems 1 and 2.

Problem 1 [N = 152]: Imagine that the U.S. is preparing for the outbreak of an unusual Asian disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimate of the consequences of the programs are as follows:

If Program A is adopted, 200 people will be saved. [72 percent]

If Program B is adopted, there is 1/3 probability that 600 people will be saved, and 2/3 probability that no people will be saved. [28 percent]

Which of the two programs would you favor?

The majority choice in this problem is risk averse: the prospect of certainly saving 200 lives is more attractive than a risky prospect of equal expected value, that is, a one-in-three chance of saving 600 lives.

A second group of respondents was given the cover story of problem 1 with a different formulation of the alternative programs, as follows:

Problem 2 [N = 155]:

If Program C is adopted 400 people will die. [22 percent]

If Program D is adopted there is 1/3 probability that nobody will die, and 2/3 probability that 600 people will die. [78 percent]

Which of the two programs would you favor?

The majority choice in problem 2 is risk taking: the certain death of 400 people is less acceptable than the two-in-three chance that 600 will die. The preferences in problems 1 and 2 illustrate a common pattern: choices involving gains are often risk averse and choices involving losses are often risk taking. However, it is easy to see that the two problems are effectively identical. The only difference between them is that the outcomes are described in problem 1 by the number of lives saved and in problem 2 by the number of lives lost. The change is accompanied by a pronounced shift from risk aversion to risk taking. We have observed this reversal in several groups of respondents, including university faculty and physicians. Inconsistent responses to problems 1 and 2 arise from the conjunction of a framing effect with contradictory attitudes toward risks involving gains and losses. We turn now to an analysis of these attitudes.

The Evaluation of Prospects

The major theory of decision-making under risk is the expected utility model. This model is based on a set of axioms, for example, transitivity of preferences, which provide criteria for the rationality of choices. The choices of an individual who conforms to the axioms can be described in terms of the utilities of various outcomes for that individual. The utility of a risky prospect is equal to the expected utility of its outcomes, obtained by weighting the utility of each possible outcome by its probability. When faced with a choice, a rational decision-maker will prefer the prospect that offers the highest expected utility (*1*, *2*).

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As will be illustrated below, people exhibit patterns of preference which appear incompatible with expected utility theory. We have presented elsewhere (3) a descriptive model, called prospect theory, which modifies expected utility theory so as to accommodate these observations. We distinguish two phases in the choice process: an initial phase in which acts, outcomes, and contingencies are framed, and a subsequent phase of evaluation (4). For simplicity, we restrict the formal treatment of the theory to choices involving stated numerical probabilities and quantitative outcomes, such as money, time, or number of lives.

Consider a prospect that yields outcome x with probability p, outcome y with probability q, and the status quo with probability $1 - p - q$. According to prospect theory, there are values $v(.)$ associated with outcomes, and decision weights $\pi(.)$ associated with probabilities, such that the overall value of the prospect equals $\pi(p)\,v(x) + \pi(q)\,v(y)$. A slightly different equation should be applied if all outcomes of a prospect are on the same side of the zero point (5).

In prospect theory, outcomes are expressed as positive or negative deviations (gains or losses) from a neutral reference outcome, which is assigned a value of zero. Although subjective values differ among individuals and attributes, we propose that the value function is commonly S-shaped, concave above the reference point and convex below it, as illustrated in Fig. 1. For example, the difference in subjective value between gains of \$10 and \$20 is greater than the subjective difference between gains of \$110 and \$120. The same relation between value differences holds for the corresponding losses. Another property of the value function is that the response to losses is more extreme than the response to gains. The displeasure associated with losing a sum of money is generally greater than the pleasure associated with winning the same amount, as is reflected in people's reluctance to accept fair bets on a toss of a coin. Several studies of decision (3, 6) and judgment (7) have confirmed these properties of the value function (8).

The second major departure of prospect theory from the expected utility model involves the treatment of probabilities. In expected utility theory the utility of an uncertain outcome is weighted by its probability; in prospect theory the value of an uncertain outcome is multiplied by a decision weight $\pi(p)$, which is a monotonic function of p but is not a probability. The weighting function π has the following properties. First, impossible events are discarded, that is, $\pi(0) = 0$, and the scale is normalized so that $\pi(1) = 1$, but the function is not well behaved near the endpoints. Second, for low probabilities $\pi(p) > p$, but $\pi(p) + \pi(1 - p) \leq 1$. Thus low probabilities are overweighted, moderate and high probabilities are underweighted, and the latter effect is more pronounced than the former. Third, $\pi(pq)/\pi(p) < \pi(pqr)/\pi(pr)$ for all $0 < p, q, r \leq 1$. That is, for any fixed probability ratio q, the ratio of decision weights is closer to unity when the probabilities are low than when they are high, for example, $\pi(.1)/\pi(.2) > \pi(.4)/\pi(.8)$. A hypothetical weighting function which satisfies these properties is shown in Fig. 2. The major qualitative properties of decision weights can be extended to cases in which the probabilities of outcomes are subjectively assessed rather than explicitly given. In these situations, however, decision weights may also be affected by other characteristics of an event, such as ambiguity or vagueness (9).

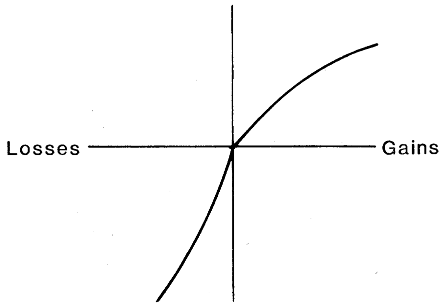

Fig. 1. A hypothetical value function.

Prospect theory, and the scales illustrated in Figs. 1 and 2, should be viewed as an approximate, incomplete, and simplified description of the evaluation of risky prospects. Although the properties of v and π summarize a common pattern of choice, they are not universal: the preferences of some individuals are not well described by an S-shaped value function and a consistent set of decision weights. The simultaneous measurement of values and decision weights involves serious experimental and statistical difficulties (10).

If π and v were linear throughout, the preference order between options would be independent of the framing of acts, outcomes, or contingencies. Because of the characteristic nonlinearities of π and v, however, different frames can lead to different choices. The following three sections describe reversals of preference caused by variations in the framing of acts, contingencies, and outcomes.

The Framing of Acts

Problem 3 [N = 150]: Imagine that you face the following pair of concurrent decisions. First examine both decisions, then indicate the options you prefer.

Decision (i). Choose between:
A. a sure gain of \$240 [84 percent]
B. 25% chance to gain \$1000, and 75% chance to gain nothing [16 percent]

Decision (ii). Choose between:
C. a sure loss of \$750 [13 percent]
D. 75% chance to lose \$1000, and 25% chance to lose nothing [87 percent]

The majority choice in decision (i) is risk averse: a riskless prospect is preferred to a risky prospect of equal or greater expected value. In contrast, the majority choice in decision (ii) is risk taking: a risky prospect is preferred to a riskless prospect of equal expected value. This pattern of risk aversion in choices involving gains and risk seeking in choices involving losses is attributable to the properties of v and π. Because the value function is S-shaped, the value associated with a gain of \$240 is greater than 24 percent of the value associated with a gain of \$1000, and the (negative) value associated with a loss of \$750 is smaller than 75 percent of the value associated with a loss of \$1000. Thus the shape of the value function contributes to risk aversion in decision (i) and to risk seeking in decision (ii). Moreover, the underweighting of moderate and high probabilities contributes to the relative attractiveness of the sure gain in (i) and to the relative aversiveness of the sure loss in (ii). The same analysis applies to problems 1 and 2.

Because (i) and (ii) were presented together, the respondents had in effect to choose one prospect from the set: A and C, B and C, A and D, B and D. The most common pattern (A and D) was chosen by 73 percent of respondents, while the least popular pattern (B and C) was chosen by only 3 percent of respondents. However, the combination of B and C is definitely superior to the combination A and D, as is readily seen in problem 4.

Problem 4 [N = 86]. Choose between:

A & D. 25% chance to win \$240, and 75% chance to lose \$760. [0 percent]

B & C. 25% chance to win \$250, and 75% chance to lose \$750. [100 percent]

When the prospects were combined and the dominance of the second option became obvious, all respondents chose the superior option. The popularity of the inferior option in problem 3 implies that this problem was framed as a pair of separate choices. The respondents apparently failed to entertain the possibility that the conjunction of two seemingly reasonable choices could lead to an untenable result.

The violations of dominance observed in problem 3 do not disappear in the presence of monetary incentives. A different group of respondents who answered a modified version of problem 3, with real payoffs, produced a similar pattern of choices (*11*). Other authors have also reported that violations of the rules of rational choice, originally observed in hypothetical questions, were not eliminated by payoffs (*12*).

We suspect that many concurrent decisions in the real world are framed independently, and that the preference order would often be reversed if the decisions were combined. The respondents in problem 3 failed to combine options, although the integration was relatively simple and was encouraged by instructions (*13*). The complexity of practical problems of concurrent decisions, such as portfolio selection, would prevent people from integrating options without computational aids, even if they were inclined to do so.

The Framing of Contingencies

The following triple of problems illustrates the framing of contingencies. Each problem was presented to a different group of respondents. Each group was told that one participant in ten, preselected at random, would actually be playing for money. Chance events were realized, in the respondents' presence, by drawing a single ball from a bag containing a known proportion of balls of the winning color, and the winners were paid immediately.

Problem 5 [N = 77]: Which of the following options do you prefer?

A. a sure win of $30 [78 percent]
B. 80% chance to win $45 [22 percent]

Problem 6 [N = 85]: Consider the following two-stage game. In the first stage, there is a 75% chance to end the game without winning anything, and a 25% chance to move into the second stage. If you reach the second stage you have a choice between:

C. a sure win of $30 [74 percent]
D. 80% chance to win $45 [26 percent]

Your choice must be made before the game starts, i.e., before the outcome of the first stage is known. Please indicate the option you prefer.

Problem 7 [N = 81]: Which of the following options do you prefer?

E. 25% chance to win $30 [42 percent]
F. 20% chance to win $45 [58 percent]

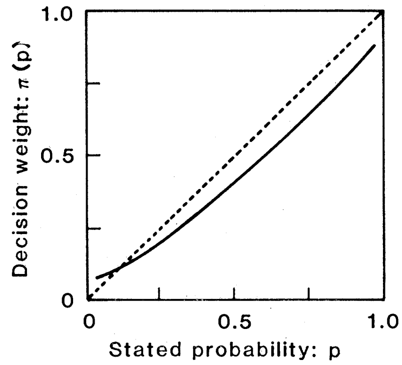

Fig. 2. A hypothetical weighting function.

Let us examine the structure of these problems. First, note that problems 6 and 7 are identical in terms of probabilities and outcomes, because prospect C offers a .25 chance to win $30 and prospect D offers a probability of $.25 \times .80 = .20$ to win $45. Consistency therefore requires that the same choice be made in problems 6 and 7. Second, note that problem 6 differs from problem 5 only by the introduction of a preliminary stage. If the second stage of the game is reached, then problem 6 reduces to problem 5; if the game ends at the first stage, the decision does not affect the outcome. Hence there seems to be no reason to make a different choice in problems 5 and 6. By this logical analysis, problem 6 is equivalent to problem 7 on the one hand and problem 5 on the other. The participants, however, responded similarly to problems 5 and 6 but differently to problem 7. This pattern of responses exhibits two phenomena of choice: the certainty effect and the pseudocertainty effect.

The contrast between problems 5 and 7 illustrates a phenomenon discovered by Allais (*14*), which we have labeled the certainty effect: a reduction of the probability of an outcome by a constant factor has more impact when the outcome was initially certain than when it was merely probable. Prospect theory attributes this effect to the properties of π. It is easy to verify, by applying the equation of prospect theory to problems 5 and 7, that people for whom the value ratio $v(30)/v(45)$ lies between the weight ratios $\pi(.20)/\pi(.25)$ and $\pi(.80)/\pi(1.0)$ will prefer A to B and F to E, contrary to expected utility theory. Prospect theory does not predict a reversal of preference for every individual in problems 5 and 7. It only requires that an individual who has no preference between A and B prefer F to E. For group data, the theory predicts the observed directional shift of preference between the two problems.

The first stage of problem 6 yields the same outcome (no gain) for both acts. Consequently, we propose, people evaluate the options conditionally, as if the second stage had been reached. In this framing, of course, problem 6 reduces to problem 5. More generally, we suggest that a decision problem is evaluated conditionally when (i) there is a state in which all acts yield the same outcome, such as failing to reach the second stage of the game in problem 6, and (ii) the stated probabilities of other outcomes are conditional on the nonoccurrence of this state.

The striking discrepancy between the responses to problems 6 and 7, which are identical in outcomes and probabilities, could be described as a pseudocertainty effect. The prospect yielding $30 is relatively more attractive in problem 6 than in problem 7, as if it had the advantage of certainty. The sense of certainty associated with option C is illusory, however, since the gain is in fact contingent on reaching the second stage of the game (*15*).

We have observed the certainty effect in several sets of problems, with outcomes ranging from vacation trips to the loss of human lives. In the negative domain, certainty exaggerates the aversiveness of losses that are certain relative to losses that are merely probable. In a question dealing with the response to an epidemic, for example, most respondents found "a sure loss of 75 lives" more aversive than "80% chance to lose 100 lives" but preferred "10% chance to lose 75 lives" over "8% chance to lose 100 lives," contrary to expected utility theory.

We also obtained the pseudocertainty effect in several studies where the description of the decision problems favored conditional evaluation. Pseudocertainty can be induced either by a sequential formulation, as in problem 6, or by the introduction of causal contingencies. In another version of the epidemic problem, for instance, respondents were told that risk to life existed only in the event (probability .10) that the disease was carried by a particular virus. Two alternative programs were said to yield "a sure loss of 75 lives" or "80% chance to lose 100 lives" if the critical virus was involved, and no loss of life in the event (probability .90) that the disease was carried by another virus. In effect, the respondents were asked to choose between 10 percent chance of losing 75 lives and 8 percent chance of losing 100 lives, but their preferences were the same as when the choice was between a sure loss of 75 lives and 80 percent chance of losing 100 lives. A conditional framing was evidently adopted in which the contingency of the noncritical virus was eliminated, giving rise to a pseudocertainty effect. The certainty effect reveals attitudes toward risk that are inconsistent with the axioms of rational choice, whereas the pseudocertainty effect violates the more fundamental requirement that preferences should be independent of problem description.

Many significant decisions concern actions that reduce or eliminate the probability of a hazard, at some cost. The shape of π in the range of low probabilities suggests that a protective action which reduces the probability of a harm from 1 percent to zero, say, will be valued more highly than an action that reduces the probability of the same harm from 2 percent to 1 percent. Indeed, probabilistic insurance, which reduces the probability of loss by half, is judged to be worth less than half the price of regular insurance that eliminates the risk altogether (*3*).

It is often possible to frame protective action in either conditional or unconditional form. For example, an insurance policy that covers fire but not flood could be evaluated either as full protection against the specific risk of fire or as a reduction in the overall probability of property loss. The preceding analysis suggests that insurance should appear more attractive when it is presented as the elimination of risk than when it is described as a reduction of risk. P. Slovic, B. Fischhoff, and S. Lichtenstein, in an unpublished study, found that a hypothetical vaccine which reduces the probability of contracting a disease from .20 to .10 is less attractive if it is described as effective in half the cases than if it is presented as fully effective against one of two (exclusive and equiprobable) virus strains that produce identical symptoms. In accord with the present analysis of pseudocertainty, the respondents valued full protection against an identified virus more than probabilistic protection against the disease.

The preceding discussion highlights the sharp contrast between lay responses to the reduction and the elimination of risk. Because no form of protective action can cover all risks to human welfare, all insurance is essentially probabilistic: it reduces but does not eliminate risk. The probabilistic nature of insurance is commonly masked by formulations that emphasize the completeness of protection against identified harms, but the sense of security that such formulations provide is an illusion of conditional framing. It appears that insurance is bought as protection against worry, not only against risk, and that worry can be manipulated by the labeling of outcomes and by the framing of contingencies. It is not easy to determine whether people value the elimination of risk too much or the reduction of risk too little. The contrasting attitudes to the two forms of protective action, however, are difficult to justify on normative grounds (*16*).

The Framing of Outcomes

Outcomes are commonly perceived as positive or negative in relation to a reference outcome that is judged neutral. Variations of the reference point can therefore determine whether a given outcome is evaluated as a gain or as a loss. Because the value function is generally concave for gains, convex for losses, and steeper for losses than for gains, shifts of reference can change the value difference between outcomes and thereby reverse the preference order between options (*6*). Problems 1 and 2 illustrated a preference reversal induced by a shift of reference that transformed gains into losses.

For another example, consider a person who has spent an afternoon at the race track, has already lost \$140, and is considering a \$10 bet on a 15:1 long shot in the last race. This decision can be framed in two ways, which correspond to two natural reference points. If the status quo is the reference point, the outcomes of the bet are framed as a gain of \$140 and a loss of \$10. On the other hand, it may be more natural to view the present state as a loss of \$140, for the betting day, and accordingly frame the last bet as a chance to return to the reference point or to increase the loss to \$150. Prospect theory implies that the latter frame will produce more risk seeking than the former. Hence, people who do not adjust their reference point as they lose are expected to take bets that they would normally find unacceptable. This analysis is supported by the observation that bets on long shots are most popular on the last race of the day (*17*).

Because the value function is steeper for losses than for gains, a difference between options will loom larger when it is framed as a disadvantage of one option rather than as an advantage of the other option. An interesting example of such an effect in a riskless context has been noted by Thaler (*18*). In a debate on a proposal to pass to the consumer some of the costs associated with the processing of credit-card purchases, representatives of the credit-card industry requested that the price difference be labeled a cash discount rather than a credit-card surcharge. The two labels induce different reference points by implicitly designating as normal reference the higher or the lower of the two prices. Because losses loom larger than gains, consumers are less willing to accept a surcharge than to forego a discount. A similar effect has been observed in experimental studies of insurance: the proportion of respondents who preferred a sure loss to a larger probable loss was significantly greater when the former was called an insurance premium (*19, 20*).

These observations highlight the lability of reference outcomes, as well as their role in decision-making. In the examples discussed so far, the neutral reference point was identified by the labeling of outcomes. A diversity of factors determine the reference outcome in everyday life. The reference outcome is usually a state to which one has adapted; it is sometimes set by social norms and expectations; it sometimes corresponds to a level of aspiration, which may or may not be realistic.

We have dealt so far with elementary outcomes, such as gains or losses in a single attribute. In many situations, however, an action gives rise to a compound outcome, which joins a series of changes in a single attribute, such as a sequence of monetary gains and losses, or a set of concurrent changes in several attributes. To describe the framing and evaluation of compound outcomes, we use the notion of a psychological account, defined as an outcome frame which specifies (i) the set of elementary outcomes that are evaluated jointly and the manner in which they are combined and (ii) a reference outcome that is considered neutral or normal. In the account that is set up for the purchase of a car, for example, the cost of the purchase is not treated as a loss nor is the car viewed as a gift. Rather, the transaction as a whole is evaluated as positive, negative, or neutral, depending on such factors as the performance of the car and the price of similar cars in the market. A closely related treatment has been offered by Thaler (*18*).

We propose that people generally evaluate acts in terms of a minimal account, which includes only the direct consequences of the act. The minimal account associated with the decision to accept a gamble, for example, includes the money won or lost in that gamble and excludes other assets or the outcome of previous gambles. People commonly adopt minimal accounts because this mode of framing (i) simplifies evaluation and reduces cognitive strain, (ii) reflects the intuition that consequences should be causally linked to acts, and (iii) matches the properties of hedonic experience, which is more sensitive to desirable and undesirable changes than to steady states.

There are situations, however, in which the outcomes of an act affect the balance in an account that was previously set up by a related act. In these cases, the decision at hand may be evaluated in terms of a more inclusive account, as in the case of the bettor who views the last race in the context of earlier losses. More generally, a sunk-cost effect arises when a decision is referred to an existing account in which the current balance is negative. Because of the nonlinearities of the evaluation process, the minimal account and a more inclusive one often lead to different choices.

Problems 8 and 9 illustrate another class of situations in which an existing account affects a decision:

Problem 8 [N = 183]: Imagine that you have decided to see a play where admission is $10 per ticket. As you enter the theater you discover that you have lost a $10 bill.

Would you still pay $10 for a ticket for the play?

Yes [88 percent] No [12 percent]

Problem 9 [N = 200]: Imagine that you have decided to see a play and paid the admission price of $10 per ticket. As you enter the theater you discover that you have lost the ticket. The seat was not marked and the ticket cannot be recovered.

Would you pay $10 for another ticket?

Yes [46 percent] No [54 percent]

The marked difference between the responses to problems 8 and 9 is an effect of psychological accounting. We propose that the purchase of a new ticket in problem 9 is entered in the account that was set up by the purchase of the original ticket. In terms of this account, the expense required to see the show is $20, a cost which many of our respondents apparently found excessive. In problem 8, on the other hand, the loss of $10 is not linked specifically to the ticket purchase and its effect on the decision is accordingly slight.

The following problem, based on examples by Savage (*2*, p. 103) and Thaler (*18*), further illustrates the effect of embedding an option in different accounts. Two versions of this problem were presented to different groups of subjects. One group (N = 93) was given the values that appear in parentheses, and the other group (N = 88) the values shown in brackets.

Problem 10: Imagine that you are about to purchase a jacket for ($125) [$15], and a calculator for ($15) [$125]. The calculator salesman informs you that the calculator you wish to buy is on sale for ($10) [$120] at the other branch of the store, located 20 minutes drive away. Would you make the trip to the other store?

The response to the two versions of problem 10 were markedly different: 68 percent of the respondents were willing to make an extra trip to save $5 on a $15 calculator; only 29 percent were willing to exert the same effort when the price of the calculator was $125. Evidently the respondents do not frame problem 10 in the minimal account, which involves only a benefit of $5 and a cost of some inconvenience. Instead, they evaluate the potential saving in a more inclusive account, which includes the purchase of the calculator but not of the jacket. By the curvature of v, a discount of $5 has a greater impact when the price of the calculator is low than when it is high.

A closely related observation has been reported by Pratt, Wise, and Zeckhauser (*21*), who found that the variability of the prices at which a given product is sold by different stores is roughly proportional to the mean price of that product. The same pattern was observed for both frequently and infrequently purchased items. Overall, a ratio of 2:1 in the mean price of two products is associated with a ratio of 1.86:1 in the standard deviation of the respective quoted prices. If the effort that consumers exert to save each dollar on a purchase, for instance by a phone call, were independent of price, the dispersion of quoted prices should be about the same for all products. In contrast, the data of Pratt *et al.* (*21*) are consistent with the hypothesis that consumers hardly exert more effort to save $15 on a $150 purchase than to save $5 on a $50 purchase (*18*). Many readers will recognize the temporary devaluation of money which facilitates extra spending and reduces the significance of small discounts in the context of a large expenditure, such as buying a house or a car. This paradoxical variation in the value of money is incompatible with the standard analysis of consumer behavior.

Discussion

In this article we have presented a series of demonstrations in which seemingly inconsequential changes in the formulation of choice problems caused significant shifts of preference. The inconsistencies were traced to the interaction of two sets of factors: variations in the framing of acts, contingencies, and outcomes, and the characteristic nonlinearities of values and decision weights. The demonstrated effects are large and systematic, although by no means universal. They occur when the outcomes concern the loss of human lives as well as in choices about money; they are not restricted to hypothetical questions and are not eliminated by monetary incentives.

Earlier we compared the dependence of preferences on frames to the dependence of perceptual appearance on perspective. If while traveling in a mountain range you notice that the apparent relative height of mountain peaks varies with your vantage point, you will conclude that some impressions of relative height must be erroneous, even when you have no access to the correct answer. Similarly, one may discover that the relative attractiveness of options varies when the same decision problem is framed in different ways. Such a discovery will normally lead the decision-maker to reconsider the original preferences, even when there is no simple way to resolve the inconsistency. The susceptibility to perspective effects is of special concern in the domain of decision-making because of the absence of objective standards such as the true height of mountains.

The metaphor of changing perspective can be applied to other phenomena of choice, in addition to the framing effects with which we have been concerned here (*19*). The problem of self-control is naturally construed in these terms. The story of Ulysses' request to be bound to the mast of the ship in anticipation of the irresistible temptation of the Sirens' call is often used as a paradigm case (*22*). In this example of precommitment, an action taken in the present renders inoperative an anticipated future preference. An unusual feature of the problem of intertemporal conflict is that the agent who views a problem from a particular temporal perspective is also aware of the conflicting views that future perspectives will offer. In most other situations, decision-makers are not normally aware of the potential effects of different decision frames on their preferences.

The perspective metaphor highlights the following aspects of the psychology of choice. Individuals who face a decision problem and have a definite preference (i) might have a different preference in a different framing of the same problem, (ii) are normally unaware of alternative frames and of their potential effects on the relative attractiveness of options,