Cambridge University Press 978-0-521-17632-3 - Conflict and Tradeoffs in Decision Making Edited by Elke U. Weber, Jonathan Baron and Graham Loomes Excerpt More information

# 1 Introduction

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Experienced conflict and difficulty characterize some decisions, but not all of them. Which decisions can be characterized in this way? What makes some tradeoffs appear hard, whereas others are made easily? How does conflict affect the experience of decision making and the way in which decisions are made? What is the relation between decision conflict and emotions, such as regret, and between decision conflict and moral conflict? Do people try to avoid making certain decisions because of the conflict? Does experienced conflict interfere with consistent judgment of tradeoffs of the sort required for public policy? What can be done to help people avoid the negative effects of conflict? What can be done to make difficult tradeoffs more consistent? And finally, at the other end of the spectrum, what can be done to get people to acknowledge and deal with difficult tradeoffs and associated conflict instead of avoiding them by making impulsive decisions?

These were some of the questions that occupied Jane Beattie and her collaborators before her untimely death in 1997. Her former collaborators and colleagues felt that an edited book on this important subject would provide a useful contribution to the literature as well as a fitting memorial to Jane.

The book includes chapters by Jane's former collaborators as well as other colleagues working on the topic of conflict and tradeoffs in decision making. The chapters attempt to review relevant literature as well as to report new findings, so that the book may serve as an introduction to the topic for students as well as experienced researchers. The chapters review existing relevant research and also include new results. They range from providing answers to important theoretical questions to providing demonstrations of practical importance of these issues in private and public decision-making applications.

In this chapter, we introduce the major themes of the book and provide some background.

In a sense, most of our behavior does not involve decision making. We do things without thinking. We do not consider options or evaluate consequences. At times, though, we catch ourselves in a moment of confusion. We don't know what to do or what to advise others to do. Some of these moments are characterized by a feeling that some fact is missing. If we had it, we would know what to do. At other times, we feel a sense of conflict. Different reasons pull or push in different directions. Such conflict is the topic of this book.

Psychology has been concerned with such conflict for a long time. It was part of the psychology of learning. Early cognitive theories of learning were satirized as having the rat "lost in thought at the choice point" (Atkinson, 1964, p. 149). Kurt Lewin (1951) classified conflicts in terms of approach and avoidance. *Approach* meant that some outcome was better than the status quo, and *avoidance* meant that it was worse. Approach-approach conflicts were between two better outcomes; approach-avoidance conflicts involved whether to change the status quo when the only alternative was better in some ways and worse in others.

Another line of work grew out of studies of stress in World War II by Irving Janis and others, culminating in the conflict-theory model of decision making (Janis & Mann, 1977). According to this view, decisions are easy, involving little stress, when doing nothing (not changing from the status quo or default) involves little risk or when there are serious risks of not changing but no risk of changing. These patterns are called uncon*flicted adherence* and *unconflicted change*, respectively. When either option (change or no change) has risks and when the decision maker hopes to find a better solution and sufficient time to do so, he or she will engage in *vigilant* decision making, that is, will seek information and weigh the options. Vigilant decision making occurs in situations of moderate stress. If it is not realistic to hope to find a better solution because all options are expected to be worse than the status quo (although one might still be better than others), the most common decision-making style is defensive avoidance, that is, not thinking about the decision at all. Finally, if there is time pressure, a condition of frantic and disorganized search called hypervigilance may result, in which the decision maker considers one option after another, with little search for evidence. When the decision maker does seek evidence, the search is unsystematic and the most useful evidence is often overlooked. Defensive avoidance and hypervigilance are examples of high-stress decision making. A unique feature

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Figure 1.1. Representation of buyer and seller indifference curves for price and selling date of a house sale. The dotted line represents the Pareto frontier.

of the conflict-theory model, for which much support exists, is the claim that decision making is highly influenced by situational factors. The same person may make rational, methodical decisions in one situation and very poor decisions in others. The theory also claims that the quality of decision making affects the outcome (Herek, Janis, & Huth, 1987).

Meanwhile, also since about 1950, part of psychology – what we shall call the *judgment and decision-making (JDM) approach* – came under the influence of economics (see Edwards & Tversky, 1967). Since the late 19th century, economists had been thinking of choice among bundles of goods as based on quantitative tradeoffs. Edgeworth (1881) showed how choices involving two goods could be represented in terms of indifference curves, as shown in Figure 1.1, which represents house sales that differ in price and selling date. Each curve represents options that were equally preferred. Of two points on the same curve, the one in the lower right would be better in terms of money but worse in terms of time of sale. A point above the curve would be preferred to any point on the curve.

The ideal consumer is characterized as choosing the combination of amounts of the two goods that will maximize the total utility. This involves equating the marginal utilities of the goods consumed. For example, a classic tradeoff is between leisure time and money. (Money, of course, is really a proxy for other goods to be consumed later.) If you have 20 hours of leisure per week and you are offered a chance to work

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Figure 1.2. Utility of a person's total wealth, according to Bernoulli.

5 additional hours for \$250, you have to figure out if that is worthwhile. The more of your time you sell in this way, the more valuable the remaining time becomes. As a result, you require a higher payment to give it up. You reach an optimal amount of leisure when the additional \$50 is worth less to you than the utility of an additional free hour.

We often think of these curves as resulting from two utility functions, one for money and one for time. The term *utility* was originally coined by Jeremy Bentham (1789), who argued that actions should maximize utility. "By utility is meant that property in any object, whereby it tends to produce benefit, advantage, pleasure, good, or happiness, (all this in the present case comes to the same thing) or (what comes against to the same thing) to prevent the happening of mischief, pain, evil, or unhappiness...." (p. 2). Evidently, Bentham had a broader concept in mind than simply pleasure and pain, but he did not dwell on its breadth.

A similar concept was developed much earlier by Bernoulli (1738) in order to explain (in essence) why people were not willing to pay \$500 for a 50% chance to win \$1,000. Bernoulli proposed that the utility of \$1,000 was less than twice that of \$500, so the expected utility of the bet – 50% of the utility of \$1,000 – was less than the utility of \$500. Bernoulli's idea of utility was quantitative. He thought of it as something that could be measured on a numerical scale. Figure 1.2 shows Bernoulli's idea of the utility of money.

This idea, in combination with Bentham's idea of maximizing utility as the proper basis for action, led to the kind of theory that Edgeworth developed. Edgeworth's indifference curves could be explained in terms of these utility curves for the two goods in question. Free time, like money, would also have a utility function. The indifference curves in Figure 1.1 can be derived from the utility functions. Each indifference curve connects points with the same total utility. The total utility is the sum of utility on the time function and the money function.

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The money-versus-leisure decision is a classic tradeoff. Money and leisure are both good things, but the world is constructed so that more of one means less of the other. It is this sort of perversity that puts us in situations of conflict and requires us to make hard decisions. This much was known by early psychologists, but the new idea is that these things can be thought of quantitatively, in terms of the utility of different goods or the utility of different attributes of options. The field of judgment and decision making, as we know it today, grew out of this infusion of economic thinking into psychology. In this way, it is different from the work of the learning theorists and of Lewin.

Major credit for making psychologists aware of economic theory must go to Ward Edwards (1954). Edward and his students (and a few others) began a program of research into the psychology of judgment and decision making. The idea was, and is, to compare judgments and decisions to economic models that specify the optimal responses. Models of optimal responses are now called *normative*.

The chapters in this book are mostly about tradeoffs that can be analyzed quantitatively in this way. They are in the JDM tradition begun by Edwards rather than in the earlier psychological tradition exemplified by Lewin. Nor are they in the economic tradition. Economists tend to assume that individual decisions are rational and then go on to work out the implications of this assumption for aggregate behavior. The JDM tradition represented in this book, on the other hand, takes a more data-driven approach; that is, it attempts to explain and predict decision-making behavior, whether such behavior appears to be rational or irrational. Two classes of questions are addressed. The first category contains questions about the role of tradeoffs and conflict in choice behavior. What makes tradeoffs difficult? How do people resolve conflicts when they make everyday decisions? The other category contains questions about the measurement of tradeoffs, that is, the measurement of the relative utilities of two goods, such as time and money or money and risk. Such measurement is undertaken for the evaluation of public programs, such as those directed at risk reduction.

Jane Beattie was interested in both of these problems. In graduate school, her interest in tradeoffs was triggered in part by research of her advisor, Jon Baron, who had just written a paper on "Tradeoffs Among Reasons for Action" (1986) and in part by Barry Schwartz's book *The Battle for Human Nature* (1986), which argued against the moral appropriateness of making tradeoffs in some situations (and hence against the economic way of thinking). In Jane's thesis, she saw the two problems as related. She thought that the measurement of tradeoffs would be more

difficult, and hence less internally consistent, when the tradeoff itself was difficult.

## Role of Tradeoffs in Choice Behavior

One of the psychological questions addressed in the literature and in Jane's thesis concerns difficulty. Some tradeoffs are made so easily that the decision maker does not even notice making them; others seem extraordinarily difficult. Perhaps the first psychologist to address this issue quantitatively was Roger Shepard (1964). Shepard had been studying perceptual judgments, including judgments of the similarity of visual forms that varied in two dimensions, such as the size of a circle and the angle of a radius drawn inside the circle. Shepard found that for this pair of dimensions (but not for all pairs of dimensions), subjects did not give consistent weights to the two dimensions. They attended to one dimension or the other but rarely to both. Shepard suggested that people might have a similar problem making decisions that involved conflict between two attributes. He thought of the problem as a general one. As people thought about a tradeoff, they would first think about one attribute, then the other. The weights of the two attributes would depend on the decision maker's "frame of mind," which would fluctuate without a stable middle point.

In her thesis, Jane Beattie (1988) suggested that Shepard's problem might apply to some pairs of attributes more than others. The difficulty of making a tradeoff might be especially great when this kind of fluctuation occurred. Beattie tested various hypotheses about the determinants of tradeoff difficulty and its effects. In particular, she presented students with scenarios like the following: "You have a term paper due tomorrow and cannot get an extension. You have an eye infection and have been told not to do any reading or writing, but if you leave the paper your grade will suffer." The subject then considered two options: "You are put in pain but your grade does not suffer" versus "You are not put in pain, but you get a worse grade." Scenarios involved tradeoffs between commodities (apartments, computers, etc.), noncommodities (health, pain, grades, etc.), and currencies (time and money). Subjects rated each scenario on "decision difficulty" (the dependent variable) and on the following scales:

- Q1 Is it ever wrong to trade off these two alternatives?
- Q2 How sure are you that you would make the right decision?
- Q3 How important is the first alternative to you?

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- Q4 How important is the second alternative to you?
- **Q5** How easy is it to imagine a decision involving these two alternatives in which you didn't care which alternative happened?
- **Q6** How easy is it to imagine a decision involving these two alternatives in which you found it very difficult to choose which alternative you wanted to happen?
- **Q7** How long do you think you would have to spend thinking about a decision with these two alternatives?
- **Q8** How experienced are you at making decisions involving these two alternatives?
- **Q9** To what extent do you think this is a moral decision?
- Q10 How vaguely described is this decision?
- Q11 How similar are these two alternatives?
- Q12 Do you have rules for making decisions of this kind?

Subjects differed in which of these measures accounted for their decision difficulty judgments. In general, though, the most important predictors were certainty (Q2), ease of imagining that one did not care (Q5), ease of imagining that one could not choose (Q6), morality (Q9), similarity (Q11), and the product of Q3 and Q4, which was high when both alternatives were important. When the alternatives were more similar, the tradeoff was easier. People have difficulty trading off attributes that seem quite different and hence hard to compare. Moral decisions were more difficult for some people but easier for others; Beattie suggested that the latter applied rules. Although these results were preliminary, they inspired further research by Beattie and others.

An extension of Beattie's work with Sema Barlas is included here as chapter 2. Beattie and Barlas proposed a set of psychological categories to account for differences in decision difficulty (commodities, noncommodities, and currencies). They found that these categories, along with other features of the decision (e.g., similarity and importance of alternatives), can be used to predict the difficulty of the decision. They also found sex differences in category structure, with women requiring a two-dimensional solution (importance of alternative and degree of personalness) and men a one-dimensional solution (importance). Decisions between categories were easier than those within categories, and decisions involving noncommodities were more difficult than those involving other items. Category information also predicted choice behavior in a "choices between equally preferred alternatives" paradigm (noncommodities were chosen most often) and reaction time needed to choose (decisions involving noncommodities took longest).

Beattie, Baron, Hershey, and Spranca (1994) developed a new concept of decision difficulty, which they called decision attitude. Your attitude toward a decision is whether you want to make that decision or avoid it. Notice that avoiding a decision is not the same as doing nothing. (Otherwise, decision attitude would be the same as attitude toward the default option.) Decision attitude was measured in two ways. First, subjects were asked to rate how much they would like to be in each of three situations: getting A without choosing it, getting B without choosing it, or choosing between A and B. Second, subjects were asked whether they wanted to choose A or B or whether they wanted some random device to make the decision. The second question is actually a choice of a more complex kind, but subjects tended to see it as a way of not deciding because its results matched those of the first method. In most cases, subjects wanted to make the decision themselves, that is, they were decision seeking in the sense of rating making the decision as better than getting either of the two options. Some decisions, though, created real decision aversion, for example, deciding which of your children would get a medical treatment when only one could get it, or even deciding which of someone else's children should inherit an antique piano. Even making a risky decision for another person, like deciding which of two medical treatments to give, induced some aversion. Generally, decision aversion was most apparent when the decision required violating the rule of equal treatment and when it could cause a bad outcome for someone else. These properties seem to be moral ones, based on principles of equity and self-determination (autonomy). Beattie et al. (1994) looked at the influence of other factors, such as anticipated regret for decisions affecting the self, and losses versus gains, but failed to find any effects.

In 1996, however, Jane supervised an undergraduate project (Shepard, 1996), which yielded more promising results concerning gains and losses and which should be replicated. The study used a version of the Asian Disease Problem (Tversky & Kahneman, 1981):

Imagine that the United States is preparing for the outbreak of an unusual Asian disease that is expected to kill 600 people. Two alternative vaccines to combat the disease exist. Assume that the exact scientific estimates of the consequences of the vaccines are as follows:

Vaccine A: 200 saved Vaccine B: 600 saved (33% chance) No one saved (67% chance) INTRODUCTION

Imagine three possibilities. In each case, you are a citizen of the United States and must be vaccinated against the disease.

Situation 1:	Only vaccine A is available.		
Situation 2:	Only vaccine B is available.		
Situation 3:	Both vaccines A and B are available, and		
	you must choose which one you want.		

In half of the conditions, "600 - x saved" was replaced with "x die," ostensibly the same event. In half of the conditions, the subject took the perspective of a "medical officer responsible for administering the vaccine program." The number of subjects showing decision seeking or aversion (as defined by Beattie et al., 1994) was:

Condition	Seeking	Neutral	Aversion
Officer/saved	6	7	12
Officer/die	3	2	20
Citizen/saved	10	9	6
Citizen/die	19	5	1

Most subjects were decision seeking when making decisions for themselves and decision averse when making decisions for others. Both of these effects were (almost significantly) greater in the loss frame than in the gain frame (despite the apparent error).

The hypothesis that tradeoffs are more difficult when dimensions are dissimilar was tested further in the work of Beattie and Baron (1995), which concerned the judgment of appropriate penalties for causing harm. Subjects preferred penalties that were more similar to the harms. For example, if a logging company negligently cut down 100 square miles of protected forest (because the company did not check to make sure it could legally cut the timber in question), subjects preferred a penalty in which the company returned about the same amount of forest of the same type to the government to a penalty in which the company returned even a larger amount of a different kind of forest (or money). When setting the optimal penalty of each kind, subjects asked for a greater area of different-type forest than of same-type forest. They also indicated that they found the judgments of different-type forest penalties to be more difficult.

As Zeelenberg, Inman, and Pieters point out in chapter 6, psychologists have known about the role of regret in decision making for some time. Regret research in the JDM tradition is more recent. Bell (1982) and

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Loomes and Sugden (1982) simultaneously proposed that many of the deviations of observed choices from expected-utility theory could be explained in terms of anticipated regret. These deviations had also been explained by features of prospect theory (Kahneman & Tversky, 1979), so for these cases *regret theory* became an alternative to prospect theory.

The idea (based on Savage, 1954) is that we experience outcomes of choices by comparing them to outcomes that would have occurred if we had chosen differently. If we buy shares of a stock and its price goes down, we regret the purchase because we compare the outcome to what would have happened if we had done nothing. If we consider buying shares, do not buy them, and the price goes up, we regret our omission. (Kahneman and Tversky, 1982, found that people expect to feel stronger regret as the result of action than as the result of an omission.)

Notice that this kind of comparison is one of two kinds that we could make. We could also compare outcomes to what would have happened if the situation had turned out differently. Thus, we could compare the price of the stock to what it would have been if interest rates had not gone up, and so on. This kind of comparison leads to disappointment as distinct from regret. In chapter 6, Zeelenberg, Inman, and Pieters review evidence that people distinguish regret and disappointment.

Regret, not disappointment, is the more important issue in decision conflict. Decisions are often difficult because we fear that we will regret whatever choice we make. A similar fear of disappointment surely exists and makes people averse to taking risks, but disappointment alone cannot lead to self-blame. It is the possibility that another choice option may lead to a better outcome that causes true conflict.

The domain of Bell and Loomes and Sugden's theory of regret were choices between gambles. The idea is that when people think about gambles, they think of the decision in terms of options, probabilistic states of the world, and outcomes. For example, the states of the world might be the different numbers that might come up in a lottery. The options are which numbers you bet on. The outcomes are the amounts you would win. The outcome depends on your bet and on the state of the world. Regret theory proposes that people choose the option that minimizes the regret that they anticipate experiencing after the selected lottery is played. They do so by comparing the outcome of each choice in each state of the world to the outcome of the other choice in the same state.

The theory turned out to be less useful than was originally thought as an account of choices among gambles (Starmer & Sugden, 1993), but the basic idea was borne out by a great deal of subsequent research. We can study the role of anticipated regret by looking at the effects of *resolution*