Reason-based choice

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Abstract

*This paper considers the role of reasons and arguments in the making of decisions.
It is proposed that, when faced with the need to choose, decision makers often seek
and construct reasons in order to resolve the conflict and fustify their choice, to
themselves and to others. Experiments that explore and manipulate the role of
reasons are reviewed, and other decision studies are interpreted from this perspec-
tive. The role of reasons in decision making is considered as it relates to
uncertainty, conflict, context effects, and normative decision rules.*

> The result is that peculiar feeling of inward unrest known as *indecision.* Fortunately it is too
> familiar to need description, for to describe it would be impossible. As long as it lasts, with the
> various objects before the attention, we are said to *deliberate:* and when finally the original
> suggestion either prevails and makes the movement take place, or gets definitively quenched by its
> antagonists, we are said to *decide.* . . in favor of one or the other course. The reinforcing and
> inhibiting ideas meanwhile are termed the *reasons* or *motives* by which the decision is brought
> about.
>
> William James (1890/1981)

> My way is to divide half a sheet of paper by a line into two columns; writing over the one *Pro,* and
> over the other *Con.* Then, during three or four days' consideration, I put down under the different'
> heads shbjt Hints Of the different motives, that at different times occur to me for or against the
> measure. When I have thus got them all together in one view, 1 endeavor to estimate the respective ·
> weights. . .find at length where the balance lies. . .And, though the weight of reasons cannol· be
> taken with the precision of algebraic quantities, yet,.when each is thus considered, separately and

comparatively, and the whole matter lies before me, I think I can judge better, and am less liable to make a rash step; and in fact I have found great advantage for this kind of equation, in what may be called *moral* or *prudential algebra.*

Benjamin Franklin, 1772 (cited in Bigelow, 1887)

Introduction

The making of decisions, both big and small, is often difficult because of uncertainty and conflict. We are usually uncertain about the exact consequences of our actions, which may depend on the weather or the state of the economy, and we often experience conflict about how much of one attribute (e.g., savings) to trade off in favor of another (e.g., leisure). In order to explain how people resolve such conflict, students of decision making have traditionally employed either formal models or reason-based analyses. The formal modeling approach, which is commonly used in economics, management science, and decision research, typically associates a numerical value with each alternative, and characterizes choice as the maximization of value. Such value-based accounts include normative models, like expected utility theory (von Neumann & Morgenstern, 1947), as well as descriptive models, such as prospect theory (Kahneman & Tversky, 1979). An alternative tradition in the study of decision making, characteristic of scholarship in history and the law, and typical of political and business discourse, employs an informal, reason-based analysis. This approach identifies various reasons and arguments that are purported to enter into and influence decision, and explains choice in terms of the balance of reasons for and against the various alternatives. Examples of reason-based analyses can be found in studies of historic presidential decisions, such as those taken during the Cuban missile crisis (e.g., Allison, 1971), the Camp David accords (Telhami, 1990), or the Vietnam war (e.g., Herman, 1982; Betts & Gelb, 1979). Furthermore, reason-based analyses are commonly used to interpret "case studies" in business and law schools. Although the reasons invoked by researchers may not always correspond to those that motivated the actual decision makers, it is generally agreed that an analysis in terms of reasons may help explain decisions, especially in contexts where value-based models can be difficult to apply.

Little contact has been made between the two traditions, which have typically been applied to different domains. Reason-based analyses have been used primarily to explain non-experimental data, particularly unique historic, legal and political decisions. In contrast, value-based approaches have played a central role in experimental studies of preference and in standard economic analyses. The two approaches, of course, are not incompatible: reason-based accounts may often be translated into formal models, and formal analyses can generally be paraphrased as reason-based accounts. In the absence of a comprehensive theory of choice,

both formal models and reason-based analyses may contribute to the understanding of decision making.

Both approaches have obvious strengths and limitations. The formal, value-based models have the advantage of rigor, which facilitates the derivation of testable implications. However, value-based models are difficult to apply to complex, real world decisions, and they often fail to capture significant aspects of people's deliberations. An explanation of choice based on reasons, on the other hand, is essentially qualitative in nature and typically vague. Furthermore, almost anything can be counted as a "reason", so that every decision may be rationalized after the fact. To overcome this difficulty, one could ask people to report their reasons for decision. Unfortunately, the actual reasons that guide decision may or may not correspond to those reported by the subjects. As has been amply documented (e.g., Nisbett & Wilson, 1977), subjects are sometimes unaware of the precise factors that determine their choices, and generate spurious explanations when asked to account for their decisions. Indeed, doubts about the validity of introspective reports have led many students of decision making to focus exclusively on observed choices. Although verbal reports and introspective accounts can provide valuable information, we use "reasons" in the present article to describe factors or motives that affect decision, whether or not they can be articulated or recognized by the decision maker.

Despite its limitations, a reason-based conception of choice has several attractive features. First, a focus on reasons seems closer to the way we normally think and talk about choices. When facing a difficult choice (e.g., between schools, or jobs) we try to come up with reasons for and against each option - we do not normally attempt to estimate their overall values. Second, thinking of choice as guided by reasons provides a natural way to understand the conflict that characterizes the making of decisions. From the perspective of reason-based choice, conflict arises when the decision maker has good reasons for and against each option, or conflicting reasons for competing options. Unlike numerical values, which are easy to compare, conflicting reasons may be hard to reconcile. An analysis based on reasons can also accommodate framing effects (Tversky & Kahneman, 1986) and elicitation effects (Tversky, Sattath, & Slovic, 1988), which show that preferences are sensitive to the ways in which options are described (e.g., in terms of gains or losses), and to the methods through which preferences are elicited (e.g., pricing versus choice). These findings, which are puzzling from the perspective of value maximization, are easier to interpret if we assume that different frames and elicitation procedures highlight different aspects of the options and thus bring forth different reasons to guide decision. Finally, a conception of choice based on reasons may incorporate comparative considerations (such as relative advantages, or anticipated regret) that typically remain outside the purview of value maximization.

In this article, we explore the logic of reason-based choice, and test some

specific hypotheses concerning the role of reasons in decision making. The article proceeds as follows. Section 1 considers the role of reasons in choice between equally attractive options. Section 2 explores differential reliance on reasons for and against the selection of options. Section 3 investigates the interaction between high and low conflict and people's tendency to seek other alternatives, whereas section 4 considers the relation between conflict and the addition of alternatives to the choice set. Section 5 contrasts the impact of a specific reason for choice with that of a disjunction of reasons. Section 6 explores the role that irrelevant reasons can play in the making of decisions. Concluding remarks are presented in section 7.

1. Choice between equally attractive options

How do decision makers resolve the conflict when faced with a choice between two equally attractive options? To investigate this question, Slovic (1975) first had subjects equate pairs of alternatives, and later asked them to make choices between the equally valued alternatives in each pair. One pair, for example, were gift packages consisting of a combination of cash and coupons. For each pair, one component of one alternative was missing, as shown below, and subjects were asked to determine the value of the missing component that would render the two alternatives equally attractive. (In the following example, the value volunteered by the subject may be, say, $10).

	Gift package A	*Gift package B*
Cash		$20
Coupon book worth	$32	$18

A week later, subjects were asked to choose between the two equated alternatives. They were also asked, independently, which dimension - cash or coupons - they considered more important. Value-based theories imply that the two alternatives - explicitly equated for value - are equally likely to be selected. In contrast, in the choice between gift packages above, 88% of the subjects who had equated these alternatives for value then proceeded to choose the alternative that was higher on the dimension that the subject considered more important.

As Slovic (1975, 1990) suggests, people seem to be following a choice mechanism that is easy to explain and justify: choosing according to the more important dimension provides a better reason for choice than, say, random selection, or selection of the right-hand option. Slovic (1975) replicated the above pattern in numerous domains, including choices between college applicants, auto tires, baseball players, and routes to work. (For additional data and a discussion of elicitation procedures, see Tversky et al., 1988.) All the results were consistent with the hypothesis that people do not choose between the equated alternatives at

random. Instead, they resolve the conflict by selecting the alternative that is superior on the more important dimension, which seems to provide a compelling reason for choice.

2. Reasons pro and con

Consider having to choose one of two options or, alternatively, having to reject one of two options. Under the standard analysis of choice, the two tasks are interchangeable. In a binary choice situation it should not matter whether people are asked which option they prefer, or which they would reject. Because it is the options themselves that are assumed to matter, not the way in which they are described, if people prefer the first they will reject the second, and vice versa.

As suggested by Franklin's opening quote, our decision will depend partially on the weights we assign to the options' pros and cons. We propose that the positive features of options (their pros) will loom larger when choosing, whereas the negative features of options (their cons) will be weighted more heavily when rejecting. It is natural to select an option because of its positive features, and to reject an option because of its negative features. To the extent that people base their decisions on reasons for and against the options under consideration, they are likely to focus on reasons for choosing an option when deciding which to choose, and to focus on reasons for rejecting an option when deciding which to reject. This hypothesis leads to a straightforward prediction: consider two options, an *enriched* option, with more positive and more negative features, and an *impoverished* option, with fewer positive and fewer negative features. If positive features are weighted more heavily when choosing than when rejecting and negative features are weighted relatively more when rejecting than when choosing, then an enriched option could be both chosen and rejected when compared to an impoverished option. Let P_c and P_r denote, respectively, the percentage of subjects who choose and who reject a particular option. If choosing and rejecting are complementary, then the sum $P_c + P_r$ should equal 100. On the other hand, according to the above hypothesis, $P_c + P_r$ should be greater than 100 for the enriched option and less than 100 for the impoverished option. This pattern was observed by Shafir (1993). Consider, for example, the following problem which was presented to subjects in two versions that differed only in the bracketed questions. One half of the subjects received one version, the other half received the other. The enriched option appears last, although the order presented to subjects was counterbalanced.

Problem 1 (n = 170):

Imagine that you serve on the jury of an only-child sole-custody case following

a relatively messy divorce. The facts of the case are complicated by ambiguous economic, social, and emotional considerations, and you decide to base your decision entirely on the following few observations. [To which parent would you award sole custody of the child?/Which parent would you deny sole custody of the child?

		Award	*Deny*
Parent A:	average income		
	average health		
	average working hours		
	reasonable rapport with the child		
	relatively stable social life	36%	45%
Parent B:	above-average income		
	very close relationship with the child		
	extremely active social life		
	lots of work-related travel		
	minor health problems	64%	55%

Parent A, the impoverished option, is quite plain - with no striking positive or negative features. There are no particularly compelling reasons to award or deny this parent custody of the child. Parent B, the enriched option, on the other hand, has good reasons to be awarded custody (a very close relationship with the child and a good income), but also good reasons to be denied sole custody (health problems and extensive absences due to travel). To the right of the options are the percentages of subjects who chose to award and to deny custody to each of the parents. Parent B is the majority choice both for being awarded custody of the child and for being denied it. As predicted, $P_c + P_t$ for parent B (64 4- 55 = 119) is significantly greater than 100, the value expected if choosing and rejecting were complementary *(z = 2.48, p<.02).* This pattern is explained by the observation that the enriched parent (parent B) provides more compelling reasons to be awarded as well as denied child custody.

The above pattern has been replicated in hypothetical choices between monetary gambles, college courses, and political candidates (Shafir, 1993). For another example, consider the following problem, presented to half the subjects in the "prefer" and to the other half in the "cancel" version.

Problem 2 (n = 172):

Prefer:
Imagine that you are planning a week vacation in a warm spot over spring break. You currently have two options that are reasonably priced. The travel

brochure gives only a limited amount of information about the two options. Given the information available, which vacation spot would you prefer?

Cancel:
Imagine that you are planning a week vacation in a warm spot over spring break. You currently have two options that are reasonably priced, but you can no longer retain your reservation in both. The travel brochure gives only a limited amount of information about the two options. Given the information available, which reservation do you decide to cancel?

	Prefer	*Cancel*
Spot A: average weather		
average beaches		
medium-quality hotel		
medium-temperature water		
average nightlife	33%	52%
Spot B: lots of sunshine		
gorgeous beaches and coral reefs		
ultra-modern hotel		
very cold water		
very strong winds		
no nightlife	67%	48%

The information about the two spots is typical of the kind of information we have available when deciding where to take our next vacation. Because it is difficult to estimate the overall value of each spot, we are likely to seek reasons on which to base our decision. Spot A, the impoverished option, seems unremarkable yet unobjectionable on all counts. On the other hand, there are obvious reasons - gorgeous beaches, an abundance of sunshine, and an ultra-modern hotel-for choosing spot B. Of course, there are also compelling reasons-cold water, winds, and a lack of nightlife - why spot B should be rejected. We suggest that the gorgeous beaches are likely to provide a more compelling reason when we choose than when we reject, and the lack of nightlife is likely to play a more central role when we reject than when we choose. Indeed, spot B's share of being preferred and rejected exceeds that of spot A ($P_c + P_r = 67 + 48 = 115$, p<.05). These results demonstrate that options are not simply ordered according to value, with the more attractive selected and the less attractive rejected. Instead, it appears that the relative importance of options' strengths and weaknesses varies with the nature of the task. As a result, we are significantly more likely to end up in spot B when we ask ourselves which we

prefer than when we contemplate which to cancel (67% vs. 52%, $\zeta = 2.83$, p<.001).

One of the most basic assumptions of the rational theory of choice is the principle of procedure invariance, which requires strategically equivalent methods of elication to yield identical preferences (see Tversky et al., 1988, for discussion). The choose-reject discrepancy represents a predictable failure of procedure invariance. This phenomenon is at variance with value maximization, but is easily understood from the point of view of reason-based choice: reasons for choosing are more compelling when we choose than when we reject, and reasons for rejecting matter more when we reject than when we choose.

3. Choice under conflict: seeking options

The need to choose often creates conflict: we are not sure how to trade off one attribute relative to another or, for that matter, which attributes matter to us most. It is a commonplace that we often attempt to resolve such conflict by seeking reasons for choosing one option over another. At times, the conflict between available alternatives is hard to resolve, which may lead us to seek additional options, or to maintain the status quo. Other times, the context is such that a comparison between alternatives generates compelling reasons to choose one option over another. Using reasons to resolve conflict has some non-obvious implications, which are addressed below. The present section focuses on people's decision to seek other alternatives; the next section explores some effects of adding options to the set under consideration.

In many contexts, we need to decide whether to opt for an available option or search for additional alternatives. Thus, a person who wishes to buy a used car may settle for a car that is currently available or continue searching for additional models. Seeking new alternatives usually requires additional time and effort, and may involve the risk of losing the previously available options. Conflict plays no role in the classical theory of choice. In this theory, each option χ has a value u(.x) such that, for any offered set, the decision maker selects the option with the highest value. In particular, a person is expected to search for additional alternatives only if the expected value of searching exceeds that of the best option currently available. A reliance on reasons, on the other hand, entails that we should be more likely to opt for an available option when we have a convincing reason for its selection, and that we should be more likely to search further when a compelling reason for choice is not readily available.

To investigate this hypothesis, Tversky and Shafir (1992b) presented subjects with pairs of options, such as bets varying in probability and payoff, or student apartments varying in monthly rent and distance from campus, and had subjects choose one of the two options or, instead, request an additional option, at some

cost. Subjects first reviewed the entire set of 12 options (gambles or apartments) to familiarize themselves with the available alternatives. In the study of choice between bets some subjects then received the following problem.

Conflict:

Imagine that you are offered a choice between the following two gambles:

(x) 65% chance to win $15
(y) 30% chance to win $35

You can either select one of these gambles or you can pay $1 to add one more gamble to the choice set. The added gamble will be selected at random from the list you reviewed.

Other subjects received a similar problem except that option *y* was replaced by option *x',* to yield a choice between the following.

Dominance:

(x) 65% chance to win $15
(.x') 65% chance to win $14

Subjects were asked to indicate whether they wanted to add another gamble or select between the available alternatives. They then chose their preferred gamble from the resulting set (with or without the added option). Subjects were instructed that the gambles they chose would be played out and that their payoff would be proportional to the amount of money they earned minus the fee they paid for the added gambles.

A parallel design presented choices between hypothetical student apartments. Some subjects received the following problem.

Conflict:

Imagine that you face a choice between two apartments with the following characteristics:

(x) $290 a month, 25 minutes from campus
(y) $350 a month, 7 minutes from campus

Both have one bedroom and a kitchenette. You can choose now between the two apartments or you can continue to search for apartments (to be selected at

random from the list you reviewed). In that case, there is some risk of losing one or both of the apartments you have found.

Other subjects received a similar problem except that option *y* was replaced by option *', to yield a choice between the following.

Dominance:
(x) \$290 a month, 25 minutes from campus
(x'~) \$330 a month, 25 minutes from campus

Note that in both pairs of problems the choice between *x* and *y* - the *conflict* condition — is non-trivial because the *xs* are better on one dimension and the _ys are better on the other. In contrast, the choice between *x* and *x'* - the *dominance* condition - involves no conflict because the former strictly dominates the latter. Thus, while there is no obvious reason to choose one option over the other in the conflict condition, there is a decisive argument for preferring one of the two alternatives in the dominance condition.

On average, subjects requested an additional alternative 64% of the time in the conflict condition, and only 40% of the time in the dominance condition *(p <* .05). Subjects' tendency to search for additional options, in other words, was greater when the choice among alternatives was harder to rationalize, than when there was a compelling reason and the decision was easy.

These data are inconsistent with the principle of value maximization. According to value maximization, a subject should search for additional alternatives if and only if the expected (subjective) value of searching exceeds that of the best alternative currently available. Because the best alternative offered in the dominance condition is also available in the conflict condition, value maximization implies that the percentage of subjects who seek an additional alternative cannot be greater in the conflict than in the dominance condition, contrary to the observed data.

It appears that the search for additional alternatives depends not only on the value of the best available option, as implied by value maximization, but also on the difficulty of choosing among the options under consideration. In situations of dominance, for example, there are clear and indisputable reasons for choosing one option over another (e.g., "This apartment is equally distant and I save \$40!"). Having a compelling argument for choosing one of the options over the rest reduces the temptation to look for additional alternatives. When the choice involves conflict, on the other hand, reasons for choosing any one of the options are less immediately available and the decision is more difficult to justify (e.g., "Should I save \$60 a month, or reside 18 minutes closer to campus?"). In the absence of compelling reasons for choice, there is a greater tendency to search for other alternatives.

4. Choice under conflict: adding options

An analysis in terms of reasons can help explain observed violations of the principle of independence of irrelevant alternatives, according to which the preference ordering between two options should not be altered by the introduction of additional alternatives. This principle follows from the standard assumption of value maximization, and has been routinely assumed in the analysis of consumer choice. Despite its intuitive appeal, there is a growing body of evidence that people's preferences depend on the context of choice, defined by the set of options under consideration. In particular, the addition and removal of options from the offered set can influence people's preferences among options that were available all along. Whereas in the previous section we considered people's tendency to seek alternatives in the context of a given set of options, in this section we illustrate phenomena that arise through the addition of options, and interpret them in terms of reasons for choice.

A major testable implication of value maximization is that a non-preferred option cannot become preferred when new options are added to the offered set. In particular, a decision maker who prefers y over the option to defer the choice should not prefer to defer the choice when both y and x are available. That the "market share" of an option cannot be increased by enlarging the offered set is known as the *regularity condition* (see Tversky & Simonson, in press). Contrary to regularity, numerous experimental results indicate that the tendency to defer choice can increase with the addition of alternatives. Consider, for instance, the degree of conflict that arises when a person is presented with one attractive option (which he or she prefers to deferring the choice), compared to two competing alternatives. Choosing one out of two competing alternatives can be difficult: the mere fact that an alternative is attractive may not in itself provide a compelling reason for its selection, because the other option may be equally attractive. The addition of an alternative may thus make the decision harder to justify, and increase the tendency to defer the decision.

A related phenomenon was aptly described by Thomas Schelling, who tells of an occasion in which he had decided to buy an encyclopedia for his children. At the bookstore, he was presented with two attractive encyclopedias and, finding it difficult to choose between the two, ended up buying neither - this, despite the fact that had only one encyclopedia been available he would have happily bought it. More generally, there are situations in which people prefer each of the available alternatives over the status quo but do not have a compelling reason for choosing among the alternatives and, as a result, defer the decision, perhaps indefinitely.

The phenomenon described by Schelling was demonstrated by Tversky and Shafir (1992b) in the following pair of problems, which were presented to two groups of students *(n* = 124 and 121, respectively).

High conflict:

Suppose you are considering buying a compact disk (CD) player, and have not yet decided what model to buy. You pass by a store that is having a 1-day clearance sale. They offer a popular SONY player for just $99, and a top-of-the-line AIWA player for just $169, both well below the list price. Do you?:

(x) buy the AIWA player.	27%
(y) buy the SONY player.	27%
(z) wait until you learn more about the various models.	46%

Low   conflict:

Suppose you are considering buying a CD player, and have not yet decided what model to buy. You pass by a store that is having a 1-day clearance sale. They offer a popular SONY player for just $99, well below the list price. Do you?:

(y) buy the SONY player.	66%
(z) wait until you learn more about the various models.	34%

The results indicate that people are more likely to buy a CD player in the latter, *low-conflict,* condition than in the former, *high-conflict,* situation *(p < .05).* Both models - the AIWA and the SONY - seem attractive, both are well priced, and both are on sale. The decision maker needs to determine whether she is better off with a cheaper, popular model, or with a more expensive and sophisticated one. This conflict is apparently not easy to resolve, and compels many subjects to put off the purchase until they learn more about the various options. On the other hand, when the SONY alone is available, there are compelling arguments for its purchase: it is a popular player, it is very well priced, and it is on sale for 1 day only. In this situation, having good reasons to choose the offered option, a greater majority of subjects decide to opt for the CD player rather than delay the purchase.

The addition of a competing alternative in the preceding example increased the tendency to delay decision. Clearly, the level of conflict and its ease of resolution depend not only on the number of options available, but on how the options compare. Consider, for example, the following problem, in which the original AIWA player was replaced by an inferior model *(n = 62).*

Dominance:

Suppose you are considering buying a CD player, and have not yet decided what model to buy. You pass by a store that is having a 1-day clearance sale. They offer a popular SONY player for just $99, well below the list price, and an inferior AIWA player for the regular list price of $105. Do you?:

(x'J	buy the AIWA player.	3%
(y)	buy the SONY player.	73%
(z)	wait until you learn more about the various models.	24%

In this version, contrary to the previous *high-conflict* version, the AIWA player is dominated by the SONY: it is inferior in quality and costs more. Thus, the presence of the AIWA does not detract from the reasons for buying the SONY, it actually supplements them: the SONY is well priced, it is on sale for 1 day only, *and* it is clearly better than its competitor. As a result, the SONY is chosen more often than before the inferior AIWA was added. The ability of an asymmetrically dominated or relatively inferior alternative, when added to a set, to increase the attractiveness and choice probability of the dominating option is known as the asymmetric dominance effect (Huber, Payne, & Puto, 1982). Note that in both the *high-conflict* and the *dominance* problems subjects were presented with two CD players and an option to delay choice. Subjects' tendency to delay, however, is much greater when they lack clear reasons for buying either player, than when they have compelling reasons to buy one player and not the other *(p < .005)*.

The above patterns violate the regularity condition, which is assumed to hold so long as the added alternatives do not provide new and relevant information. In the above scenario, one could argue that the added options (the superior player in one case and the inferior player in the other) conveyed information about the consumer's chances of finding a better deal. Recall that information considerations could not explain the search experiments of the previous section because there subjects reviewed all the potentially available options. Nevertheless, to test this interpretation further, Tversky and Shafir (1992b) devised a similar problem, involving real payoffs, in which the option to defer is not available. Students *(n = 80)* agreed to fill out a brief questionnaire for $1.50. Following the questionnaire, one half of the subjects were offered the opportunity to exchange the $1.50 (the default) for one of two prizes: a metal Zebra pen (henceforth, Zebra), or a pair of plastic Pilot pens (henceforth, Pilot). The other half of the subjects were only offered the opportunity to exchange the $1.50 for the Zebra. The prizes were shown to the subjects, who were also informed that each prize regularly costs a little over $2.00. Upon indicating their preference, subjects received their chosen option. The results were as follows. Seventy-five per cent of

the subjects chose the Zebra over the payment when the Zebra was the only alternative, but only 47% chose the Zebra *or* the Pilot when both were available *(p < .05).* Faced with a tempting alternative, subjects had a compelling reason to forego the payment: the majority took advantage of the opportunity to obtain an attractive prize of greater value. The availability of competing alternatives of comparable value, on the other hand, did not present an immediate reason for choosing either alternative over the other, thus increasing the tendency to retain the default option. Similar effects in hypothetical medical decisions made by expert physicians are documented in Redelmeier and Shafir (1993).

In the above study the addition of a competing alternative was shown to increase the popularity of the default option. Recall that the popularity of an option may also be enhanced by the addition of an inferior alternative. Thus, in accord with the asymmetric dominance effect, the tendency to prefer x over y can be increased by adding a third alternative ζ that is clearly inferior to χ but not to y (see Fig. 1). The phenomenon of asymmetric dominance was first demonstrated, by Huber, Payne, and Puto (1982), in choices between hypothetical options. Wedell (1991) reports similar findings using monetary gambles. The following example involving real choices is taken from Simonson and Tversky (1992). One group *(n = 106)* was offered a choice between $6 and an elegant Cross pen. The pen was selected by 36% of the subjects, and the remaining 64% chose the cash. A second group *(n = 115)* was given a choice among three options: $6 in cash, the same Cross pen, and a second pen that was distinctly less attractive. Only 2% of the subjects chose the less attractive pen, but its presence increased the percentage of subjects who chose the Cross pen from 36% to 46% *(p < .10).* This pattern again violates the regularity condition discussed earlier. Similar violations of regularity were observed in choices among other consumer goods. In one
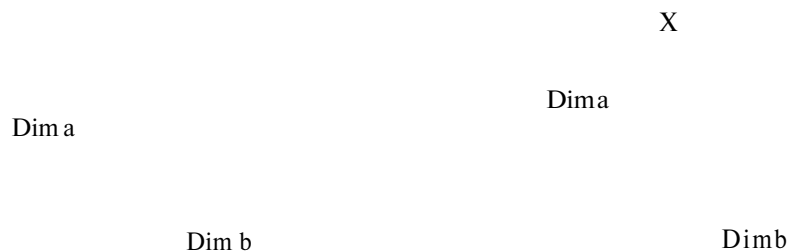
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Figure 1. *A schematic representation of asymmetric dominance. The tendency to prefer x over y can be increased by adding an alternative, z, that is clearly inferior to x but not to y.*

Figure 2, *A schematic representation of extremeness aversion. Option y is relatively more popular in the trinary choice, when both x and ζ are available, than in either one of the binary comparisons, when either χ or ζ are removed.*

study, subjects received descriptions and pictures of microwave ovens taken from a "Best" catalogue. One group *(n = 60)* was then asked to choose between an Emerson priced at $110, and a Panasonic priced at $180. Both items were on sale, one third off the regular price. Here, 57% chose the Emerson and 43% chose the Panasonic. A second group *(n = 60)* was presented with these options along with a $200 Panasonic at a 10% discount. Only 13% of the subjects chose the more expensive Panasonic, but its presence increased the percentage of subjects who chose the less expensive Panasonic from 43% to 60% (p<.05).[1]

Simonson and Tversky (1992) have interpreted these observations in terms of "tradeoff contrast". They proposed that the tendency to prefer an alternative is enhanced or hindered depending on whether the tradeoffs within the set under consideration are favorable or unfavorable to that alternative. A second cluster of context effects, called *extremeness aversion,* which refers to the finding that, within an offered set, options with extreme values are relatively less attractive than options with intermediate values (Simonson, 1989). For example, consider two-dimensional options *, y,* and z, such that *y* lies between *x* and z (see Fig. 2). Considerations of value maximization imply that the middle alternative, *y,* should be relatively less popular in the trinary choice than in either one of the binary comparisons *(y* compared to *x,* or *y* compared to z). Extremeness aversion, on the other hand, yields the opposite prediction because *y* has small advantages and disadvantages with respect to χ and to z, whereas both χ and z have more extreme advantages and disadvantages with respect to each other. This pattern was observed in several experiments. For example, subjects were shown five 35 mm cameras varying in quality and price. One group *(n = 106)* was then given a choice between two cameras: a Minolta X-370 priced at $170 and a Minolta 3000i priced at $240. A second group *(n = 115)* was given an additional option, the Minolta 7000i priced at $470. Subjects in the first group were split evenly between the two options, yet 57% of the subjects in the second group chose the middle option (Minolta 3000i), with the remaining divided about equally between the two extreme options. Thus, the introduction of an extreme option reduced the "market share" of the other extreme option, but not of the middle option. Note that this effect cannot be attributed to information conveyed by the offered set because respondents had reviewed the relevant options prior to making their choice.

We suggest that both tradeoff contrast and extremeness aversion can be understood in terms of reasons. Suppose a decision maker faces a choice between

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[1] These effects of context on choice can naturally be used in sales tactics. For example, Williams-Sonoma, a mail-order business located in San Francisco, used to offer a bread-baking appliance priced at $279. They later added a second bread-baking appliance, similar to the first but somewhat larger, and priced at $429 - more than 50% higher than the original appliance. Not surprisingly, Williams-Sonoma did not sell many units of the new item. However, the sales of the less expensive appliance almost doubled. (To the best of our knowledge, Williams-Sonoma did not anticipate this effect.)

two alternatives, χ and y, and suppose χ is of higher quality whereas y is better priced. This produces conflict if the decision maker finds it difficult to determine whether the quality difference outweighs the price difference. Suppose now that the choice set also includes a third alternative, z, that is clearly inferior to _y but not to x. The presence of z, we suggest, provides an argument for choosing y over .v. To the extent that the initial choice between x and y is difficult, the presence of z may help the decision maker break the tie. In the pen study, for example, the addition of the relatively unattractive pen, whose monetary value is unclear but whose inferiority to the elegant Cross pen is apparent, provides a reason for choosing the Cross pen over the cash. Similarly, in the presence of options with extreme values on the relevant dimensions, the middle option can be seen as a compromise choice that is easier to defend than either extremes. Indeed, verbal protocols show that the accounts generated by subjects while making these choices involve considerations of asymmetric advantage and compromise; further-more, asymmetric dominance is enhanced when subjects anticipate having to justify their decisions to others (Simonson, 1989). It is noteworthy that the arguments leading to tradeoff contrast and extremeness aversion are comparative in nature; they are based on the positions of the options in the choice set, hence they cannot be readily translated into the values associated with single alternatives.

Tversky and Simonson (in press) have proposed a formal model that explains the above findings in terms of a tournament-like process in which each option is compared against other available options in terms of their relative advantages and disadvantages. This model can be viewed as a formal analog of the preceding qualitative account based on reasons for choice. Which analysis - the formal or the qualitative - proves more useful is likely to depend, among other things, on the nature of the problem and on the purpose of the investigation.

5. Definite versus disjunctive reasons

People sometimes encounter situations of uncertainty in which they eventually opt for the same course of action, but for very different reasons, depending on how the uncertainty is resolved. Thus, a student who has taken an exam may decide to take a vacation, either to reward herself in case she passes or to console herself in case she fails. However, as illustrated below, the student may be reluctant to commit to a vacation while the outcome of the exam is pending. The following problem was presented by Tversky and Shafir (1992a) to 66 under-graduate students.

Disjunctive version:

Imagine that you have just taken a tough qualifying examination. It is the end of the fall quarter, you feel tired and run-down, and you are not sure that you passed the exam. In case you failed you have to take the exam again in a couple of months - after the Christmas holidays. You now have an opportunity to buy a very attractive 5-day Christmas vacation package in Hawaii at an exceptionally low price. The special offer expires tomorrow, while the exam grade will not be available until the following day. Would you?:

(a) buy the vacation package.	32%
(b) not buy the vacation package.	7%
(c) pay a $5 non-refundable fee in order to retain the rights to buy the vacation package at the same exceptional price the day after tomorrow - after you find out whether or not you passed the exam.	61%

The percentage of subjects who chose each option appears on the right. Two additional versions, called *pass and fail,* were presented to two different groups of 67 students each. These two versions differed only in the expression in brackets.

Pass /fail versions:

Imagine that you have just taken a tough qualifying examination. It is the end of the fall quarter, you feel tired and run-down, and you find out that you [passed the exam./failed the exam. You will have to take it again in a couple of months- after the Christmas holidays.] You now have an opportunity to buy a very attractive 5-day Christmas vacation package in Hawaii at an exceptionally low price. The special offer expires tomorrow. Would you?:

	Pass	*Fail*
(a) buy the vacation package.	54%	57%
(b) not buy the vacation package.	16%	12%
(c) pay a $5 non-refundable fee in order to retain the rights to buy the vacation package at the same exceptional price the day after tomorrow.	30%	31%

The data show that more than half of the students chose the vacation package when they knew that they passed the exam and an even larger percentage chose the vacation when they knew that they failed. However, when they did not know

whether they had passed or failed, less than one third of the students chose the vacation and 61% were willing to pay $5 to postpone the decision until the following day, when the results of the exam would be known.[2] Once the outcome of the exam is known, the student has good - albeit different - reasons for taking the trip: having passed the exam, the vacation is presumably seen as a reward following a hard but successful semester; having failed the exam, the vacation becomes a consolation and time to recuperate before a re-examination. Not knowing the outcome of the exam, however, the student lacks a definite reason for going to Hawaii. Notice that the outcome of the exam will be known long before the vacation begins. Thus, the uncertainty characterizes the actual moment of decision, not the eventual vacation.

   The indeterminacy of reasons for going to Hawaii discourages many students from buying the vacation, even when both outcomes - passing or failing the exam -ultimately favor this course of action. Tversky and Shafir (1992a) call the above pattern of decisions a *disjunction effect.* Evidently, a disjunction of different reasons (reward in case of success or consolation in case of failure) is often less compelling than either definite reason alone. A significant proportion of the students above were willing to pay, in effect, for information that was ultimately not going to affect their decision - they would choose to go to Hawaii in either case - but that promised to leave them with a more definite reason for making that choice. The willingness to pay for non-instrumental information is at variance with the classical model, in which the worth of information is determined only by its potential to influence decision.

   People's preference for definite as opposed to disjunctive reasons has significant implications in cases where the option to defer decision is not available. Consider the following series of problems presented by Tversky and Shafir (1992a) to 98 students.

Win/lose version:

Imagine that you have just played a game of chance that gave you a 50% chance to win $200 and a 50% chance to lose $100. The coin was tossed and you have [won $200/lost $100]. You are now offered a second identical gamble: 50% chance to win $200 and 50% chance to lose $100. Would you?:

"An additional group of subjects *(n* = 123) were presented with both the fail and the pass versions, and asked whether or not they would buy the vacation package in each case. Two thirds of the subjects made the same choice in the two conditions, indicating that the data for the disjunctive version cannot be explained by the hypothesis that those who like the vacation in case they pass the exam do not like it in case they fail, and vice versa. Note that while only one third of the subjects made different decisions depending on the outcome of the exam, more than 60% of the subjects chose to wait when the outcome was not known.

	Won	*Lost*
(a) accept the second gamble.	69%	59%
(b) reject the second gamble.	31%	41%

The students were presented with the *win* version of the problem above, followed a week later by the *lose* version, and 10 days after that by the following version that is a disjunction of the previous two. The problems were embedded among other, similar problems so that the relation between the various versions was not transparent. Subjects were instructed to treat each decision separately.

Disjunctive version:

Imagine that you have just played a game of chance that gave you a 50% chance to win $200 and a 50% chance to lose $100. Imagine that the coin has already been tossed, but that you will not know whether you have won $200 or lost $100 until you make your decision concerning a second, identical gamble: 50% chance to win $200 and 50% chance to lose $100. Would you?:

(a) accept the second gamble.	36%
(b) reject the second gamble.	64%

The data show that a majority of subjects accepted the second gamble after having won the first gamble and a majority also accepted the second gamble after having lost the first gamble. However, the majority of subjects rejected the second gamble when the outcome of the first was not known. An examination of individual choices reveals that approximately 40% of the subjects accepted the second gamble both after a gain in the first and after a loss. Among these, however, 65% rejected the second gamble in the disjunctive condition, when the outcome of the first gamble was not known. Indeed, this response pattern (accepting in both conditions but rejecting in the disjunction) was the single most frequent pattern, exhibited by 27% of all subjects. This pattern, which violates Savage's (1954) sure-thing principle, cannot be attributed to unreliability (Tversky & Shafir, 1992a).

The students above were offered a gamble with a positive expected value, and an even chance of a non-trivial loss. Different reasons were likely to arise for accepting the second gamble depending on the outcome of the first. In the *win* condition, the decision maker is already up $200, so even a loss on the second gamble leaves him or her ahead overall, which makes this option quite attractive. In the *lose* condition, on the other hand, the decision maker is down $100. Playing the second gamble offers a chance to "get out of the red", which for many is more attractive than accepting a sure $100 loss. In the *disjunctive* condition, however, the decision maker does not know whether she is up $200 or down $100;

she does not know, in other words, whether her reason for playing the second gamble is that it is a no-loss proposition or, instead, that it provides a chance to escape a sure loss. In the absence of a definite reason, fewer subjects accept the second gamble.

This interpretation is further supported by the following modification of the above problem, in which both outcomes of the first gamble were increased by $400 so that the decision maker could not lose in either case.

Imagine that you have just played a game of chance that gave you a 50% chance to win $600 and a 50% chance to win $300. Imagine that the coin has already been tossed, but that you will not know whether you have won $600 or $300 until you make your decision concerning a second gamble: 50% chance to win $200 and 50% chance to lose $100.

A total of 171 subjects were presented with this problem, equally divided into three groups. One group was told that they had won $300 on the first gamble, a second group was told that they had won $600 on the first gamble, and the third group was told that the outcome of the first gamble - $300 or $600 - was not known (the disjunctive version). In all cases, subjects had to decide whether to accept or to reject the second gamble which, as in the previous problem, consisted of an even chance to win $200 or lose $100. The percentage of subjects who accepted the second gamble in the $300, $600, and disjunctive versions, were 69%, 75%, and 73%, respectively. (Recall that the corresponding figures for the original problem were 59%, 69%, and 36%; essentially identical figures were obtained in a between-subjects replication of that problem.) In contrast to the original problem, the second gamble in this modified problem was equally popular in the disjunctive as in the non-disjunctive versions. Whereas in the original scenario the second gamble amounted to either a no-loss proposition or a chance to avoid a sure loss, in the modified scenario the second gamble amounts to a no-loss proposition regardless of the outcome of the first gamble. The increased popularity of the second gamble in the modified problem shows that it is not the disjunctive situation itself that discourages people from playing. Rather, it is the lack of a specific reason that seems to drive the effect: when the same reason applies regardless of outcome, the disjunction no longer reduces the tendency to accept the gamble.

As illustrated above, changes in the context of decision are likely to alter the reasons that subjects bring to mind and, consequently, their choices. Elsewhere (Shafir & Tversky, 1992) we describe a disjunction effect in the context of a one-shot prisoner's dilemma game, played on a computer for real payoffs. Subjects *(n = 80)* played a series of prisoner's dilemma games, without feedback, each against a different unknown player. In this setup, the rate of cooperation was 3% when subjects knew that the other player had defected, and 16% when they knew that the other'had cooperated. However, when subjects did not know

whether the other player had cooperated or defected (the standard version of the prisoner's dilemma game) the rate of cooperation rose to 37%. Thus, many subjects defected when they knew the other's choice - be it cooperation or defection - but cooperated when the other player's choice was not known. Shark and Tversky (1992) attribute this pattern to the different perspectives that underlie subjects' behavior under uncertainty as opposed to when the uncertainty is resolved. In particular, we suggest that the reasons for competing are more compelling when the other player's decision is known and the payoff depends on the subject alone, than when the other's chosen strategy is uncertain, and the outcome of the game depends on the choices of both players.

The above "disjunctive" manipulation - which has no direct bearing from the point of view of value maximization - appears to influence the reasons for decision that people bring to mind. Another kind of manipulation that seems to alter people's reasons without bearing directly on options' values is described in what follows.

6. Non-valued features

Reasons for choice or rejection often refer to specific features of the options under consideration. The positive features of an option typically provide reasons for choosing that option and its negative features typically provide reasons for rejection. What happens when we add features that are neither attractive nor aversive? Can choice be influenced by features that have little or no value?

Simonson and his colleagues have conducted a number of studies on the effects of non-valued features, and tested the hypothesis that people are reluctant to choose alternatives that are supported by reasons that they do not find appealing. In one study, for example, Simonson, Nowlis, and Simonson (in press) predicted that people would be less likely to choose an alternative that was chosen by another person for a reason that does not apply to them. UC Berkeley business students $(n = 113)$ were told that, because of budget cuts and in order to save paper and duplicating costs, a questionnaire that they will receive was designed for use by two respondents. Thus, when subjects had to enter a choice, they could see the choice made by the previous "respondent" and the reason given for it. The choices and reasons of the previous respondents were systematically manipulated. One problem, for example, offered a choice between attending the MBA programs at Northwestern and UCLA. In one version of the questionnaire, the previous respondent had selected Northwestern, and provided the (handwritten) reason, "I have many relatives in the Chicago area." Because this reason does not apply to most subjects, it was expected to reduce their likelihood of choosing Northwestern. In a second version, no reason was given for the choice of Northwestern. As expected, those exposed to an irrelevant reason were less likely

to choose Northwestern than subjects who saw the other respondent's choice but not his or her reason (23% vs. 43%, p<.05). It should be noted that both Northwestern and UCLA are well known to most subjects (Northwestern currently has the highest ranked MBA program; the UCLA program is ranked high and belongs to the same UC system as Berkeley). Thus, it is unlikely that subjects made inferences about the quality of Northwestern based on the fact that another respondent chose it because he or she had relatives in Chicago.

In a related study, Simonson, Carmon, and O'Curry (in press) showed that endowing an option with a feature that was intended to be positive but, in fact, has no value for the decision maker can reduce the tendency to choose that option, even when subjects realize that they are not paying for the added feature. For example, an offer to purchase a collector's plate - that most did not want - if one buys a particular brand of cake mix was shown to lower the tendency to buy that particular brand relative to a second, comparable cake mix brand (from 31% to 14%, $\rho < .05$). Choosing brands that offer worthless bonuses was judged (in a related study) as more difficult to justify and as more susceptible to criticism. An analysis of verbal protocols showed that a majority of those who failed to select the endowed option explicitly mentioned not needing the added feature. It should be noted that sale promotions, such as the one involving the collector's plate offer above, are currently employed by a wide range of companies and there is no evidence that they lead to any inferences about the quality of the promoted product (e.g., Blattberg & Neslin, 1990).

The above manipulations all added "positive", albeit weak or irrelevant, features, which should not diminish an option's value; yet, they apparently provide a reason against choosing the option, especially when other options are otherwise equally attractive. Evidently, the addition of a potentially attractive feature that proves useless can provide a reason to reject the option in favor of a competing alternative that has no "wasted" features.

7. Concluding remarks

People's choices may occasionally stem from affective judgments that preclude a thorough evaluation of the options (cf. Zajonc, 1980). In such cases, an analysis of the reasons for choice may prove unwarranted and, when attempted by the decision maker, may actually result in a different, and possibly inferior, decision (Wilson & Schooler, 1991). Other choices, furthermore, may follow standard operating procedures that involve minimal reflective effort. Many decisions, nonetheless, result from a careful evaluation of options, in which people attempt to arrive at what they believe is the best choice. Having discarded the less attractive options and faced with a choice that is hard to resolve, people often search for a compelling rationale for choosing one alternative over another. In

this paper, we presented an analysis of the role of reasons in decision making, and considered ways in which an analysis based on reasons may contribute to the standard quantitative approach based on the maximization of value. A number of hypotheses that derive from this perspective were investigated in experimental settings.

The reasons that enter into the making of decisions are likely to be intricate and diverse. In the preceding sections we have attempted to identify a few general principles that govern the role of reasons in decision making, and thus some of the fundamental ways in which thinking about reasons is likely to contribute to our understanding of the making of decisions. A reliance on the more important dimensions - those likely to provide more compelling reasons for choice - was shown in section 1 to predict preferences between previously equated options. The notions of compatibility and salience were summoned in section 2 to account for the differential weighting of reasons in a choice versus rejection task. Reasons, it appears, lend themselves to certain framing manipulations that are harder to explain from the perspective of value maximization. In section 3, manipulating the precise relationships between competing alternatives was shown to enhance or reduce conflict, yielding decisions that were easier or more difficult to rationalize and justify. Providing a context that presents compelling reasons for choosing an option apparently increases people's tendency to opt for that option, whereas comparing alternatives that render the aforementioned reasons less compelling tends to increase people's tendency to maintain the status quo or search for other alternatives. The ability of the context of decision to generate reasons that affect choice was further discussed in section 4, where the addition and removal of competing alternatives was interpreted as generating arguments for choice based on comparative considerations of relative advantages and compromise. The relative weakness of disjunctive reasons was discussed in section 5. There, a number of studies contrasted people's willingness to reach a decision based on a definite reason for choice, with their reluctance to arrive at a decision in the presence of uncertainty about which reason is actually relevant to the case at hand. Section 6 briefly reviewed choice situations in which the addition of purported reasons for choosing an option, which subjects did not find compelling, was seen to diminish their tendency to opt for that option, even though its value had not diminished.

The nature of the reasons that guide decision, and the ways in which they interact, await further investigation. There is evidence to suggest that a wide variety of arguments play a role in decision making. We often search for a convincing rationale for the decisions that we make, whether for inter-personal purposes, so that we can explain to others the reasons for our decision, or for intra-personal motives, so that we may feel confident of having made the "right" choice. Attitudes toward risk and loss can sometimes be rationalized on the basis of common myths or cliches, and choices are sometimes made on the basis of

moral or prudential principles that are used to override specific cost-benefit calculations (cf. Prelec & Herrnstein, 1991). Formal decision rules, moreover, may sometimes act as arguments in people's deliberations. Thus, when choosing between options χ and z, we may realize that, sometime earlier, we had preferred χ over y and y over z and that, therefore, by transitivity, we should now choose χ over z. Montgomery (1983) has argued that people look for dominance structures in decision problems because they provide a compelling reason for choice._ Similarly, Tversky and Shafir (1992a) have shown that detecting the applicability of the sure-thing principle to a decision situation leads people to act in accord with this principle's compelling rationale. Indeed, it has been repeatedly observed that the axioms of rational choice which are often violated in non-transparent situations are generally satisfied when their application is transparent (e.g., Tversky & Kahneman, 1986). These results suggest that the axioms of rational choice act as compelling arguments, or reasons, for making a particular decision when their applicability has been detected, not as universal laws that constrain people's choices.

In contrast to the classical theory that assumes stable values and preferences, it appears that people often do not have well-established values, and that preferences are actually constructed - not merely revealed - during their elicitation (cf. Payne, Bettman, & Johnson, 1992). A reason-based approach lends itself well to such a constructive interpretation. Decisions, according to this analysis, are often reached by focusing on reasons that justify the selection of one option over another. Different frames, contexts, and elicitation procedures highlight different aspects of the options and bring forth different reasons and considerations that influence decision.

The reliance on reasons to explain experimental findings has been the hallmark of social psychological analyses. Accounts of dissonance (Wicklund & Brehm, 1976) and self-perception (Bern, 1972), for example, focus on the reasons that people muster in an attempt to explain their counter-attitudinal behaviors. Similarly, attribution theory (Heider, 1980) centers around the reasons that people attribute to others' behavior. These studies, however, have primarily focused on postdecisional rationalization rather than predecisional conflict. Although the two processes are closely related, there are nevertheless some important differences. Much of the work in social psychology has investigated how people's decisions affect the way they think. The present paper, in contrast, has considered how the reasons that enter into people's thinking about a problem influence their decision. A number of researchers have recently begun to explore related issues. Billig (1987), for example, has adopted a rhetorical approach to understanding social psychological issues, according to which "our inner deliberations are silent arguments conducted within a single self (p. 5). Related "explanation-based" models of decision making have been applied by Pennington and Hastie (1988, 1992) to account for judicial decisions, and the importance of

social accountability in choice has been addressed by Tetlock (1992). From a philosophical perspective, a recent essay by Schick (1991) analyzes various decisions from the point of view of practical reason. An influential earlier work is Toulmin's (1950) study of the role of arguments in ethical reasoning.

In this article, we have attempted to explore some of the ways in which reasons and arguments enter into people's decisions. A reason-based analysis may come closer to capturing part of the psychology that underlies decision and thus may help shed light on a number of phenomena that remain counterintuitive from the perspective of the classical theory. It is instructive to note that many of the experimental studies described in this paper were motivated by intuitions stemming from a qualitative analysis based on reasons, not from a value-based perspective, even if they can later be interpreted in that fashion. We do not propose that accounts based on reasons replace value-based models of choice. Rather, we suggest that an analysis of reasons may illuminate some aspects of reflective choice, and generate new hypotheses for further study.

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