2

CONSUMER DECISION MAKING*

James R. Bettman
Duke University

Eric J. Johnson
Wharton School, University of Pennsylvania

John W. Payne
Duke University

This chapter reviews theories and research on consumer decision making. We characterize the properties of the consumer decision-making task and the consumer information environment. The limited information processing capabilities of consumers are addressed, and the choice heuristics used by consumers to cope with difficult decisions are described. Conceptual frameworks for understanding contingent consumer decision making and a review of relevant research on contingent processing are presented. Finally, methods for studying consumer decision making are discussed, and future research opportunities are outlined.

INTRODUCTION

Consumers constantly make decisions regarding the choice, purchase, and use of products and services. These decisions are of great import not only for the consumers themselves, but also for marketers and policymakers. These decisions are often difficult. Consumers are often faced with a large number of alternatives, which are constantly changing due to new technologies and competitive pressures. There is often a great deal of information available from many sources (e.g., advertisements, packages, brochures, salespeople, and friends). Moreover, the consumer is often not completely certain about how a product might perform. Finally, the consumer is often faced with difficult value trade-offs, such as price versus safety in the purchase of an automobile.

This multifaceted nature of the consumer decision-making task has generated a number of important research questions. Such ques-

*This chapter was partially supported by a contract from the Perceptual Science Programs, Office of Naval Research, and by a grant from the National Science Foundation.

signing information displays so that strategies which tend to be more accurate are simpler to implement. The basic concept is that mental processing capacity should be viewed as a scarce resource (Simon 1978). To the extent that the mental effort associated with that processing can be reduced, people will tend to process more of the available information.

CHOICE HEURISTICS

The decision-making strategies described in this section are defined in terms of a typical choice problem, consisting of a set of alternatives, each described by values on several attributes. For each attribute, there may also be an importance weight and a cutoff value specifying a minimal acceptable level for that attribute (see Klein and Bither, 1987, for a model of cutoff selection).

Before considering the specific heuristics, some general aspects of consumer decision processes should be addressed briefly. First, these heuristics can either be used alone or in combination with other heuristics. Some typical combinations are discussed subsequently after the individual heuristics have been presented. Second, as noted previously, heuristics can be either constructed on the spot or their use could be planned a priori. Third, heuristics differ in both how much effort they require to use and how accurate they are likely to be. For example, a heuristic that only considered information on one attribute (e.g., the lexicographic heuristic) might require less effort and be less accurate for some types of decisions than a heuristic which examined a larger proportion of the available information. Following the descriptions of the heuristics and their properties, we will provide a framework for determining which heuristics will be used in a particular choice situation.

The Weighted Additive (WADD) Rule. Normative procedures for dealing with decision problems generally prescribe processes involving the consideration of all the relevant problem information. For example, the weighted additive (WADD) rule considers the values of each alternative on *all* the relevant attributes and considers *all* the relative importances of the attributes to the decision maker. Furthermore, a rule like WADD involves substantial computational processing of the information. For instance, the WADD rule develops a weighted value for each attribute by multiplying the weight times the attribute value and summing over all attributes to arrive at an overall evaluation of an alternative. It is assumed that the alternative with the highest overall evaluation is chosen. While people sometimes make decisions in ways consistent with such a normative procedure, more often people appear to make decisions using simpler decision processes (heuristics).

A number of heuristics used to solve decision problems have been identified (Svenson 1979). Some of the more common heuristics are described subsequently. Each heuristic represents a different method for simplifying decision making by limiting the amount of information that is processed and/or by making how that information is processed easier.

The Satisficing (SAT) Heuristic. Satisficing is one of the oldest heuristics identified in the literature (Simon 1955). With this strategy, alternatives are considered one at a time, in the order they occur in the set. The value of each attribute of an alternative is considered to see whether it meets a predetermined cutoff level. If any attribute value is below the cutoff, then that alternative is rejected. The first alternative that has values which meet the cutoff requirements for all attributes is chosen. If no alternatives pass all the cutoffs, the cutoff level can be relaxed and the process repeated, or an alternative can be randomly selected. An implication of the satisficing heuristic is that choice will be a function of the order in which consumers evaluate products. That is, if Brand A and Brand B both pass the cutoff levels, then whether A or B is chosen will depend on whether A or B is evaluated first. There will be no comparison of the relative merit of Brand A as compared with Brand B.

The Lexicographic (LEX) Heuristic. The lexicographic procedure determines the most important attribute, and then examines the values of all alternatives on that attribute. The alternative with the best value on the most important attribute is selected. If two alternatives are tied, that is, are equivalent on the key attribute, the second most important attribute is then considered, and so on, until the tie is broken. An example from consumer choice of the LEX procedure might be choosing the cheapest brand. Sometimes the LEX strategy includes the notion of a just-noticeable difference (JND). If several alternatives are within a JND of the best alternative on the most important attribute, they are considered to be tied (Tversky 1969). This version of the LEX rule is sometimes called lexicographic-semiorder (LEXSEMI).

The Elimination-by-Aspects (EBA) Heuristic. First described by Tversky (1972), an EBA strategy begins by determining the most important attribute. Then, the cutoff level for that attribute is retrieved, and all alternatives with values for that attribute below the cutoff level are eliminated. The process continues with the second most important attribute, then the third, and so on, until one alternative remains. Interestingly, the example Tversky used to motivate this heuristic involved an advertisement for computer training schools in San Francisco. The advertisement presented a series of arguments about why all other schools should be eliminated on the basis of various aspects until only the advertised school remained.

The Majority of Confirming Dimensions (MCD) Heuristic. This heuristic, described by Russo and Dosher (1983), involves processing pairs of alternatives. The values for each of the two alternatives are compared on each attribute, and the alternative with a majority of winning (better) attribute values is retained. The retained alternative is then compared with the next alternative among the set of alternatives. The process of pairwise comparison repeats until all alternatives have been evaluated and the final winning alternative identified.

The Frequency of Good and Bad Features (FRQ) Heuristic. Alba and Marmorstein (1987) suggest that consumers may evaluate or choose alternatives based simply upon counts of the good or bad features the alternatives possess. To implement this heuristic, consumers would need to develop cutoff levels for specifying good and bad features. Then the consumer would count the number of such features. Depending upon whether the consumer focussed on good features, bad features, or both, different variants of the heuristic would arise.

The Equal Weight (EQW) Heuristic. This processing strategy examines all the alternatives and all the attribute values for each alternative. However, the equal weight strategy simplifies decision making by ignoring information about the relative importance or probability of each attribute. A value is obtained for each alternative by simply summing the values of the attributes for each alternative. Hence this heuristic is a special case of the weighted additive rule. The equal weight rule has been advocated as a highly accurate simplification of the decision-making process for both risky (Thorngate, 1980) and nonrisky choice (Dawes 1979; Einhorn and Hogarth 1975).

Combined Heuristics. In some instances, consumers may use combined or phased strategies. Typically, such combined strategies have an initial phase where poor alternatives are eliminated, and then a second phase examining the remaining alternatives in more detail (Payne 1976). One such combined heuristic is an elimination-by-aspects plus weighted additive strategy. EBA would be used to reduce the number of alternatives to some small number (e.g., two or three), and then a weighted additive rule would be used to select among those remaining alternatives.

Other Heuristics. In the area of consumer choice, several even simpler heuristics have been proposed. A frequent strategy for choice of this type is the habitual heuristic: choose what one chose last time. A related heuristic, suggested by Wright (1975), is *affect referral.* The consumer simply elicits a previously formed

evaluation for each alternative from memory and selects the most highly evaluated alternative. No detailed attribute information is considered.

General Properties of Choice Heuristics

The strategies we have just discussed are only some of those proposed to describe choice behavior. These strategies have come from a number of disciplines and have been described using very different kinds of formalisms. As a result, in order to compare and contrast strategies for choice, researchers have often described them using fairly broad and global characteristics (Bettman 1979).

Compensatory versus Noncompensatory. One of the most important distinctions among rules is the extent of compensatory as compared to noncompensatory processing. Some rules (e.g., the lexicographic rule) are noncompensatory, since excellent values on less important attributes cannot compensate for a poor value on the most important attribute. Rules such as weighted additive or equal weight are compensatory, on the other hand, since high values on some attributes can compensate for low values on others. Hogarth (1987) has suggested that people find making explicit trade-offs emotionally uncomfortable. Thus, consumers may avoid strategies that are compensatory not only because they are difficult to execute (require great cognitive effort), but also because they require the explicit resolving of difficult value trade-offs.

Consistent versus Selective Processing. A related aspect of choice heuristics is the degree to which the amount of processing is consistent or selective across alternatives or attributes. That is, is the same amount of information examined for each alternative or attribute, or does the amount vary? In general, it has been assumed that more consistent processing across alternatives is indicative of a more compensatory decision strategy (Payne 1976). Consistent processing sometimes involves examination of all information for every alternative and attribute. A more variable (selective) processing pattern, on the other hand, is seen as indicating a strategy of eliminating alternatives or attributes on the basis of only a partial processing of information, without considering whether additional information might compensate for a poor value.

Amount of Processing. A third general processing characteristic is the total amount of processing carried out. Whether processing is consistent or not, the total amount of information examined can vary, leading to an examination that can be quite cursory to very exhaustive. For some strategies, such as EBA, lexicographic, and satisficing, the total amount of information processed is contingent upon the particular values of the alternatives and the cutoff levels.

Alternative-based versus Attribute-based Processing. A fourth aspect of processing concerns whether the search and processing of alternatives proceeds across or within attributes. The former (across attribute processing) is often called holistic, alternative-based, or brand-based processing. The latter (within attribute processing) is called dimensional or attribute-based processing. In alternative-based processing, multiple attributes of a single alternative are considered before information about a second alternative is processed. In contrast, in attribute-based processing, the values of several alternatives on a single attribute are processed before information about a second attribute is processed. Russo and Dosher (1983) suggest that attribute-based processing is cognitively easier.

Quantitative versus Qualitative Reasoning. Note that heuristics also differ in terms of the degree of quantitative versus qualitative reasoning used. Some heuristics include quantitative reasoning operations. For example, the equal weight method involves a summing of values, and the frequency heuristic requires counts. The weighted adding rule, a normative strategy, includes the even more quantitative operation of multiplying two values. In contrast, most of the reasoning contained in the

other heuristics described above is more qualitative in nature. That is, most of the operations for a heuristic such as EBA involve simple comparisons of values. Hegarty, Just, and Morrison (1988) have recently explored strategy differences in making inferences about mechanical systems that involve a similar distinction between qualitative and quantitative reasoning.

Formation of Evaluations. Finally, the heuristics differ in terms of whether or not an evaluation for each alternative is formed. In the equal weight or weighted additive rules, for example, each alternative is given a score that represents its overall evaluation. On the other hand, rules such as lexicographic or EBA eliminate some alternatives and select others without directly forming an overall evaluation.

The various heuristics described previously represent different combinations of these general properties. Table 2.1 characterizes each heuristic in terms of five of these properties. Amount of information processed is not included in the table because it is variable for many of the strategies.

Implementation of Heuristics

By now the reader might ask if any of these rules describes how consumers make decisions. While we can categorize specific heuristics using distinctions like those previously described, an obvious question is exactly how these heuristics might be implemented. Do people actually use any one heuristic to make a given decision? As noted earlier, an important distinction can be made between two ways in which choice processes might be implemented. On one hand, consumers may have a set of strategies or rules stored in memory and then invoke these rules in their entirety when needed. This might be called a *stored rule* method for implementing choice. A second conception, a *constructive method,* states that rules of thumb are developed at the time of choice using fragments or elements of rules stored in memory (Bettman 1979; Bettman and Park 1980 a,b). These fragments or elements may be beliefs about alternatives; evaluations; simple rules of thumb involving subsets of beliefs (e.g., "Compare these products on Attribute A to see if they differ very much"); rules for integrating beliefs (e.g., "Count how many attributes Alternative X is best on" or "Average those ratings"); rules for assigning weights (e.g., "If performance is comparable across brands, weight price heavily"); or, perhaps, even computational rules. Presumably the elements used will be a function of what is available in the particular choice situation and how easy various pieces of information are to process (e.g., a "Compare prices" element may not be used if unit prices are not given and different brands have different-size packages). The basic idea behind the distinction between the stored rule methods and constructive methods for implementing heuristics is that in some cases completed heuristics or rules do not exist in memory, but must be built up from subparts. Biehal and Charkravarti (1986) argue that simple processing operations

TABLE 2.1 Properties of Choice Heuristics

Heuristics	*Compensatory (C) versus Noncompensatory (N)*	*Consistent (C) versus Selective (S)*	*Attribute-based (AT) versus Alternative-based (AL)*	*Quantitative (QN) versus Qualitative (QL)*	*Evaluation Formed? (Yes or No)*
WADD	C	C	AL	QN	Y
EQW	C	C	AL	QN	Y
EBA	N	S	AT	QL	N
SAT	N	S	AL	QL	N
LEX	N	S	AT	QL	N
MCD	C	C	AT	QN	Y
FRQ	C	C	AL	QN	Y

Note: WADD = weighted additive; EQW = equal weight; EBA = elimination-by-aspects; SAT = satisficing; LEX = lexicographic; MCD = majority of confirming dimensions; FRQ = frequency of good and bad features.