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Consideration-set heuristics[☆]

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ABSTRACT

Consumers often choose products by first forming a consideration set and then choosing from among considered products. When there are many products to screen (or many features to evaluate), it is rational for consumers to use consider-then-choose decision processes and to do so with heuristic decision rules. Managerial decisions (product development, marketing communications, etc.) depend upon the ability to identify and react to consumers' heuristic consideration-set rules. We provide managerial examples and review the state-of-the-art in the theory and measurement of consumers' heuristic consideration-set rules. Advances in greedoid methods, Bayesian inference, machine-learning, incentive alignment, measurement formats, and unstructured direct elicitation make it feasible and cost-effective to understand, quantify, and simulate "what-if" scenarios for a variety of heuristics. These methods now apply to a broad set of managerial problems including applications in complex product categories with large numbers of product features and feature-levels.

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1. Introduction

Consumers often face a myriad of alternative products, whether it is deodorants (more than 30 brands on the market) or automobiles (more than 350+ model–make combinations). Evidence suggests that consumers, who are faced with many products from which to choose, simplify their decisions with a consider-then-choose decision process in which they first identify a set of products, the consideration set, for further evaluation and then choose from the consideration set. There is also compelling evidence that consumers use heuristic decision rules to select the products for their consideration sets. Both the consider-then-choose decision process and the heuristic decision rules enable consumers to screen many products more rapidly with reduced cognitive and search costs and are thus both fast and frugal heuristics as discussed in Gigerenzer and Goldstein (1996), Gigerenzer and Selton (2001), Goldstein and Gigerenzer (1999, 2002), and elsewhere in this issue. In this paper we review recent developments in the measurement of heuristics for consideration-set decisions and the managerial implications of such heuristics.

We begin with examples where consideration sets are key to business strategy. We then turn to the science and review arguments that it is typical, and rational, for consumers to simplify multi-product decisions with a consider-then-choose decision process and it is typical, and rational, for consumers to use decision heuristics to form consideration sets. With this motivation, we review the heuristics that have been identified and show that most can be represented by disjunctions of conjunctions. The heart of the paper reviews recent advances in the identification and measurement of decision heuristics and includes illustrations of how the knowledge of such heuristics affects managerial strategies.

2. Managerial relevance

In 2009 two American automakers declared bankruptcy. These two automakers were once part of the "Big 3" and enjoyed a dominant position in the American market. However, through the 1980s and the 1990s consumers turned to a variety of Japanese and European manufacturers who provided vehicles that consumers perceived as more reliable, better engineered, or that met their needs more effectively. A US automotive manufacturer (disguised here as USAM) was faced with a situation around 2004–2005 where roughly half of US consumers (and 64% in California) would not even consider a USAM vehicle (Hauser, Toubia, Evgeniou, Dzyabura, & Befurt, 2010).

In response, USAM invested heavily in quality, reliability, styling, and interior design to produce vehicles that would be rated well. By 2007 a USAM car was tied with Lexus as the most dependable vehicle (J. D. Power) and by 2008 a USAM car was the top-rated US vehicle in *Consumer Reports*. But these achievements were not enough to entice consumers to consider USAM vehicles in sufficient numbers.

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Part of the problem (though not the only cause of the bankruptcy) was that consumers never experienced the improved products because they never considered them. USAM had evidence that if consumers could be persuaded to test drive a USAM car, then they would again trust USAM, consider USAM, and purchase USAM vehicles. For example, in one experiment USAM brought consumers to a test track where they could test drive up to 100 vehicles from Acura, BMW, Buick, Cadillac, Chevrolet, Chrysler, Dodge, Ford, Honda, Lexus, Lincoln, Mercedes, Pontiac, Saab, Saturn, Toyota, Volkswagen, and Volvo without sales pressure. In another experiment USAM provided competitive brochures on its website in the hopes that such a one-stop, unbiased source would encourage consumers to consider USAM vehicles. Indeed, in an elaborate multi-year experiment, trust, consideration, and purchase of USAM vehicles increased when this competitive information broke down barriers to USAM consideration (Liberali, Urban, & Hauser, 2013). These multi-million dollar programs were successful because they changed the heuristics that consumers used to select vehicles to consider. Without mechanisms to lower consideration costs or raise expected benefits, consumers eliminated USAM brands without detailed evaluation.

Another example is Suruga Bank. Suruga is a commercial bank in the greater Tokyo area that has a significant online presence through virtual banking. However, Suruga was a relatively small player in the Japanese card-loan market. A card loan is a loan of ¥3–5 million in which the consumer is given a bank card and a PIN and pays interest only on the amount withdrawn. In 2008 Japanese consumers had approximately ¥25 trillion available in card-loan balances. While card-loan products vary on interest rates, credit limits, credit screening, and customer service, consumers are more likely to choose a product from well-known banks — likely an example of the fast-and-frugal recognition heuristic for consideration (Gigerenzer & Goldstein, 1996; Goldstein & Gigerenzer, 1999, 2002). (For empirical tests of the recognition heuristics see Bröder and Eichler (2006), Coates, Butler, and Berry (2004, 2006), Frosch, Beaman, and McCloy (2007), and Marewski, Gaissmaier, Schooler, Goldstein, and Gigerenzer (2010).) In response, Suruga developed a customer-advocacy website that morphed to match customers' cognitive and cultural styles while providing unbiased information on competitive banks. In a field experiment, the website led to substantial increases in trust and consideration of Suruga Bank (Hauser, Urban, & Liberali, 2014).

The GM and Suruga strategies were evaluated with careful field experiments (a rarity in business practice), but there are many anecdotes to the importance of consideration sets. In the US, consideration-set sizes for most consumer package good categories are approximately 1/10th of the number of brands that are available to consumers in the product category. For example, Hauser and Wernerfelt (1990) report the following average consideration set sizes: deodorants (3 brands), shampoos (4 brands), air fresheners (2.2 brands), laundry detergents (4 brands), and coffees (4 brands). (The usual explanation is the benefit vs. cost tradeoff discussed in Section 3, but cognitive limitations might also influence costs. See Lynch and Srull (1982), Nedungadi (1990), Paulssen and Bagozzi (2005), Punj and Brookes (2001), and Simon (1967).) It is not surprising that typical advertising and communication budgets can be in the tens (or even hundreds) of million dollars for a new consumer package good. Advertising drives consideration. (See, for example, Coates et al. (2004, 2006).) If a brand is in the consideration set, all else equal, the firm has the odds of a sale from, say, 1-in-40 to 1-in-4. For example, in deodorants Hauser (1978) showed that 80% of the uncertainty in predicting consumer choice is resolved by simply knowing each consumer's consideration set. This fact is used by pretest market forecasting methods which rely upon consideration-set measurement to increase their forecasting accuracy (Ozer, 1999; Urban & Hauser, 1993).

Advertising gains recognition and to the extent that consumers use a recognition heuristic to form their consideration sets (e.g., Marewski, Gaissmaier, & Gigerenzer, 2010), the recognition heuristic is key to managerial strategy. Other decision heuristics matter as well. The recent introduction of many "natural" or "organic" products represents a reaction to decision heuristics in which consumers eliminate brands that do not have these aspects. (Following Tversky (1972), we use "aspect" to mean a level of a product feature.)

We return to managerial issues in Section 7, but first review theories that suggest that both consideration sets and decision heuristics are rational for consumers.

3. Consideration sets are rational

In seminal observational research Payne (1976) identified that consumers use consider-then-choose decision processes. This phenomenon is firmly rooted in both the experimental and prescriptive marketing literature (e.g., Bronnenberg & Vanhonacker, 1996; Brown & Wildt, 1992; DeSarbo, Lehmann, Carpenter, & Sinha, 1996; Hauser & Wernerfelt, 1990; Jedidi, Kohli, & DeSarbo, 1996; Mehta, Rajiv, & Srinivasan, 2003; Montgomery & Svenson, 1976; Paulssen & Bagozzi, 2005; Roberts & Lattin, 1991; Shocker, Ben-Akiva, Boccara, & Nedungadi, 1991; Wu & Rangaswamy, 2003). While there are many potential explanations for the consideration-set phenomenon, the most-common explanation is based on arguments that it is rational for consumers to form consideration sets. Like many decision heuristics, consideration sets are consistent with a benefit-vs.-cost tradeoff.

Suppose that the utility that a consumer derives from choosing product j is $\tilde{u}_j$. Prior to detailed evaluation this utility is a random variable. If the evaluation was perfect and the consumer considered n products, the consumer would choose the maximum utility from the set of n products. Thus, prior to evaluation, the expected utility is the expected value of the maximum of the n random variables, $E[\max\{\tilde{u}_1, \tilde{u}_2, \ldots, \tilde{u}_n\}]$. We expect this maximum value to be a concave function of n as shown in Fig. 1. For example, if each $\tilde{u}_j$ is an independently normally distributed random variable with mean, μ, and variance, σ^2, then this expected maximum value is given by $\mu + \sigma e_n$ where e_n is a concave tabled function for $n \geq 1$ (Gumbel, 1958, 131; Stigler, 1961, 215). Even if the consumer cannot choose the best of the set with certainty, the expected maximum value is just $\mu + \rho R \sigma e_n$ where ρ and R are the validity and reliability of the consumer's ability to choose the maximum utility from a set (Gross, 1972). These formulae describe situations when the consumer chooses the n products randomly from the set of available products. If the consideration-set decision heuristic is even moderately effective the consumer will select such that better products are more

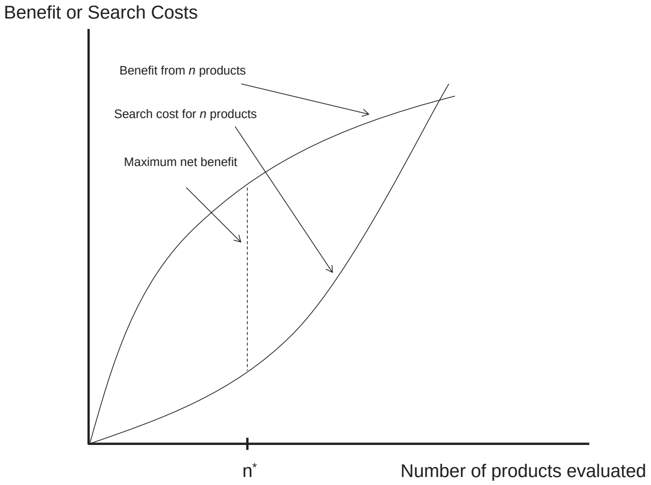

Fig. 1. Consideration sets are rational.

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