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Brief article

Pricing decisions from experience: The roles of information-acquisition and response modes

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ABSTRACT

While pricing decisions that are based on experience are quite common, e.g., setting a selling price for a used car, this type of decision has been surprisingly overlooked in psychology and decision research. Previous studies have focused on either choice decisions from experience, or pricing decisions from description. Those studies revealed that pricing involves cognitive mechanisms other than choice, while experience-based decisions involve mechanisms that differ from description-based ones. Thus, the mutual effect of pricing and experience on decision-making remains unclear. To test this effect, we experimentally compared real-money pricing decisions from experience with those from description, and with choices from experience. The results show that the mode of acquiring information affects pricing: the tendency to underprice high-probability prospects and overprice low-probability ones is diminished when pricing is based on experience rather than description. The findings further reveal attenuation of the tendency to underweight rare events, which underlies choices from experience, in pricing decisions from experience. The difference occurs because the response mode affects the search effort and decision strategy in decisions from experience.

1. Introduction

The expression of preferences by means of decision-making is often perceived as the essence of purposeful behavior. Yet behavioral decision research consistently shows that decisions are heavily influenced by the context in which they are made. A classic example is the "preference reversal" phenomenon (Lichtenstein & Slovic, 1971): when people face a choice between prospect A that offers low value with high probability, and prospect B that offers high value with low probability, they choose A. However, when they are asked to assign a price to each prospect, they assign a higher price to B. The finding that decisions might be altered by seemingly irrelevant factors, such as the decision-maker's response mode (choice or pricing), suggests the value of studying the situational factors and cognitive processes that may underlie decisions across contexts and explain such discrepancies.

The preference reversal phenomenon, like all subsequent studies of pricing decisions, has been studied exclusively in the context of "decisions from description" (Hertwig & Erev, 2009), i.e., situations in which decision-makers receive a full description of all possible outcomes and their probabilities. The current paper explores a new decision context, that to our knowledge has never been studied systematically, which we refer to as "*pricing decisions from experience*". These are situations in which people need to value (i.e., assign a price to) a prospect whose properties are unknown a priori, but can be learned through experience. Examples may include setting a

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selling price for a used car, or asking residents to state their value for conserving a local park.

The current body of knowledge in behavioral decision research seems insufficient to inform on how people make pricing decisions from experience. An attempt to rely on the conclusions of studies on pricing, which have focused on description-based tasks, is problematic given demonstrations of robust differences between decisions from description and those from experience (Hertwig, Barron, Weber, & Erev, 2004). Similarly, relying on the conclusions from studies on decisions from experience, which have focused on choice tasks, is problematic given previous demonstrations of robust differences between choice and pricing decisions in other domains (Tversky, Slovic, & Kahneman, 1990).

The current paper studies pricing decisions from experience directly by conducting an experiment that systematically compares this context with each of the well-known paradigms outlined above (pricing from description, and choice from experience). The comparison between pricing from description and from experience enables us to assess whether pricing decisions are affected by the mode of information acquisition (described or experienced). The second comparison, between pricing and choice decisions from experience, enables us to evaluate whether and how the response mode (choice or pricing) affects the way in which decision-makers experience their environment.

2. Information acquisition and the description–experience gap

It seems that the focus on description-based tasks is not unique to pricing studies. As Lejarraga, Hertwig, and Gonzalez (2012) noted: "Decision researchers, using choice between monetary gambles as a canonical model for risky choice, have grown accustomed to presenting their respondents with a complete description of the problem, spelling out all outcomes and their probabilities" (Lejarraga et al., 2012, p. 335). Yet in real life, people rarely receive descriptions of probability distribution over outcomes. Instead they can learn about them by trying them out, making "decisions from experience". It turns out that people respond quite differently to the same quantitative information, depending on whether it is described or experienced (Hertwig et al., 2004). This "description–experience" gap is most prominent when people face outcomes with low probability: they overweight low probabilities when they make decisions from description but underweight them when they make decisions from experience (Erev et al., 2010; Hertwig & Erev, 2009). These tendencies imply that when people receive a description of a low-probability prospect, e.g. one that pays 41 with a probability of 0.05 and 1 otherwise, they tend to overweight the probability of getting the desirable outcome (41), and this prospect therefore appears better than its expected value (EV). If this prospect is not described, but people experience it by drawing random samples from its payoff distribution, they tend to underweight the probability of receiving the desirable outcome (41) and the prospect appears inferior to its EV. Notice that the description–experience gap also applies to cases in which people face high-probability prospects, since the probability of the complementary event is low. To illustrate, consider a prospect that pays 21 with a probability of 0.95 and 0 otherwise. The complementary event of not receiving the desirable outcome occurs with a low probability (0.05). Overweighting this low probability implies that the prospect looks worse than its EV while underweighting the low probability implies the exact opposite.

Studies of the description–experience gap demonstrate the role of information-acquisition mode in decision-making, but its boundaries remain unclear. Recent studies have explored whether the gap reflects different cognitive processes in each information mode (Erev et al., 2010). They found that while decisions from description involve weighting and summing of outcomes and probabilities, decisions from experience are best predicted by models of reliance on small samples of past experiences. These models assume that the decision-maker recalls the realization of N outcomes of his/her past experiences with each alternative. When the sample N is small, this cognitive process implies underweighting because low-probability events are underrepresented in small samples. Therefore, if people rely on small samples in pricing decisions as they do in their choices, then we expect consistent differences between prices from experience and description. This is an open question, however, given that studies of decisions from experience have focused almost exclusively on choice tasks (Fantino & Navarro, 2012).[1]

3. Response mode and the choice–pricing gap

While studies of decisions under risk tend to focus on choice tasks, individuals can express their valuations of prospects in other ways, e.g., a common way of valuing an option in economics is assigning a price to it. The normative perspective assumes procedural invariance, according to which the exact response mode should not affect preferences. That is, a rational individual who chooses prospect A over B should assign a higher price to prospect A. However, as noted in the introduction, experimental studies consistently show preference reversal: people choose high-probability-low-payoff prospects over low-probability-high-payoff ones, but assign higher prices to the latter prospects (Lichtenstein & Slovic, 1971; Slovic, 1995).

A common explanation for the discrepancy between pricing and choice is the "compatibility principle", which entails that pricing tasks facilitates focusing on the payoff outcomes, as these are more compatible with thinking of values/prices (Tversky et al., 1990). Notice that higher focus on outcomes than probabilities implies the same behavioral pattern as overweighting low probabilities: both imply overvaluing low-probability-high-payoff prospects and undervaluing high-probability-low-payoff

[1] We know of only one study (Pachur & Scheibehenne, 2012) that elicited prices from experience. That study was designed to explore the role of information search on the endowment effect, a question that differs from that posed in the current study.