Marketers Mispredict Price Elasticity

Christopher Hsee, University of Chicago, USA
Luxi Shen, Fundan University, China

Price elasticity refers to consumers’ sensitivity to price variation. We identify a systematic discrepancy between marketers’ estimate of consumers’ price elasticity and consumers’ actual price elasticity. When setting prices, marketers consider many alternatives. When deciding whether to purchase a product, consumers consider only one price. A series of experiments show that this marketer-consumer mismatch leads marketers to over-estimate consumers’ price sensitivity, under-price their products and consequently profit less than they otherwise could. We also identify an important moderator for these effects: they occur only for unfamiliar products (e.g., a newly introduced drink) and not for familiar products (e.g., Coke).

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There is a (deeply hypothetical) world in which the link between price and value is simple and intuitive. In this world, marketers set prices that reflect some combination of the amount of money they need and the amount the customer is willing to pay. Customers look at a product on the shelf, decide how much they want it (in currency), and if the price is below that level, they decide to buy. Consumer research has suggested that this simple and intuitive world is a mediocre proxy for its complex and confusing reality. This symposium presents four papers investigating the relationship between value and price in an effort to further the understanding of how these factors play into the perceptions of consumers.

In a hypothetical pricing world, people first evaluate a product and then ponder that value in relation to its price. In reality, the price can influence evaluation. Numerous studies have found that increased prices increase evaluations. The first paper (Gneezy, Carmon, and Nelson) shows that even this peculiar finding is more complicated than it seems. When prices are raised to particularly high levels, they find, perceptions of quality are reduced. A cookie that was tasty at one price is spontaneously a lot less palatable at a higher price.

Intuitively, fees should reduce consumption. The second paper (Lee and Norton) challenges this assumption, by showing that fees can increase consumption. The authors consider the influence of membership fees and find a surprising result: fees increase subsequent spending. People assume that fee-requiring stores must offer low prices and so go on to buy with the belief that they are finding great deals. Paying for the privilege to shop may seem like a deterrent to customers, but the company that charges such a fee may benefit not only from revenue from membership, but also from increased sales.

If nothing else, marketers should have some mastery of consumer price sensitivity. The third paper (Hsee and Shen) suggests that this is not true either. Marketers, because they are jointly evaluating multiple price possibilities, generate fundamentally different prices than their separately evaluating customers. Joint evaluation necessarily leads to extreme price sensitivity, whereas separate evaluation (in the absence of more knowledge of price distributions) should lead to general price insensitivity. For new and unfamiliar products, marketers tend to set prices too low.

Perhaps the most well know pricing peculiarity is the endowment effect, in which randomly assigned ownership produces systematically higher selling prices. Classically, this has been interpreted as consistent with loss aversion and prospect theory. The fourth paper (Weaver and Frederick) offers a new account. Consumers compare trades to market prices (which typically exceed consumer value), and increase their reservation prices to a point where they think they would be getting a good deal.

These four papers take very different approach to a related problem, so we are lucky to have an expert on the dynamics of pricing and value as our discussant. Dan Ariely is an expert in experimental psychology and consumer research, and has authored numerous articles on related topics, and recently published a best-selling book about some related research. 

**SYMPOSIUM SUMMARY**

**Consumer Perceptions of Value and Price**

Leif D. Nelson, University of California, San Diego, USA

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**SESSION OVERVIEW**

“Getting Less Than You Pay For: Very High Prices Lead to Inferences of Very Low Quality”

Ayelet Gneezy, University of California, San Diego, USA

Ziv Carmon, INSEAD, Singapore

Leif D. Nelson, University of California, San Diego, USA

Consumers often lack the time, training, or inclination to judge the actual quality of a product or service. Accordingly, to infer quality they seek simpler alternative signals (cf. Aaker 1991) like the product’s country of origin, how heavily it was promoted, or its price (Huber and McCann 1982; Rao and Monroe 1989). As a result, considerable evidence demonstrates that higher priced products are judged to be higher quality (see e.g., Gerstner 1985; Riesz 1979). One step further, price and brand name, for example, can influence actual consumption experience (e.g., Allison and Uhl 1964; Levin and Gaeth 1988). Finally, prices have been shown to produce placebo effects, as products identified as price-reduced are less effective than products identified as full price (e.g., Shiv, Carmon, and Ariely 2005; Weber, Shiv, Carmon, and Ariely 2008).

Do higher prices always lead to inferences of higher quality? In this paper, we illustrate that truly high prices actually reduce perceived quality. In a pilot study, three groups of participants were given an unfamiliar cookie to taste and rate. To create a slightly negative experience for participants we served cookies that we had strategically allowed to become stale in the week prior to the experience. Participants were informed that the cookies were now being sold on the market, and were told one of three possible prices (low, medium high). Replicating past research, the moderately priced cookie was judged to be tastier than the lower priced cookie. But most notably, participants tasting the high-priced cookie judged it to be lower quality than participants in either of the other conditions.

In our next study (Study 1) we wanted to see if variation in actual product quality moderated this effect. We employed the same three price levels as in the pilot, but this time we presented only approximately half of the participants with a stale cookie whereas the remainder received a cookie taken from a freshly open package. Replicating the pilot results, when participants tasted a stale cookie a moderate priced cookie was judged more favorably than a low priced cookie, but the high priced cookie was judged more negatively than both. For the comparatively tasty cookies, there was a linear relationship between price and inferred quality: moderate priced cookies tasted better than low priced cookies, and high priced cookies tasted better than both. When prices are vaguely in line with actual quality we found a standard price-quality link, but when prices were more obviously out of line, the price-quality link was reversed.

Perhaps consumers are merely drawing on an unusual theory of the relationship between price and quality? If so, then people should predict the above results regardless of actual consumption. A follow up study (Study 2) then distinguished between two possible causes of the effect: (1) judgments of the quality of the high priced product as lower than that of the moderately priced product, reflect lower quality expectations; (2) an alternative cause could be that these judgments reflected contrast between expectations and the consumption experience. Our results support the latter cause—
high priced cookies were assessed as being of significantly higher quality.

Finally, we sought to investigate how higher prices influence perceived quality (Study 3). Lee and his colleagues (Lee et al. 2007) have argued that information can operate on experience only if it is presented prior to consumption. With that in mind we replicated the moderate and high priced conditions from the previous study, while manipulating whether price information was presented prior to consumption or after consumption (but before reporting a quality measure). If the earlier findings are due to an explicit rescaling effect or a recasting of quality relative to expectation, then the manipulation should have no effect. If, on the other hand, high prices fundamentally change the experienced flavor of the product as we predict, then we should only replicate our effects when the price is presented before consumption. We found strong support for the latter: if people were told the price before tasting, the expensive cookie tasted much worse than the moderately priced cookie, but when told the price afterwards this effect was entirely eliminated.

Significantly, within the same experiment, participants sampled two much more familiar product categories (water and tissue paper). We predicted that product novelty would be crucial to our effects, but though much smaller in magnitude, the effects persisted for these product categories as well. Perhaps even the consumption of well known products can be enhanced or undermined by mere price perception.

“The ‘Fees → Savings’ Link, or Purchasing Fifty Pounds of Pasta”

Leonard Lee, Columbia University, USA
Michael I. Norton, Harvard University, USA

Discount membership clubs have a large and growing presence in retail—one recent survey reported that Costco sells to 1 in every 11 people in the United States and Canada, and warehouse clubs are estimated to be a $120 billion industry today in the United States alone. As a result, more and more people have had the experience of entering one of these popular clubs and leaving hours later with more goods than can fit in their car and enough pasta to outlast a nuclear winter; at minimum—as is the case with at least one of the authors—many are familiar with a family member who engages in this kind of behavior.

One rational reason for such behavior is that membership clubs offer lower prices (due to volume discounts and lower overhead), but we suggest that the presence of membership fees alone—independent of the actual savings on any given product—spurs this increased spending, due to perceptions of “good prices.” What might account for this generalized belief in the savings offered by discount clubs? We suggest that membership fees required for the consumption of a brand or service signal dominance on the dimension most salient to the particular brand or service: for country clubs, higher fees might signal greater exclusivity; for health clubs or healthcare plans, fees may signal higher service quality: for discount stores such as Costco or Sam’s Club, where the most salient dimension is cost savings, fees may signal greater price discounts. The presence of fees at membership stores thus may instantiate an implicit norm with consumers (see Grice 1975): “We wouldn’t charge you this fee if we weren’t making it worth your while,” leading consumers to infer a “fees → savings” link.

In a series of studies, we created our own membership clubs and sold goods to participants in our stores. Some participants were allowed to purchase whatever they liked; other participants, however, were informed that the store charged a fee, which they were required to pay before making a purchase. We show that 1) the presence of fees increases spending and overall store profitability (despite people’s predictions to the contrary); 2) fees serve as a signal of price, such that stores that charge fees are perceived as offering better deals.

In addition, another study showed that the mere presence of fees may drive choice of retail outlets: when we presented participants with newspaper advertisements for stores that mentioned membership fees, such stores were preferred to stores which did not mention fees—even when both stores offered similar goods at similar prices. Finally, we explore the impact of fees on memory: several field studies show that reminding people of membership fees paid in the past (for health insurance and gym memberships) lead them to remember having used those services more. In sum, fees lead retailers to make more money both on increased sales and, ironically, on collecting the fees that cause these increased sales, and also lead customers to see themselves as more frequent users of that outlet, a potentially important precursor to customer loyalty.

Our results seem to suggest that consumers behave irrationally in response to membership fees, attributing low prices to the perceived savings offered by retailers that charge fees, and then trying to capitalize on these seeming savings by buying more than they otherwise would. At the same time, however, the feeling of getting a good deal—whether erroneous or not—likely has positive (transaction) utility for these consumers (Thaler 1985), which would only be increased the more items placed in one’s shopping cart. In addition, this transaction utility gained from perceived savings is unlikely to be offset by regret upon encountering a better deal, given the difficulty of comparing prices at other retailers. Although some utility may be offset by the vocal displeasure of the shopper’s loved ones when forced to lug groceries into the house for 30 minutes, consumers may on average come out ahead despite their overgeneralized perception of the link between fees and savings.

“Marketers Mispredict Price Elasticity”

Christopher Hsee, University of Chicago, USA
Lxi Shen, Fudan University, China

Price elasticity is a key concept in economics and marketing. It reflects how consumers’ demand for a good varies as the price of the good varies, and thus reflects consumers’ sensitivity to price variation. What determines price sensitivity? Can marketers accurately predict consumers’ price sensitivity?

We propose that an important determinant of consumers’ price sensitivity toward a good or service is their familiarity with the distribution information (including reference, range, etc) of the price of the given good or service. Consumers are more price sensitive when they have more price information (e.g., the price of a can of Coke) than when they have less (e.g., the price of a newly-introduced soft drink).

Marketers know much more about price distributions than do ordinary customers, and for this reason systematically overestimate consumer price sensitivity. Specifically, marketers, when pricing a product, must jointly evaluate (JE) alternative possible prices by juxtaposing those possibilities. However, consumers, when deciding whether to purchase a product, are usually confined in the single evaluation mode (SE) in which they only see the finally offered price. Consumers know much less about price ranges than do the marketers who set the price.

This mismatch in evaluation mode should lead marketers to overestimate consumers’ price sensitivity with unfamiliar products, and as a result, should lead them to systematically underpricing their products or services.

Our research is important for at least four reasons: First, it addresses a fundamental issue in economics and marketing: price
elasticity or price sensitivity. Second, this is the first research showing that the mismatch in evaluation mode between marketers and consumers would not only lead marketers to mispredict consumers’ price sensitivity, but also lead to reduced profit. Third, we identify that product familiarity serves as a crucial moderator of this mismatch. Finally, we show that the effects we described above occur not only when marketers are ‘placed’ in the JE mode (that is, they are shown alternative prices), but also when marketers are naturally in the JE mode (that is, they are simply asked to set the price for the target good). We assume that to set a price, marketers would naturally consider alternative prices and naturally found themselves in the JE mode.

We tested our ideas in six studies involving different contexts (ranging from taxi ride, coffee beans, puzzles, etc.), different dependent variables (willingness to pay, and purchase intention), and involving both hypothetical scenarios and real purchasing behavior.

In one study, for example, some participants assumed the role of marketers and some assumed the role of consumers. The marketers either set the price of a taxi ride (familiar) or of a horse ride (unfamiliar). Consumers were resent at these prices and asked whether they would purchase the service at that price. As predicted, marketers overestimated consumers’ price sensitivity and therefore under priced the horse ride but not the taxi ride.

In another study, the target product was a set of psychological tests. As in the horse-ride/taxi study, we also asked some research participants to assume the role of marketers and to make a price decision on the tests, and asked other participants to assume the role of consumers and to make a price decision according to the tests. For half of the marketers and consumers (the familiar condition), there was a reference price for the target product for both marketers and consumers; for the other half participants (the unfamiliar condition), there was no reference price for either marketers or consumers. Unlike the horse-ride/taxi study, this study involved real consequences to both the marketers and the consumers, that is, marketers could earn profit by selling the tests and consumers had to pay to get the tests. Again, the study confirmed our predictions: In the price-unfamiliar condition but in the price-familiar condition, marketers overestimated consumers’ price sensitivity, set too low a price, and consequently made less profit than they otherwise could had if they had set a higher price.

This research has both theoretical implications for what influences price elasticity, and prescriptive implications for how to improve profitability by improving marketing prediction accuracy.

“Transaction Disutility and the Endowment Effect”
Ray Weaver, Harvard University, USA
Shane Frederick, Massachusetts Institute of Technology, USA

Buying and selling are different expressions of the value one places on a good, with money as the medium for this expression. Accordingly, the minimum amount an owner requires to relinquish an item should correspond closely to the amount a non-owner is willing to pay for it. In fact, however, this presumption is often violated: in a review of 59 studies involving market goods, Horowitz and McConnell (2002) found that minimum selling prices exceeded maximum buying prices by a factor of nearly three. This endowment effect is commonly attributed to loss aversion (Thaler, 1980): people are assumed to compare potential trades to the status quo, and to feel losses from their current holdings more keenly than gains. According to this model, selling prices exceed buying prices because owners charge a premium to offset the psychological pain they expect to feel when they give up possessions.

We propose an alternative explanation: the endowment effect is caused not by the anticipated pain of losing possessions, but by a reluctance to trade on terms that are perceived to be disadvantageous or unfair — an experience Thaler (1985) calls transaction disutility. Stated maximum buying or minimum selling prices are based on the value consumers expect to get from ownership, but can be influenced by concerns about making “bad” deals. Consumers judge potential deals against some reference price (r), and experience transaction disutility whenever trading at their valuation would be unfavorable with respect to that price. That is, non-owners dislike stating reservation prices that are greater than r, and owners dislike stating reservation prices that are less than r. In this way, transaction disutility tends to distort buying prices downward and selling prices upward, away from underlying values.

The degree of transaction disutility depends on the relationship between a consumer’s valuation and r, and therefore may affect buyers and sellers asymmetrically. Suppose, for example, that valuations for a coffee mug vary uniformly between zero and ten dollars. If the mug’s reference price is eight dollars, transaction disutility will have a large influence on potential sellers because for most people, selling at their valuations would be a bad deal. Conversely, it will have little effect on potential buyers, most of whom could pay their valuations without making a bad deal.

Reference prices are usually based on market prices, which typically exceed the value most consumers place on products: consumers turn down the opportunity to buy most goods in the marketplace. Supermarkets, for example, carry tens of thousands of items, but each shopper buys at most a few dozen on a given trip and repeatedly declines to purchase almost everything else in the store. Like the pain-of-losing account, our account of evaluation disparities implicates sellers rather than buyers. That is, we argue that buying prices closely mirror underlying valuations, whereas selling prices significantly exceed them. In contrast to the pain-of-losing explanation, however, we attribute this to the incidental fact that reference prices are generally high, rather than to a fundamentally different consideration on the part of sellers, namely an aversion to parting with possessions.

In four experiments, we test our model. Study 1 shows that reducing r from a high (typical) level to a more moderate level alleviates sellers’ transaction disutility, shrinking the endowment effect. Consumers were assigned to the role of either buyer, then asked the maximum they would pay for a box of “movie theater” candy; or given a box of candy and assigned to the role of seller, then asked the minimum they would demand to sell it. The ratio of selling prices to buying prices was greater among subjects who were suggested a high r (“the Harvard Square Theater sells this candy for $4.00”) than among those given a moderate r (“Target sells this candy for $1.49”).

Our model predicts that very low values of r (i.e. below most consumers’ underlying valuations) will induce transaction disutility in buyers, causing a disparity driven by a reluctance to buy, but not to sell. Study 2 confirms this prediction. Consumers were randomly assigned to the role of either buyer or seller, shown a picture of a 1925 buffalo nickel, and told, “A randomly chosen person who took this survey before you would [pay at most] [sell for as little as] $x,” where x varied from $0 to $20. Consistent with our model, we found that the magnitude of the endowment effect was a U-shaped function of r. When r was low, the gap was large because of deflated buying prices; when r was moderate, the gap was small because neither buying nor selling prices were severely distorted; and when r was high, the gap was again large, this time because of inflated selling prices.

In Study 3, we show that internally-generated r’s function similarly as externally-provided ones. We asked consumers for maximum buying or minimum selling prices for two domestic airline tickets. We then asked them to estimate the market price of
those tickets. Among people who estimated a high market price, the endowment effect was substantial. But there was no endowment effect among people whose market price estimates were similar to their valuations.

The pain-of-losing account of the endowment effect suggests that owners who value a good most highly will anticipate the most psychological pain from its loss, and therefore that the gap between buyers and sellers will be largest among these “fans.” Our transaction disutility model, however, predicts the opposite: given a relatively high $r$, selling prices will be similarly inflated among both fans and non-fans. But buying prices, which more closely reflect underlying values, will be higher for fans. Study 4 confirms our account. We categorized people as video game fans or non-fans according to how often they play and whether they own home video game systems. For a Nintendo Wii system, the endowment effect was larger for fans than for non-fans.

Our experimental evidence supports our hypothesis that an aversion to bad deals, not an aversion to losing possessions per se, causes buying and selling prices to diverge. The results also suggest that marketing efforts designed to make favorable reference prices salient will be more effective than those that try to instill a sense of ownership in potential customers.