

"Name your price" – online auctions and reference prices

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Abstract

Purpose – This paper aims to investigate the presence of varying price points on the impact of product valuations in both English and reverse auctions on potential bidders, that is, those not yet engaged in the auction. Internet auctions, both English style and reverse, constitute one of the success stories of digital commerce.

Design/methodology/approach – As its method of research, this paper uses an experimental approach to explore the effects of multiple reference prices.

Findings – While previous research has done well to show that a lower initial price decreases barriers to entry and can lead to a higher final price in English-style auctions, this research shows that such a strategy may harm potential bidders' product perceptions due to multiple reference prices. The authors explore situations of multiple reference prices in the context of reverse auctions, where both higher and lower reference prices are shown to be able to increase product valuations.

Research limitations/implications – Additional research of a variety of products and using a representative sample would enhance the findings of this paper.

Practical implications – The findings show that reference prices have differing impacts, which are dependent upon the goal of either maximizing or minimizing the distance between the initial price and the price consumers are willing to pay in an online auction.

Originality/value – The investigation links differing goals created by the type of auction to the potential impact of the reference price. In addition, we explore the effects of multiple reference prices on consumer valuations.

Keywords Dynamic pricing, Online auctions, Reference prices

Paper type Research paper

The Internet has been a boon to commerce, not only because of its ability to bring buyers and sellers together but also because it deviates from traditional models of commerce by allowing consumers to set the price they are willing to pay (Kung *et al.*, 2002). The success of Web sites such as eBay and Priceline is rooted in their ability to connect consumers who are seeking to pay as little as they can for a product or service with sellers who are willing to sell to these consumers at the price they seek. The co-creation of price between buyers and sellers raises some interesting questions regarding how the prices set by sellers can influence the prices buyers are willing to pay (Hardesty and Suter, 2005). For example, in the eBay marketplace, a seller may set an initial low price because doing so creates a low barrier to entry for buyers; buyers will then compete with each other, ultimately driving up the price (Ariely and Simonson, 2003). However, as low prices are

associated with low-quality products, does the initial low price also drive away consumers (Kalita *et al.*, 2004)?

Furthermore, in an online marketplace, where consumers set the price, they are willing to pay, the seller often exposes consumers to multiple prices. In eBay auctions, the consumer witnesses an initial starting price, as well as the price the last bidder has placed on the product, while in a reverse-auction format (such as that operated by Priceline.com), the consumer is given the average price for a hotel room, which can differ by factors such as quality, location and date. Consequently, in a shopping experience on Priceline, the consumer can view multiple reference prices, a scenario that raises the question of how multiple reference prices might influence consumer valuations in an online marketplace.

When consumers can determine the price based on an initial starting point, it creates contrasting goals for the consumer. In an English-style auction, the goal of the consumer is to minimize the distance between the initial price and the price for which the item ultimately sells. In a reverse-style auction, the consumer seeks to maximize the distance between the

The current issue and full text archive of this journal is available at www.emeraldinsight.com/1061-0421.htm



Journal of Product & Brand Management
23/6 (2014) 420–428
© Emerald Group Publishing Limited [ISSN 1061-0421]
[DOI 10.1108/JPBM-06-2014-0626]

The authors would like to thank Kent Monroe, the anonymous reviewers and the editors for their helpful comments throughout the development of this paper. This research was made possible by a grant from The George Washington University Institute for Decision Sciences.

initial reference price and the final price. In our study, we intend to explore how the goal of minimizing versus maximizing the distance between price increments may influence consumer willingness to pay. In the process, we contribute to theory on reference prices under conditions of maximization versus minimization. Please see Figure 1 for a visual representation of our conceptual framework.

Online auctions and reference prices

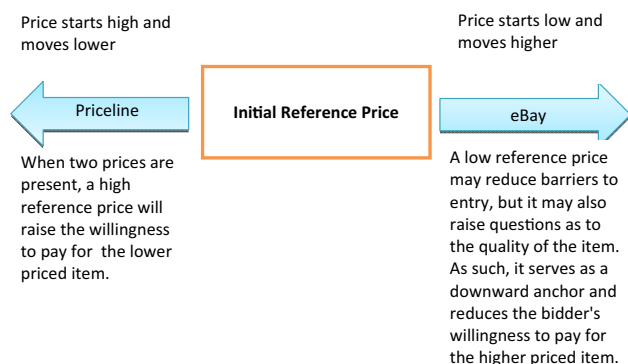
Online auctions

Using the context of online auctions, both English and reverse style, we explore the impact that multiple reference prices – what we refer to as a “price progression” – can have on consumer valuations. In an English-style auction like eBay.com, consumers bid for an item and raise its price (Li *et al.*, 2009). Sellers on eBay place the item for sale, and consumers then bid to obtain the item. When the auction closes, the final bidder wins the right to buy the product. To represent a reverse-style auction, we use the “Name Your Own Price” option on Priceline.com, where consumers are exposed to a reference price and can then choose to bid lower. In this situation, the seller can choose to accept or reject the consumer’s bid.

Reference prices in an English-style auction

In an English-style auction, the consumer’s goal is to minimize the monetary distance between the seller’s initial price and the final price paid by the consumer. To encourage multiple bidders, low prices are initially set for the product (Ariely and Simonson, 2003), and this practice can have an impact on the reference price that consumers have in mind for the item. First, a low initial price may signal issues of quality with the product, which may drive prices down. A market such as eBay is especially rife with poor quality products (Li *et al.*, 2009). Second, in line with our earlier conceptual model, we suspect that consumers will be motivated to minimize the amount they bid, and a lower price anchors consumers downward. The higher the price moves away from its initial price, the less consumers are willing to bid for the product. A change from \$0.99 to 5 reflects a 400 per cent increase in the price of the product, while a change from \$9.99 to 14 represents less than a 50 per cent change. As the price moves further away from

Figure 1 Differential impact of reference points in an online auction



the initial point, the gain from making the purchase diminishes, and consumers become less willing to purchase the item. Thus, for both reasons stated above, we suspect that a low initial price will decrease the price that bidders are willing to pay. Stated formally:

- H1.* If the price progresses from a low point to a high point, potential bidders will pay more, on average, for a product than if the high point was the initial price and there was no price progression.

In terms of online-auction research, product price represents one of the most studied cues. It has been demonstrated that creating an initial low price can facilitate traffic and lead to higher final prices (Ariely and Simonson, 2003; Ku *et al.*, 2006). We do not debate the fact that low initial prices reduce barriers to entry and encourage multiple bidders; however, this prior work focused solely on those already engaged in the bidding process. Bidders who are already engaged in the process have incurred a sunk cost in terms of time and energy invested and, therefore, walking away from the auction before completion of the process may be less desirable than continuing, despite the price increase (Häubl and Leszczyc, 2004).

Similarly, bidders who are engaged in the process of pursuing an item in a competitive environment such as an auction may be driven to bid higher, due in part to affective reasons, such as the arousal from competition and the fear of failure (Häubl and Leszczyc, 2003). Even those who enter the auction late may be motivated by their pursuit of a good deal, which encourages them to continue bidding (Hou, 2008). These motivations may serve to inflate the price of the product, but they are not likely to apply to consumers who are not yet engaged in the auction. Our study focuses on those who are not already engaged in the auction. In the case of online English-style auctions like eBay, these consumers are important because not all bidders are exposed to the auction at its start. Rather, they may be exposed to the auction after the price has already progressed through the bidding process, and their decision to engage in the auction may result from their valuation of the product.

Reference prices in a reverse auction

Continuing with our earlier conceptual arguments, the reverse auction causes consumers to maximize the distance between the initial price and the price they are willing to pay. Previously, we hypothesized that, in an English-style auction, the low price may cause consumers to reduce their willingness to pay, partially because they are trying to minimize the distance between the initial price and their bid price. With a reverse auction, the consumer maximizes that distance, and thus the effects of the reference price are likely to differ from those in English-style auctions. Prior work has done well to demonstrate that, in a reverse auction, consumers are often unwilling to continue bidding after they have bid once (Joo *et al.*, 2012). Part of the rationale for this unwillingness to continue bidding is that consumer motivation diminishes beyond the first price drop (from the initial to the bid amount). After the initial drop, the incremental drops that follow are smaller, and consumers may be less willing to expend the energy to reduce the price a little more (Joo *et al.*,

2012). Thus, a high price anchors consumers upward. Furthermore, if we incorporate the price/quality relationship, then high prices raise consumer expectations due to the perceived link between price and quality. Thus, a consumer's assessment of a product or service will increase, and their willingness to pay will also increase as a result. Using the arguments we presented above, we propose the following hypothesis:

H2. The visibility of high prices in a reverse-auction format will raise the amount consumers are willing to pay and cause potential bidders to pay more, on average, for a low-priced product or service.

If *H2* is supported, our potential implications will not be complete unless we also examine the effect of a lower reference price on a higher priced product or service in a reverse-auction setting. In other words, how will consumers value a product or service when it is priced high but was priced lower at another point in the process? If consumers are value maximizers, then it would be in their best interest to offer the lowest amount they expect will be accepted (e.g. \$50 for a \$200 hotel room). However, sellers that operate in a reverse-auction marketplace want to encourage customers to offer a higher price. A seller might provide a lower-priced option as a reference, as doing so may act as a guide to consumers as to what amount constitutes a minimum acceptable bid (Fay, 2008). Two reference prices can raise the amount that consumers are willing to pay, even if one reference price is of a lower priced option. That is, an initial high reference price can pull consumer valuations higher, but a second reference price for a lower priced option can act as a floor. For example, consumers wishing to bid on a vacant hotel room on a Saturday are given the average price of the hotel room in that hotel for a Saturday (high initial reference price), but they are also given the average price of the hotel room on a Monday (lower second reference price). The lower price will likely prevent the consumer from bidding too low for the room. Formally, we expect the following:

H3. The visibility of low prices in a reverse-auction format acts as a floor in terms of how much consumers are willing to pay and causes potential bidders to pay more, on average, for a high-priced good.

Empirical investigation

Study 1 – English-style auction

Pre-test

To explore the impact that low initial prices and the presence of multiple bidders can have on consumer willingness to pay for an item, we conducted an experimental investigation using the popular online auction house eBay.com. Our counterpoint to previous literature, which has established that low prices can lead to greater overall prices for the product, rests on the premise that low prices may harm perceptions of the product if the quality is suspect. One example of suspect product quality can be seen in the case of counterfeit goods. As revealed during testimony from the trial of *L'Oreal v. eBay International (L'Oreal S.A. v. eBay International AG, High Court of Justice Chancery Division)*, the eBay.com marketplace

contains an abundance of sellers who are selling counterfeit versions of legitimate products and attempting to pass these items off as authentic. Even if the counterfeit products are an exact replica of their legitimate alternative, they carry with them no expectation of quality, and therefore, the quality of the replica is more suspect than that of a legitimate version of the product (Grossman and Shapiro, 1988).

Certain products on eBay have and are known to be impacted by counterfeiting (*L'Oreal SA et al. v. eBay International AG and Others*, [2011]). Using a sample of 42 undergraduate students from a large mid-Atlantic university, we investigated the perception of likelihood of counterfeiting toward several different product categories (universal remote controls, computers, pharmaceuticals, cosmetics, DVDs, watches and running shoes). Using a seven-point scale that was anchored by “not at all likely” to “very likely”, the participants were asked to state the likelihood that each of these products would be counterfeited. The results showed that both DVDs ($MDVD = 6.2$) and watches ($Mwatch = 5.6$) were viewed as most likely to be counterfeited. We decided to choose DVDs as our product category to avoid any confounds as a result of brand perceptions and subsequent interactions between brand perceptions and product quality (Wilcox et al., 2009). When consumers choose to purchase a DVD, it is unlikely that their affinity for the content of the movie will alter their perceptions of the quality of the DVD. The same, however, cannot be said of a product such as a watch, where the consumer's affinity for the brand may alter the way they perceive the quality of the product (Commuri, 2009). Furthermore, the sale of counterfeit DVDs around the world is fairly widespread, with estimates that the practice costs the motion picture industry in excess of \$6 billion annually (Motion Picture Association of America, 2006). Therefore, it would be reasonable to expect that consumers may be skeptical as to the authenticity of a DVD when purchasing one on eBay.com.

Stimulus selection

For our study, we chose the motion picture *Angels and Demons* as the item for sale by auction. This film grossed over \$130 million in domestic box office receipts and over \$350 million worldwide (Boxofficemojo.com). We located a DVD of the movie for sale on eBay.com, noting that it had 10 bids; a graphic designer was then paid to capture the web page in its entirety. The designer modified the page slightly to remove certain signals of quality, such as user feedback and seller rating. The page was modified further by altering the prices for the DVD and/or removing bidders.

We chose at least three different price points for our investigation: \$0.99, \$9.50 and \$19. The rationale for the choice of these three points was based on an assessment of various prices for the product in the eBay.com marketplace. In an analysis of versions of the DVD for sale on eBay.com, we found that the initial price was often set at \$0.99. We then searched for the product in local bricks-and-mortar retailers and found that it retailed for approximately \$19; therefore, we used this value as the high end point. The third price point in our study was simply half of this high end point (\$9.50), a value that was consistent with the amount bidders were paying for the DVD after bidding on eBay.com.

Once the editing of the web page was complete, five nearly identical versions were created with differences in prices and in the number of bidders; the differences in the five cells are summarized in Table I. It should be noted that we included one version (Cell 5) that contained a price progression but no bidders and a “buy-it-now” option. The inclusion of the buy-it-now option was based on prior work by Budish and Takeyama (2001), which alluded to the possibility that, in an English-style auction, the simple presence of the higher price can draw the final price of the item higher.

It should be noted that two factors changed between two different cells, a point that may, at first glance, inhibit our ability to attribute a cause to any differences between the groups. In Cell 2, consumers were presented with a stimulus that displayed a price progression from \$0.99 to 9.50, and in Cell 3, consumers were presented with a stimulus that displayed a \$9.50 final price with no other bids. This scenario may raise the question of which of the factors (price progression or bidders) can account for any differences between the two cells. To ameliorate such concerns, in Cell 5, we isolated the effect of a simple price change (no bidders, a \$0.99 introductory price and a \$9.50 buy-it-now price). Thus, changes between Cell 3 and Cell 5 would be attributed to multiple bidders causing the price progression. However, to enhance external validity, we felt it necessary to provide a justifiable cause as to why the price increased, and, in this case, the cause was the product demand by multiple bidders.

We justified combining price increases with multiple bidders by drawing upon attribution theory, which contends that consumers must evaluate the cause of the price progression before they can assess the value of the product (Campbell, 1999). The online marketplace we chose is characterized by price progressions (i.e. from lower priced goods to higher priced goods) that are caused by increased demand, and thus, consumers are likely to accept the progression if it has been caused by the demand of others. We deliberately removed any information on seller ratings to remove the potential moderating effects that those ratings could have on the value assessments of the product (Li *et al.*, 2009). For those companies who wish to portray themselves in a positive light, seller ratings can be easily manipulated. In the past several years, eBay.com’s administration has uncovered a number of different schemes that manipulate the feedback given to sellers (see eBay.com Feedback Manipulation Policy). Therefore, to avoid adding a potential confound that may or may not accurately reflect product quality, we chose to remove seller feedback.

Table I Summary of cells

Version	Initial price	Last price	Number of bidders
1	\$0.99	\$0.99	0
2	\$0.99	\$9.50	10
3	\$9.50	\$9.50	0
4	\$9.50	\$19	10
5	\$0.99	\$9.50 ^a	0

Note: ^aThis figure represents the buy-it-now price, i.e. the price that consumers could pay for the item without having to engage in any bidding

Procedure

A total of 174 undergraduate business students from a large, private, mid-Atlantic university participated in our study in exchange for course credit. The students were randomly divided into one of five cells, based on the different versions of the experimental treatment. To enhance external validity, the students used their own personal computers to make online evaluations of the respective web pages at a time and location of their choosing over a seven-day period. Once they had viewed the DVD, the students were asked to fill out a short online survey regarding their willingness to pay for the product. They were first asked to state the maximum amount they would pay for the product. Next, they were asked to briefly explain how they decided on that valuation in an open-ended format.

Results

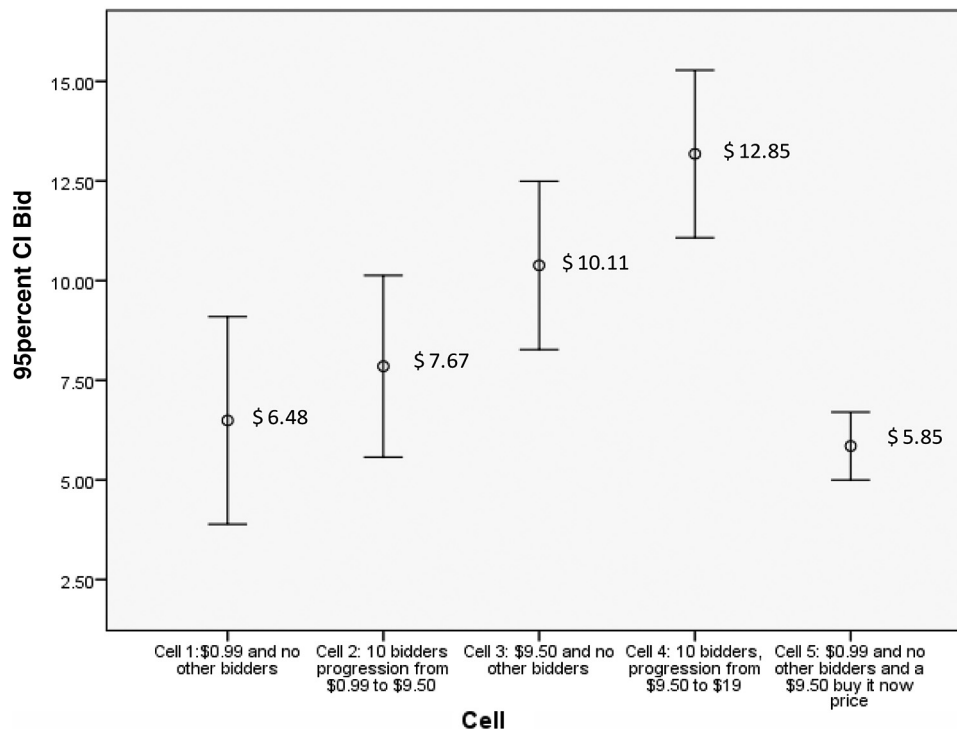
We found that participants were willing to pay the least amount for the version of the DVD that contained no other bidders and a buy-it-now price of \$9.50 ($M_{\text{BNP_}\$9.50} = \5.85). This version was followed by the version priced at \$0.99 with no other bidders ($M_{\text{\$0.99}} = \6.48). The version priced at \$9.50 with no other bids received a higher willingness to pay than did the previous two versions ($M_{\text{\$9.50}} = \10.11). The version of the DVD that was initially priced at \$9.50 but progressed to \$19 received the highest willingness to pay from participants ($M_{\text{\$19}} = \12.85).

An analysis of variance was used to determine whether differences existed between the groups, and the results support the inference that between-group differences were indeed present [$F(4,150) = 10.61, p < 0.001$]. A Scheffé *a posteriori* test was then conducted to determine which groups differed significantly from one another. In line with *H1*, differences were revealed ($p < 0.05$) between Cell 3 (\$9.50 with no bidders) and Cells 1, 2 and 5, which indicated that the progression of prices from \$0.99 to 9.50 may have caused consumers to value the product less than they would have if the price had started at \$9.50. (For a summary of these findings, please see Figure 2.)

The responses from the open-ended question, which asked participants to briefly explain their valuation, were then analyzed by one of the authors to identify key themes; this methodology was in line with similar methods of analyzing qualitative content (McCracken, 1988). Based on the initial analysis, three key themes were identified: participants frequently mentioned that quality concerns were an issue for them; they also stated that their valuation was based on their ability to obtain the DVD from another outlet; and participants in Cell 2 frequently stated that they based their valuation on the progression of bids. Based on these three themes, the content was then coded using two independent coders who were unaware of the research question posed in the paper. The coders were asked to code the participants’ responses based on whether any of the themes above were indicated to be a primary or a secondary concern for the participant. For example, one participant wrote the following:

Well, there is always a possibility that a product like this movie can be counterfeit. So, in a case where I buy online, I do not bid much higher than the current bid. Also, before I arrive at an amount like this, I compare prices in other online sites as well as actual stores, and from there I get to decide on the price of such a product.

Figure 2 Willingness to pay for a DVD



Thus, the primary concern in this narrative was coded as “quality issues”, while the secondary concern was coded as “alternative sources”. The judgment of the coders was used to determine the primary and secondary concern. Once the two research assistants had finished coding, any discrepancies between the two were resolved through discussion with one of the authors. After the coding was complete, the frequencies of each concern were aggregated across participants. In the above narrative, the issue of quality as a primary concern would receive a frequency score of one, while alternative sources as a secondary concern would receive a frequency score of one.

Unsurprisingly, participants stated the largest concerns with quality when the initial price was \$0.99. When the price started at \$9.50, the majority of participants stated that they could find the product at a better price elsewhere. Therefore, in line with our earlier argument, the low price led to questions regarding the quality of the product. It should be noted that reference points were prominently mentioned in Cell 2. We contend that this is largely because consumers in Cell 2 have an indication of how much the product could sell for and were able to determine what a winning bid would be. In Cells 1 and 3, there was only one price given, which was simply an opening price that had no other bidders. Thus, consumers did not have any indication of how much the product would actually sell for. In Cell 4, there were two points in this price progression, but the final price was much higher than the consumer would have to pay from alternative sources (86 per cent of respondents mentioned alternative sources). (For a summary of the responses please see Table II).

Interestingly, quality as a secondary concern was highest for those who evaluated a progression from \$9.50 to 19 (Cell 4). This finding is noteworthy but not unexpected, and we explain it using the expectancy violation framework, which argues that, as

expectations rise, so too does the risk associated with consumption (Rhee and Haunschild, 2006). Consumers who are considering paying the expensive price of \$19 for a DVD may feel confident that the disc will play, as well as the one selling for \$9.50, but they may question the total value at the higher cost.

As a further measure of consumers’ perceptions of the quality of an item on auction, we asked participants to state the probability that the item was counterfeit. Participants indicated that the DVD priced at \$0.99 was most likely to be counterfeit (MProbability = 60.77), and this response was statistically more common than that of the other cells [$F(3,127) = 2.67, p < 0.05$]; however, the perceived probability of all of the other cells ranged from 30 per cent for Cell 3 to 36 per cent for Cell 2, which indicates that the bidders’ concerns about quality diminished once the price increased from its initial low price.

It should be noted that we also measured participant experience with eBay.com and found no significant differences between those who frequently used the online auction house and those who were unfamiliar with it.

Study 1 – discussion

The purpose of Study 1 was twofold:

- 1 to investigate the impact of an initial low price on subsequent willingness to pay on the part of those who have not yet bid; and
- 2 to explore the rationale behind the willingness to pay.

The participants also expressed their greatest concerns as to the quality of the DVD when it was at the lowest price, which supports our rationale for *H1*. In the cell showing \$0.99 and no other bidders, the low price anchored consumers downward. With no other bidders, consumers remain unsure of the true worth of the product, and they have to reconcile

Table II Reasoning behind participant's willingness to pay

Cells	Mean WTP	Percentage of respondents per Cell			
		Issues of quality were a primary concern (%)	Issues of quality were a secondary concern (%)	Alternative sources for the product were raised (%)	Mention of reference points (%)
Cell 1: \$.99, no bidders (cell size: 36)	\$6.48	33	19	36	
Cell 2: \$.99 to \$9.50, 10 bidders (cell size: 41)	\$7.67	20	10	34	37
Cell 3: \$9.50, no bidders (cell size: 36)	\$10.11	8	14	50	
Cell 4: \$9.50 to \$19, 10 bidders (cell size: 21)	\$12.85	19	28	86	

their desire for a low price with their acceptance that others may bid as well. However, the lack of other bidders may be used as a signal to infer a lack of demand, thereby giving the consumer confidence that they can obtain the product for a low price. In other words, the lack of other bidders causes consumers to adjust their bid downward.

In terms of the impact on price changes, we found that participants were willing to pay less for the DVD when it changed from \$0.99 to 9.50 than when it was initially priced at \$9.50. We contend that when consumers form their valuations, they look to the initial price to assess how much the product is worth and how much they can pay without being outbid. A product that has already received several bids may be nearing the end of its bid amount, and thus, consumers may feel they can purchase the product for the low price and outbid others (as indicated by those who have already bid). However, in Cell 3, the anchor was comparatively higher than in Cell 2, and the consumer had to offer an amount they thought would win the product when other bidders entered the auction. Thus, the combination of the high anchor and no other bidders increased the amount consumers were willing to bid. Our investigation into the reasoning behind the participants' responses revealed that many of the participants used the price progressions as reference points and, in turn, bid an amount based on the price progression. This finding provides support for *H1*, which posits that lower reference prices decrease consumer valuations.

Study 2a – reverse auction

The online travel Web site Priceline.com was used to investigate the effects of price progressions on consumer bidding behavior. Priceline.com operates a reverse-auction format, where consumers can name their own price for a hotel room in any given city, and different vendors can accept the price stated by the consumer. To help guide consumers in choosing their price, the Web site lists a reference price, which is the median price for a hotel room of a particular quality in a given area on the day that the consumer seeks (e.g. a four-star hotel in Montreal on a Thursday). A change in room price can occur when different median prices are given for different days. For example, a consumer who wishes to book a hotel room on a Saturday may view a higher median price than if they booked the room on a Wednesday. Therefore, the reference price for the same room can change over the course of the week.

We used a graphic designer to capture screen images of the Web site under the scenario where the consumer was considering purchasing a four-star hotel room in Montreal. The graphic designer captured three versions of the

Priceline.com webpage and made three minor modifications such that different prices and different days appeared on each page, while keeping the quality rating and area constant. These three modifications were used in four cells. In Cell 1, the median hotel price given for a weekday hotel room at a four-star hotel was \$140. In Cells 2 and 4, the median price included both a weekday rate of \$140 and a weekend rate of \$190. In Cell 3, the median hotel price given for a weekday hotel room at a four-star hotel was \$190. In actuality, the median price was almost \$100 higher in each instance; however, we took into consideration our study population of undergraduate students and reduced the median prices to fall within the students' accepted means.

Procedure

A total of 101 undergraduate business students from the same university participated in this study in exchange for course credit. Similar to the procedure used in Study 1, the students were randomly divided into the four cells, and they viewed the web pages from their own personal computers during a time and location of their choosing. Participants were asked to bid on the hotel room on their respective days. Further, so the issue of scarcity would not confound Study 2a, the participants were told that Priceline.com offered deals with several of the dozens of hotels in Montreal. The students were told that they would be bidding for a hotel room during their spring break, and thus, in a hypothetical travel scenario, we did not expect that consumers would have differing preferences for a room on a weekday or a weekend.

Apart from willingness to pay, we also measured the participants' experience using the travel portal with a seven-point scale anchored by "not at all" to "very familiar". As well, we measured the participants' concerns about the quality of the room they were booking using a seven-point scale anchored by "not concerned at all" to "very concerned".

Results

We conducted two separate ANOVA. The first ANOVA compared the amount that participants were willing to pay for a hotel room on a weekday (Cell 1) with the amount that participants were willing to pay for a hotel room on a weekday when they were also exposed to a weekend price (Cell 2). In support of *H2*, the findings revealed that participants who viewed the weekday *and* weekend prices bid higher for the room on a weekday compared to those who viewed only the weekday price without any other reference prices [$M_{cell_1} = 97.59$ vs. $M_{cell_2} = 111.62$, $F(1, 90) = 7.46$, $p < 0.05$]. When we compared the responses by participants who viewed only the weekend price (Cell 3) with those who viewed both the weekend and the weekday price (Cell 4), we again found

a significant difference between the two groups [$M_{cell_3} = 121.00$ vs $M_{cell_4} = 146.51$, $F(1,89) = 13.51$, $p < 0.01$]. The presence of the lower price raised the amount that consumers were willing to pay for the weekday hotel room, thus providing support for *H3*. That is, the lower price acted as a basement reference price, and consumers who were exposed to this lower price bid an amount higher than that bid by consumers who viewed only the higher price of \$190 for a weekend rental. (For a summary of these findings, please see Figure 3.)

We investigated the potential influence of confounding variables by regressing willingness to pay onto participants' familiarity with the Web site (for each cell), and we found no significant relationships. We also explored the relationship between willingness to pay and perceived quality of the hotel room for each cell; no significant relationships were revealed.

Study 2b

We encountered one issue with our use of a four-star hotel in Montreal as our treatment. The hotel had an established level of quality (i.e. a four-star rating), and because of this pre-set level, the issue of quality may not have been a large concern among the bidders. To test whether our results would hold when quality *was* an issue, we attempted to replicate our findings from Study 2a but instead used a two-star hotel in Montreal as our treatment. We set the weekday price for the hotel room at \$70, while the weekend price was set to \$110.

In a check of our quality manipulation, we asked 40 different participants to rate their level of concern with a four-star hotel in Montreal and a two-star hotel in Montreal. The level of concern was measured on a five-point Likert scale (anchored by “not at all concerned” to “extremely

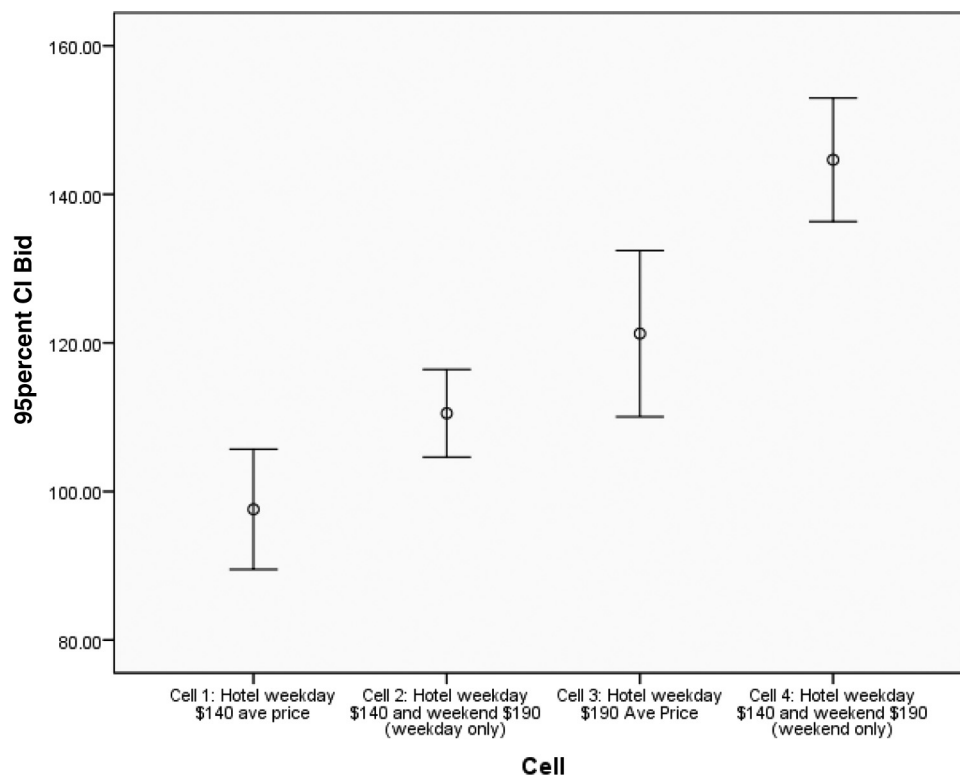
concerned”). A paired-samples *t*-test was then used to evaluate the differences between the two conditions, and we found that participants had significantly greater negative concerns with the two-star hotel in Montreal than with the four-star hotel in Montreal [$M_{two_star} = 3.775$ vs $M_{four_star} = 1.1417$, $F(1, 39) = 10.81$, $p < 0.001$].

A total of 77 students took part in Study 2b for course credit. The participants were divided into two groups. One group viewed both a weekday price (\$70) and a weekend price (\$110) for the hotel room and each individual participant was then asked to place a bid on the room's weekday price. The second group viewed only the weekday price and each individual participant was asked to place a bid, given only that one piece of information. We then analyzed the results using ANOVA and found that participants were willing to bid significantly more for the hotel room when they viewed both the weekday *and* weekend price versus the condition where they viewed only the weekday price [$M_{weekday_weekend} = \$60.52$ vs $M_{weekday} = \$51.89$, $F(1,76) = 6.22$, $p < 0.05$]. Thus, our findings from Study 2b support those from Study 2a. In both studies, the presence of a higher price alongside the lower price raised the amount that participants were willing to pay for the lower priced service.

Study 2 - discussion

It is interesting to note that, in the reverse-auction format, the price change from a low price to a higher price increased the amount that participants were willing to pay for the room on a weekday (lower priced). Earlier, in Study 1, we found that with a price change, participants focused on the low price and

Figure 3 Willingness to pay for a four-star hotel in Montreal



anchored their responses accordingly; however, Study 2 offered a contrast.

Implications, summary and conclusion

Our findings supported the view that a progression of reference prices will produce differing effects based on the type of auction format. In an English-style auction, where quality concerns may be an issue, the auction started low but the presence of a low price pulled down the valuation. Consumers were willing to pay less when they knew that the price was originally lower. Thus, the lower price may attract more buyers, but it may also reduce the valuation toward the product, which could cause consumers not to bid if the price rises too much. In the reverse-auction format, however, the low price did not pull down the price. Rather, consumers focused on the higher price, which pulled up their valuations.

From a theoretical standpoint, our work links the differing goals (minimization vs maximization) and different reference price effects. In a minimization mode, consumers focus on the lowest price, while in a maximization mode, the consumer focuses on the highest price. The impact of reference prices on consumer valuations can differ according to the goal the consumer has when determining their valuation based on the reference price.

For firms, this work adds to prior research that informs on how to price an item, given changing valuations. Although our study used online auctions as the context, both online and traditional brick-and-mortar retailers are increasingly integrating dynamic pricing models to capture demand elasticity and price accordingly (Grewal *et al.*, 2011). Managers use complex software to spot patterns and estimate elasticities in transaction data (Grewal *et al.*, 2011; 2010), and these patterns can then be used for pricing and promotional efforts. Consumers may devalue a product that was recently on sale for 50 per cent but is now being sold at its regular price because they know the seller was willing to part with the item for a 50 per cent discount. Conversely, consumers who are unsure of which goods provide the best value may use the most expensively priced item as the reference price and then choose an item that is slightly cheaper (i.e. the high price increases the consumer's valuation of other items).

We acknowledge that the generalizability of our study is limited due to our context. Our study was conducted in an experimental setting using only two online marketplaces. However, we believe that as more sellers employ dynamic pricing models, the relationships demonstrated in our work will become more prevalent. For future studies, we would welcome and invite researchers to build on the premise that reference prices can have differing impacts when consumers minimize or maximize the distance between the reference price and the amount they are willing to pay. We believe that this area of study is especially pertinent in today's marketplace because of its connection to dynamic pricing. Dynamic pricing models allow customers to dictate their ideal valuation for the product (Grewal *et al.*, 2010) and, in the process, such models give sellers a competitive edge by prying away once-loyal customers (Grewal *et al.*, 2011; 2010).

Conclusion

The dynamic nature of the Internet continues to create opportunities for sellers to reach new markets for their products or services, enabling them to garner greater revenues than they would if they pursued a more traditional route. To ensure that they extract maximum value for their products or services, firms must exercise care in selecting their opening prices. It is hoped that the present research provides some insight into the effects of different price levels, thereby ensuring that sellers will achieve maximum value from the online auction marketplace.

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