

EFFECTS OF PRICE RECOMMENDATIONS IN NAME-YOUR-OWN-PRICE AUCTIONS

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ABSTRACT

This article examines how price cues can be used strategically to influence consumers' perceptions and bid judgments in Name-Your-Own-Price (NYOP) auctions. It focuses on three specific types of price cues: a low and plausible price cue, a high but implausible price cue, and a range price cue that is bounded at the upper end by the high price cue and at the lower end by the low price cue. A controlled experiment indicates that consumers perceive the range and low price cue as more useful in aiding their bidding decisions than the high price cue. The range and low price cue positively impact bidders' confidence in winning while the high price cue reduces their confidence level. Interestingly, consumers' value and bid judgments' can be influenced by the high price cue even though they view it with skepticism. The low end of a range price cue is found to have a greater impact on consumers' perceptions and bid judgments than the high end, possibly because a range price cue has the potential to make loss aversion more pronounced.

Keywords: NYOP auctions, price recommendations, bidder perceptions

1. Introduction

The internet's computational power, flexibility, and ability to bring together a large number of participants have conferred companies the opportunity to experiment with various innovative business models. One such model is the name-your-own-price (NYOP) auction popularized by PricelineTM. The NYOP model tends to be economically attractive because it has the potential to help suppliers reduce inventory while generating additional yields and it may also provide savings to consumers [Jones, Kuan, and Newton, 2006]. Despite the excitement over NYOP mechanisms, uncertainty remains surrounding their ultimate survival and long-term success [Ding, Eliashberg, Huber, and Saini, 2005; Jones et al., 2006].

In a NYOP auction, the consumer submits the price that they are willing to pay for a product or service (e.g. an air ticket, a hotel room, a rental car etc.) in the form of a bid. The auction site then conducts a search to find whether the named price matches or exceeds any unrevealed threshold prices set by participating suppliers. If it does, the bid

is accepted and the auction site retains the margin (the difference between the bid B_i and the threshold price T) as its revenue. Otherwise, the bid is rejected and further bids by that particular bidder on that product or service are not permitted for a predetermined period. Unlike most single-item auctions in which buyers compete for one unit of a product, NYOP auction sites permit simultaneous offerings of numerous units of the same or similar products. With multiple items available, NYOP auction sites can improve their revenue (π) through improving the margin ($B_i - T$), or increasing the number of successful bids (N), or a combination of the two.

In the literature, the provision of information about the “right” price has been found to positively impact buyers’ value evaluation of an item [Kalyanaram and Winer, 1995; Kamins, Držek, and Folkes, 2004; Mazumdar, Raj, and Sinha, 2005] and their intention to use the NYOP mechanism [Chernev, 2003; Jones et al., 2006]. NYOP auction sites may therefore be able to effectively use price recommendation as a powerful strategy to persuade higher bids, improve their margins, and/or attract more buyers to increase sales volume. However, presenting the *right* price recommendation is not simple because information perceived as relevant, useful, or effective by NYOP auction sites could be of little effect and be perceived completely differently by the bidders. Currently, knowledge of how price information influences online bidders is limited [Ariely and Simonson, 2003; Dellaert, Golounov, and Prabhu, 2005; Hardesty and Suter, 2005; Miyazaki, 2003], particularly in the NYOP context [Wolk and Spann, 2008]. This is surprising given the increasing popularity of NYOP mechanisms and the ability for NYOP auctioneers to use price recommendations to compete effectively. Further, the limited extant literature in this area only considers price cues presented in a single-number format and their impact on buyers’ final bids. Hence, price recommendations presented in different formats and their impact on other outcome measures are yet to be explored. These issues are important because exploring different presentation formats may help identify better recommendation tactics [Wolk and Spann, 2008]. In addition, other outcome measures other than final bids could all have an impact on NYOP auctioneer’s revenue. Therefore, a goal of this study is to examine the impact of price recommendations on various auction outcome measures.

Specifically, this study intends to consider three types of price recommendations: a low and plausible price recommendation, a high but implausible recommendation, and a range price recommendation that is bounded at the upper end by a high implausible price and at the lower end by a low plausible price. Two research questions are addressed: 1) What are the impacts of the different types of price recommendations (plausible vs. implausible and point vs. range) on NYOP consumers’ final bids, their perceived value of the item, perceived probability of the bid winning the auction, and perceived usefulness of the price information in aiding their bid construction? 2) How can NYOP auctioneers strategically use various price recommendations?

The rest of the paper is organized as follows. The following section reviews extant related literature. Thereafter, a set of hypotheses are developed and tested. Finally, we discuss the results and their implications for research and practitioners.

2. Related Work

In the dynamic environment of online auctions where the value of an item is constantly changing, determining what price to bid constitutes a complex task for many bidders [Chernev, 2003; Gregg and Walczak, 2006; Jones et al., 2006]. Hence, researchers have generally agreed that the provision of reference price information is essential for facilitating easier and/or better bid decision making in such environments [Chernev, 2003; Gregg et al., 2006]. Accordingly, this study seeks to deepen our understanding of how NYOP bidders perceive various types of price recommendations provided to them and what the impacts of such information are on their value judgments. Prior to reviewing work related to our topic, we first discuss the significance of studying price recommendations in NYOP auctions.

2.1. Why Studying the Effects of Price Recommendations in NYOP Auctions?

NYOP auctions differ from traditional auction mechanisms in non-trivial ways that warrant this research. Under traditional auction mechanisms such as English auctions, bidders bid against each other and can hence receive price cues from not only the seller but also from other bidders in the auction to aid bid construction. In contrast, participant in NYOP auctions bid for a product against an unrevealed threshold price set by the seller and receive the product at their bid price bid if the bid exceeds an undisclosed threshold price. Another unique feature of many NYOP websites, most notably Priceline, is their opaque nature. Specifically, buyers do not have complete information regarding many of the attributes of the products or services that they submit bids on [Shapiro and Zillante, 2009; Terwiesch, Savin, and Hann, 2005]. For instance, prior to their bid being accepted customers bidding on air travel do not know the detailed travel schedule and the carrier that will fulfill their demand. The absence of price cues from other bidders and the unknowns surrounding the threshold price and attributes of the products could pose great uncertainty and cognitive demand on NYOP auction bidders [Chernev, 2003; Shapiro et al., 2009; Terwiesch et al., 2005]. Research indicates that incorporating price recommendations into NYOP auction design

has the potential to facilitate bidders' decision making, reduce their cognitive effort, and prevent them from searching and subsequently purchasing from other sales channels [Chernev, 2003]. As suggested by some, many problems surrounding NYOP auction sites may not lie with the business model itself, but rather with the fact that NYOP auctions could create a complex decision-making environment for many and suboptimal bids could ultimately be submitted [Chernev, 2003; Jones et al., 2006]. Therefore, studying how to use price recommendations to facilitate bidders' decision-making and positively influence their behavior could be critical to the long-term success of the NYOP auction model.

Moreover, with numerous product units available, NYOP auction sites revenues are not only directly impacted by buyers' final bids, but also by sales volume. Therefore, in addition to the traditional research focus on the effects of price information on buyer's final bids, using NYOP auctions as the research setting opens up new research issues and opportunities worth pursuing, including how to use price recommendations to attract bidders and increase sales volume.

From a consumer and policy makers' perspective, it is also important to examine the effects of price information in NYOP auctions. The absence of price cues from other bidders implies that consumers are susceptible to manipulation. The findings from this study should permit researchers to examine the degree to which consumers are affected by different price recommendation strategies and help consumers cope with deceptive price recommendation strategies.

2.2. Pricing Mechanisms in NYOP Auctions

Research on NYOP revenue maximization under different pricing mechanisms has recently gained popularity however the literature is still limited [Kim, Natter, and Spann, 2009; Shapiro et al., 2009; Wolk et al., 2008]. Studies in this area have mainly focused on the structural design of the pricing mechanisms and its impacts on bidding behavior and profitability. For instance, Fay [2004] considers whether it is more profitable for a NYOP merchant to restrict bidders to a single bid, or to allow them to make multiple bids if a previous bid was rejected. The results suggest that merchants are better off when they design their auctions to permit repeated bidding. Similarly, Gupta and Abbas [2008] examine repeat bidding in multi-item NYOP auctions and find that the repeat-bidding design can be beneficial for both merchants and bidders. Amaldoss and Jain [2008] examine whether permitting bidders in NYOP auctions to place a joint bid for multiple items, rather than on a single item can increase profits for a merchant significantly. They find that auctions designed to allow joint bidding on multiple items can increase both NYOP retailers' profits and consumers' surplus. A few studies also focus on the informational aspect of the NYOP pricing mechanisms and investigate how bidder behavior and NYOP profitability can be positively influenced through the provision of informational cues. For instance, Shapiro and Zillante [2009] suggest that provision of product information in NYOP auctions increases both seller profit and consumer surplus. Wolk and Spann [2008] examine the effects of internal, external, and advertised reference prices on search behavior, intention to purchase, and the value of bids placed by bidders. The results indicate that reference prices can indeed influence bid values. Even an exaggerated advertised reference price can have an influence on bid values if the bidder perceives it to be believable. Furthermore, the availability of an advertised reference price can decrease searches for additional information when it is perceived as believable, but can motivate bidders to search more when it is not believable.

Wolk and Spann's [2008] work represents one of the few efforts that focuses on examining the relationship between reference price information, bidding behavior and NYOP profitability. This is surprising given that NYOP auctioneers could significantly benefit from a particular reference price strategy. Despite the scarcity of work on price cues in the NYOP setting, a few studies have examined this research issue in the context of second-price English auction. In the following section, we briefly review these studies as they could provide additional insights to our research.

2.3. The Effects of Price Cues in Online Auctions

In the general online auction literature, studies examining the effect of price cues have largely focused on second-price English auctions as the research setting and on final bids as the dependent variable. Reference price cues in these studies have been operationalized as the buy-it-now price [Dodonova and Khoroshilov, 2004], the seller-specified minimum starting price [Ariely et al., 2003; Kamins et al., 2004; Ku, Galinsky, and Murnighan, 2006], and the reserve price [Kamins et al., 2004]. In most cases, bidders' final bids have been found to assimilate towards the provided prices cues. For instance, Dodonova and Khoroshilov [2004] found that bids assimilated towards the buy-it-now price with people bidding more for an item with a higher buy-it-now price than for an identical item with a lower buy-it-now price. Ariely and Simonson [2003] found that lower starting prices led to lower final bids, particularly when comparable items were not available during the same time in which the auction was conducted. Kamins et al. [2004] found that the final bid was greater when a high price (a reserve price) was specified than when a low price (a minimum starting bid) was specified. They also found that the low price (a

minimum bid) led to a lower outcome compared to when no price information was provided, and the reserve price exerted greater impact on the final bid than the minimum bid when both were specified. Nevertheless, Ku et al. [2006] did not find this assimilating effect in their study. By contrast, they found that lower starting prices were associated with higher final prices. They suggest that the results could be explained by three social processes created in online auctions: 1) low starting prices reduced entry barriers and activated traffic, 2) lower starting prices created sunk costs by enticing bidders to invest time and energy; and 3) the traffic generated by lower starting prices functioned as a signal for the bidders to infer the value in the item.

Comparison of Wolk and Spann's work [2008] with the general online auction literature that examines the effects of price cues yields several interesting observations. In addition to extending the research setting from second-price English auction to NYOP, Wolk and Spann [2008] contribute to the literature by investigating the effect of reference prices on search and purchase intentions as well as on final bids. This is an important contribution since many products sold in auctions are readily available from multiple auction sites or electronic channels (e.g., auctions and e-tailors etc.), consumers always have the option of walking away and purchasing the product elsewhere [Chernev, 2003]. Therefore, improving consumers' auction participation likelihood should be of paramount importance when attempting to maximizing revenue. Only when consumers participate, will auction sites be able to impact consumers' final bids and improve revenue. In addition, a greater likelihood of participation implies a higher sales volume, and higher revenue. Moreover, focusing on final bids alone in the NYOP auction setting could result in an oversight of the trade-off between margin and sales volume because strategies that aim to increase final bids and margin may impair strategies that aim to increase sales volume. Additionally, Wolk and Spann's work [2008] represents one of the few efforts that deal with the issues related to believable versus exaggerated price cues. As bidders do not have price cues from other bidders under the NYOP mechanism, a comparative evaluation of the varying effects between believable versus exaggerated price cues will serve to inform the degree to which buyers are susceptible to the manipulation of implausible price cues.

Recent progress notwithstanding, important gaps in the literature remain. For instance, Wolk and Spann use advertised price as the price cue however, advertised price can carry a negative connotation of being deceptive and can exert a differing effect than a cue that is less negatively perceived. Thus, the possibility of other and maybe more positively perceived price cues must be explored.

Second, like the other studies, Wolk and Spann [2008] focus on the effects of price information presented as a single number. In "real-life" settings however, it is not uncommon for consumers to be exposed to other formats of price cues such as a numeric range price (e.g. "previous winning bids range from \$180 to \$500"). Recognizing this limitation, Wolk and Spann [2008] specifically call for research that explores price recommendations in different presentation formats. While rare, studies of this nature are important because they can help NYOP auction designers identify better recommendation tactics.

Finally, in Wolk and Spann's experiment design, subjects were instructed to bid on shoes and MP3 players. Such products are more common in NYOP auctions that allow repeat bidding and the bidders are typically provided with detailed description about the product attributes. There is less uncertainty associated with such products compared to products such as airline tickets and hotel rooms because bidders are often given incomplete information about product attributes in the latter case. Thus, one important extension to Wolk and Spann's work could be to investigate the effect of price cues in the context of products and services associated with more uncertainties.

To fill in these gaps in the literature the current study develops an analytical framework (Figure 1) that allows us to a) map the important extensions the current research adds to the literature and b) to define the outcome variables that are critically important to understanding the relationship between price recommendation and NYOP auction revenue. The following section describes the framework in detail.

3. Analytical Framework

As is highlighted by the framework (Figure 1), this research considers NYOP auctions rather than English auctions as the research setting. It addresses the gaps in the literature in the following ways. First, it not only distinguishes plausible from implausible price recommendations, but also studies recommendations presented in different formats (point vs. range). Second, instead of operationalizing the price recommendations as advertised reference price as do some prior studies (e.g. Biswas and Burton, 1994), it frames the price recommendation as a past winning bid distribution (e.g., the lowest successful bid in the past 12 months was \$180). This is because research has suggested that bidders may base their estimates of an item's value, bids and winning probability on historical winning bid data [Bichler et al., 2002] and bidders may perceive recommendations framed as historical data as less deceptive than an advertised reference price. Third, the experimental contextual setting is different. In this study the subjects submit bids on airline tickets rather than on products associated with less uncertainty such as the ones used in Wolk and Spann's study.

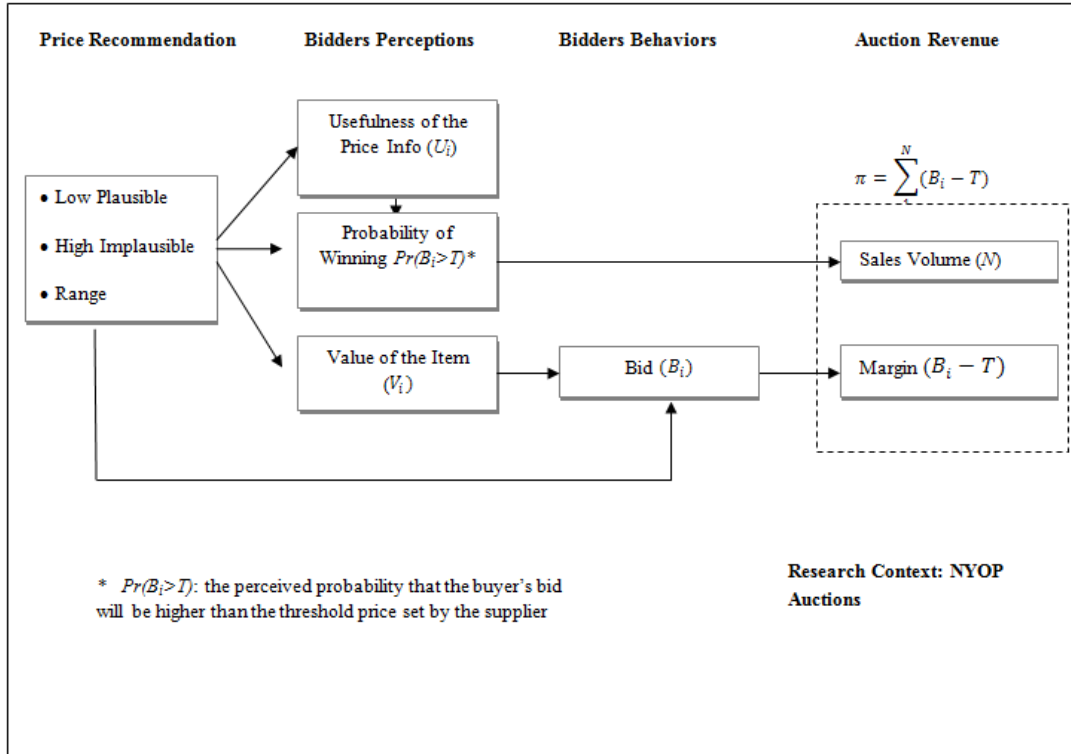


Figure 1. The Relationship among Price Recommendations, Bidder Perceptions, Bidder Behavior, and NYOP Auction Revenue

Finally, similar to Wolk and Spann' work [2008], this research extends to the extant literature by stressing the importance of investigating other outcome measures (in this case, bidder perceptions) in addition to final bids. Understanding consumers' perceptions is important. In offline settings, researchers have found that consumers' likelihood to purchase can be positively impacted by enhancing their deal perceptions and sellers can effectively promote an item by stressing the price bargain a buyer can enjoy [Grewal, Monroe, and Krishnan, 1998; Lichtenstein and Bearden, 1989]. Given the deal-oriented nature of NYOP auctions, deal perceptions or the sense of price bargains could have a significant impact on consumers' likelihood of participating in, and subsequently purchasing from an auction. One way to enhance bidders' deal perceptions in NYOP auctions is to increase the gap between the bids they are willing to place and their perceived value (V_i) of the item, therefore the greater the deal perception and the greater the likelihood they will participate in NYOP auctions.

The likelihood of bidders participating also stems from their perception of the probability that the submitted bid will win the auction ($Pr(B_i > T)$) and their perception of the usefulness of the price recommendations in aiding their bid construction (U_i). When bidders believe that the bids they are willing to place have a low probability of winning, they are more likely to choose other channels to avoid wasting time in the NYOP auction. Negative perceptions on the usefulness of the recommended price may generate distrust ("the recommended price is misleading"), or cognitive stress ("I do not know the best price to bid without any useful information"), or low confidence ("there is no way my bid will win because it is based on some useless price information"), driving buyers away from participating in NYOP auctions.

To encapsulate, the deal-oriented nature of NYOP auctions implies that their customers are quite price-sensitive and are ready to switch to other channels with very little enticement [Kauffman and Wang, 2001]. Given that NYOP auctions encompass much greater uncertainty than the posted-price and traditional auction channels, consumers will have no incentive to participate in NYOP auctions unless they believe that they have a reasonable chance of winning, the price information is useful, and they may get a deal by doing so. Therefore, consumers' final bids (B_i), their perceived value of an item (V_i), perceived usefulness of the price cues (U_i), and perceived probability of the bid winning the auction ($Pr(B_i > T)$) could all significantly impact NYOP sites' revenue. Therefore, By stressing the significance of bidder perception as well as bidder behavior in revenue generation, the framework identifies four critical outcome measures ($Pr(B_i > T)$, U_i , B_i , and V_i) that will be included in this study.

The framework (Figure 1) summarizes the above discussion and is the focus of this study. The subsequent sections relate to this framework and examine the effects of the three types of price recommendation strategies on the four identified dependent variables ($Pr(B_i > T)$, U_i , B_i , and V_i) in detail.

4. Conceptual Foundation and Hypotheses Development

Research has shown that people's judgment of uncertain quantities is influenced by what has been referred to as anchors [Chapman and Bornstein, 1996; Chapman and Johnson, 1994; Nunes and Boatwright, 2004; Tversky and Kahneman, 1974; Wong and Kwong, 2000]. In dynamic market environments such as online auctions, determining an item's value or the price to bid for the item could represent a situation where buyers face the arduous task of judging uncertain quantities [Chernev, 2003; Gregg et al., 2006; Jones et al., 2006]. Therefore, price recommendations provided by NYOP sites could function as anchors and impact buyers' perceptions and judgment. In this section, we provide a theoretical discussion of how the three types of price recommendations considered could exert differing anchoring effects on the dependent variables.

4.1. The Anchoring Paradigm

The anchoring effect describes a phenomenon in which a starting point given in a comparative judgment (i.e., the anchor) systematically affects people's subsequent evaluative estimates. More specifically, people often form numeric estimates based on an initial anchor. In their seminal work, Tversky and Kahneman [1974] asked participants to first compare whether the percentage of African countries represented in the United Nations is higher or lower than a number randomly generated from 1 to 100 (the anchor), and then to submit estimates on the actual percentage. They found that participants' estimates assimilated towards the anchor with those who were exposed to larger arbitrary numbers giving higher estimates than those who were exposed to smaller arbitrary numbers [Tversky et al., 1974]. Participants' estimates were biased towards the direction of the initial anchor even in studies where care was taken to explain that the anchor value was not a useful clue for estimating the true value as it was generated randomly [Jacowitz et al., 1995; Mussweiler and Strack, 2001].

Anchoring effects are remarkably robust and have been identified across a wide range of domains and both inside and outside experimental environments. Research suggests that final agreements in many negotiations are influenced by the opening offer [Chertkoff and Conley, 1967; Galinsky and Mussweiler, 2001]. Anchor-based promotions such as multiple-unit prices, purchase quantity limits, and suggestive purchasing quantity increase sales by influencing grocery shoppers' quantity decisions [Wansink, Kent, and Hoch, 1998]. The price of completely unrelated items is also found to influence people's valuation of the target item represented by their willingness to purchase at a certain price [Nunes et al., 2004].

The anchoring and adjustment heuristic and the knowledge accessibility account have been the two most widely cited explanations used to understand anchoring effects [Chapman and Johnson, 1999; Strack et al., 1997]. The former interprets anchoring effects as the result of insufficient adjustment from the initial anchor. When making a judgment on an uncertain quantity, people tend to start by questioning whether the anchor value is a plausible estimate and then adjust until they reach a level that they believe to be appropriate. However, because adjustment requires mental effort that people are either unwilling or unable to expend, they tend to make insufficient adjustment and their final estimates gravitate towards the initial anchor value [Tversky et al., 1974]. More recent work suggests that the anchoring and adjustment heuristic accounts for the cases when people are presented with implausible anchors. Plausible anchors, on the other hand, impact human judgment by selectively activating anchor-consistent knowledge. Such knowledge becomes disproportionately accessible when people estimate the true value of the target, yielding an absolute estimate biased in the direction of the initial anchor value [Chapman and Johnson, 1999; Strack et al., 1997].

4.2. The Anchoring Effects of Price Information in NYOP auctions

The robustness of the anchoring phenomenon suggests that anchoring effects may be related to some underlying mechanisms involved in human judgment and decision processes. It thus stands to reason that various pieces of price information available in on-line auctions could act as potential anchors and influence bidders without them noticing it. This section provides a theoretical explanation on how and why the three types of price recommendations considered in this study may function as anchors to impact the identified dependent variables.

4.2.1. Low Plausible vs. High Implausible Price Recommendations

When facing implausible anchors, people begin with the anchor and then adjust their judgment of the value toward a more plausible value [Tversky et al., 1974]. This implies that in NYOP auctions bidders bring some range of plausible values for the bids that they believe will be accepted by the auction sites. When provided with high implausible recommendations, bidders start with the recommended values and then compare these with their internal plausible range. In such situations two outcomes are possible. One possibility is that they will question the usefulness of the implausibly high recommendation in supporting their bid decision making. Another possibility is

that as a high-contrast, novel stimulus, the implausibly high recommendation is more likely to capture their attention [Johnston, Hawley, Plewe, Elliott, and DeWitt, 1990; Valerie and Matta, 2004] and may be perceived as useful. While the second possibility seems reasonable in certain contexts, in the context of NYOP it may be less reasonable. In this study, price recommendations are provided by the seller or the auction house. We expect that the bidders would challenge the usefulness of the implausibly high recommendation because of the ability for the seller or the auction house to manipulate the recommendation. This argument is supported by research that suggests that consumers generally view price information provided by marketers and sellers with skepticism [Urbany, Bearden and Weilbaker, 1988]. Research in information processing also suggests that individuals tend to seek and use information that fits their belief system [Chen and Lee, 2003]. Therefore, a high implausible recommendation that is inconsistent with bidders' believed plausible price range is expected to be perceived as inutile. On the other hand, a low price recommendation is consistent with bidders' believed plausible price range, and is hence expected to be perceived as more useful by the bidders than the high implausible price recommendation.

H₁. Bidders will perceive low and plausible price recommendations as being more useful than high and implausible price recommendations in supporting their bid decision-making.

In addition, price recommendations could also impact bidder confidence as reflected by their perceived probability of the submitted bid winning the auction. Researchers have suggested that peoples' level of confidence increases as the amount of relevant information increases [Oskamp, 1982; Zacharakis and Shepherd, 2001]. Decision makers generally believe that with more information provided, they can make better and more accurate decisions. However, this study posits that decision makers' confidence level depends not only on the amount of information, but also on the way in which information is framed. As previously discussed, the low plausible price recommendation is expected to be viewed as useful in aiding bidder decision making. Therefore, when presented with such recommendations, bidders would tend to believe that they based their bid decisions on useful information and hence demonstrate a high perceived probability of the bid winning the auction. By contrast, the high implausible price recommendation is inconsistent with bidders' believed plausible price range and is expected to produce bewilderment, doubt [Brunsson, 1982], increase uncertainty, and be perceived as less useful than the low plausible recommendation. Hence, when a high implausible price recommendation is provided, bidders may feel uncertain about their bids and view their decisions being based on less useful information, thereby demonstrating a lower confidence level than when the low and plausible recommendation or when no information is presented.

H_{2a}. Bidders in auctions that provide low plausible price recommendations will perceive a higher probability of winning the auction than bidders in auctions that do not provide price information.

H_{2b}. Bidders in auctions that provide high implausible price recommendations will perceive a lower probability of winning the auction than bidders in auctions that do not provide price information.

H_{2c}. Bidders in auctions that provide low plausible price recommendations will perceive a higher probability of winning the auction than bidders in auctions that present high implausible price information.

Given their opaque nature, bidders face various uncertainties in NYOP auctions such as ambiguity about the value and certain attributes of the auctioned product [Shapiro et al., 2009; Terwiesch et al., 2005]. When faced with high levels of uncertainty, bidders are likely to suffer from cognitive limitations and may be susceptible to the influence of various price recommendations. Therefore, it is expected that low and plausible price recommendations will act as external anchors to selectively activate anchor-consistent knowledge and make such knowledge more accessible in buyers' judgment of the value of the items being auctioned. This in turn influences buyers' final bids towards the anchor.

However, this study also contends that bidders are likely to view a high and implausible price recommendation with skepticism and question its usefulness. Therefore, another question becomes whether such high and implausible price recommendations can still function as anchors. According to the anchoring and adjustment heuristic, when people question the anchor as a plausible estimate, they will adjust their estimation until they reach a level that they believe to be appropriate. However, the adjustment tends to be insufficient and their final estimates therefore gravitate towards the initial anchor value [Tversky et al., 1974; Urbany et al., 1988]. Due to the robustness of the anchoring effect, it is expected that the anchoring and adjustment heuristic will reasonably characterize the basic bid decision process when buyers are exposed to high and implausible recommendations. In other words, bidders are expected to discount rather than completely reject implausible high price recommendations even though they may doubt the credibility and usefulness of the information, yielding a bid evaluation biased in the direction of the high and implausible anchor value. Research on implausible anchors lends further support to this contention [Mussweiler et al., 2001].

H_{3a}. Auctions that provide low and plausible price recommendations will yield lower final bids than auctions that do not provide price information.

H_{3b}. Auctions that provide high and implausible price recommendations will yield higher final bids than auctions that do not provide price information.

H_{3c}. Auctions that provide high and implausible price recommendations will yield higher final bids than do auctions that provide low and plausible price recommendations.

Unlike the final bid which is the price a consumer is willing to pay for an item in a particular auction (context specific), consumers' perceived value of the item is not context specific. This is because it reflects the value of the item in a consumer's minds regardless of where the item is on sale (NYOP auctions, non-NYOP auctions, or other e-commerce channels etc.). As the price recommendations considered are specifically for NYOP auctions, the question becomes whether context specific price information will have an impact on perceived value, a non-context specific outcome measure. In the anchoring literature, researchers have suggested that the effects of anchors are so profound that even random or unrelated numbers can anchor people's judgment [Jacowitz et al., 1995; Nunes et al., 2004]. Therefore, although the price recommendations under study are not directly targeting consumers' perceived value, this study contends that such information could still exert an anchoring effect on V_i .

H_{4a}. Bidders in auctions that provide low and plausible price recommendations will perceive lower value than bidders in auctions where no price information is provided.

H_{4b}. Bidders in auctions that provide high and implausible price recommendations will perceive higher value than bidders in auctions where no price information is provided.

H_{4c}. Bidders in auctions that provide high and implausible price recommendations will perceive higher value than bidders in auctions where low and plausible price recommendations are provided.

4.2.2. Range vs. Point Price Recommendations

Sellers may choose to present their price recommendations as a range rather than a single value, e.g., previous winning bids range from \$180 to \$500. In this case, one possibility is that a value that is an average of the two will function as an anchor to impact the dependent variables. However, based on research on loss aversion, it is arguable that the lower bound price cue will have a larger impact than the higher bound cue on consumers. The logic here is that with a high price cue being presented together with a low one, a range recommendation gives consumers the opportunity to explicitly contrast the high price cue with the low one. Consequently, this may raise their awareness that relying on a high price cue could lead to overpaying for an item compared to following the low price cue. Specifically, because a range recommendation makes comparison more salient, consumers are more likely to consider the possibility that relying on the high price cue will result in a loss as opposed to if they rely on the low price cue. Prior research has suggested that consumers react more strongly to losses than they do to gains and behave in a loss-averse manner [Kalyanaram et al., 1995; Novemsky and Kahneman, 2005]. Therefore, a range recommendation is expected to make the possibility of a loss salient, resulting in bidders being more risk averse in biddings as they attempt to avoid overpaying for the item. Such risk-averse bidding behavior could lead to the lower bound price cue exerting a greater impact on consumers than the higher bound price cue.

On the other hand, some may argue that by giving consumers the opportunity to explicitly contrast the high price cue with the low one, a range recommendation could also raise consumers' awareness that although bidding low may prevent them from overpaying for the item auctioned, a low bid could also end up being rejected by the auction site. To avoid regretting being rejected, consumers may end up being equally influenced by the higher cue. While this argument seems reasonable in certain contexts, it is less convincing in the context of NYOP auctions. The effect of regret is expected to be minimal because many products sold in NYOP auctions are available on other auction sites or electronic channels [Chernev, 2003]. Therefore, the loss-aversion effect is expected to dominate the regret effect and consumers will make greater effort to avoid overpaying than to avoid being rejected by the auction site.

Further, based on the knowledge accessibility account, the low plausible price anchor is expected to activate any anchor-consistent knowledge such as the association between online shopping and deals [Jensen, Kees, Burton, and Turnipseed, 2003; Lee, 1998]. Such knowledge confirms and reinforces the low plausible price anchor. Yet when exposed to the high implausible price anchor, bidders are expected to question the anchor, as contended by the anchoring and adjustment framework. Thus when presented with both high implausible and low plausible price cues, consumers may be naturally drawn towards the low plausible price cue due to the confirmation and reinforcement effect from the anchor-consistent knowledge.

H_{5a}. The lower bound of a range recommendation will have a more dominant impact on consumers' perceived usefulness of the information such that the range recommendation will result in an equal perceived usefulness score to the low and plausible price recommendation.

H_{5b}. The lower bound of a range recommendation will have a more dominant impact on consumers' perceived probability of winning the auction such that the range recommendation will result in an equal perceived probability score to the low and plausible price recommendation.

H_{5c}. The lower bound of a range recommendation will have a more dominant impact on perceived value such that the range recommendation will result in an equal perceived value score to the low and plausible price recommendation.

H_{5d}. The lower bound of a range recommendation will have a more dominant impact on consumers' final bids such that the range recommendation will result in an equal final bid score to the low and plausible price recommendation.

5. Experiment

A laboratory experiment was conducted to test the above hypotheses. The participants were 140 undergraduate students from different academic disciplines, including Accounting, Economics, Finance, Marketing, and Management and Information Systems at a large public university in the mid-west. Arguably, it is preferable to use non-student subjects in experimental studies to ensure the generalizability of the findings. However, studies have demonstrated that the results from experimental studies with student subjects can be comparable to those using experienced professionals [Cooper, Kagel, Lo, and Gu, 1999]. More recently, Depositarioa, Nayga, Wu, and Lauded [2009] compared the behavior of student and non-student subjects in laboratory experimental auctions and found no significant differences between the two groups.

To motivate the subjects to be fully engaged in bidding and to answer questions carefully, they were informed that they would earn course bonus points for participation and additional bonus points if their responses qualified to be included in the research. In the auction literature the use of bonus points for student subjects in experiments is quite common and has been found to be effective in motivating performance [Bichler, 2000; Williams and Walker 1993; Arend, 2005].

Prior to the experiment, all the subjects received an introductory instruction. During this session, they were first informed that the purpose of the study was to examine how consumers used NYOP auctions. To minimize the variability in prior experience with using NYOP auctions, all the subjects were trained using an example to explain how the NYOP auction mechanism works. Thereafter, they were presented with a hypothetical scenario in which they were asked to purchase an airline ticket from a popular NYOP auction site. Two popular locations (Cleveland and Los Angeles) which all the subjects were familiar with were selected as the origin and destination of the flight. Finally, similar to the procedures employed in the literature (e.g. [Lichtenstein et al., 1989; Suter and Burton, 1996; Urbany et al., 1988]), a computerized pre-test was administered, asking the subjects to provide estimates on the lowest price that they believed the airline would accept (lower bound) and the bidding price above which they believed the airline would definitely accept (higher bound). This pre-test estimation was used to discover the lower and higher bound of subjects' perceived acceptable/plausible bid range and subsequently to calibrate the low plausible and high implausible reference prices. Then \$180, which represented the mode of the lower bound estimation, and \$500, which was considerably above the higher bound (60% higher than the mean price (\$312) of subjects' higher bound estimation), were chosen to operationalize the low plausible (the lowest winning bid during the past 12 months was \$180.), the high but implausible (the highest winning bid during the past 12 months was \$500.), and the range recommendations (the winning bids during the past 12 months range from \$180 to \$500) respectively. The subjects were not informed of the pre-test results. The experiment was conducted in small group sessions where the researcher was present throughout the experimental setting, reading off the instruction, paying attention to whether each participant was serious in performing the requested tasks. All these would ensure the reliability and validity of the measures being gathered.

During the experiment, the three experimental treatments, low plausible, high implausible, and the range recommendations were randomly assigned to the subjects with a before-after layout. In the before stage, all 140 subjects were asked to provide estimates of the actual value of the ticket, bid, and probability that the bid they just submitted would be the winning bid. After these measures were secured, the treatments were randomly assigned, yielding 35 subjects in the 'low' group (group 1), 35 subjects in the 'high' group (group 2), and 70 subjects in the range group (group 3). Again, the subjects in the after stage were asked to provide the three estimates. They were also asked to estimate the usefulness of the price information in aiding their bid construction. Given the nature of treatment 3, the range, it was suspected that the amount of variability in group 3 will be higher than group 1 or 2. Thus the size for group 3 was intentionally doubled to control this added variation. Subjects also completed two manipulation-check questions. One question assessed whether the three treatments were effective by asking the subjects to provide an estimate on the price range that they perceive Priceline would accept. Following Holloway et al., 2009, another question assessed how realistic the subjects perceived the given experimental scenario. Finally, subjects answered demographic questions and were debriefed shortly afterwards. To ensure that they had paid attention in the experiment, during the debriefing session subjects were asked to state how NYOP auctions work and the recommended price given to them. Subjects who failed to answer these two questions and who did not complete the

experimental questions were eliminated from further analysis, yielding a total of 33 subjects in group 1, 32 in group 2 and 58 in group 3.

Table 1 illustrates the experimental design used. The before-after and three-treatment-group experimental design is appropriate for the purpose of testing the proposed hypotheses. Table 2 maps out how the design is aligned with the hypothesis testing. As shown in Table 3, the before-after differences correspond to testing the net effects of each individual treatment while the between-treatment comparisons correspond to comparing the effects of low plausible, high implausible, and range recommendations.

Table 1: Experimental Design

Scenario Group	Before	After
1 (Low)	No price information	Low price cues (\$180)
2 (High)	No price information	High price-cues (\$500)
3 (Range)	No price information	Range price-cues (\$180-\$500)

Table 2: Experimental Design and Hypothesis Testing

Experimental Design	Statistical Tests	Hypothesis
Before-after design	Before-after differences	Net effects of each treatment (H2a, H2b, H3a, H3b, H4a, H4b)
3-treatment-group design	Between treatment comparisons	The effects of the treatments relative to each other (H1, H2c, H3c, H4c, H5a-H5d)

6. Analyses and Results

6.1. Manipulation Check

Consistent with our expectation, subjects who received the low plausible price recommendation provided significantly lower estimates on the price range that they perceive the auction site would accept than the subjects who received range or high implausible price recommendation ($F = 5.505$, $p\text{-value} = 0.005$). This result supported the validity of manipulating the independent variables in the design of experimental stimuli. Further, subjects in all three groups perceived the experimental setting as fairly realistic. On a seven-point scale with seven indicating most realistic, the mean rating was 5.66.

6.2. Control Variables

Control variables include subjects' prior experience with NYOP and general knowledge of NYOP auctions due to their potential influence on the dependent variables. Prior experience with NYOP was measured by the number of times the subjects have used NYOP during the last 24 months and general knowledge of NYOP auctions was measured a composite of three items: How knowledgeable/familiar/comfortable you are with NYOP auctions?

6.3. Hypotheses Testing

Multivariate analysis of covariance (MANCOVA) procedures controlling for prior experience with NYOP and general knowledge of online auctions covariation were employed to guard against Type 1 error that could be expected if each dependent variable is analyzed separately. Hypotheses were tested using MANCOVA analysis with bidders' final bids, perceived value, and perceived probability of winning included as dependent variables and the two control variables entered as covariates. A series of univariate analyses were used as post hoc tests to pinpoint individual value differences between the groups (Table 3).

The results from the MANCOVA analysis indicate a main effect of various types of price recommendations on the dependent variables (Wilks' Lambda = 2.788, $p\text{-value} = 0.012$). Further, no effects were detected from the two covariates ($F = 0.363$, $p\text{-value} = 0.780$ for prior experience; $F = 0.378$, $p\text{-value} = 0.769$ for knowledge level).

Results in Table 3 show that there is no statistically significant difference in means in value, bid, and perceived probability of the submitted bid winning the auction in the before stage. Given the random assignment of treatments, there is no reason to suspect that there will be any difference in the before stage. It should be noted that in all 3 groups, the mean value is consistently higher than that of the bid, indicating that the subjects are quite rational. Subjects are not willing to submit a bid higher than the perceived actual value. Also, with no information about the threshold price, the average perceived probability of winning the auction is around 50%.

Results indicate that the low plausible price recommendation is perceived to be the most useful (7.24), followed by the range (6.41), and then by the high implausible recommendation (5.91). ANOVA indicates the overall differences are significant at the 0.007 level (F-statistic = 5.113) and H_1 is supported. Statistically the averages of usefulness for the low plausible recommendation and the range recommendation are not different (H_{5a} is supported).

The average perceived probabilities of winning the auction associated the bids increase by 5.30% in group 1, decrease by 5.63% in group 2 and increase by 5.10% in group 3. The absolute magnitude of change shows a similar impact of the three pieces of information. In the case of group 1 and 3, the provided low and range price information is plausible leading to a higher (although not statistically significant) perceived probability of winning the auction. During the debriefing session the subjects in group 2 indicated that they were surprised by the high value of the price recommendation (\$500). As a result, they tended to discredit the information which actually decreased the level of confidence that their submitted bid would win the auction. While the increase or decrease in perceived winning probability are in the same direction as was hypothesized, the changes are not statistically significant (H_{2a} and H_{2b} are not supported). The statistical power of the experiment design used in this study relies on balance in cell sizes. The actual cell sizes used are deemed sufficient to capture the expected significant differences. Tukey's pairwise comparison shows the mean differences between group 1 and 2 and between 1 and 3 are not statistically significant at the 0.05 level. This suggests that the low plausible price recommendation did not significantly improve subjects' winning probability estimate over the high implausible price recommendation. Also, the lower bound of the range recommendation demonstrated a more dominant impact on consumers' perceived probability of winning the auction because the range recommendation resulted in a similar perceived probability measure to the low plausible price recommendation. Hence, H_{2c} is not supported but H_{5b} is supported.

Table 3: Means of Perceived Value, Bidding Price, Winning Probability, and Usefulness

	Low (1) I (N=33)	High (2) II (N=32)	Range (3) III (N=58)	F	p-value
Usefulness	7.24	5.91	6.41	5.113	.007
				[1, 2] ^a [2, 3]	
Probability [Before]	51.06%	52.97	46.67	1.597	.207
Probability [After]	56.36	47.34	51.78	1.546	.217
Diff=After-Before	5.30 t=1.542 p=.133 ^b	-5.63 t=-1.447 p=.158	5.10 t=2.229 p=.030	3.699	.028
				[2, 3]	
Value [Before]	\$335.15	311.09	365.17	1.404	.250
Value [After]	298.18	426.09	378.28	7.632	.001
				[1, 2] [1, 3]	
Diff=After-Before	-36.97 t=-2.265 p=.030	115.00 t=4.463 p=.000	13.10 t=.949 p=.347	15.051	.001
				[1, 2] [2, 3]	
Bid [Before]	241.97	221.41	246.66	.519	.596
Bid [After]	190.76	334.84	235.60	23.508	.001
				[1, 2] [2, 3]	
Diff=After-Before	-51.21 t=-3.236 p=.003	113.44 t=4.738 p=.001	-11.05 t=-.986 p=.328	23.634	.001
				[1, 2] [2, 3]	

Note: a : Tukey's pairwise comparisons, significant at the .05 level.
 b: One-Sample t-test.
 Usefulness (U_i): Perceived Usefulness of the Price Recommendation
 Probability ($Pr(B_i > T)$): Perceived Probability of a submitted bid Winning the Auction
 Value (V_i): Perceived Actual Value of the Item

In group 1, after the low plausible price information \$180 was presented, the average value decreased by \$36.97 (from \$335.15 to \$241.97). A one-sample t-test indicated this decrease was significant at the 0.03 level implying a significant impact of the low plausible price recommendation on perceived value. Correspondingly the average bid fell by \$51.21 (\$241.97 to \$190.76; t-statistic = -3.236, p-value = 0.003), again indicating the positive relationship between value and bid. Hence, H_{3a} and H_{4a} are supported. In group 2, the high implausible price information of \$500 increased the mean value from \$311.09 to \$426.09 (mean difference = \$115.00; t-statistic = 4.463, p-value = 0.001). The bid went from \$221.41 to \$334.84 (mean difference = \$113.44; t-statistic = 4.738, p-value = 0.001). Thus in both cases, subjects in our study have incorporated the stimulus information in their revised estimates. In

other words, even though subjects questioned the usefulness of the high implausible price information, it still effectively acted as an anchor to influence their value and bid estimation (H_{3b} and H_{4b} are both supported). One-way ANOVA showed a significant difference in ‘after-before’ means for both the value and bid measure (F-statistic = 15.051, p-value = 0.001 for the value measure and F-statistic = 23.634, p-value = 0.001 for the bid measure). Tukey’s pairwise comparison showed that the mean of group 2 was significantly higher than that of group 1 for both the value and bid measure, supporting hypotheses 3c and 4c. The means between group 1 and 3 were not statistically significant at the 0.05 level for both the value and bid measure (H_{5c} and H_{5d} are supported).

As shown by the results for the value and bid measure, it should be quite obvious that the impact of low plausible price information is substantially greater than that of the high implausible information, again supporting hypotheses 5a-5d. The final average bid of \$190.76 was closer to the low plausible price recommendation of \$180.00 than \$334.84 is to \$500.00. This pattern is supported by the evidence shown in group 3 when the range information is given. The average difference of \$13.10 (t-statistic = 0.949, p-value = 0.347) was closer to \$-36.97 in group 1 than \$115.00 in group 2. Subjects in group 3 combined the stronger negative effect of the low plausible bound with the ‘lifting’ effect of the high implausible bound. This information integration process seems to produce a large amount of variability in the estimates. A similar pattern was also detected in group 3 with respect to the bid. The average decrease of \$11.05 (not significantly different from ‘zero’) fell between -\$51.21 and \$113.44, closer to -\$51.21 (as indicated by the Tukey’s pairwise comparison – the means between group 1 and 3 are not significant at the 0.05 level).

In general, results from usefulness of information fully support the results for value, bid and probability. The more the subjects perceived the price recommendation as useful in aiding their decision making, the more confident they were about winning the auction and the closer their value and bid estimates were drawn towards the recommendation.

7. Discussion, Implications, and Conclusion

Despite the potential of price recommendations to be a powerful pricing mechanism for NYOP auctioneers, work which examines the impact of such recommendations on NYOP bidder perceptions and bid estimates is limited [Wolk and Spann, 2008]. This study makes an important contribution to the literature by examining the effects of various types of price recommendations on bidders’ final bids, perceived value, perceived usefulness of the recommendations, and perceived probability of winning an NYOP auction.

Our findings indicate that consumers generally view the range and low plausible price recommendations as more useful in aiding their decision making than high implausible recommendations. Nevertheless, all three types of price recommendations are found to exert an anchoring effect on consumers’ value and bid estimation. Consistent with Wolk and Spann’s [2008] finding, the low plausible recommendation is found to yield a lower value and final bid outcomes than no price information and the high implausible recommendation. However, our results indicate that although buyers perceived the high implausible recommendation as the least useful in helping them construct bids, they were still anchored by this type of recommendation and submitted significantly higher value estimates and final bids relative to when they are given no information or when they are given the low or range recommendations. This result differs from the finding in Wolk and Spann’s [2008] work which indicates that an exaggerated seller-provided reference price does not have any impact on final bids unless the reference price is perceived as believable by the bidders (i.e., the main effect is not significant but the interaction is). This difference in findings may be attributed to the difference in the experimental contextual setting and the operationalization of the seller-provided price cue. The past winning bid distribution used in this study to operationalize the price cue may be perceived as less deceptive than an advertised price cue used by Wolk and Spann [2008], and thus may exert a greater impact on final bids. Also, bidding on airline tickets as opposed to MP3 players and shoes increases the uncertainty and complexity of the bidding task. When facing greater uncertainty and complexity, subjects in this study could be more susceptible to the influence of implausible information. When the range recommendation was provided, the low plausible price cue is found to have a more dominant anchoring effect than the high, implausible upper bound price cue, possibly because the range recommendation makes loss aversion more pronounced. Bidders demonstrate a higher confidence level in winning the auction when they are given the range recommendation than when they are given the high price recommendation.

7.1. Implications for Research

These results have important implications. From a theoretical perspective, this research extends the anchoring literature by exploring the implication of presenting the anchor through a range value. With an upper as well as a lower bound of price cues, the range recommendation provides consumers with two focal cues that could serve as anchors. The anchoring literature offers little theoretical insight with regard to the effects of dual anchor points [Biswas and Burton, 1994]. The results of this study show that the lower bound of the range has a more dominant

anchoring effect than the upper bound. Future research may wish to uncover the psychological mechanisms that underlie due-point anchoring. Additionally, the difference in findings between this research and Wolk and Spann's [2008] work highlights the importance of future research that examines how the effects of price cues in online auctions are contingent upon experimental contextual settings and the operationalization of price cues.

7.2. Implications for Practice

From a practical perspective, findings of this research suggest that NYOP auctioneers can use price recommendations as an effective strategy to increase their revenue. They may increase profit margin by persuading higher bids from buyers through the provision of high price cues. However, they should also be aware that while inflating price recommendations may result in higher bids, overinflating could trigger negative perceptions from buyers. Such negative perceptions could lead to severe consequences including bidders leaving the auction, seeking other sales channels, and spreading negative information about either the NYOP auction mechanism or the seller or both. This could severely reduce NYOP auctioneers' sales volume and negatively impact their revenue. As inflating price recommendation to an implausible level could be a double-edged sword, NYOP auctions may wish to pursue alternative strategies. Although low plausible recommendations may lead to lower bids and lower margins as a result, such recommendations do trigger positive perceptions, which will ultimately result in higher sales volume because satisfied buyers are more likely to participate in and return to the NYOP auctions. Alternatively, NYOP auctioneers may also wish to focus on a combination of margin and sales volume. The range recommendation is found to be associated with higher bids relative to the low plausible recommendation (although not statistically significant), and more positive perceptions than the high implausible recommendation. Therefore, using range recommendations enables the NYOP auctioneers to pursue a strategy that keeps a balance between maximizing margins through primarily focusing on high bids and maximizing sales volume through solely focusing on positive perceptions.

Another key managerial implication of this research is the possible long-term impact of different types of price recommendations. In addition to being a balanced strategy, the range recommendation also has the advantage of enhancing consumers' perceived value of the item over low plausible price information. As shown in Table 3, the low price recommendation significantly lowered group 1's perceived value, while the range recommendation increased group 3's value (although not statistically significant). In the literature, researchers have found that consumers tend to obtain psychological satisfaction or pleasure if their perceived value is higher than the actual price because the gap between the two gives them an important sense of a price deal [Grewal et al., 1998]. By enhancing bidders' perceived value in the deal-oriented online auction environment, the range price recommendation hence has the advantage of giving bidders the satisfaction of obtaining a deal, resulting in positive benefit perceptions. This can in turn enhance participation in and purchases from NYOP auctions and reduce search behavior for lower prices from other channels. In contrast, by lowering bidders' perceived value of the item, the low price recommendation can potentially lead to buyers expecting even lower price in the future. In the long-run, this can result in a situation where bidders consistently lower their bids in order to obtain a deal, and ultimately negatively impact the margin of NYOP auction sites.

These findings are critical because without fully understanding the consequences of different types of recommendations, NYOP auctioneers may unintentionally undermine their own efforts. For instance, those who seek to improve margin by using high price recommendations may unintentionally engender negative perceptions, leading to severe unintended consequences such as driving away potential customers and consequently reducing sales volumes. If NYOP auctioneers only focus on final bids, they may underestimate the value of using range and low, plausible price recommendations to improve revenue through maximization of sales volume. Also, focusing solely on the short-term revenue at the expense of long-term benefits by NYOP auctioneers might be a strategic mistake.

Our findings also have specific implications for policy makers and bidders participating in NYOP auctions. The results of this research provide evidence for consumer vulnerability to the robust anchoring effects of price recommendations. Policy makers and bidders in NYOP auctions must be educated about the existence and severity of biased influences from inflated implausible price recommendation on their bidding behavior. They need to be informed that bidders could be manipulated by inflated recommendations even when they view such recommendations with skepticism. Further, the findings indicate that when high implausible price recommendations are given, bidders do discount such recommendations and adjust their bids to the level they feel appropriate. This suggests that to some degree, buyers are able to protect themselves from deceptive manipulations of price recommendations if they are well-informed about the appropriate value for the item auctioned. Therefore, it is important that buyers gather enough information on the value of an item before they participate in NYOP auctions.

7.3. Conclusions and Future Research

Despite the important contributions of this study, it has limitations which future research may wish to address. For instance, the measures used consist of single items. Future studies may wish to validate the findings of this study by using multi-item measures to improve item reliability.

Moreover, just three levels of price recommendations are considered: low plausible, high and implausible, and range recommendations. In future research, a broader combination or a distribution of price recommendations may be explored in order to uncover other interesting effects. For example, it is currently unclear whether there are potential contrast and assimilation effects if the range of price recommendations is increased. It would also be interesting to investigate the conditions under which either contrast or assimilation effects would occur. In addition, the results indicate a weaker anchoring effect from high implausible price recommendations in assimilating final bids relative to the low plausible recommendations. Future research may wish to investigate how the effects of price recommendations on bidder perceptions and behavior may change as the recommendations cross from a high but still plausible level to a high and implausible level, and even to a high and extremely implausible level. Studies of this nature may help NYOP auctions discover other effective price recommendation tactics.

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Appendix 1-Example of Range Anchor Scenario

You plan to visit Los Angeles to take a vacation. You need to book a round trip air ticket [economy/coach class] using Name-Your-Own-Price with Priceline now. This is a flight between Cleveland and Los Angeles. Priceline also offers you some additional information as below: The price range for successful bids during the last 12 months is between \$180 and \$500. You are asked to submit your price for the flight ticket.

Think about the scenario and based on the information provided, please respond to the following questions.

1. Please state your perceived actual value of the offered air ticket?

In the amount of \$: _____

2. Please state the price you are willing to bid for the offered air ticket?

In the amount of \$: _____

3. What do you think the likelihood that the price you just offered will be accepted? Please circle one of the following.

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

4. How useful was the price range information provided to you in determining the bidding price submitted?

Not useful 1 2 3 4 5 6 7 8 9 useful