Bid or Buy? Individual Shopping Traits as Predictors of Strategic Exit in On-Line Auctions

Corey M. Angst, Ritu Agarwal, and Jason Kuruzovich

ABSTRACT: This paper examines the behavioral aspects of bidder conduct in on-line auctions. It utilizes price data from 113 on-line auctions, surveys of winning bidders, and draws upon the consumer behavior and auction's literature to examine individual *trait* differences in shopping preferences that predict a buyer's decision to use "strategic exit," the fixed-price Buy-it-Now (BIN) functionality. It argues that impulse-buying tendencies, trait competitiveness, and hedonic need fulfillment are antecedents of strategic exit, and that hedonic need fulfillment moderates the effect of impulse-buying tendencies on strategic exit. Buyers who exit an auction early by using the BIN feature end up paying a higher than average price. Theoretical and practical implications for the design of electronic auctions and the process of selling goods are offered.

KEY WORDS AND PHRASES: Auctions, behavioral predictors, Buy-it-Now, hedonic need, impulse buying, on-line auctions, product knowledge, shopping traits, strategic exit, trait competitiveness.

The emergence of electronically mediated transaction environments has significantly altered the nature of commerce. In addition to the use of the Internet for purchasing and selling activities [50, 70], an important emerging transformation is the growing popularity of on-line auctions. With eBay alone having more than 100 million users worldwide and transacting more than $16 billion in gross merchandise volume in the fourth quarter of 2007 in the United States [25], it is evident that individuals and retailers are increasingly selecting the electronic medium as a preferred way to buy and sell goods. The growth in electronic trade has been enabled, in large measure, by design features unique to electronic markets. For example, electronic feedback mechanisms serve as an adequate substitute for the institutional assurances typically associated with established on-line retailers and click-and-mortar companies [23, 63, 64]. The relatively low costs associated with using on-line auction sites make it profitable for sellers to sell items that have very low values. Given the presence of these and other features unique to the on-line environment, researchers have called for investigation of their impact on bidder behavior and auction outcomes [61].

The Buy-it-Now (BIN) price is a distinctive design feature of on-line auctions that has been widely adopted and used. It allows an individual to purchase an item at a fixed price prior to the commencement of bidding. A consequence of the availability of a BIN price is that the bidder receives a signal of the maximum price for the item being auctioned. From the perspective of the

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seller, the voluntary use of a maximum price in an auction seems surprising, especially in the case of sequential auctions for the same goods. However, numerous analytical models have demonstrated that the BIN functionality provides greater revenue than the traditional English auction when there are risk-averse buyers or buyers who are unwilling to risk losing an item to other bidders who may have a similarly high valuation for it [18, 31, 59, 65].

An alternative explanation for the widespread adoption of the BIN price functionality emerges from considering the heterogeneous preferences of bidders who typically enter an auction market. Individual preferences related to the shopping experience may cause some individuals to obtain value from the act of bidding in an auction channel, while others value the ability to purchase immediately through this fixed-price channel. Given heterogeneity in bidder preferences, the BIN functionality, in essence, provides a way for sellers to provide a *mixed mechanism* that encompasses the features of the auction and the fixed-price channel. As a consequence, the BIN function may allow the auction channel to simultaneously appeal to buyers who prefer fixed-price mechanisms *and* buyers who prefer auction mechanisms, thereby allowing sellers to market their products to a larger group. Thus, from a seller's standpoint, the use of the BIN functionality is advantageous in at least two respects—it extracts additional surplus from risk-averse buyers, and it appeals to a greater number of potential buyers.

From the buyer's perspective, however, this functionality poses an interesting paradox. Prior work has illustrated that allowing the auction to proceed to completion would yield a lower final price for the winner than the initial posted BIN price [18, 31, 59, 65]. Why then would a buyer utilize the BIN option? The present paper examines the nature of this behavior. Arguing that a buyer enters an auction environment to satisfy a consumption need, it utilizes a theoretical framework informed by the consumer behavior literature. Specifically, it suggests that the decision to participate in an auction can be viewed as reflective of a desire to "compete" in a consumptive situation, and it examines the relevant dispositional antecedents. In doing so, this paper responds to the call to examine the effects of behavioral characteristics of bidders in empirical studies of electronic auctions [7]. The paper also contributes to the growing literature on buyer characteristics in on-line environments and the associated implications for the design of such environments [58, 70].

The approach in this paper is simultaneously different from and complementary to prior empirical work that has investigated on-line auctions and fixed-price mechanisms. Empirical studies of auction outcomes have primarily focused on econometric models in which auction design, seller feedback, or bidder behaviors influence auction outcomes (e.g., [6, 7, 50, 65]). Table 1 lists several studies that have examined factors that influence auction outcomes. This review of the literature highlights the absence of studies that incorporate *individual traits* of bidders into models predicting auction outcomes. Investigating individual differences in shopping preference through a survey methodology offers an opportunity to gain insights into bidder behavior that are not immediately evident through an analysis of bid data or analytical models alone. Grounded in the psychology literature on theoretical models of individual differences, traits have been shown to play an important role

Author	Key findings
Ariely and Simonson [2]	Behavioral characteristics and preferences of consumers are not likely to vary between on-line auctions and traditional buying channels.
	Factors such as endowment, self-perception, and escalation can lead to consumer purchases not informed by a priori perceived value.
	Lower starting prices in auctions draw more bidders than higher starting prices, but the final selling price is not significantly different between the two.
	Loser's curse is more powerful than winner's curse, i.e., bidders will be more upset with potential loss of an item than possibility of overpaying for an item and regretting it.
Bapna, Goes, and Gupta [6]	Bid increments have important implications in a market consisting of bidders with heterogeneous strategies.
Bapna et al. [7]	Identifies heterogeneous bidder strategies and the implications for auction design.
Brazerman and Samuelson [10]	Empirically identifies instances of winner's curse.
Kahneman, Knetsch, and Thaler [39]	"Endowment" effect. Bidders take psychological ownership of an item on auction if they are high bidder for a time. If outbid prior to close of auction, they have more incentive to bid again to ensure that they win.
Kauffman and Wood [41]	Presence of a picture in coin auctions yields 12% greater final price
Kirkegaard and Overgaard [43]	Experienced sellers can generate more profit when selling multiple goods if they use a BIN feature in subsequent auctions once the selling price has been established in previous auctions.
Lucking-Reiley [48]	Dutch auctions earned 30% higher revenues than first-price auctions. English and second-price auctions earned approximately the same revenue.
Ottaway, Bruneau, and Evans [60]	In a commodity-type auction, a picture of the item has no bearing on the final price paid.
	Buyer reputation (feedback) has no bearing on the final price paid, but seller feedback does impact the final bid.
Resnick and Zeckhauser [63]	Feedback is a good proxy for experience. Sellers with higher feedback yield higher prices for their goods.
Roth and Ockenfels [68]	Late bidding, or bid sniping, occurs at equilibrium, as it offers a way for bidders to implicitly collude.
	Experienced bidders submit bids later than less experienced bidders.
Stafford and Stern [72]	Integrates the Technology Acceptance Model (TAM), affinity theory, and involvement theory to predict bidding in on-line auctions.
Ward and Clark [78]	Auctions won by bidders submitting bids early in the auction yield higher revenue than auctions won by bidders submitting bids late in the auction.
Wilcox [80]	More experienced bidders are more likely to bid according to theoretical predictions

Table 1. Auction Bidder Behavior Studies.

in influencing shopping processes [3, 15]. The study combines actual price data collected from 113 on-line auctions with surveys of auction winners to test a conceptual model of why individuals choose to strategically exit or BIN rather than compete and to examine the effects of this early exit on the price paid for the goods.

Theoretical Background and Hypotheses

On-Line Auctions and BIN

A substantial body of empirical evidence suggests that the revenue outcomes of on-line auctions differ from both theoretical predictions and traditional off-line auctions. In other words, buyers in on-line auctions face considerable uncertainty with respect to the final price they may be able to obtain. Lee compared the prices of wholesale autos in the Japanese ACUNET market before and after the implementation of an electronic auction mechanism [46]. He discovered that prices were significantly higher after the implementation of the electronic auction mechanism. Lucking-Reiley compared four different on-line auction mechanisms and found relative price outcomes different than what was predicted by analytical models and lab experiments involving off-line auctions [47]. Price comparisons between on-line auctions and other shopping channels indicate that buyers tend to discount products sold at on-line auctions [4]. This is consistent with previous theoretical work predicting that in markets for goods of uncertain quality, bidders discount their bids in order to prevent the "winner's curse" [51]. The curse results from the fact that winning bidders base their bids on their own estimates of value. These estimates are correct on average, but ignore the fact that to win, one's estimate must be higher than everyone else's bids. Kagel and Levin point out that this adverse selection effect must be accounted for during bidding or the winning bidder will experience below normal or negative surplus [37].

In addition to their uncertainty regarding the final price of an on-line auction, there is evidence that bidders strategically manipulate the auction process through alternative bidding strategies. One such strategy is bid sniping—not executing a bid until the final minutes of the auction. Sniping has been observed in nearly every type of on-line auction and is especially prevalent in auctions that have a fixed ending time [4, 68, 76]. By contrast, auctions employing the "going, going, gone" rule, in which the auction continues until no bid is entered for a set time, experience less pronounced sniping behavior [68]. Roth and Ockenfels attribute sniping behavior to a type of collusion among bidders, in which individuals do not bid until the final minutes of the auction to prevent a run-up of the bid [68]. The overall result of sniping is that the bidders do not have an accurate idea of price until the end of the auction.

The BIN functionality, which allows the bidder to end the auction early and avoid competition, directly addresses the price uncertainty that characterizes on-line auctions. Currently, auctions employ the BIN mechanism at a single fixed price before there is a bid on the item, but this flexible mechanism can be utilized to include either temporary, permanent, or dynamic prices [28]. When a bidder selects the BIN option, the price paid is likely to be significantly higher than what the final price would be if bidding were completed [28]. However, results from a field experiment found that consumers often do not use the BIN function even when the price is set below the prevailing market clearing price [31, 73]. Thus, there is empirical uncertainty related to when buyers will opt for the BIN price and what the final price will be.

Why then do bidders choose to end or not end the auction early? To find a theoretical explanation for these actions, one must look past the assumption of agents who strictly maximize economic outcomes (i.e., price paid) and focus instead on other factors driving the behavior that produce alternative sources of value. Recent research by Standifird, Roelofs, and Durham recognizes that benefits related to the shopping experience may be a much stronger driver of behavior in on-line auctions than the resulting price paid [73]. To understand the individual characteristics likely to influence bidding behavior that are specifically related to the use of the BIN feature, the discussion in this paper draws on the extensive literature in consumer behavior and marketing that focuses on individual characteristics as drivers of behavior in shopping contexts.

Theoretical Model

The overall theoretical model guiding this research, grounded in trait theory, is shown in Figure 1. Strategic exit is defined as the bidder's use of the BIN feature, which results in a termination of the auction. The model suggests that strategic exit from an auction, the focal variable in the study, will influence the price the bidder will pay for a good, above and beyond known covariates that affect final price. The decision to utilize BIN, in turn, is posited to be driven by the heterogeneous characteristics of individuals relevant to shopping behavior—specifically, trait competitiveness, the propensity to engage in impulsive shopping, and hedonic need fulfillment desires. Theoretical arguments supporting the proposed relationships are developed below.

Trait Theory and the Antecedents of Strategic Exit

Trait theory, as described in the psychology literature, stipulates that certain traits or dispositions help to characterize differences among individuals. These individual dispositions are commonly viewed as being relatively stable across situational contingencies and are generally regarded as consequential drivers of behavior [1, 21]. Trait theory assumes that there is variance in these dispositions and that the dimensions are continuous insofar as they measure the "degree" to which a person possesses the trait. The intensity can fall anywhere on the continuum from very low to very high, but traits are nonetheless an inherent characteristic of all individuals [1, 19, 49]. Fundamental traits such as personality dimensions provide a general way of predicting outcomes in a wide array of situations, including job satisfaction and job performance [9, 36]. Context-specific traits provide researchers with specific individual characteristics relevant to some behavioral domain. In attempting to explain the variance in strategic exit, context-specific traits directly related to shopping and consumption are likely to provide the greatest predictive power. A review of the literature reveals that trait competitiveness, impulse-buying tendencies,

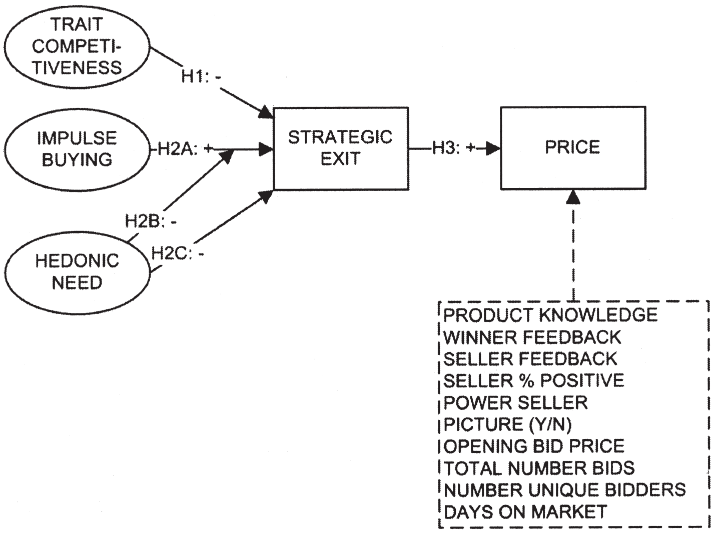

Figure 1. Theoretical Model

Note: Ovals represent latent constructs measured through their indicators, while rectangles represent variables measured directly.

and hedonic need fulfillment are key individual differences related to shopping behavior that may influence the decision to strategically exit an auction.

The trait of competitiveness is an essential ingredient of an individual's psychological profile [53]. Trait competitiveness is defined as the tendency to struggle to defeat others in order to achieve recognition or receive a prize, even in situations judged to be noncompetitive [30]. It is a core aspect of personality that reflects the enjoyment of interpersonal competition and the desire to be the best [44, 71]. It influences individual reactions to a wide range of situations. For instance, in bargaining situations, some evidence suggests that although bargaining behavior is primarily determined by situational contingencies, buyers often attribute their opponents' behavior to personal dispositions, such as their level of competitiveness [16]. Research suggests that competitiveness can be a motivating force for individuals' self-set goals and can influence performance outcomes [16]. The work of Brown, Cron, and Slocum and of Spence and Helmreich related to competitiveness in an industrial setting has recently been extrapolated to consumer behavior by Mowen to demonstrate the applicability of trait competitiveness to consumer purchasing situations [16, 54, 71]. Although intuitively it would appear that competitive tendencies are positively related to performance, the empirical evidence is equivocal. For example, Helmreich and Spence found that in certain contexts, performance was highest in people with low trait competitiveness, while Carsrud and Olm observed just the opposite—high trait competitiveness produced improved performance [20, 30].

What role does trait competitiveness play in on-line auctions? In a traditional, ascending-bid on-line English auction, the auction begins with a reserve price, and the price increases in regular increments (or in whatever increments the bidders choose). The winner is the bidder who bids the highest amount and pays it. Since there is only one item sold per auction, the winner gets the only reward, and the others lose [44]. Thus, only one winner emerges. Although research related to competitiveness in auctions is lacking, a study by Kelley and Stahelski in off-line contexts revealed that bidders attributed their opponents' behavior to specific personality traits, such as a competitive nature, even when they could have attributed it to situational factors [42]. In addition, winning bidders have been shown to be substantially more aggressive than other bidders [10].

It follows that individual buyers with a high degree of competitiveness will be less likely to use the BIN feature because they assume that they can get a better price by competing. Hence, winning in this instance is analogous to obtaining the product at a lower price than those who used BIN. Alternatively, it stands to reason that competitiveness will drive people to stay in an auction because of the desire to prevail over their opponents and seize the prize at the end. Therefore, using BIN is not likely to be a competitive play. Thus, independent of *a priori* price expectations, the competitive bidder will participate in the auction. In his examination of conspicuous consumption, Mowen argued that buying conspicuous consumer goods such as jewelry or clothing is an advertisement for oneself and often results in a price premium [54, 77]. The product in the present study, a top-of-the-line consumer electronics good, would also be considered a status item, since it is highly visible and relatively expensive [34, 54]. Finally, there is evidence that a high level of competitiveness is associated with the need to play in contests because of the intrinsic satisfaction afforded by the contest [54]. Here, the buyer derives utility from the act of participation in a competition. This leads to the first hypothesis:

> ***H1:*** *A bidder's level of trait competitiveness is negatively related to strategic exit (i.e., highly competitive bidders will be less likely to choose the strategic exit option).*

Rook observes that impulsive buying occurs when customers experience a sudden, often powerful and persistent urge to buy something immediately [38]. Stern classifies this act as planned, unplanned, or impulsive [74]. By his definition, a planned act is time-consuming, information intensive, and leads to considered and deliberate decision-making. By contrast, unplanned buying, including impulsive buying, is characterized by limited information search and does not involve planning [62]. The key distinction between planned and impulsive purchases is the relative speed with which the decision is made—by virtue of their information intensity, planned behaviors take longer to execute, while impulsive behaviors occur in the spur of the moment. Most researchers agree that impulse buying involves an instant-gratification component such that the shopper feels a strong desire to purchase the good [29, 62, 66, 67].

Impulse buying behavior can be emotionally complex and may stimulate internal, psychological conflict [62]. Marketing scholars note that impulse buying is difficult to understand theoretically because it often leads to the buyer paying a higher price, yet it accounts for a substantial amount of sales of goods each year [12]. One study indicated that up to 90 percent of buyers have at one time or another made purchases based on impulse [79]. Shoppers do not view their impulse purchases as inappropriate, because the benefits related to the shopping experiences outweigh the additional costs [66].

There are at least two plausible mechanisms through which the effect of an impulse-buying tendency on the decision to participate in an auction can be exhibited. First, bidders who possess impulsive buying tendencies will have less of a desire to compete in the auction and will be driven by the urge to buy instantly [74]. They are not interested in collecting information about the product or waiting until the end of the auction; their driving need is to obtain instant gratification rather than the best price. Second, scholars have argued that impulse-buying tendencies arise from the need to reduce the cognitive effort involved in comparing alternatives, searching for products, and the like [13, 29]. To the degree that participating in the auction imposes a cognitive burden and entails an investment of time, buyers unwilling to expend this effort prefer not to participate. Thus, one would expect to see a positive relationship between impulse-buying tendencies and strategic exit.

> ***H2a:*** *A bidder's level of impulse buying is positively related to strategic exit (i.e., bidders who buy on impulse will exit early).*

There is, however, an important factor that moderates the effects of impulse buying on strategic exit. Much research suggests that individuals' shopping behavior is often dictated by the inherent enjoyment and fun associated with the act, commonly characterized as the "hedonic" motive for shopping [3, 11]. It means that buyers are energized by the very act of shopping itself [29]. The hedonic motives for shopping include the need for novelty, fun, or surprise [29, 32, 33]. Hausman notes that for certain consumers shopping is a "surrogate for more primal types of hunting and the search and acquisition of goods are the reward, not any utility resulting from the purchase" [29, p. 407]. Hedonic need fulfillment assesses the degree to which an individual derives value from the shopping experience, independent of its outcome. Thus, even in the presence of an impulse-buying propensity, a high level of hedonic need fulfillment and the pleasure derived from participation will motivate such a buyer to extend the experience as long as possible. Therefore:

> ***H2b:*** *A bidder's level of hedonic need fulfillment negatively moderates the positive relationship between impulse-buying tendency and strategic exit (i.e., the effects of impulse buying on strategic exit are weaker for bidders who enjoy the on-line auction shopping experience).*

Finally, there is another aspect of hedonic need that could directly influence strategic exit. Consumer behaviorists have noted that shoppers will linger in malls because the experience of wandering through the mall is inherently satisfying and, as with all activities that are enjoyable, the shopper does not wish to terminate the activity [22, 66]. To the extent that the process of participating in an auction satisfies hedonic needs related to fun, novelty, and variety, buyers who enjoy the bidding process and the experience of the auction mechanism will desire to extend the length of the auction and thus choose not to use the BIN feature.

> ***H2c:*** *A bidder's level of hedonic need fulfillment is negatively related to strategic exit (i.e., bidders who enjoy the on-line auction shopping experience will not exit early).*

Strategic Exit and Price

Strategic exit is a deliberate decision by the auction participant to purchase the good at a preset price. The result of strategic exit is that the participant prematurely terminates the auction process, pays the preset price, and does not compete with other bidders to the completion of the auction. In essence, early exit changes the price-setting mechanism for the buyer to fixed rather than dynamic pricing. How does the final price paid compare with the price that would have emerged if the auction had been allowed to proceed? In theory, buyers seeking to purchase commodity items in contexts with low search costs, as is the case for on-line markets, will be able to locate the lowest-priced item [5]. Hence, if the preset price were higher than the expected market clearing price, strategic exit would not occur. The bidder would either search for the good elsewhere or wait for the auction to unfold, observe the dynamic prices that emerge, and make a decision to place a bid or not.

However, on-line auctions are not frictionless markets, where identical products yield a common market clearing price with no price dispersion. Rather, on-line auction mechanisms enable sellers to extract different values based on consumers' willingness to pay. It is argued here that strategic exit is a behavior driven by individual differences in shopping preferences. Because buyers using the BIN function obtain benefits such as immediate gratification and ensured success in the purchase of goods, they are expected to pay more than other buyers who wait until the completion of the auction. Thus:

> ***H3:*** *Strategic exit is positively related to the price paid for the good (i.e., bidders who choose to use the BIN feature will pay a higher price).*

Methodology

Sample and Data Collection

Data to test the proposed theoretical model were collected in two stages. In the first stage of the study, sales data on one specific type of item for sale on eBay were gathered. The product chosen was a Palm® m515 personal digital assistant. Over the course of five weeks, data were captured on the selling price of these units (including shipping cost). The Palm m515 was chosen for the study because of the relative frequency with which it is sold compared to other electronic goods. Its price is in the range $193.50–$300.00 with an acceptable amount of variance.

Description	Direct effect	Value
Search criteria used to ensure identical items	Price range	$150–$300
	Keywords	Palm, m515, new
	Keywords removed	-almost -gps -magellan -like -metal -hard -128 -leather -keybrd -keyboard -more -extras -x'tras -xtras
Sample timeframe		3/22/03 – 5/1/03
Sample size	Total m515s sold	598
	Surveys sent	418
	Usable responses	113 (27.0%)
Overall average price of Palm m515 including shipping (BIN and complete)		eBay: $243.89, SD $23.94 WebVendor: $289.88,[a] SD $19.52

Table 2. Sample Description.

Notes: [a] There was a statistically significant difference in price between eBay and six lowest-priced Web vendors (as determined by scanning webbot) over the same timeframe ($p < 0.001$).

In addition to selling price, data related to the buyer's and seller's reputation and experience level, the presence of a picture of the good, and other auction characteristics were collected. All of the data were acquired using a commercially available data-mining agent. To ensure that identical goods were compared, the mining agent was set to exclude specific words such as "almost, gps, 128, keyboard, extras." For instance, many sellers would label their m515 as "almost new" or would include a GPS (global positioning add-on), which would alter the price significantly. A complete listing of the search criteria will be found in Table 2. To further ensure the validity of the data, every product was manually reviewed to confirm that it conformed to the criteria. Only brand-new, still in the original box, m515 Palm Pilots were included in the analysis. During the timeframe sampled, 598 m515 Palm Pilots meeting the criteria were sold (*see Table 2*).

The e-mail addresses of all the successful buyers were extracted from the information collected while the auctions were in process. The buyers were contacted by e-mail and asked to complete a short 23-item survey regarding their purchase and individual traits. Of the 598 total Palm Pilot m515s sold, only 418 surveys were sent, due to the fact that there were several duplicate buyers and some failures to meet the reserve price. Of the 418 surveys sent, 113 usable responses were received, resulting in a response rate of 27.0 percent. This response rate is similar to typical response rates for mail surveys of the same length (21–30 items), which are generally less than 30 percent [81], and compares favorably with previous response rates of Web surveys, which have been found to be approximately 20 percent [40]. Although many auction papers use large data sets on actual bids and outcomes, the data set for the present study is necessarily more modest in size because primary data were collected from actual buyers on eBay. The survey was administered to the respondents between two and four weeks after the completion of the auction, allowing them sufficient time to complete the transaction. A nonresponse bias test showed that there were no statistically significant differences between responders and nonresponders with regard to price paid or the use of BIN (responders vs. nonresponders: used BIN, 26.3 percent vs. 25.9 percent; overall mean price paid, \$247.53 vs. \$246.83; $p = 0.560$, $p = 0.780$, respectively).

Operationalization of Variables

Strategic exit was operationalized through the BIN feature in eBay auctions. This is a binary variable reflecting whether the buyer in a particular auction used this feature. It is important to note that the operationalization assumes that if BIN was not used, the auction ran to completion. Note that a seller can post a BIN price, but the buyer may not use it. Such cases were coded as 0 (BIN was not used). Price was calculated as the amount paid for the good including shipping costs during the timeframe sampled.

Multi-item scales validated in prior research were used for all the behavioral characteristics (*see Appendix 1*) and were measured using seven-point Likert scales with strongly disagree/strongly agree as anchors. The four-item trait competitiveness scale was adapted from Helmreich and Spence [30] and yielded a reliability (coefficient alpha) of 0.68. The original impulse-buying scale was developed by Rook and Fisher and then modified by Hausman [29, 67]. One of the seven items comprising this scale was removed due to poor factor loading (*see Appendix 1*). The coefficient alpha was 0.87. Finally, the scale used for hedonic need fulfillment comes from Hausman and is a collection of items borrowed from the fun scale and novelty scale [27, 29, 75]. The items were adapted to reflect the enjoyment associated with shopping in an on-line auction. One of the six items used to define this scale was removed due to poor loading. The coefficient alpha was 0.83.

Control Variables

Prior research suggested that the final price paid for a good in an on-line auction is influenced by characteristics of the buyer, the seller, and the auction itself. Thus, to isolate the effects of the variables of interest, these characteristics were included as controls in the statistical analysis. Specifically, the auction-specific controls included product knowledge, auction winner feedback, auction seller feedback (both total feedback and the percentage of positive feedback relative to negative feedback), whether the seller was a *power seller,* the presence of a picture, the opening bid price, the total number of bids, the number of unique bidders, and the number of days on the auction market. Researchers have suggested that product knowledge is an important influence on the consumer's reference price and the level of a buyer's product knowledge related to the good being purchased will result in a more competitive price being paid [14, 17]. The study measured product knowledge using a validated scale [52]. One of the six items used for the product knowledge scale was eliminated due to poor factor loading. The resulting coefficient alpha was 0.81.

Winner feedback is a proxy for the winning bidder's experience during an on-line auction [63]. It is measured by the total number of positive feedbacks received. Seller-related controls included seller feedback, whether the seller was a power seller (an additional distinction given to individuals with a large number of listings), and the percentage of positive feedback. Sellers on eBay are rated according to two different scales. The first instrument is the reputation system, as used by many other on-line vendors and auctions, in which buyers provide feedback in the form of +1, 0, or –1 based on the buying experience. In general, the higher the feedback, the better the seller's reputation. However, this measure can be problematic in that a seller may have 500 net points, yet could have received 1,000 positives, and 500 negatives, yielding a very poor reputation. For this reason, *seller percent positive* was also used to assess the seller's reputation.

Empirical evidence for the effects of a picture of the good on the final price in an auction is equivocal. A study by Kauffman and Wood examining prices paid for coins in eBay auctions showed that placing a picture on the Web page that displays the item's description contributed to a premium of approximately 12 percent over sites that had only a description of the good [41]. However, a subsequent study by Ottaway, Bruneau, and Evans found that in commodity-type goods, the presence of a picture had no impact on the sale price [60]. Although the Palm m515 is a standard product, and the descriptions would presumably be the same because only brand-new m515s were examined, the *a priori* expectation was that a picture might add richness and subsequently result in a premium.

Finally, characteristics of the auction itself were included as controls. These variables control for the length of the auction, the number of bids, the opening bid, and the number of unique bidders.

Statistical Tests

The analytic strategy included confirmatory factor analysis, logit regression, and ordinary least squares regression (the measurement model loadings are shown in Figure 2). Because strategic exit, the focal variable, was binary, and non-normal data have been shown to affect the robustness of structural equation models and have been criticized by some researchers [35, 45], logit regression was used to examine the predictors of strategic exit. The drivers of price were investigated using OLS regression. Hypothesis tests were conducted using the logit function and regression in SPSS 11.0.

Results

Table 3 presents univariate statistics for all the observed variables. Deviations from normality did not appear as a major concern in the data. There were no missing values. In 29 of the 113 auctions, the buyer utilized the BIN feature. For auctions that ended with BIN, the mean total price paid was \$255.94 (\$18.99 SD, \$205.00 – \$284.00 range, n = 29). The mean for the auctions that went to completion was \$239.73 (\$24.25 SD, \$190.00 - \$300.00 range, n = 84).

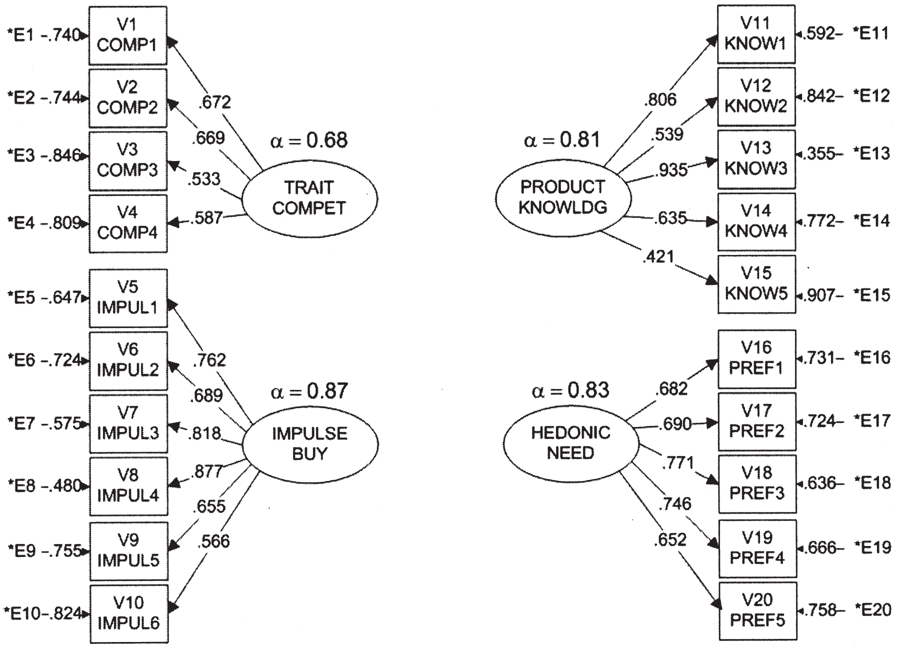

Figure 2. Measurement Model with Factor Loadings

Table 4 presents the factor and variable intercorrelations. All the variable loadings were significant and larger than four times the standard error.

After verifying the acceptability of the model fit, the beta coefficients and statistical significance of the hypothesized relationships were examined. Using logit regression, trait competitiveness was a statistically significant predictor of strategic exit ($\beta = -0.243$, $p = 0.011$; *see Figure 3*). Therefore, hypothesis H1 was supported, highlighting the desire of competitive bidders to avoid strategic exit, for which it was hypothesized that a higher price would be paid. Next tested was the moderating effect of hedonic need fulfillment on the relationship between impulse-buying tendency and strategic exit. Baron and Kenny's proposed method for testing moderation includes direct relationships between impulse buying and hedonic need and a multiplicative term representing the interaction of the two [8]. Following this method a significant negative interaction effect was found as hypothesized (main effect: $\beta_{\text{ImpBuy}} = 1.101$, $p = 0.000$; interaction effect: $\beta_{\text{IBxHN}} = -1.402$, $p = 0.001$). Therefore, hypotheses H2a and H2b were supported. The direct relationship between hedonic need and strategic exit was hypothesized to be negative but a significant positive relationship was found ($\beta_{\text{HedNeed}} = 0.509$, $p = 0.021$). Using the Nagelkerke estimation of variance explained, an R^2 of 27.8 percent was calculated for strategic exit.

Hypothesis 3 was tested by including all the control variables and examining the relationship between strategic exit and the dependent variable, price. There was a statistically significant relationship between strategic exit (as measured by BIN) and price ($\beta_{\text{StratExit}} = 0.531$, $p = 0.000$, supporting H3. Col-

Latent Construct	Variable	Mean	SD	Skewness	Kurtosis
Trait competitiveness (TC)	V1	2.73	1.519	0.399	-1.097
	V2	2.69	1.553	0.882	0.257
	V3	4.26	1.694	-0.333	-0.983
	V4	3.86	1.903	0.033	-1.126
Impulse-buying tendency (IMPUL)	V5	3.24	1.649	0.436	-0.635
	V6	2.34	1.480	1.134	0.294
	V7	2.08	1.324	1.567	2.298
	V8	2.35	1.620	1.217	0.416
	V9	3.46	1.727	0.095	-1.039
	V10	2.74	1.689	0.945	0.036
Product knowledge (KNOW)	V11	5.30	1.575	-1.070	0.694
	V12	5.65	1.186	-1.325	2.103
	V13	4.66	1.579	-0.577	-0.401
	V14	3.88	1.495	0.069	-0.204
	V15	5.79	1.448	-1.434	1.640
Hedonic need (HEDO)	V16	3.51	1.778	0.215	-1.049
	V17	2.75	1.578	0.696	-0.531
	V18	4.13	1.550	-0.372	-0.947
	V19	3.14	1.469	0.249	-0.927
	V20	2.52	1.643	0.877	-0.498

Table 3. Univariate Statistics.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1 Price	1.000												
2 StrExit	0.297***	1.000											
3 TraitComp	0.005	-0.239**	1.000										
4 HedNeed	0.028	-0.154	0.374***	1.000									
5 ImpBuy	0.211*	0.068	0.191*	0.492***	1.000								
6 PrdKnow	-0.188*	-0.053	0.084	-0.051	-0.019	1.000							
7 WinFeed	-0.119	0.067	-0.016	-0.029	-0.002	0.014	1.000						
8 SellFeed	-0.106	0.072	-0.240**	-0.204*	-0.102	0.056	-0.057	1.000					
9 Sell%Pos	0.191*	0.067	-0.029	0.161	0.062	-0.245**	-0.176	-0.527***	1.000				
10 Picture	0.026	0.202*	-0.034	-0.015	0.072	0.049	-0.090	0.091	0.058	1.000			
11 OpenBid	0.124	0.659***	-0.191*	0.019	0.164	-0.032	0.078	0.011	0.077	0.109	1.000		
12 TotalBids	-0.010	-0.599***	0.269**	0.064	-0.190*	0.035	-0.059	-0.011	-0.051	-0.239**	-0.865***	1.000	
13 UniqBids	-0.015	-0.640***	0.237**	0.022	-0.182*	0.008	-0.058	-0.010	-0.066	-0.160	-0.916***	0.915***	1.000
14 DaysOn	0.021	-0.607***	0.063	-0.004	-0.096	-0.150	-0.118	0.045	-0.068	-0.075	-0.567***	0.522***	0.608***

Table 4. Correlation Matrix.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

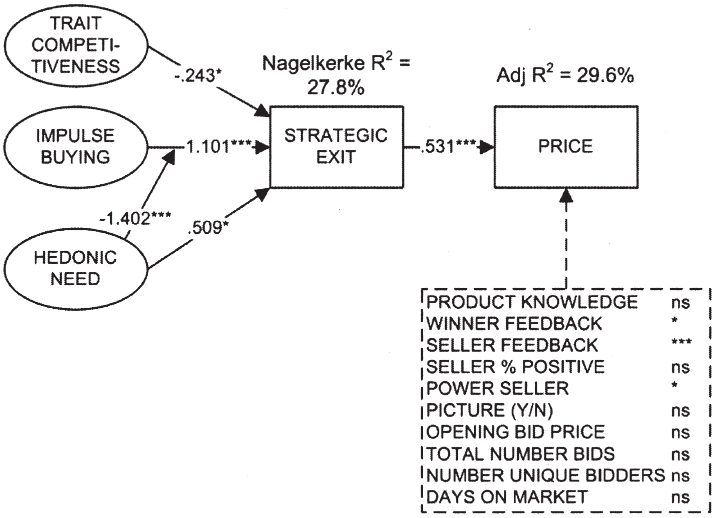

Figure 3. The Drivers of Strategic Exit and Price: Hypothesis Tests

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

lectively, strategic exit and the control variables explained approximately 30 percent of the variance in price.

Of the 10 control variables, all except winner feedback, seller feedback, and power seller were nonsignificant. Strategic exit contributed 12.5 percent to the variance explained beyond what was explained by the control values, resulting in a statistically significant change in R^2 ($\Delta F = 19.1(1, 97)$, $p = 0.000$). The initial examination was somewhat surprising, in that the presence of a picture was not significant because of the *ex ante* expectation. A plausible explanation could be the unique nature of the product. In contrast to the coins in Kauffman and Wood's study [41], the Palm m515 is a commodity product with no differentiating features, and 90 percent of the postings contained a picture.

Discussion and Implications

Discussion

Scholars in disciplines ranging from economics to marketing to psychology to information systems are keenly interested in understanding the dynamics of market transactions in auctions. Although on-line channels are now commonly included in research related to multichannel strategies (e.g., [56]), the discussions typically encompass traditional retailing via an on-line fixed-price channel. As electronic auction environments continue to grow both in number and trading volume, they offer alternative mechanisms for reaching consumer populations. The present research was motivated by the need to construct richer conceptualizations of individual characteristics and observed buyer behaviors in on-line auctions. It was suggested that the behavioral characteristics of bidders are important explanatory variables and that researchers need to look beyond strictly normative models of bidder behavior to account for discrepancies between theoretical predictions and empirical reality. The framing of the decision to exit an auction early includes factors that both positively and negatively influence buyer use of the BIN functionality. The premise that utilizing the BIN functionality maximizes the utility associated with the overall shopping experience rather than the price paid was further illustrated by relating the early-exit strategy to a price premium.

Consistent with the hypotheses, specific behavioral characteristics, such as trait competitiveness and impulse-buying tendencies, were indeed found to be significant factors in determining the decision to strategically exit an auction early by using the BIN feature. The study also illustrated the complex effects of the impulse-buying construct and found empirical support for the assertion that the increased enjoyment associated with participation in the auction overpowers impulsive tendencies. Interestingly, and contrary to the prediction, there was a positive relationship between hedonic need and strategic exit. There are at least two plausible explanations for this finding. First, the enjoyment of winning overpowers the pleasure derived from participation in the auction, and thus strategic exit is used as a sure means of winning. Second, while the study items were intended to tap into the enjoyment of using an auction, perhaps people have a difficult time discerning their feelings about shopping in general and shopping using an auction mechanism.

Note, too, that the product studied in this research was a functional utilitarian product—not something typically purchased on an impulse. Therefore, it is plausible that the findings related to impulse buying will generalize to noncommodity products to a greater extent because specialty products introduce an element of rarity that is likely to increase the impulse experience. However, further studies need to be undertaken to confirm this.

Limitations

Before any discussion of the implications of these findings for research and practice, it is important to acknowledge the limitations inherent in the study. First, the sample size, although reasonable given the nature of the data, could be improved. As noted above, this may have limited the study's ability to empirically detect theoretically significant relationships. Second, the response rate for the behavioral component of the study was 27 percent. Although tests for nonresponse indicated that there was no significant difference between responders and nonresponders on price paid, the results of the study must be interpreted with the response rate limitation in mind. Third, although the study used scales proposed and validated in other studies, the reliability of the trait competitiveness scale (0.68) is less than the conservative cut-off of 0.70 [57]. Fourth, only a single product was investigated in the empirical study, and therefore the generalizability of the findings is restricted to products with similar characteristics. The eBay auction marketplace consists of a diverse array of products, including clothing (16%), collectibles (12%), consumer electronics

(3%), and crafts (2%) [24]. The choice of consumer electronics was motivated by the fact that these products are easily comparable across channels and can be easily shipped, making them an appropriate choice for auction studies.

Further, one must acknowledge the possibility that endogeneity exists such that the buyer selects the BIN price because it is lower than other BIN prices. While this may explain some variance in strategic exit, the study's central argument is that individual behavioral characteristics influence the use of strategic exit, which results in a premium being paid. Thus, even if there is a small price difference between one BIN price and another during the same auction period, both of these BIN prices will, on average, be greater than the price of the product if it were to run to auction end. Finally, the study did not directly assess whether outcomes were affected by other auctions occurring simultaneously for the same good. However, as noted earlier, there was no statistically significant difference in the price paid or the use of BIN between responders and nonresponders in the sample, suggesting that simultaneous auctions are unlikely to change the findings in any substantive way.

Implications for Research

There are three ways researchers could extend the present work. First, the conceptualization explained approximately 30 percent of the variance in price and 28 percent of the variance in the strategic-exit BIN decision. While these results are encouraging and suggest that the proposed nomological net is a reasonable conceptualization of the phenomenon, the findings also point to the need to enrich the model with additional explanatory variables. One variable likely to be important in explaining early exit is the inherent risk aversion of a buyer (e.g., [18]). To the extent that risk-averse buyers sacrifice utility when faced with uncertain outcomes, risk aversion would be expected to significantly influence early exit in a positive direction, as predicted by analytical models [18].

A second fruitful avenue for future research is to explicitly incorporate the nature of the product into both the theory and empirical studies. For instance, it would be important to extend this study to other product categories that also include nonfunctional products, such as tickets to a basketball game or vacation packages, to determine whether the boundaries of the theoretical model extend beyond utilitarian purchases. Additionally, it may be possible to incorporate product typologies directly into the theoretical model. One could argue that the nature of the product (e.g., search vs. experience vs. credence [26]) moderates the effects of behavioral characteristics on early exit. One illustrative example of this relationship is presented. Trait competitiveness is likely to explain the greater variance in early exit for search goods rather than experience goods because for search goods, the relative valuations of other buyers are easier to determine and there is lower price dispersion [55]. Thus, a bidder's preference for early exit will be a function of the degree to which competitive shoppers for search goods believe that the likelihood of winning is higher via the auction process. By contrast, for experience goods, the cognitive regret associated with the possibility of losing the good to a buyer with a higher private valuation during the auction will drive the shopper to select the BIN option.

A third and final opportunity for extending this work is to examine variations in the BIN feature as well as other unique design features of on-line auctions. As noted earlier, the exit option could theoretically be made available at any point during the auction process rather than only at the beginning. How do bidder behaviors change when this functionality is suddenly made available during an auction? What characteristics explain the behavior of individuals who then choose to select this option? These questions would be important to investigate as logical extensions to this research. Furthermore, on-line auctions include a variety of features that may be important to bidder behavior and have not yet been fully investigated, including electronic agents that will enter a bid during the final minutes of an auction and proxy bidding that enables individuals to set a maximum bid and then remove themselves from an auction. Additionally, the very nature of the electronic environment enables auction properties such as bid increment to be dynamically controlled to maximize revenues [6]. The impact of such design features on bidder strategies or satisfaction represents an opportunity for future research.

Implications for Practice

The results of this study also have implications for on-line merchants and auction designers. On-line retailers have an opportunity to extend the traditional fixed-price channel by offering an alternative auction mechanism, thereby reaching a consumer population that is inherently more competitive and derives enjoyment from participating in and winning competitions. To the degree that data-mining and profiling techniques allow marketers to make inferences about a consumer's level of competitiveness (e.g., [69]), retailers may find it profitable to target such consumers with auction formats that offer a BIN feature. The findings can also help sellers avoid resource-intensive features such as highly detailed Web sites, for as was noted above, a picture may not be necessary for commodity-like goods. Another interesting insight for sellers is related to the difference in price between BIN and taking the auction to its end. The study found that BIN customers pay a premium, and thus sellers may find it useful to adjust prices to higher than the normal selling price but less than the mean BIN price.

For auction designers, the findings point to the need to pay attention to the behavioral characteristics of auction participants. Others have recently observed that behavioral characteristics are important considerations in determining the nature and design of electronic auctions [7]. In their empirical examination of Yankee-style auctions, Bapna et al. found evidence for the existence of different bidding strategies and concluded that there is significant heterogeneity in the bidder population [7]. The present study's results show that alternative price formats (fixed vs. dynamic) appeal to bidders with varying levels of trait competitiveness. Thus, it would be valuable for auction designers to explore other design mechanisms and characterize bidders in terms of their preferences for such mechanisms. Finally, the auction designer (e.g., eBay) could create a feature that enables sellers to adjust their BIN price if it is not selling rapidly enough or if a bid comes in on the product, which currently triggers the BIN feature to be disabled. While eBay is the dominant player in on-line auctions, it is important for eBay to create functions and features that are appealing to sellers.

Conclusions

In conclusion, this paper makes four primary contributions to the research literature. Arguably the most important contribution is the investigation of individual trait differences as an explanation of auction outcomes. While others have identified differences in bidder behavior as detected by the bidding pattern as a determinant of auction outcomes (e.g., [7]), this is the first study to measure individual bidder behaviors. Thus it extends the auction literature on behavioral differences to include constructs drawn from individual differences as they relate to shopping. Second, the study offers an alternative theoretical lens with which to view market participants in on-line markets, helping to inform how decisions are driven by utility gained from aspects of the shopping experience. Third, it identifies personal characteristics and dispositions that are related to the BIN functionality. Finally, the empirical study combining primary data collection on behavioral characteristics with secondary auction data represents a departure from the prevalent research tendency to utilize bid data alone.

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Appendix 1

Scales

Trait Competitiveness

V1. I enjoy shopping in situations involving competition with others. [comp1]
V2. It is important to me to perform better than others when I am shopping. [comp2]
V3. I feel that winning is important in both work and play. [comp3]
V4. I try harder when I am in competition with other people. [comp4]

Propensity for Impulse Buying

V5. I often buy things spontaneously. [impu11]
V6. "Just do it" describes the way I buy things. [impu12]
V7. I often buy things without thinking. [impu13]
V8. "Buy now, think about it later" describes me. [impu14]
V9. Sometimes I feel like buying things on the spur of the moment. [impu15]
V10. Sometimes I'm a bit reckless about what I buy. [impu16]
–removed–If I see something I want, I generally buy it. [impuls7]

Product Knowledge

V11. I am very familiar with Personal Digital Assistants (PDA) [know1]
V12. I am very clear about which features are important for providing me maximum satisfaction with this PDA. [know2]
V13. I know a lot about PDAs. [know3]
V14. My knowledge of PDAs is probably greater than other eBay purchaser's knowledge. [know4]
V15. I did my homework before I bought this PDA. [know5]
–removed–I will use this PDA nearly all the time. [know6]

Hedonic Need Fulfillment

V16. I like to shop in online auctions for the novelty of it. [pref1]
V17. Shopping in online auctions satisfies my sense of curiosity. [pref2]
V18. Shopping in online auctions offers me new experiences. [pref3]

V19. I feel like I'm exploring new worlds when I shop in online auctions. [pref4]
V20. I shop in on-line auctions to be entertained. [pref5]
–removed–I get a real "high" from shopping in online auctions. [pref6]

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