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# THE IMPACT OF AUCTION ITEM IMAGE AND BUYER/SELLER FEEDBACK RATING ON ELECTRONIC AUCTIONS

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## Abstract

*One of the oldest forms of commerce, the auction, has gained amazing popularity online. The largest online auction, eBay, boasts 18.9 million registered users of its services. They further claim that users buy and sell items in more than 4,500 categories and that everyday eBay hosts millions of auctions with over 600,000 new items being offered for sale (eBay Website, 2001). And eBay is only one of many websites providing electronic auctions on the Internet today. Amazon.com, MSN and other companies are beginning to join the online auction bandwagon started by eBay in September 1995. Even well known auctioneers such as Sothebys and Guernsey's Auction House have begun e-auctions (Business Week, 1999b).*

*Yet, despite the popularity of online auctions, little academic research has been devoted to this relatively new phenomenon. Because buyers do not have face-to-face contact with either the items being sold or the sellers, challenges not present in tradition auctions arise. How do buyers choose which items to bid on? What consumer decisions rules apply to online auctions? This research study proposes that three variables are particularly important to online buyers: 1) whether or not a picture of the item is available for the buyer to view; 2) the experience of the buyer (measured by buyers' feedback ratings); and 3) the reputation of the seller (measured by sellers' feedback ratings).*

## Introduction

This study examines consumer behavior in an online auction environment. A field experiment was conducted to examine three hypotheses regarding online auction bidding behavior. The results of this study provide insights to online sellers and buyers, as well as companies involved in online auction services. The three factors particularly important to online buyer's bidding amounts are as follows: 1) whether or not a picture of the item is available for the buyer to view; 2) the experience of the buyer (measured by buyers' feedback ratings); and 3) the reputation of the seller (measured by sellers' feedback ratings). The data used for the study consists of 120 proof sets of coins that can be considered a commodity product. Common sense dictates that none of the above factors should influence the purchasing price of a commodity, but the authors' and others' intuition and informal observation indicate that these factors may indeed be important to the amount bid on items in electronic auctions.

## Picture Effects on Information Processing

One variable we propose to be significant for consumers' bidding in electronic auctions is whether or not a picture of the product exists. A picture may serve at several functions for the consumer bidding on an item: it provides additional information about the item being sold; and it can assure the buyer that the seller has experience and expertise in online auctions. Both of these functions help reduce the high level of perceived risk that is inherent in buying situations where the buyer cannot personally inspect the item being sold or the person selling the item. The picture may also influence the bidder's attitude toward the seller and the item being auctioned.

While research has not been conducted on the effect of pictures on product choice or perceived risk, there is an extensive research stream on the presence of pictures in advertising. Pictures have long been used in advertising to convey information about the

brand, to show its users and uses, and/or to create an image or personality for the brand (Edell & Staelin 1983). Prior research on the subject has focused predominantly on the effect of pictures on consumers' attitudes (Mitchell & Olson 1981) and/or memory (Childers & Houston 1984; Houston, Childers & Heckler 1987; and Heckler and Childers 1992). As memory of an auction item does not seem to be an issue when the bidder has the whole array of items for sale immediately accessible on a Website, it is the attitude toward the brand that will be the focus of this discussion.

Mitchell (1986) suggests that visual element of advertisements may affect brand attitudes in at least two ways. First, individuals may form inferences about the advertised brand based on the visual elements presented. These inferences may result in the formation or change of beliefs about the advertised brand. Second, if the visual component of the advertisement is positively or negatively evaluated, it may have an effect on brand attitudes that operates through attitudes toward the advertisement. In other words, if a picture is negatively evaluated, the viewer has a negative attitude toward the advertisement that is then transferred as a negative attitude toward the brand in the advertisement. Other research studies have demonstrated varying levels of support for these hypotheses. Mitchell and Olson (1981) found that a picture of an attribute created a stronger belief that the brand possessed that attribute than an explicit verbal claim. However, Edell and Staelin (1983) found that a "framed" picture (in which the verbal information is a restatement of the picture) and a verbal message alone elicited similar reactions from consumers. Therefore, the picture did not reinforce beliefs about the brand. Despite these mixed research findings, which may be due to individual differences in the ability and preference to process visual or verbal information (Childers, Houston and Heckler 1995), some support does exist that pictures reinforce consumers' attitudes toward the brand in an advertisement.

Based on the above findings, intuition and informal observation by the authors and others (Bauerly 1998) of eBay auctions, we propose that pictures will influence potential buyers' attitudes and thus the amounts they are willing to bid on auction items. We propose the following hypothesis:

H1: The presence of a photographic image in the item description will positively influence the amount bid on the item.

Two reasons for this positive relationship may exist. First, the presence of a picture elicits stronger beliefs about the attributes associated with the items placed in the auction. In turn, these stronger beliefs reduced the buyer's perceived risk associated with buying a product sight unseen.

## Source Credibility

Another factor that we propose to be important in consumers' assignment of bids to items in an online auction is the credibility of the seller. Seller credibility is measured in eBay by the comments that buyers provide about the sellers. Sellers that received a large number of positive comments from buyers are given a colored star to indicate their rating. Sellers with high credibility, or in other words, a high seller rating, would be instrumental in reducing the amount of risk perceived by consumers in the online auction environment. In other words, buyers could see that the seller had been rating highly by other buyers and realize that they will be getting a fair deal.

The idea of seller credibility fits with marketing research on source credibility. According to Sternthal, Phillips and Dholaki (1978), source credibility consists of two components: expertise and trustworthiness. Both of these components could be important to the buyer who is deciding which seller to give his/her business. Also, highly credible sources often have resulted in more behavioral compliance than have sources that have less credibility (Sternthal, Phillips & Dholaki 1978). Thus the second hypothesis of this study:

H2: A high seller rating will positively influence the amount bid on the item because a higher rating implies higher seller credibility.

## Consumer Expertise

The influence of the buyer expertise should also be considered. Similarly to the seller ratings, eBay allows for sellers to post positive or negative comments about the buyers they with whom they have dealt. These buyer ratings provide information on previous transactions by that buyer.

Many studies have focused on the difference between experienced consumers and novices (Alba & Hutchinson 1987; Bettman & Park 1980; Brucks 1985; Maheswaran, Sternthal & Gurhan 1996; Mitchell & Dacin 1996; Rao & Seiben 1992). Alba and

Hutchinson (1987) identify two dimensions of consumer expertise: expertise and familiarity. Familiarity is defined as the number of product-related experiences that have been accumulated by the consumer, while expertise is defined as the ability to perform product-related tasks successfully. While the eBay buyer ratings do not measure the consumer's expertise in the product category, they do provide an indication of the consumer's familiarity with the online auction medium and possibly with the product category. In general, increased product familiarity results in increased consumer expertise (Alba & Hutchinson 1987).

Studies have indicated that experts have greater ability to analyze information presented to them and isolate that which is most important and task relevant (Alba and Hutchinson 1987). Thus experts should realize that the pictures of commodity products are irrelevant as no differences between brands exist. Thus knowledgeable consumers should be less willing to pay prices that are no commensurate with the quality of the product than consumer who are not knowledgeable (Rao and Sieben 1992). However, facilitating the novices' message processing by providing a picture would enhance their learning of the appeal and thereby the favorableness of the message evaluations (Maheswaran, Sternthal and Gurhan 1996). Therefore, we propose the following:

H3: A high buyer feedback rating will negatively influence the amount bid on the item; whereas a low buyer feedback rating will positively influence the amount bid on the item.

## **Overview of Online Auctions and Ebay**

The online auction phenomenon is quickly becoming a force to be reckoned with in e-commerce. In 1998, online auctions accounted for \$3.8 billion in sales and it is predicted that by 2002, online auctions will account for 29 percent of all e-commerce or \$129 billion. In 1998, 35 percent of online buyers, or 3 million users, had purchased through online auctions. This number is estimated to increase to 14 million users by 2002 (Business Week 1999a). There are three basic kinds of online auctions: business-to-business, business-to-consumer and person-to-person (Bauerly 1998). Many e-retailers, such as Amazon.com and traditional retailers, such as Sharper image are opening e-auction sites. Sharper Image uses an online auction as a method of liquidating excess inventory. They can receive 40 percent of retail on excess goods via online auctions compared to 20 percent from liquidators (Business Week 1999a). While business-to-business auctions currently have the largest dollar volume (Peterson 1999), the focus of this study is on the person-to-person auction exemplified by eBay.

eBay started the auction bandwagon in 1995 when founder Pierre Omidyar tried to find a market for his wife's Pez dispenser collection (Business Week 1999a, eBay Website, 1999). eBay was the first and is currently the largest online person-to-person auction and boasts 5.6 million registered users of its services. They further claim that the users buy and sell items in more than 1,600 categories including collectibles, electronics, computers and household products. Every 24 hours, eBay hosts over 2.5 million auctions with over 250,000 new items being offered for sale (eBay Website 1999). In December 1998, eBay was the second most visited Web shopping site according to Media Metrix, a Website tracking company (Turner 1999). Media Metrix reported in June of 1999 that eBay users average 111 minutes on the site making it the third most popular Website by user minutes (eBay Website 1999). In a study conducted by Vanderbilt University's Owen Graduate School of Management of 10 major online auction sites, eBay was rated highest for the level of customer support it provides (PC Week 1999).

Online auctions are creating new variables in a company's marketing mix including the concept of dynamic pricing. A wide range of goods is being priced at what the market will bear (Business Week 1999a). However, online auctions are not without their drawbacks. Levels of perceived risk tend to be higher when consumers cannot examine either the merchandise or the sellers. A study by Advertising Age (Maddox 1998) surveyed consumers who are unwilling to shop on the Internet. They found that the first reason for resisting Internet shopping was security and the second most important reason was the inability to examine the merchandise before purchasing it. Internet auctions have the additional hurdle of trust as anyone with a browser can place a bid or auction goods. Sellers remain wary of getting paid and buyers are concerned about the shipment of an item and its quality (Busch 1999). To circumvent this obstacle, eBay has devised a reputation rating system to help traders judge each other. Buyers and sellers may leave public comments, known as "feedback" about transactions on the site. Each positive entry is assigned a point and tallied to give a numerical rating. Each negative comment lowers the score by a point (Mannix, 1999; eBay Website 1999).

When placing an item up for auction on eBay, the seller must choose from several different auction formats. These formats include a standard auction based on the English open-outcry mechanism, reserve price auction, private auction, Dutch auction, and restricted access auction. The standard auction displays a current bid, bid increment, and minimum bid. The minimum bid is the current bid plus the bid increment. The amount of the bid increment varies according to predefined price ranges published on the eBay site. The reserve price auction is similar to the standard auction with the exception that the seller has established a minimum price at which he or she will sell the item. A private auction differs from the standard auction in that the identity of the bidders is not displayed. At the conclusion of the auction the buyer's identity is revealed only to the seller. A Dutch auction

is used when the seller has more than one of an item available for auction. In the Dutch auction the seller specifies the quantity available and a minimum price. All winning bidders in the Dutch auction pay the same price for the item, the lowest successful bid. The restricted access auction is used to sell adult-oriented items. The restricted access auction requires that the buyer have a credit card on file with eBay thus providing some level of assurance that the buyer is an adult.

As stated above, when an item is placed up for auction using a standard auction format the current bid, bid increment, and minimum bid are displayed. A bidder may bid the minimum price or may choose to use what eBay describes as an automated proxy. When using the automated proxy, the bidder enters the maximum price he or she is willing to pay for an item. The automated proxy will bid the minimum bid on the item and, if outbid, will raise the bid. The automated proxy will continue this process until the auction closes or the maximum amount the bidder is willing to spend is reached. The amount bid by the automated proxy will be the new minimum bid or the maximum amount of a competing automated proxy plus the bid increment.

## Methodology

The experimental design for this study was a 2 x 2 x 2 grid consisting of independent fixed variables of the picture/no picture conditions and the high seller rating/low seller rating conditions; and an independent random variable of the high buyer rating/low buyer rating conditions. The data consisted of 128 proof sets of coins from the years 1956 to 1992. There were four matched groups of proof sets so that there were 32 observations in each of the fixed variable conditions (picture/no picture; high seller rating/low seller rating). A proof set is a set of one of each denomination coin for a given year. They are struck using new polished dies and are manually transferred from the die into hard plastic cases. A proof set from any given year should have the same value and can be treated as a commodity, thus a picture should make no difference in the amount an individual is willing to bid on the set. The book value of the coins was considered a covariate in this study.

Each of the 128 proof sets was individually sold at auction on eBay. These auctions were conducted over an eight-week period in the spring of 2000. All auctions were the same length, seven days, and were initiated on the same day of the week, Sunday. The auctions were organized according to the four matched groups mentioned above, with 32 coins being placed up for auction as near simultaneously as possible. A minimum of one week elapsed between matched groups.

The description for each proof set was identical except for the proof set year. To realize the picture/no picture condition, images were generated for 64 proof sets. Two pictures, one of the front and one of the back, were taken of each proof set. All pictures were taken using the same equipment, thus image quality was identical across all proof sets. Although the size and shape of proof sets varies across years, the picture size was adjusted to provide approximately the same degree of enlargement of the coins across all images.

Two eBay accounts, representing high/low seller rating, were used to place the proof sets up for auction. The account associated with the low seller rating condition began the experiment with 6 positive feedback comments on eBay's feedback system. The account associated with the higher seller rating condition began the experiment with 1986 positive feedback comments. During the eight weeks over which the experiment was conducted both accounts received additional positive feedback comments. At the conclusion of the experiment, the account associated with the low seller rating condition had 31 positive feedback comments and the account associated with the higher seller rating condition had 2187 positive feedback comments.

No reserve amount (minimum final bid) was established for auctions, however, an initial bid (minimum first bid) was used to protect the proof sets' owner's investment. The initial bid was set at 75% of the book value, rounded down to the nearest \$0.25.

## Results

The initial data analysis consisted of calculating means and standard deviations for the two dependent variables, which were final bid and number of bids. These means and standard deviations were computed within each of the independent variable groupings: picture and no picture, and high seller rating and low seller rating. Tables 1 and 2 show the results of this analysis.

A factorial analysis of variance (ANOVA) model was performed to test the effect of picture and seller rating on the final bid price. In order to adjust for the market value of the coins, the fair market value of each coin was used as a covariate in this analysis. This procedure is similar to computing the difference between the final bid price and the fair market value and using the resulting difference as the dependent variable. However, the analysis of covariance model is preferred since the covariance is removed from the error term resulting in a more powerful test. The results of this analysis indicated that the fair market value of the coins was a significant covariate ( $F_{(1,123)} = 440.15, p < .0001$ ). This result was expected since higher value coins should garner a higher price at an auction. Although expected, this result confirms the necessity of using analysis of covariance.

**Table 1. Means and Standard Deviations by Picture**

|            |      | <b>Final Bid</b> | <b>Number of Bids</b> |
|------------|------|------------------|-----------------------|
| No Picture | Mean | \$12.29          | 3.88                  |
|            | SD   | 7.20             | 2.21                  |
|            | N    | 64               | 64                    |
| Picture    | Mean | \$12.18          | 3.66                  |
|            | SD   | 7.42             | 2.15                  |
|            | N    | 64               | 64                    |
| Total      | Mean | \$12.24          | 3.77                  |
|            | SD   | 7.28             | 2.18                  |
|            | N    | 128              | 128                   |

**Table 2. Means and Standard Deviations by Seller Rating**

|                    |      | <b>Final Bid</b> | <b>Number of Bids</b> |
|--------------------|------|------------------|-----------------------|
| Low Seller Rating  | Mean | \$11.65          | 3.39                  |
|                    | SD   | 6.83             | 2.13                  |
|                    | N    | 64               | 64                    |
| High Seller Rating | Mean | \$12.83          | 4.14                  |
|                    | SD   | 7.70             | 2.18                  |
|                    | N    | 64               | 64                    |
| Total              | Mean | \$12.24          | 3.77                  |
|                    | SD   | 7.28             | 2.18                  |
|                    | N    | 128              | 128                   |

After the covariate was removed, the analysis on the two independent variables was conducted. The results for the main effect for the picture condition indicated that there was no difference in final selling price for coins auctioned with a picture and matching coins auctioned without a picture ( $F_{(1,123)} = .034, p = .85$ ). The inspection of the means in Table 1 confirms this analysis since the means on the final bids for these two groups are virtually identical. The analysis of the main effect for seller rating indicated that coins sold at auction from a seller with a high rating produced a higher average price than coins sold from a seller with a low rating ( $F_{(1,123)} = 3.81, p = .05$ ). The means presented in Table 2 indicate that the coins auction by a seller with a higher rating resulted in an average price that was \$1.19 higher than the matching coins sold by a seller with a low rating. This is a 10.2% higher price caused by a higher seller rating. There was no interaction between the picture condition and the seller rating condition ( $F_{(1,123)} = 2.15, p = .145$ ).

A similar analysis was done using the number of bids as the dependent variable. Again, analysis of covariance was used with the fair market value of the coins used as the covariate under the hypothesis that more valuable coins would potentially produce more bid activity. This hypothesis was not supported. There was no relationship between the fair market value of the coins and the number of bids received for each coin ( $F_{(1,123)} = .002, p = .962$ ). There was no main effect for picture indicating that coins sold with a picture received a similar number of bids as coins without a picture ( $F_{(1,123)} = .325, p = .57$ ). There was a main effect for seller rating indicating that coins sold by sellers with a high rating received more bids than coins sold by sellers with a low rating ( $F_{(1,123)} = 3.82, p = .05$ ). From Table 2 we can see that coins sold by sellers with a high rating produced on average of .75 more bids than coins sold by a seller with a low rating. This works out to a 22% increase in the number of bids. There was no interaction between the picture variable and the seller rating variable ( $F_{(1,123)} = .956, p = .33$ ).

To better understand the relationship among the various variables in this study and to explore the relationship between buyer rating and the other variables, a correlation and regression analysis was performed. Buyer rating in this study was a variable that ranged from 0 indicating a completely inexperienced buyer to 836 which indicated a buyer with a very high rating.

The correlation between buyer rating and the other variables revealed no significant relationships. Specifically, the correlation between buyer rating and final bid, initial bid, number of bids, and fair market value was -.002, -.031, -.066, and -.03 respectively. Clearly buyer rating was not an important variable in this analysis. Four significant correlations were observed. These significant effects were between the final bid and the number of bids ( $r = .346, p < .001$ ), final bid and initial bid ( $r = .881, p < .001$ ), final bid and fair market value ( $r = .879, p < .001$ ), and between initial bid and fair market value ( $r = .99, p < .001$ ). A stepwise

regression analysis was performed using final bid as the dependent variable and initial bid, number of bids, and fair market value as the independent variables. The first variable to enter the equation was the initial bid with an  $R^2$  of .775 ( $F_{(1,126)} = 435.186$ ,  $p < .001$ ). The second variable to enter the equation was the number of bids with an  $R^2_{\text{change}}$  of .116, ( $F_{(1,125)} = 132.630$ ,  $p < .001$ ). Interestingly, fair market value did not enter this analysis.

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