行政院國家科學委員會專題研究計畫 成果報告

電子行銷典範--子計畫五:消費者的網路資訊搜尋、處理與使用行為(3/3) 研究成果報告(完整版)

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中 華 民 國 96 年 10 月 31 日

行政院國家科學委員會專題研究計畫成果報告
消費者的網路資訊搜尋、處理與使用行為
Consumers' Information Searching, Processing, and Usage Behavior on the Internet

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In the Eye of the Beholder: The Curse of Winning at the On-line Auction

ABSTRACT

Most people think that the winners of an auction must be happy.　Nonetheless, the winners are likely to experience regrets; this is referred to as "the winner's curse."　This study investigates the major contributors to the degree of a winner's curse.　Instead of employing the price difference as the proxy of the curse, as in previous econometrics research, this study measures a winner's feelings of regret directly.　In addition, a nonlinear relationship between the price difference and the intensity of the winner's curse is discussed based on Prospect Theory.

In the Eye of the Beholder: The Curse of Winning at the On-line Auction

INTRODUCTION

Online auctions have recently gained widespread popularity and are one of the most successful types of electronic commerce. For example, at least 30 million people bought and sold more than $20 billion in merchandise on eBay in 2003 (Hof, 2003; Lucking-Reiley, 2002). This is more than the gross domestic product (GDP) of all but 70 of the world's countries (Aldridge, 2004). Somewhere between 150,000 and 200,000 entrepreneurs earn a full-time living by selling anything from new and used underwear to real estates on eBay (Adler, 2002; Bradley and Porter, 2000; Hof, 2003). In fact, more automobiles are now sold on eBay than are sold by Auto Nation, the leading volume car dealer in the United States (Aldridge, 2004; Bold, 2004; Hof, 2003). In Taiwan, the biggest auction website, Yahoo! Taiwan, reported that the revenue from its online auction business accounted for more than 90% of its total e-commerce transactions revenue (IDIC, 2005).

The proliferation of online auction users has attracted the attention of many researchers who have focused primarily on bidder behavior, such as herding behavior (Dholakia and Soltysinski, 2001), the influence of reserve prices (Jap 2002), the impact of expertise (Wilcox, 2000), and the effects of auction formats (Lucking-Reiley, 2000). However, despite the copious research into the bidder's behaviors, the exploration of the bidder's attitudes and perceptions is rather limited.

Considering the competition during an auction, it is usually assumed that the winner of an auction should be happy and satisfied with the result. However, this study would like to explore the fact that winners may experience some regret or disappointment after the auction. This phenomenon is termed "the winner's curse" in economic studies regarding auctions (e.g., Capen,

Clapp, and Campbell, 1971; Holt and Sherman, 1994; Milgrom 1989).

Some researchers have explored bidders' regrets from an economic perspective, measuring the "curse" in monetary amounts: namely, the difference between the price the bidder offered and the price that bidder believed to be reasonable (Bajari and Hortacsu, 2003; Thaler, 1992). Although the monetary measurement is convenient to employ data from auction sites (e.g., e-Bay), the economic perspective is dubious because it is uncertain that a monetary amount can truly reflect the sense of regret in a bidder. The implicit assumption behind the economic measurement is that the curse is linearly correlated with the amount of extra monetary sacrifice. Taking the perspective of Prospect Theory (Kahneman and Tversky, 1984), it is reasonable to suspect that the degree of regret (or disutility) may not be linearly related to the amount of perceived monetary loss. In other words, the difference of paid price and expected price is just one factor that influences the sense of regret; thus, using mere monetary figure as a proxy, especially a linear proxy, of the real feelings of consumers may not be appropriate. Therefore, this study proposes to probe a consumer's feelings of regret directly and to discuss the relationship of the price difference and the sense of regret via the Prospect Theory.

In summary, the purpose of the present study for the on-line auction is three-fold: 1) to directly measure bidders' feelings of regret without applying the price difference as a proxy measure; 2) instead, treating the price difference as a contributor of the regret to explore the relationship between the degree of regret and price differences; and 3) to investigate the factors that are influential on the intensity of a bidder's curse. This research investigated the above by two studies. Study 1 employed an experiment on a virtue auction web site, while Study 2 adopted a quasi-experiment method to explore the real response of bidders of auction web site. In the following sections, we will first introduce the concept of a bidder's curse and review

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Prospect Theory to derive the research hypotheses. A survey of on-line bidders is employed to collect data for examining the hypotheses and to conduct the implications.

LITERATURE REVIEW AND HYPOTHESES

Winner's Curse

The concept of "winner's curse" was first introduced by Capen, et al., (1971) while discussing the bidding for oil leases. The winner's curse indicates the situation in which the bidders win the auction, but they may feel regrets because they overestimated the value of the commodity (Thaler, 1992). In this situation, the winner of the auction feels just like a loser and experiences the phenomenon of the "winner's curse" (Capen, et al., 1971).

The bidder's curse cannot occur if all the bidders are rational (Cox and Isaac, 1984) since the rational bidder would not bid a price over the true perceived value. However, most people are bounded rational that means people have limited cognitive ability, time, and/or willingness to evaluate every alternatives before they make decisions. Thus, the bidder's curse is a general phenomenon (Thaler, 1992) experienced by both experts and novices (Bazerman and Samuelson, 1983; 1985). Moreover, the bidder's curse has been demonstrated to exist not only in the controlled situation of experimental studies but also in the real world (Cassing and Douglas, 1980; Kagel and Levin, 1986).

In addition to the nature of the bounded rationality, some additional factors may influence the bidder's curse, for example, the number of bidders (Capen et al., 1971) and the desire and uncertainty toward the bid (Bazerman and Samuelson, 1983; Boatler, 1978; Dumas, Aldred, Governatori, and Hofstede, 2005). It seems that the more bidders there are and the stronger the

desire is toward the item, the bidder may become less rational.

Most previous studies discussed this issue via econometric models (eg., Bajari and Hortacsu, 2003; Bazerman and Samuelson, 1983; Cassing and Douglas, 1980; Cox and Isaac, 1984; 1985; Kagel and Levin, 1986) with the problem of measurement.   In these studies, the curse was measured by the price difference, which is the gap between the final bid and the estimated price. It is doubtful that the price difference can properly represent the bidder's feeling of regrets.   A proxy of the curse with price difference is not as insightful as a direct measurement of feelings of regret; especially, this proxy is built on a strong assumption of a linear relationship between the fact of price gap and the psychological status of regret is made.   Furthermore, few of these studies explained the reasons for the curse with theorems.

In the present study, the extent of the winner's real psychological states about the feelings of regret is directly measured with a perceptual viewpoint.   The relationship of the curse and price difference is also investigated based on Prospect Theory.   In the following sections, Prospect Theory is introduced to explain the phenomenon of the winner's curse, and to induce relevant hypotheses.

The Winner's Curse and the Reference Point

Kahneman and Tversky (1979) proposed Prospect Theory to describe an individual's choice under conditions of uncertainty.   The essential feature of Prospect Theory is that a person's perceived value is based on changes of welfare rather than final states.   In other words, people's perceptual apparatus is attuned to the evaluation of changes rather than to the evaluation of absolute values; the magnitude of the change is a relative concept which is compared with the original.   For example, it is easier to discriminate an increase from $5 to $10 than an change

from \$955 to \$960.   Therefore, the concept of a reference price is introduced into the value function for discussing the effect of the price on purchase decisions.   Consumers compare the purchase price with their reference price to form the feeling of gain or loss.   When spending more than the reference price, consumers perceive a loss; when spending less than the reference price, they sense a gain.   Correspondingly, in an online auction, the bidder's gain or loss results primarily from the comparison between the bidder's final price and the price he/she estimates to be reasonable—that is the bidder's internal reference price.   If the winner offers a final price higher than his/her original reasonable price, he/she tends to feel a loss.   If the winner's final price is lower than the reasonable price in his/her mind, he/she will feel a gain.

Part of the bidder's pleasure or discouragement results from the bidder's gain or loss, but is not solely based on winning or losing the bid.   If the bidder won a bid with a price higher than his/her expectation, he/she may not feel too happy about the winning and start to wonder if he/she had irrationally overestimated the value of the product, resulting in regrets.   Since the winner must have offered a price higher than others, it perhaps acts like a signal or an external reference price that the value of the product was perceived lower by other bidders.   The likely feelings of regret are like a curse to the winner and very hard to avoid.   However, if the winner uses a price much lower than his/her expectation to win the product, he/she should be happy due to the extra gain compared with his/her internal reference price.   The above discussion, therefore, leads to the following hypotheses:

H1: The winner's regret level (i.e., the winner's curse) increases as the difference between the end price and the estimated reasonable price increases.

According to Prospect Theory, the value function is a concave line for gains and a convex line for losses (Kahneman and Tversky, 1979).   The difference between a gain of \$10 and a gain

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of $20 appears greater than the difference between a gain of $110 and a gain of $120.   Similarly, the difference between a loss of $10 and a loss of $20 appears greater than the difference between a loss of $110 and a loss of $120.   Thus, it is reasonable to believe that the winner's curses should also follow the convex line for losses and the concave line for gains.   Similarly, the bidder's feeling of loss increases convexly with the extra cost of the product, and the bidder's feeling of gain increases concavely with the extra savings.   Figure 1 illustrates our proposed shapes of the winner's regrets.   It should be noted that the x-axis in the figure is the price difference ratio and a larger value on the x-axis indicates an unwise bid which may cause some monetary loss.   The price difference ratio is taken before discussing its relationship with the corresponding feeling of regrets because the absolute difference of $5 from the final bid price and the reasonable price may evoke different levels of regret in an auction of a $10 T-shirt versus a $100 suit.   Taking the price difference ratio is to come out a comparable price unit for various products on auction.   The y-axis is the regret level, which is a negative feeling and defined here as the opposite of positive "value" perception by Kahneman and Tversky (1979).   In Figure 1 for the winner, the net positive value on the x-axis represents that the end price is higher than the estimated reasonable price, which in turn means an unwise overbid.   Thus, when the value of this price gap is positive, the winner loses in monetary terms.   Based on Prospect Theory, the rate of increase of the winner's regret level should diminish when the magnitude of the price difference increases.   The nonlinear curve in Figure 1 is then similar to an upside-down and right-side-left mirror impression of Prospect Theory in both the x and y-axis.

H2: The marginal value of the winner's regret level (i.e., the winner's curse) decreases when the magnitude of the price difference between the end price and the estimated reasonable price increases.

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Situational Factors

Many researchers have proposed some situational factors that influence the attitude and behavior of consumers in an on-line auction.   Among these situational factors the degree of competition which is closely related to the number of bidders (Varaiya, 1988) and the desire toward the bid (Boatler, 1978; Dumas et al., 2005) are two major factors that impact the magnitude of bidders' behaviors.   The increase of competition and/or desire toward the bid may result in irrational bidding decisions, for example, higher bidding price (Boatler, 1978; Dumas et al., 2005).

When the number of bidders increases, the participants of the auction perceive stronger threats of losing the bid.   Therefore, they tend to raise the price during the bid, and the auction would have a higher probability of success and with a higher end price (Hansen 1985; Vincent 1995; Wilcox 2000).   In a situation with stronger competition, the bidders are likely to overestimate the value of the item (Capen et al., 1971) since "many bidders" acts as a sign for the higher quality of the item.   Therefore, Thaler (1992) suggested that the bidder should take into consideration the presence of other bidders and the information revealed from their bidding in order to avoid the winner's curse.   However, it is difficult to stay calm because the increasing number of bidders easily leads to the perception that the competition is becoming intense.   It appears especially true with online auctions that more bidders can be easily taken as the proxy of the quality of the object, despite the fact that the auctioned item online cannot be examined and usually has an ambiguous value.   Intense competition can lure the bidders into being more

involved and bid aggressively to win the object (Ariely and Simonson, 2003).   Therefore, the winner is likely to overbid and experience subsequent regret after the closure of the bid when there were more bidders involved.

When a bidder wants the auctioned item badly and is very worry about if he/she can win the bid, his/her bidding decision may be biased by this anxiety due to the desire toward the item and the uncertainty about bidding result.   The uncertainty makes it hard for the bidder to estimate the proper price to offer during the auction, then very likely results in a bipolar reaction, either the bidder heavily overestimates or strongly underestimates the value of the item.   Wang and Zender (1998) showed that risk-averse investors shaded their bids more when there was a greater uncertainty in the absence of private information.   On the other hand, if a bidder desires a product deeply, it is hard for the bidder to evaluate the true value of it rationally.   In this case, both uncertainty and unsatisfied desire urge the bidder to overestimate the value of the item and sink into the winner's curse.

This research employs two studies to probe the regret feeling of winners.   The first study is a virtual auction experiment to reveal the major concerns of this paper, and the second study uses the real data on the auction website to demonstrate the external validity.

STUDY 1

METHOD

Experimental Design and Procedure

This study conducted a quasi-experimental design in a real e-auction web site, Yahoo!

Auction.   In order words, we used an existing e-auction web site to run the experiment to imitate the true e-auction environment.   Participants consisted of 228 college students from three basic management courses.   The participants were encouraged to practice bidding on a trial item prior to the experiment to make sure that they were familiar with the interface before the formal experiment started.

In addition, since this is still an experiment and the participants could not actually acquire a product at the end, this study employed a reward mechanism such that the winners of each bid could receive a prize to encourage bidding as a real auction.   In other words, the attraction for all bidders was the prize rather than the auctioned items.   The winner of each bid was scored based on the difference between the final price and the market price.   The bidder could only be ranked if he/she won the bid and offered a final price lower than the market price.   The top five "smartest" bidders won a cash coupon worth from $6 to $30.   This mechanism ensured that bidders did their best to participate in the auction without the influence of product preferences.

The auctioned products included a cell phone, a digital camera, an electronic dictionary, an MP3 player, and a USB flash driver—products with which all the college students were familiar. The market price range of these items was wide, ranging from $10 to $300.   Four participants were randomly assigned to one auction.   The mission of participants was to win the assigned product with a lower-than-market price.

Each experiment session had at least five auctions ongoing simultaneously, which meant 20 bidders participated in at the same time.   The participants arrived at a computer lab at the assigned time and were asked to login to the website where the auctioned items were already all set.   The seats in the lab were randomly arranged so that the bidders did not know who the competing bidders were or where they sat.

Before the bidding game started, the participants were first asked to estimate the reasonable price of the target item.   Each auction lasted for four minutes for participants to bid the item. After the bidding game, the experimenters stopped the bidding and announced whose final bidding price was the highest and the actual market price.   Then, the participants were asked to fill out a questionnaire about their attitudes toward their bids, the regret level, number of bidders, and the participant's background information.

Every four of the 228 participants bid on one item, so there were 57 auctions, which generated 57 winners after the experiment.   In the screening question that "In your opinions, how many people want to win the bid," 9 records providing answers larger than 4 were deleted. It might signal that the participants did not fully understand the rule of the bidding game or the interface because the actually number of bidders were observable on the screen.   Consequently, the final valid sample size was 48.

RESULT

The price difference is defined as the ratio of the price gap to the estimated reasonable price. The average ratio is -0.007 (SD=0.43) with a range from -0.87 to 1.45; and 47.92% of the price differences are less than zero which means these winners overbid and their estimated reasonable price is lower than the end price.

The winner's range of regret is from 1.25 to 4.5, and the average regret level is 3.13 (SD =0.80) out of a 7-point scale.   The value close to 1 would imply "not regret at all" and near 7 would be "very regret."   However, since the neutral level is 4, winners on average do not feel too sorry about the auctions.

A multiple regression model is applied to examine the determinants of the winner's curse.

To illustrate the nonlinear relationship between the regret level and the price difference between the end price and the reasonable price, both square and cube terms of the price difference are added in the model to reflect a cumulative effect and an hypothesized S curve in Figure 1.   The dependent variable is the winner's regret level, and the independent variables are price difference, the square of price difference, the cube of price difference.   Because the past experience of auctions might relate to the bidder's regret level, the hours of using Yahoo! auction per day was controlled variables in the models.   The model is significant at the α=0.01 level with F=6.83.

As shown in Table 1, when the end price is higher than the estimated reasonable price, the winner is more regretful.   Thus, hypothesis 1 is supported.   The winner's regret level increases as the difference between the estimated reasonable price and the end price increases (β=1.57, t=4.36, p<0.01).   In addition, hypothesis 2 states that the marginal value of the winner's curse decreases as the difference between the end price and the estimated reasonable price increases. The results shows that the square of the price difference ratio increases, the regret level also increases (β=1.33, t=2.84, p<0.01).   Furthermore, the significance of the cube of the price difference ratio (β=-1.51, t=-3.19, p<0.01) and the negative coefficient indicate that the shape of the regret function is like an S, which is steep in the middle and flat at the extremes.   Therefore, the larger the price gap is, the greater the regret, and there is a negatively accelerative accumulation rate.   Both hypothesis 1 and 2 are supported.

Insert Table 1 here

STUDY 2

METHOD

Real bidders on the Yahoo! Auction were the sampling frame of this phase. Data were collected from two resources: a survey after the auction was finished to collect bidders' regret levels, attitudes, and original estimated reasonable price directly; the record of corresponding bids to trace all the public information about the auction. All of the bidding behavioral outcomes were obtained from the database of the e-auction website and re-coded by experimenters.

Because the purpose of this study is concerned with mainly the auction price and the regret, the item for bid is not a focal consideration. As a result, almost all the items were accepted in this study. The criteria for an eligible auction were: 1) the closing time was between 10:00 a.m. on February 25th and 1:00 a.m. on March 1st, 2005; 2) the items were not tagged with a "Buy Now" price which sent out a strong signal of the ideal price from the seller; 3) real estates, automobiles, motorcycles, and items related to stars or idols were not included, due to the possible bias from the extremely high price of the first three categories and unnecessary external influence in the last category; 4) an auction with multiple same items was excluded since it could be sold by a professional seller; and 5) a valid record must have more than one bidder.

Questionnaire Design

An electronic questionnaire was designed to collect the bidders' attitudes toward their bids right after the auctions were closed. The first section of the questionnaire was about the general attitudes toward the bid, including satisfaction, desire for the goods, and worry about the possibility of failure. The second part was the measurement of the regret level. The third section asked respondents to estimate the reasonable price and memorize how many sincere bidders participated in the auction. The last section was about the respondent's background

information, including demographic profiles and experiences with the Internet and e-auction.

Record of Bid

Other than the survey, the history and other related information of each bid were also recorded during the bid and after the bid closed.   The recorded information includes the item on auction, new or used, with or without a photo, with a reserved price or not, the sellers' and buyers' ids, the seller's positive or negative rating, the total number of participants, the total bids, the starting price, and the ending price.

Process of Data Collection

All eligible auctions were identified before the set closing time.   Right after the closing time of each auction, all necessary information about the auction was recorded and the email survey invitation was sent out to the winner and the loser with second high price.   The web-survey started from 10:00 a.m. on February 25th and closed at 5:00 p.m. on March 1st. During this time period, the bidders who received the email invitation could link to the website and fill out the questionnaire.   Valid respondents could receive a coupon of a chained convenient store with a face value of US \$6 as the compensation for their participation.

During the five days, 1089 auctions were recorded and 2066 invitation emails were sent out. After cross checking the respondents' ids with the auction participants' ids and deleting incomplete responses, 330 valid samples were kept out of the 455 respondents.   Among the 330 samples, 192 were winners.   Next, 8 outliers whose price differences were greater than triple the standard deviation were deleted.   The final valid sample size was then 184 winners.

Definition of Variables

The dependent variable of this study was the winner's curse.   The variable was directly measured by the regret levels of the winner.   Compared to previous research which measured the curse in monetary amounts, the current study suggests that measuring the psychological feeling of regret can probe the winner's curse more thoroughly.

The measurement of regret was adapted from two previous scales used for the regret of the purchase experience (Creyer and Ross 1999; Inman and Zeelenberg 2002).   These two scales were combined and revised to fit the bidding decisions.   After deleting overlapping items in these two scales, 10 items remained on the questionnaire as a set to measure the regrets that respondents had over their bidding prices and bidding decisions.   The final scale included the regret over the bidding price, the action, and the decision on a 7-point Likert-type scale, 1 as "strongly disagree" to 7 as "strongly agree."   The Cronbach's alpha for the reliability of this scale was 0.81.

The major independent variables were the price differences, the number of bidders, and the degree of desire.   The price difference was defined as the difference between the end price of a bid and the estimated reasonable price divided by the estimated reasonable price.   The information of the end price and the number of bidders were gathered directly from the auction record on Yahoo!   The estimated reasonable price and the degree of desire were collected through the survey.

The degree of the desire covered both the bidder's attitude as to how worried and unsure about the bid result was and how great his/her desire was for winning the auction before the bid was closed.   It was measured on two 5-point scales, where 1 was "not very worried/not very desired" and 5 was "very worried/very desired."   The uncertainty about the bidding result was treated as the weight of the desire based on the rationale in the hypothesis.   These two measures

were also collected through the survey.   The other controlled variables in the model were the starting price, gender, age, educational level, the hours of using Yahoo auction per day, and if the item was new or used.   These were exogenous variables in the models to control the variance because they might relate to the bidder's regret level.

RESULTS

Demographic Profiles of the Respondents and the Eligible Auctions

Among the 313 valid respondents, there were slightly more females than males; 53% of the bidders were females.   14% of the respondents were under 19 years old, 54% of the respondents were 20-29 years old, 25 %of the respondents were 30-39 years old, and only 7% of the respondents were older than 40.   The education levels ranged from high school to graduate school.   25% of the respondents had a high school level of education.   19% of the respondents indicated attainment of a college degree: 49% with a bachelor's degree, 8% with a master's or Ph.D.   The average time that the respondents spent on Yahoo auction per day was 2.62 hours.

The most popular auction items were 3C products, female clothing, and female accessories. More than half (55%) of the auction items were used.   The price range of these items was wide, ranging from NT $11 to $11,000.   The average number of bidders for each auction was 6.26 (SD=3.83).

The price difference is defined as the ratio of the price gap to the estimated reasonable price. The average ratio is -0.08 (SD=0.32) for the winner's group.   The range of price difference ratio in the winner's group is from -0.92 to 1.06; and 57.07% of the price differences are less than zero which means these winners estimate the reasonable price to be lower than the end price..

The winner's range of regret is from 1.18 to 5.96, and the average regret level is 3.32 (SD =0.86) out of a 7-point scale. The value close to 1 would imply "not regret at all" and near 7 would be "very regret." However, since the neutral level is 4, winners and losers on average do not feel too sorry about the auctions. The winner's curse does not necessary appear, but only occurs on part of bidders.

<p style="text-align:center">Winner's Curse</p>

A general linear model is applied to examine the determinants of the winner's curse. To illustrate the nonlinear relationship between the regret level and the price difference between the end price and the reasonable price, both square and cube terms of the price difference are added in the model to reflect a cumulative effect and an hypothesized S curve in Figure 1. The dependent variable is the winner's regret level, and the independent variables are price difference, the square of price difference, the cube of price difference, the degree of desire, and the number of bidders. The model is significant at the $\alpha=0.01$ level with F=2.87.

Hypothesis 1 states that the winner's regret level increases as the difference between the estimated reasonable price and the end price increases. As shown in Table 1, when the end price is higher than the estimated reasonable price, the winner is more likely to feel regretful ($\beta=1.57$, F=20.99, $p<0.01$). In addition, hypothesis 2 indicates that the marginal value of the winner's curse decreases as the difference between the end price and the estimated reasonable price increases. The result shows that when the square of the price difference ratio increases, the regret level also increases ($\beta=0.67$, F=4.44, p=0.04); and the significance of the cube of the price difference ratio ($\beta=-1.48$, F=7.29, $p<0.01$). Therefore, the result is similar to the Study 1.

In the controlled variable, this study found that the winner's regret level does not increases

as the number of bidders increases, which is not significant ($F=0.00$, $p>0.05$).   However, the winner's regret is positively related to the level of desire ($F=5.64$, $p=0.02$).   The degree of desire appears to influence the level of the winner's curse.   When the degree of desire is higher, the winner is more regretful.

Insert Table 2 here

DISCUSSION AND IMPLICATIONS

This research investigated the factors that influence the winner's curse by two studies. Study 1 adopted an experiment method by using virtue auction web site, while study 2 adopted a quasi-experiment method to explore the real response of bidders of auction web site.

In both studies, instead of using the monetary loss as a proxy of the curse, as in previous studies, we directly measured the perceived regret levels to estimate the psychological state of the winner's curses.   The monetary loss became one of the causes of the bidder's curse, and then the relationship between the price gap and the feeling of the extent of the curse could be properly revealed.

The results of two studies both suggest that the primary factor that impacts the winner's curse is the price differences between the end prices and their estimated reasonable prices.   For the winners who are in the real bidding situation, the desire toward the auctioned item is also critical to the degree of the curse.

The primary contributor to the winner's curse is the price difference between the estimated reasonable price and the end price.   The results show that the level of regret is not linearly related to the price difference, which has been overlooked in economic theory on auctions.   This

study suggests that the level of regret increases at an accelerative rate as the difference between the end price and the estimated reasonable price increases. It is consistent with Prospect Theory which posits that consumers respond more to the perceived changes than to the absolute monetary levels.

The insight gained from this finding with respect to the winner's curse is that the price gap or monetary loss can be a proxy for the winner's curse. However, it should not be simply treated as a linear term as has been done in previous auction studies which are based on an economic viewpoint. According to our findings, the nonlinear relationship between the monetary loss and the regret should be considered while using it as the proxy for the winner's curse. In this research, not as the previous research, the competition of the bid is not related to the winners' curse, the reason may be that since the winners have won the bid and own the item, they don't care how many people were in the game. The primary concern or source of their regrets after winning is that they might have overpaid for the item.

The results of this study also indicate that in the real world, the winner's curse is impacted by his/her desire toward the auctioned item. This finding is consistent with the previous research on the winners (e.g., Bazerman and Samuelson 1983; Boatler, 1978; Dumas et al., 2005; Nyborg, Rydqvist, and Sundaresan 2002). It is also worth noticing that this research addresses a broader scope of desire, including the degree of desire for the product under the uncertainty about the bidding result; but previous research aimed at the desire for the item itself only (e.g., Boatler, 1978; Dumas et al., 2005).

From the above, price difference and desire level are the major factors that impact a winner's regret. Winner's regret is very much like a curse since the winner has to bid higher than all other losers; so the winner realizes that the value of the auction item is lower in other

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bidders' minds after bidding has concluded. This may also explain the bidding pattern of "snipers." Snipers don't make any offers until the last minute. They then bid the price only slightly higher than the second highest price to win the item just seconds before the auction is closed. Using this tactic, snipers can reduce their winner's curse because the price difference is minimal. In order to reduce the winner's curse, consumers should also keep their reasonable price in mind and bid carefully. Consumers may also want to search for more information on a product in order to reduce the uncertainty of the product's quality, especially for second-hand products, such as used computers or used brand accessories. If the quality and price are estimated accurately, bidders should be able to think rationally and will not have too much regret.

The two studies of this research are complementary to each other. For the experimental design, the hypotheses were examined in the lab, and the confounding factors about the auction were controlled; therefore, the internal validity is good while. Of course, an experimental design may provide an unreal environment for participants and lose the external validity required. Hence, the real situation study met this deficit and increased the external validity. Actually, a real situation study may face the problem about that the feeling of the curse, or regret, is not expected to hold too long. According to Balance Theory, bidders have to reduce their post-auction dissonance to reach a new balanced status. This adjustment starts right after the auction closes for winners. The research process of study 2 was designed to distribute the invitation emails to the bidders immediately after the auction was closed while the bidders would hopefully still be online. However, the bidders might not have responded instantaneously. Study 1 can solve this deficit, the bidders in a lab can report their feelings during and right after the auction so that more prompt reactions can be observed.

In the past research on the bidder's curse, the focus is often on the monetary loss without

discussing bidders' psychological states.   This research tested the hypotheses both in the experiment design and real bidding situation and provides another view so that both economic and psychological perspectives of the curses will be fully investigated in the future.

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FIGURE 1

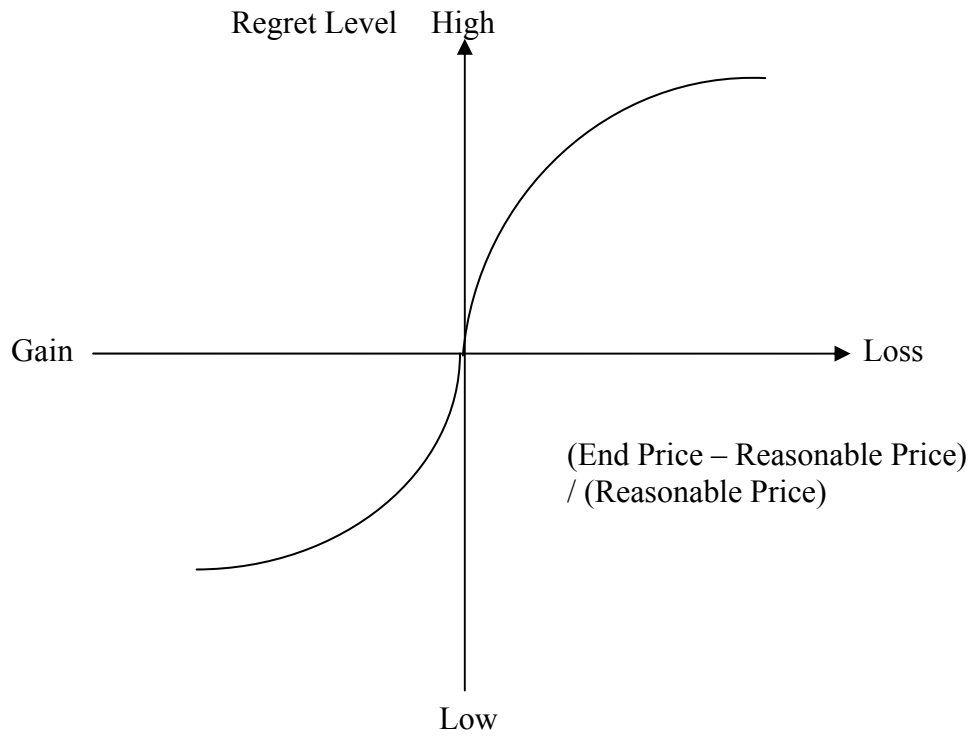*The Proposed Winner's Curse with the Price Difference*

Regret Level   High

Gain

Loss

(End Price – Reasonable Price)
/ (Reasonable Price)

Low

TABLE 1

The Factors of the Winner's Curse

Source	Hypothesized Direction	Coefficient (std err)	t Value
Intercept		3.29 (0.26)	12.72 **
Price Difference[a] Ratio	+	1.65 (0.38)	4.36 **
(Price Difference Ratio)^2	+	1.33 (0.47)	2.84 *
(Price Difference Ratio)^3	-	-1.51 (0.47)	-3.19 **
Hours of using Yahoo auction		-0.15 (0.11)	-1.36

[a] The price difference for the winner's curse is the end price of the auction minus the winner's estimated reasonable price.
[b] Sample size is equal to 48.
* denotes the $\alpha=0.05$ significant level and ** denotes the $\alpha=0.01$ significant level.

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TABLE 2

The Factors of the Winner's Curse

Source	Hypothesized Direction	Coefficient (std err)	DF	F Value
Price Difference[a] Ratio	+	1.57 (0.34)	1	20.99 **
(Price Difference Ratio)^2	+	0.67 (0.32)	1	4.44 *
(Price Difference Ratio)^3	-	-1.48 (0.55)	1	7.29 **
Desire	+	0.03 (0.01)	1	5.64 *
Number of bidders	+	0.00 (0.02)	1	0.00
Starting price		-0.00 (0.00)	1	0.86
New/used item			1	0.38
Used (versus New)		0.08 (0.13)		
Gender			1	0.27
Female (versus male)		0.07 (0.13)		
Age (versus 50 to 59 Years)			4	1.45
Younger than 19 years		0.20 (0.46)		
20 to 29 years		0.57 (0.43)		
30 to 39 years		0.49 (0.44)		
40 to 49 years		0.17 (0.46)		
Educational level (versus Junior high school)			4	3.00 *
Master or Ph. D.		-1.13 (0.36)		
University		-0.95 (0.30)		
College		-0.79 (0.33)		
Senior high school		-0.82 (0.29)		
Hours of using Yahoo auction			4	1.24
Model			20	2.87**

[a] The price difference for the winner's curse is the end price of the auction minus the winner's estimated reasonable price.
[b] Sample size is equal to 184.
* denotes the $\alpha=0.05$ significant level and ** denotes the $\alpha=0.01$ significant level.