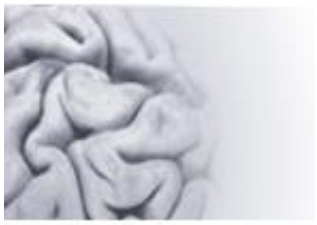

Social Comparison and Overbidding at Auctions:

Loss Aversion of Superiority as an Explanation for Overbidding Behavior

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Abstract

Overbidding is an irrational economic behavior repeatedly observed at auctions, for which two classic explanations have been proposed: loss aversion and joy of winning. The current study attempts to explain overbidding from a social comparison perspective, specifically to answer the question: Does the prospect of social comparison increase overbidding at auctions? The results partially confirmed the main hypothesis of an association between relative standing feedback and overbidding and suggested a role of loss aversion that arises from social comparison concern. Results did not support the other two hypotheses: that participants who received first-place ranking feedback would overbid more than those who received other feedback and that desire to win would influence overbidding. The practical implication is that auctioneers should provide relative standing feedback to bidders in ongoing auctions to increase their bids and, eventually, auctioneers' revenue. Conversely, bidders should be careful when receiving relative standing feedback, especially moderate ranking feedback.

Keywords: overbidding at auctions, social comparison, loss aversion

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Auctions are a popular and universal method to acquire goods, more so when the internet made online auctions possible. The success of online auctions has attracted researchers to study consumer behaviors at auctions (Ariely & Simonson, 2003). Among the consumer behaviors studied at auctions, one interesting and puzzling behavior called *overbidding* has captured the attention of behavioral economists and social psychologists. Overbidding is repeatedly found in experimental auctions although it is economically irrational (Cox, Roberson, & Smith, 1982). It happens when bidders bid above the value of the good, surpassing the risk-neutral Nash equilibrium bid. Rationally, no one would bid US$10 for a good that has US$8 value, but that behavior example is what researchers have observed in experimental and even real auctions (Wolf, Arkes, & Muhanna, 2005) over time.

Two classical perspectives have emerged to explain the existence of overbidding at auctions: loss aversion and joy of winning (Delgado, Schotter, Ozbay, & Phelps, 2008, p. 1849). Studies with different methods have produced support for each perspective (Astor, Adam, Jähnig, & Seifert, 2013). The first reason for overbidding is loss aversion, which occurs when someone weighs loss substantially more than gains (Kahneman & Tversky, 1979, 1984). Loss aversion in auction contexts manifests in a pseudo-endowment effect (Ariely & Simonson, 2003; Heyman, Orhun, & Ariely, 2004; Wolf, Arkes, & Muhanna, 2005). This effect occurs when someone places the highest bid in an ongoing auction and develops a feeling of owning the auctioned good, but then other bidders bid higher, creating a feeling of losing the auctioned good. Overbidding results in an attempt to reclaim the "lost" auctioned good (Ariely & Simonson, 2003). The second perspective to explain overbidding at auctions is the joy of

winning. This occurs when someone expects a good feeling from winning an auction and then overbids to obtain that good feeling (Astor et al., 2013). However, when the auction is still going, no one has won the auctioned good. Thus, the expected joy of winning is a more appropriate term (Astor et al., 2013).

Recent research using functional magnetic resonance imaging has offered another explanation for overbidding behavior. Delgado et al. (2008) claimed that the fear of losing the social competition is a probable cause of overbidding at auctions, independent of pure loss aversion. In their research, these authors found no support for the joy of winning to drive overbidding at auctions. However, Lee and Harris (2013) argue in response to Delgado et al.'s (2008) findings that social loss aversion may emerge because of a procedural effect. At the beginning of Delgado et al.'s (2008) study, the experimenters told participants that they would reveal the list of top players at the end of the auctions. This procedure could activate impression management concern among bidders. Bidders want to be on the list of top players because it means that they are more competent in comparison to other players who are not on the list. This concern is related to social comparison theory, in which someone wants to maintain superiority coming from a unidirectional drive upward (Festinger, 1954).

To date, research that examines social comparison as a possible driver of overbidding at auctions is lacking. Therefore, studying overbidding at auctions from the social comparison perspective is important. For this reason, the current study attempts to examine the prospect of social comparison to increase overbidding at auctions. The results from examination of overbidding at auctions from a social comparison perspective may offer new insights for researchers in this area of study.

Social Comparison

Festinger was the first to propose social comparison theory systematically in 1954 (Suls & Wheeler, 2012). In general, this theory posits that a person tends to evaluate his or her opinion and ability by comparing himself or herself with others who are similar when there are no objective evaluation criteria available. Because bidding behavior is related more to ability than to opinion, I will limit the social comparison discussion only to the comparison of ability.

The ability comparison is a spontaneous, unintentional, and effortless process as a reaction to other's performance (Gilbert, Giesler, & Morris, 1995). Goethal and Darley (1977) explained that when someone wants to evaluate his or her ability, he or she has to compare it with another who has similar attributes. Someone cannot compare his or her ability directly with the other's ability; rather, he or she can compare only the manifestation of that ability, which is his or her observable performance, with the other's observable performance. From that observable performance, the individual can make inferences about the other's underlying ability. However, many things influence observable performance, including age, gender, and luck. Therefore, it is important to compare someone's observable performance with the observable performance of another who has similar attributes (e.g., age and gender) to evaluate the first person's ability accurately.

Furthermore, the ability comparison process does not rely only on the other's similar attribute as a subject for comparison. A person also has a tendency to compare with the other's similar performance, as explained by Suls, Martin, and Wheeler (2002). These authors summarized the process of ability comparison in the proxy model that proposes that other people with similar performance (and similar attributes) in a previous task act as a proxy in answering, "Can I do a particular task?" This proxy is useful when someone is facing an unfamiliar task that

a person with similar performance has already faced. Using a proxy, someone can predict his or her level of success with the unfamiliar task.

Competitive Behavior

Recently, some researchers began to examine the consequences of social comparison for competitive behavior (Garcia, Tor, & Schiff, 2013). Garcia et al. (2013) argue that Festinger's social comparison theory has a strong link with competitive behavior, a link expressed in his fourth hypothesis (Festinger, 1954, p. 124), "[t]here is unidirectional drive upward in the case of abilities which is largely absent in opinions." This hypothesis was followed by an explanation that people want to be better in comparison to others to protect their superiority (Festinger, 1954; Garcia et al., 2013). However, people want to be only slightly better to fit with a desire to be similar (Festinger, 1954; Suls & Wheeler, 2012; Wheeler, 1966). Therefore, a competitive behavior is the manifestation of social comparison (Garcia et al., 2013).

Someone can compare oneself to another person with a higher performance, and competitive behavior emerges in this upward comparison (Hoffman, Festinger, & Lawrence, 1954). In the same fashion, when someone feels threatened by some other with a lower performance, competitive behavior would also emerge (Garcia, Tor, & Gonzalez, 2006). Realizing that both upward and downward comparison mechanisms work in competitive behavior, Garcia et al. (2013, p. 635) coined the concept of social comparison concern, "the desire to achieve or maintain a superior relative position." This social comparison concern is the bridge to competitive behavior from influential individual and situational factors (Garcia et al., 2013).

Four individual factors influence social comparison concern as follows (Garcia et al., 2013): (a) relevance of performance dimension (e.g., tennis performance is more relevant to

tennis athletes than speed reading ability); (b) similarity to the other being compared (e.g., similar performance or attributes); (c) closeness to the other being compared (e.g., the closer the relationship, the more comparison concern and more competitive); and (d) individual differences (e.g., different personalities). There are also four objective situational factors that influence social comparison concern (Garcia et al., 2013), as follows: (a) incentive structure (e.g., a zero-sum situation increases someone's comparison concern and competitiveness); (b) proximity to a meaningful standard (e.g., the closer someone is to the first-place ranking, the more comparison concern and more competitive he or she is); (c) competitor number (e.g., the smaller the number of competitors, the more comparison concern and more competitive); and (d) social category fault lines (e.g., comparison across social category fault lines increases comparison concern and competitiveness relative to within social category fault lines).

Furthermore, Malhotra (2010, p. 139) differentiated the motivation to compete and the desire to win. He described that competitive motivation is "[a] desire to pursue scarce and contested assets" while the desire to win is "a preference for maximizing relative payoffs, even at personal cost." He added, "[t]he desire to win requires competitive motivation, but competitive motivation does not require a desire to 'win.'" This argument shows that the desire to win is an advanced form of competitive motivation that may arise or not arise, depending on some conditions. However, competitive motivation and desire to win are inclusive in Garcia et al.'s (2013) model – together with unwillingness to maximize joint gains, harmful behavior, positional concern, and other forms of competitive behavior. Thus, the desire to win is a more specific component of general competitive behavior. Logically, individual and situational factors of general competitive behavior in Garcia et al.'s (2013) model apply to this particular competitive behavior form in the same fashion.

Ku, Malhotra, and Murnighan (2005), in their competitive arousal model of decision-making, specifically postulated some situational conditions that can increase the desire to win. Those conditions are social facilitation, rivalry, time pressure, and/or the uniqueness of being first that can fuel arousal and then impair decision-making. Competitive arousal is what shifts competitive motivation to a desire to win (Malhotra, 2010). This model is important because it can explain how social decision-making, which produces irrational economic decision and behavior, can be impaired. Although other specific forms of competitive behavior may also possibly impair decision-making, only desire to win has a more or less clear explanation so far.

Social Comparison and Overbidding at Auctions

In the auctions context, a relative standing feedback (i.e., a list of bidder rankings) serves as an indication of someone's bidding ability compared to others' bidding ability. This relative standing feedback would induce social comparison concern, either via upward comparison or via downward comparison. Then, this social comparison concern would lead bidders to do the necessary action in the auctions, specifically doing more overbidding, to achieve or protect superiority from other bidders. In other words, the availability of social feedback in the form of relative standing feedback may increase overbidding at auctions. Therefore, I postulated a hypothesis as the following:

Hypothesis 1: Participants who receive relative standing feedback will overbid more than those who do not receive relative standing feedback.

As discussed earlier, proximity to a standard is one of the situational factors that influence the social comparison concern that increases competitive behavior. The implication of this particular situational factor is that bidders' competitive behavior would increase if they received first-place ranking feedback, compared to other ranking feedback. Consequently,

increased competitive behavior would be followed by more overbidding. Therefore, I postulated a hypothesis as the following:

Hypothesis 2: Participants who receive first-place ranking feedback will overbid more than those who receive other place ranking feedback.

From the argument earlier, factors that influence general competitive behavior (Garcia et al., 2013) may apply to desire to win, including the individual differences factor, which could lead to variation in the degree of desire to win. These differences would then influence the degree of overbidding, and specifically, overbidding behavior would be higher among individuals with a high desire to win and lower among individuals with a low desire to win. Therefore, I postulated a hypothesis as the following:

Hypothesis 3: Desire to win influences overbidding at auctions, in which participants who have a high desire to win will overbid more than those who have a low desire to win.

Method

This study used an online experiment with a pretest–posttest control group design, a classic true experimental design that randomizes participants to either a control group or one of the experimental groups (Creswell, 1994). Participants in all groups were measured before and after treatment, but only participants in the experimental groups received treatment of relative standing feedback.

Participants and Materials

Participants were recruited using Amazon's Mechanical Turk to participate in the online experiment developed with Qualtrics. The minimum age of participants was 18 years old. A total of 342 participants started the experiment, but 39 did not finish or did not qualify because they did not pass the instruction understanding test. Sixty-five participants were eliminated from the

analyses because their bidding values' standard deviation was very low (< .10). This low standard deviation indicated that they did not change their bids during the auctions, which suggested that they did not properly attend to the task and simply pursued the financial reward from the experiment. Therefore, the data of 238 participants were used in this study.

The mean age of participants was 33.8 years, and 46.6% were female. Participant ethnicities were mostly White (74.8%), followed by Asian (11.3%), Hispanic or Latino (5%), Black or African American (3.8%), American Indian or Native Alaskan (.8%), Native Hawaiian or Other Pacific Islander (.8%), and other ethnicities (3.4%). Most participants had some college education (38.2%) or a bachelor's degree (38.7%), followed by high school (12.6%), master's degree (6.7%), advance graduate work or Ph.D. (2.9%), did not complete high school (.4%), and other educational backgrounds (.4%).

Variables and Measurements

There were three variables in this study. The independent variable was the relative standing feedback, in which participants were randomly assigned to one of twelve ($3 \times 2 \times 2$) conditions. The details for those 12 conditions were three types of feedback (extreme feedback [first-place or tenth-place ranking], moderate feedback [fourth-place or seventh-place ranking], no-feedback), two outcomes (more win outcomes [6 wins, 3 losses], more loss outcomes [3 wins, 6 losses]), and two first bids (won in the first bid, lost in the first bid). See Table 1, Table 2, and Table 3 for the number of participants in each condition.

The rise of overbidding was the dependent variable, measured by the difference between the average Nash bidding values (bidding value minus the Nash equilibrium value) from two auction game sets, after and before treatment. Thus, overbidding occurred when the difference between Nash bidding values from two auction game sets was above zero. The more deviated

from zero in a positive direction, the more overbidding there was. Note that an optimal strategy for these auctions would be to spread the bidding values ranging from US$5.00 to US$10.00 in more or less the same numbers in those nine consecutive auctions. Hence, the Nash equilibrium value was US$7.50.

The desire to win was the moderating variable, which was measured with two questions ($\alpha = .66$, adapted from Malhotra, 2010) at the beginning of the study, together with demographic data questions. Those desire to win questions were "*How important is winning (beating other players) to you in this auctions game?*" and "*How much do you want to win in this auctions game?*" with a seven-point Likert scale (1 = *Not at All*; 7 = *Very Much*). I then classified participants' desire to win categories by dividing them into two groups (high and low) by the median split.

Procedures and Manipulations

Participants who met the criteria and agreed to take the task in Amazon's Mechanical Turk received a link to the online experiment. In the beginning, they found informed consent and a welcome message page, and then they filled in the demographic data questions and two questions measuring the desire to win. After that, they filled in a username and chose one out of six neutral avatars (taken from Oosterhof & Todorov, 2008) before playing the auctions.

Participants then were presented with a general instruction page of how to play the auctions. The general instructions stated that for each auction against each player in nine consecutive auctions, participants needed to bid (rounded to two decimal places, e.g., US$7.89) on a fictitious good that had a random secret value ranging from US$5.00 to US$10.00, which was unknown to players. The minimum bidding value was US$5.00 and the maximum bidding value was US$10.00. Win or loss status was revealed after each game against each player, in

which a player could win each game if they bid higher than their opponent did. However, the results were predetermined, so no matter how much they bid, they received the same results based on their experimental condition. Participants in the experimental groups were told that they would receive relative standing feedback while participants in the control groups had no information about the relative standing feedback and did not see it. In addition, to create a more realistic auction sense, participants were told that there would be a US$5.00 bonus, which was randomly picked up by computer from one bidding round, and would receive the bonus if they were winning against the opponent. However, if they bid more than the secret random value in that round, the amount of dollars they overbid would be subtracted from the US$5.00 bonus (e.g., if a bidder won against an opponent by bidding US$9.00, but the secret value was set to US$6.00, the bonus would be US$5.00 – US$3.00 = US$2.00). Note that this bonus rule was not real and that in the end, all participants had the same 10% chance of winning US$5.00 bonus.

Participants then were presented with a trial page for practice and afterwards an instruction understanding test page with four questions presented to ensure that they understood the game. The questions were "*What is the range of the value of the fictitious good? a) US$5.00–10.00* or *b) US$10.00–15.00*"; "*Against how many other players do you have to bid? a) 6* or *b) 9*"; "*You will win a bid and the full US$5.00 bonus when: a) Your bid is HIGHER than your opponent's bid, and not above the secret value* or *b) Your bid is LOWER than your opponent's bid, and not above the secret value*"; and "*You will get US$5.00 bonus money when: a) Each time you win a bid against an opponent* or *b) You won the round that was randomly selected.*"

Afterwards, they were randomly assigned into one of the twelve conditions and played nine consecutive auctions against nine players (each game against one opponent) in the first set of auctions. They did not know that this was the first auctions set and that there would be another

auctions set. Participants then received relative standing feedback based on their group (except for control groups that received no-feedback). In this relative standing feedback, they saw a list of all players with their usernames and avatars, including their own username and avatar. They also saw their relative ranking with other players highlighted and win/loss status from each opponent to create a more realistic feeling of auctions and activate their social comparison concerns.

After the first set of auctions and relative standing feedback, all participants played another set of auctions against the same nine players with the same rules and conditions. In the end, they were thanked and debriefed. Finally, they were invited to play a bonus game, where they had a 10% chance of winning US$5.00.

Results

The first hypothesis to test was whether or not participants who received relative standing feedback would overbid more than those who did not receive relative standing feedback. A 3 × 2 × 2 (feedback type [extreme, moderate, no-feedback] × number of win/loss outcomes [more win outcomes, more loss outcomes] × first bid outcome [won the first bid, lost the first bid]) analysis of variance (ANOVA) on the rise of overbidding was performed to test this first hypothesis. The analysis revealed that there was a significant main effect of number of win/loss outcomes, $F(1, 237) = 12.10$, $p = .001$, $\eta^2 = .047$, where participants who received more loss outcomes ($M = .48$, $SD = .06$) overbid more than participants who received more win outcomes ($M = .17$, $SD = .06$). There was also a significant main effect of first bid outcome, $F(1, 237) = 6.42$, $p = .012$, $\eta^2 = .025$, in which participants who received a win outcome first were higher ($M = .44$, $SD = .06$) in the rise of overbidding than participants who received loss outcome first ($M = .21$, $SD = .06$). Finally, there was a significant interaction of number of win/loss outcomes

and first bid outcome, $F(1, 237) = 5.79$, $p = .017$, $\eta^2 = .022$, where participants who received more loss outcomes and received a win outcome in their first bid overbid most ($M = .70$, $SD = .08$) compared to the other groups (Table 4). Meanwhile, the main effect of feedback type, the interaction of feedback type and more loss outcomes, and the interaction of feedback type and first bid outcome were not significant.

Subsequent analyses were performed to test the first hypothesis further. Three (feedback type) one-sample t-tests were performed to test the rise of overbidding against zero. Note that the significance criterion was set to .017 to overcome a cumulative familywise error arising from multiple t-tests. The analyses revealed significant differences of the rise of overbidding against zero for participants in all feedback type groups. The rise of overbidding for participants in the moderate feedback group was the highest ($M = .43$, $SD = .60$, $t(82) = 6.44$, $p < .001$), followed by the rise of overbidding for participants in the extreme feedback group ($M = .35$, $SD = .86$, $t(75) = 3.54$, $p = .001$) and the no-feedback group ($M = .26$, $SD = .64$, $t(78) = 3.66$, $p < .001$). The results suggested that participants in all feedback type groups overbid but that participants in the moderate and extreme feedback groups overbid more than participants in the no-feedback group (Figure 1).

Furthermore, to check whether merely knowing that there would be a relative standing feedback would make participants in the experimental groups overbid or not, I performed three (feedback type) one-sample t-tests on the mean of Nash bidding values in the first set of auctions against zero. The extreme and moderate feedback groups were told that there would be a relative standing feedback at the end while the no-feedback group was not told about the relative standing feedback and received no relative standing feedback. Therefore, if there were any significant difference for participants in the extreme and moderate feedback groups and no

significant difference for participants in the no-feedback group, then merely knowing that there would be a relative standing feedback would make participants overbid. The analyses revealed that the mean of Nash bidding values in the first set against zero for participants in all feedback type groups was not significant (Table 5). Thus, merely knowing that there would be a relative standing feedback was not enough to trigger overbidding at auctions.

The 3 × 2 × 2 ANOVA analysis result had already revealed that participants who received more loss outcomes overbid more than participants who received more win outcomes. This finding indicated that if participants received a loss outcome in the previous bid, they would increase the tendency to overbid in the next bid. To test this notion, a paired-samples t-test was performed on the change in Nash bidding values (i.e., next Nash bidding value minus the previous Nash bidding value) between previous bid outcomes (win or loss). I averaged all changes in Nash bidding values with previous win outcomes and all changes in Nash bidding values with previous loss outcomes. The result revealed that when participants received a loss outcome in their previous bid (M = .16, SD = .40), they overbid more in their next bid compared to when participants received a win outcome in their previous bid (M = -.04, SD = .34), $t(237) = 4.56$, $p < .001$.

The four analyses performed above partially supported the first hypothesis. Particularly, participants in the moderate and extreme feedback groups overbid more than participants in the no-feedback group, although there were no significant differences between them. Participants overbid most if they received more loss outcomes and received a win outcome in the first bid. In addition, participants overbid more in their next bid when they received a loss outcome in the previous bid. However, merely knowing that there would be a relative standing feedback was not

enough to trigger overbidding behavior; rather, overbidding behavior occurred when participants received the relative standing feedback.

The second hypothesis was that participants who received the first-place ranking feedback would overbid more than those who received other place ranking feedback. To test this second hypothesis, an independent-samples t-test was performed on the rise of overbidding between participants in the first-place ranking feedback group and participants in the fourth-place ranking feedback group. I did not analyze other ranking feedback groups because only participants in the fourth-place ranking feedback group received a parallel number of win/loss outcomes (6 wins, 3 losses) with participants in the first-place ranking feedback group. The analysis revealed no significant difference on the rise of overbidding between participants in the two groups (Table 6). Therefore, the result suggested no statistical evidence to support the second hypothesis.

Finally, a 3 × 2 (feedback type [extreme, moderate, no-feedback] × desire to win [high, low]) ANOVA was performed to test the third hypothesis that the desire to win influences overbidding at auctions, so that participants who have a high desire to win would overbid more than those who have a low desire to win. There were 129 (54.2%) participants with a high desire to win, and 109 (45.8%) participants with a low desire to win. The analysis revealed no significant main effect of desire to win and no significant interaction of feedback type and desire to win on the rise of overbidding (Table 7). Hence, there was no statistical evidence to support the third hypothesis.

In addition, I analyzed whether or not the bidding value in the trial round could explain variance in the bidding values in the real auction game. The experimental design allowed participants to have a trial bid where participants could bid any bidding value between the

minimum and maximum values. This trial bidding value might predict participants' real bidding values because of the anchoring effect. To test this notion, I performed two regression analyses for trial bidding value to predict the mean of bidding values in the first auctions set and to predict the mean of bidding values in the second auctions set. Regression analysis for trial bidding value to predict the mean of bidding values in the first auctions set was significant: $F(1, 237) = 80.17$, $p < .001$, $\beta = .50$, $R^2 = .254$. Regression analysis for trial bidding values to predict the mean of bidding values in the second auctions set was also significant: $F(1, 237) = 24.98$, $p < .001$, $\beta = .31$, $R^2 = .096$. The results supported the notion that the trial bidding value could explain the variance in participants' bidding values, in which a large proportion of variance (25.4%) of bidding values mean in the first auctions set and a medium proportion of variance (9.6%) of bidding values mean in the second auctions set could be explained by the trial bidding value.

Discussion

The first hypothesis is partially supported in this study. The results demonstrated that participants who received relative standing (moderate and extreme) feedback overbid more than participants who did not receive relative standing feedback, although the difference was not significant. Specifically, overbidding occurred most among participants who received more loss outcomes and received a win outcome in their first bid. Finally, further analysis showed that participants overbid more in their next bid when they had received a loss outcome in the previous bid. However, overbidding behavior was triggered when participants received the relative standing feedback but not when they merely knew that they would receive a relative standing feedback. Therefore, it can be concluded that relative standing feedback is one of the drivers of overbidding at auctions.

Those findings show that when someone expects to receive a relative standing feedback, his or her overbidding behavior at auctions will increase, as Lee and Harris (2013) suspected. Someone's social comparison concern is aroused more when he or she expects to receive a relative standing feedback, and he or she therefore will overbid more at the auctions. Note that the expectation occurs not because of merely knowing that there will be a relative standing feedback but also because he or she already experienced the relative standing feedback. Thus, the relative standing feedback has to be salient to be able to trigger the overbidding behavior.

Furthermore, when someone receives a win outcome first, he or she wants to keep the score and protect his or her winning status by overbidding more, especially when receiving more loss outcomes. This condition is in line with Festinger's (1954) notion that people want to maintain superiority. It is also important to know that previous outcome influences the next bid, in which loss outcome makes participants overbid more than win outcome in the next bid. This phenomenon may arise from loss aversion of a winning status, in which participants receive a loss outcome in their previous outcome and will put more bidding value in their next bid to reclaim their pseudo-endowment of a win outcome (see Ariely & Simonson, 2003). This phenomenon probably occurs to reclaim participants' pseudo-endowment of higher place ranking status in a larger picture because higher place ranking is associated with higher competency in auctions (Lee & Harris, 2013). The motive for this phenomenon is independent of the loss aversion of the monetary reward because if participants increase their bid, they risk getting a lower amount of monetary bonus. The motive is also independent of the loss aversion of the auctioned good because the auctioned good is fictitious. These observations indicate that overbidding motive is related more to loss aversion of winning status, to protect superiority from other bidders, than to pure loss aversion of monetary reward or the auctioned good. Therefore,

the loss aversion of superiority in bidding skill that arises from the social comparison concern is the reason for overbidding at auctions.

The second hypothesis was not supported in this study. One possible explanation for no evidence found here for the second hypothesis is that participants in the first-place ranking feedback and the fourth-place ranking feedback received more win outcomes. From the earlier statistical analysis, participants who received more loss outcomes overbid more than participants who received more win outcomes. That analysis indicated that participants' social comparison concerns were activated more when they lost. Therefore, it may be that the effect of proximity to a meaningful standard was offset by more win outcomes. The other explanation is that participants in the first-place ranking feedback might already have been better than anybody else and did not feel threatened by other bidders, so that their social comparison concern was not activated.

Finally, the third hypothesis was not supported in this study. The questions measuring desire to win were asked in the beginning, before participants were randomly assigned to different groups, indicating that it was measuring individual differences in desire to win. However, the result might be different if the questions were asked at the end, when the desire to win has already been evoked by environment rather than being a factor of individual differences. This result indicates that the effect of environment on overbidding behavior at auctions is stronger than individual differences in desire to win. It may also suggest that the effect of environment on overbidding behavior at auctions is stronger than general individual differences, which could be interesting to explore in future research.

Theoretical Implications

The findings in this research suggest that the reason for overbidding at auctions is the loss aversion of superiority that arises from social comparison concern. It is different from loss aversion of the auctioned good because the auctioned good in this research was fictitious. Loss aversion of superiority does not contradict social loss aversion because there was no significant difference between the feedback and no-feedback groups, although participants who received feedback overbid more. However, it is more appropriate to say that the loss aversion of superiority is the underlying reason for overbidding at auctions because the foundation of a fear of losing the social competition is to maintain the superiority and become slightly better than other bidders. Therefore, this study offers a new explanation for overbidding at auctions from a social comparison perspective.

Practical Implications

Auctioneers and managers or persons in charge in auction platforms (such as auction galleries or online auctions) could benefit from the findings in this research. Giving social feedback, concretely in the form of relative standing feedback to bidders in auctions, may be a good idea to evoke the social comparison concern of the bidders. Evoking the social comparison concern could increase competitiveness, which in turn could increase overbidding among bidders and, finally, increase auctioneers' revenue. To maximize the effect, auctioneers should first give a feeling of winning the auctioned good in the beginning and then highlight the loss outcomes in the relative standing feedback. This approach could lead bidders to try to protect their superiority and overbid more in the auctions.

From the individual point of view, a bidder should be careful when there is relative standing feedback available at the auctions, especially when the bidder receives a win outcome

first and the loss outcomes are salient. In addition, a bidder should be careful when placed in a moderate ranking because the probability of overbidding is higher in the moderate ranking compared to in the extreme ranking. A bidder should not fall into the temptation of comparing oneself to other bidders to avoid overbidding at auctions.

Limitations and Future Research Direction

One limitation of this study is that the bidding value in the trial round was not controlled. Although it was mentioned that the trial round was independent of real auctions, it was still possible that participants who bid higher in the beginning (trial round) were anchored to that bidding value in their next bids. If so, their next bidding values would be more limited. Meanwhile, participants who bid lower in the beginning had a big window for overbidding. Indeed, two regression analyses performed earlier confirmed this limitation, in which a large proportion of variance of bidding values mean in the first auctions set and a medium proportion of variance of bidding values mean in the second auctions set could be explained by the trial bidding value. Therefore, future research should pay attention to this limitation by, for example, narrowing the bidding value range or providing only several options for fixed bidding values. Another limitation is that more win or more loss outcomes influenced the result, so the effect of variation on ranking feedback is unclear. Future studies should control for this limitation as well by, for example, setting the same number of win and loss outcomes for all groups.

The current study provides an alternative explanation of overbidding behavior at auctions. That is, the underlying reason for overbidding at auctions is the loss aversion of the superiority that arises from social comparison concern. Therefore, research on overbidding at auctions can now focus on finding more evidence from the social comparison perspective. For example, future research should address factors that increase the social comparison concern at

auctions and when the upward comparison or downward comparison occurs. Future research should also address when the relative standing feedback becomes salient and activates the social comparison concern, thus activating the loss aversion of superiority and increasing overbidding at auctions.

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Table 1

Number of Participants in Each Feedback Type Condition

Feedback Type	Participants
Extreme	76
Moderate	83
No-feedback	79

Table 2

Number of Participants in Each Outcome Condition

Outcome	Participants
More Win Outcomes	111
More Loss Outcomes	127

Table 3

Number of Participants in Each First Bid Condition

First Bid	Participants
Win First	128
Loss First	110

Table 4

The Rise of Overbidding of Interaction Effect of Outcome and First Bid

	Win First		Loss First	
Outcome	*M*	*SD*	*M*	*SD*
More Win Outcomes	.17	.09	.16	.09
More Loss Outcomes	.70	.08	.26	.09

Table 5

Result of One-Sample T-tests on the Mean of Nash Bidding Values in the First Set of Auctions against Zero

Feedback Type	*M*	*SD*	*df*	*t*	*p*
Extreme	-.16	.91	75	-1.56	.123
Moderate	-.05	.83	82	- .54	.590
No-feedback	-.13	.90	78	-1.32	.190

Note. To overcome a cumulative familywise error arising from multiple t-tests, the significance criterion was set to .017.

Table 6

The rise of Overbidding between Participants in First-Place Ranking and Fourth-Place Ranking Groups

Group	*N*	*M*	*SD*	*df*	*t*	*p*
First-Place Ranking	37	.13	.52	71	-.946	.347
Fourth-Place Ranking	36	.24	.51			

Table 7

Main Effects of Feedback Type, Desire to Win, and Interaction of Feedback Type and Desire to Win

Main Effect	*df*	*F*	*p*
Feedback Type	2	1.07	.344
Desire to Win	1	.57	.450
Interaction	2	2.21	.112

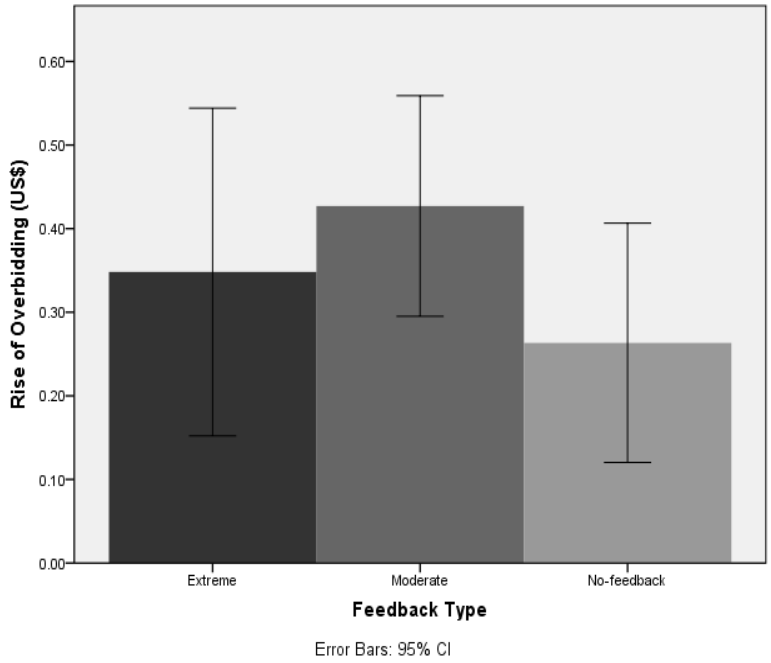

Figure 1. The rise of overbidding (US$) difference between feedback type groups. The difference of the rise of overbidding between feedback type groups is not statistically significant but significantly different against zero ($p < .017$) for each feedback type.