

Date: 11 May 2020
To: "Murray S Bennett" murray.bennett@uon.edu.au
cc: jwolfe@partners.org
From: "Cognitive Research: Principles and Implications Editorial Office" revati.gireesh@springernature.com
Subject: Your submission to Cognitive Research: Principles and Implications - CRPI-D-19-00098

CRPI-D-19-00098

Going, Going, Gone: Competitive Decision Making in Dutch Auctions
Murray S Bennett; Rachel Mullard; Marc Adam; Mark Steyvers; Scott Brown; Ami Eidels
Cognitive Research: Principles and Implications

Dear Mr Bennett,

Your manuscript "Going, Going, Gone: Competitive Decision Making in Dutch Auctions" (CRPI-D-19-00098) has been assessed by our reviewers and by Guest Editor, Lael Schooler. Although it is of interest, we are unable to consider it for publication in its current form. The reviewers have raised a number of points which we believe would improve the manuscript. It will need to be revised before it can be considered for publication in Cognitive Research: Principles and Implications.

Their reports, together with any other comments, are below. If a review appears to be missing please also take a moment to check our website at <https://www.editorialmanager.com/crpi/> for any additional comments that were saved as attachments.

If you are able to fully address these points, we would encourage you to submit a revised manuscript to Cognitive Research: Principles and Implications. Once you have made the necessary corrections, please submit online at:

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The due date for submitting the revised version of your article is 10 Jul 2020. However if you are unable to meet this timeframe please contact the Editorial Office for assistance.

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Please be aware that we may investigate, or ask your institute to investigate, any unauthorised attempts to change authorship or discrepancies in authorship between the submitted and revised versions of your manuscript.

We look forward to receiving your revised manuscript soon.

Best wishes,

Jeremy Michael Wolfe, PhD
Cognitive Research: Principles and Implications
<http://www.springeropen.com/journals>

Reviewer reports:

Dear Mr. Bennet,

Thank you for submitting your article, "Going, Going, Gone: Competitive Decision Making in Dutch Auctions" (CRPI-D-19-00098). The reviewers are split on the potential they see in your paper. Reviewer 1 believes that there is "enough of interest in this paper for publication", whereas Reviewer 2 does not recommend your paper for publication. It will need to be revised significantly before it can be considered for publication in Cognitive Research: Principles and Implications. If

you choose to resubmit, I would send it back to these same reviewers, and perhaps a new one as well.

Both reviewers provide excellent feedback for how to improve your article. If you decide to resubmit, I would like you to respond to each of the points raised by the reviewers and to the additional points that I raise. If you choose to address a point in the paper, please indicate where you have done so. If you decide to not address the point in the paper, please address the point in your cover letter and explain why you have not addressed it in the paper.

Let me highlight a couple of points the reviewers make. Both Reviewers 1 and 2 believe that the adaption of Prospect theory could be highlighted more. Both Reviewers agree with you that one of the main contributions of the article is the development "of a novel platform for testing competitive decision making", but that CRPI may not be the right outlet for a paper where a new experiment platform is the major contribution. Reviewer 2 writes that the "exposition needs to be improved", and both mentioned that they had difficulties understanding how you were using the Kolmogorov-Smirnov tests, another indication of problems with the exposition. Reviewer 1 notes that "Usually computational models are used so that a prediction is made (e.g., if we change the experiment in a particular way, the model predicts that participant's will change their behavior in a particular way)". Adding an experiment along these lines would strengthen a resubmission. Especially one that included financial incentives (see comments 5 and 6 below). I want to emphasize again that you should address all of their concerns and not just the ones I highlight here.

Beyond the concerns of the reviewers, I have some comments of my own:

(1) I believe the figures need attention. In Figure 6 the curve labeled continuous is a step function and the curve labeled discrete is smooth. In contrast, in Figure 12 the curves are labeled the other way around.

With respect to Figure 16, I found it difficult to evaluate the quality of the fit of the model to the data, given the that the scales of the y axes are so different. It looks to me like the price distributions for the model predictions sum to more than 1. Am I reading Figure 16 correctly?

(2) "On the theoretical side, we developed a simple, novel adaptation of Prospect Theory that can account for bidding behaviour in Dutch Auction." (p. 39). Placing your adaption of prospect theory in the context of past work would help the reader appreciate this contribution. A google search of "prospect theory Dutch auctions" returns many hits. Is any of this work related to your extension of Prospect Theory? Or perhaps there are previous applications of prospect theory to other kinds of auctions that would be relevant.

(3) I would like to see an R script (or equivalent) that takes in the raw subject data and produces the analyses, tables and any figures you include in the paper. Having these R files will help people understand what you have done and increase the chances that they might replicate and build on your results.

(4) Given that a major contribution of your paper is the development of a "platform for testing competitive decision making in a simulated Dutch Auction." (p. 31), I think it is important to share the code for the experiment in the supplementary materials. As is the case with the R scripts, making the platform code available would help someone who wants to build on what you have done.

(5) It is not until the methods section that it became clear to me that these experiments were not incentivized. There are many researchers -- especially those in the fields of experimental economics and judgment a decision making -- that would stop reading as soon as they saw on page 13 that subjects only made hypothetical bids, rather than consequential ones. To accommodate those researchers who believe that consequential incentives are essential, please add to the abstract that the bids were hypothetical. I'd also suggest adding a discussion about hypothetical rewards in auction settings. Is there a literature suggesting that behavior in hypothetical auctions reflects behavior in real auctions?

For future experiments you might consider comparatively inexpensive ways of including financial incentives. For example, by selecting a few trials from the experiment to be paid out. Even though only a few subjects would end up receiving payment, I believe lotteries like this would satisfy researchers who only pay attention to incentivized experiments.

(6) On a related point about incentives, starting on p.32 you consider a number of differences between your experiment at that of Katok and Kwasnica (2008). However, you don't mention that one important difference is that Katok and Kwasnica's (2008) subjects were financially incentivized: "Participants were paid their total individual earnings from the 21 auctions plus a \$10 show-up fee at the end of the session". Based on your reading of Katok and Kwasnica's (2008) do you think that financial incentives might have changed your results in meaningful ways?

If you are able to fully address these points, we would encourage you to submit a revised manuscript. I wouldn't be overly concerned with reasonable deviations from the word count, if it enables you to address the reviewers' points and improves the manuscript. Again, thank you for submitting your work to Cognitive Research: Principles and Implications.

Sincerely,

Lael Schooler

Reviewer #1: Bennett et al. report the results of two dutch auction experiments in which participants played either against human opponents or computer opponents. Neither the price nor the step of the winning bids was affected by whether changes were continuous or discrete. In experiment one, participants did not seem to adjust their bidding behaviour across block, while in experiment two they did. However, these results could have been affected by the fact that computer competitor conditions occurred first (I wasn't clear why the data from this condition wasn't relevant to drawing this conclusion however). Participants bid more when playing against human competitors as compared to computerized competitors.

Overall, I think there is enough of interest in this paper for publication, but the exposition needs to be improved.

The abstract misses describing the result of the competitor type and refers to price volatility which really is not clear until you read the manuscript.

The introduction feels repetitive. It seems like the basic mechanism of the auction is explained three or four times, which is not necessary. I think it would be better to spend more time setting up for the model which in general, I think should have played a more central role. The adjective rudimentary is used a couple of times to describe it, but I didn't think it was that rudimentary and I would have liked to have seen a more extensive treatment with implications - especially of the multiple player component of it drawn out more completely.

Also, while the aim of building a platform to study dutch auctions is laudable, for a journal like CRPI it seems that it would be better to have the primary aim focused on the behavioural properties of the auctions and in particular the model not the instrumentation issues.

Specific Issues

Why were the starting price and warehouse capacities different when the participant was playing against human competitors versus computer competitors?

Line 437: "Therefore, we examine the data using both of these measures." - why does a significant negative correlation indicate that you should examine both of these measures. It seems like the fact that they are not too high is more the issue.

Line 449: I was a bit confused about the discussion of the KS test. Provided you are using the two sample test (incorporating the $\sqrt{(n+m/nm)}$ term), I would have thought everything should have been ok? Especially since you got significant results. The test is conservative.

Typos

194: Continuous => continues

276; the last couple of sentences of this paragraph could be dropped

349: Numbers at the starts of sentences should be spelt

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Reviewer #2:

This research involved developing a platform for testing a Dutch auction and testing the effects of discrete vs. continuous price change on bidding behavior. The main finding was that discrete vs. continuous changes in the price did not make much of a difference in participants' bidding behavior.

Overall, the main contribution of this research is the development of a new platform for testing Dutch auctions. Unfortunately, however, I found the research itself not to provide much insight or advance the field, which is why I do not feel like I can recommend it for publication. I will address the three main sets of results:

First, the effects of discrete vs. continuous were null effects, and it simply was not clear to me how important of a factor this was from the prior literature - this particular issue did not seem to be strongly motivated to the extent that a null finding is especially noteworthy. I had two further questions about the discrete vs. continuous analyses:

a) I was confused how the data was aggregated. When participants compete in a group, for a given auction only one participant makes a bid, because the first bid ends the auction. So, different participants have different numbers of bids. I can't tell from the statistics how this was handled. Were the bids within a participant averaged?

b) I did not understand the Kolmogorov-Smirnov tests, and they were not interpreted for the reader. I worry that perhaps these tests are sensitive to the fact that the discrete vs. continuous conditions have different numbers of possible outcomes, so their distributions are inherently different?

Second, one of the topics being investigated was learning. However, the analyses only looked at change over the blocks. These findings were non-significant, and the explanation in the general discussion was useful. However, no learning theory was developed or tested, so I did not get much out of these analyses, and even if they had been significant (e.g., bidding price falls or increases over time), I'm not sure what they would tell us psychologically.

Third, there were significant differences in bids when the participants were playing against themselves vs. a computer. However, I don't feel that this comparison is fair. First, participants started out with different amounts of money, and the warehouse capacity was also different across conditions. Wouldn't it make sense that these factors could impact participants' bids? Also, in the human condition participants were playing against two competitors but in the computer condition they were just playing against one computer. It seems to me that a clean comparison would involve something like a 2 (participants actually playing against one human competitor vs. a computer) x 2 (participants told that they were playing against one human competitor vs. a computer). This way you could separate out participants' beliefs from the differences in how the human vs. computer competitor produce bids. In sum, for the current study I don't think that the comparison is fair.

Fourth, an adaption of prospect theory is developed. However, all that is done is that parameters are found such that the mean bids from the model approximate participants' mean bids. However, I don't see how this really provides psychological insight into participants' behavior. Usually computational models are used so that a prediction is made (e.g., if we change the experiment in a particular way, the model predicts that participant's will change their behavior in a particular way). This tells us something about why people are behaving a particular way. But just fitting a mean to me does not provide insight like this.

As a result of the significant disruption that is being caused by the COVID-19 pandemic we are very aware that many researchers will have difficulty in meeting the timelines associated with our peer review process during normal times. Please do let us know if you need additional time. Our systems will continue to remind you of the original timelines but we intend to be highly flexible at this time.

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