



# Nonstandard bidder behavior in real-world auctions <sup>☆</sup>



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## ABSTRACT

Empirical work on auctions has found that bidders deviate from standard behavior in important ways. We investigate a range of these behaviors, including nonrational herding, auction fever, quasi-endowment effect, and escalation of commitment. Our innovations are to more completely control for unobservables by using new data from a field experiment on eBay, and by accounting for censoring of bids below the starting price. Consistent with standard auction theory and in contrast to the predictions of the nonstandard behaviors, we find that auction starting price has no effect on bidder willingness to pay in a private-values setting. We conclude that there is little evidence that these nonstandard behaviors are important in the field.

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## 1. Introduction

Early laboratory studies of auctions by [Kagel et al. \(1987\)](#) and [Kagel and Levin \(1993\)](#) found that bidders deviate from standard rational behavior in significant ways. In first-price auctions, overbidding by bidders quickly dissipated with experience. But in second-price auctions, overbidding was significant and persistent. Subsequent laboratory studies of second-price auctions by [Harstad \(2000\)](#), [Cooper and Fang \(2008\)](#), and [Garratt et al. \(2011\)](#) found that bidders that gained certain types of auction experience subsequently performed closer to the standard model. These results suggest that bidders may sometimes exhibit bounded rationality and perhaps nonstandard preferences, but also that bidders may learn to avoid these behaviors with experience.

Key questions in this literature are if and how bidders deviate from standard behavior in real-world auctions.<sup>1</sup> Because most real-world bidders may have significant experience (e.g., on eBay, bidders in the lowest quartile of experience have bid in dozens of auctions), one might expect less nonstandard behavior in the field than the laboratory.<sup>2</sup> In this study, we provide new evidence from eBay on whether bidders in real-world auctions exhibit nonstandard behavior.<sup>3</sup> Following previous work, we test for

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<sup>1</sup> We will use the term “standard behavior” to refer to what is predicted for a utility-maximizing bidder under traditional assumptions about rational preferences, and “nonstandard behavior” to refer to deviations from this.

<sup>2</sup> There is evidence that individuals in real-world settings sometimes learn to avoid behavioral biases with experience (e.g., [List, 2003](#)), and that bidder performance in real-world first-price auctions improves with experience ([Pownall and Wolk, 2013](#)).

<sup>3</sup> eBay uses a modified ascending second-price auction and is the largest consumer auction platform in the world. [Bajari and Hortacsu \(2004\)](#), [Ockenfels et al. \(2007\)](#), and [Hasker and Sickles \(2010\)](#) survey the literature on eBay and provide more detail about the platform.

nonstandard behavior by estimating the effect of auction starting price on bidder willingness to pay, and so a second aim of the paper is to provide new evidence on the causal effect of starting price on bidder willingness to pay.

We examine the main nonstandard behaviors that researchers have used to explain overbidding in second-price auctions, including (1) “nonrational herding” (Simonsohn and Ariely, 2008), whereby bidders prefer auctions with more previous bids despite these bids providing no valuable information; (2) “auction fever,” which is the excitement from competition that causes bidders to bid beyond their initial valuations; (3) “quasi-endowment effect” (Heyman et al., 2004), which is similar to the traditional endowment effect; and (4) “escalation of commitment” (e.g., Ku et al., 2005), where bidders may overbid in order to self-justify the sunk cost of the time and effort they have already committed. We will collectively refer to these behaviors as “bidder effects.”

Previous work has tested for bidder effects by estimating the effect of starting price on auction outcomes. The idea is that under bidder effects an auction with a low starting price (an “LSPA”), all else equal, will accumulate more bids as it is bid up to a high *standing* price compared to an auction with a high starting price (an “HSPA”); these extra bids will then trigger more activity at high standing prices. For example, because LSPAs have received more bids by the time they reach a given standing price compared to HSPAs, nonrational herding would cause new bidders to favor LSPAs. In contrast, in a standard private-values auction model, bidding activity at a given standing price is generally unrelated to starting price. We use this distinguishing prediction to test for bidder effects.

Previous estimates of starting-price effects in online second-price auctions have varied widely. Ariely and Simonson (2003) and Haubl and Leszczyc (2003) found positive effects; Kamins et al. (2004), Ku et al. (2006), and Simonsohn and Ariely (2008) found negative effects; and Lucking-Reiley et al. (2007) and Einav et al. (2015) found mixed or no effects. We will comment on these results in Section 6, but for now we note the lack of consensus regarding the effects of starting price.

We approach the question of starting-price effects by analyzing data from a natural field experiment in which we sold 420 new movie-DVDs on eBay in matched pairs of simultaneous auctions. The matched auctions were identical except that one had a low starting price of \$0.99 (the LSPA) and the other had a high starting price, which averaged \$6.84 (the HSPA). By using new movie-DVDs, a standardized product for which buyers have private values, we avoid the possibility that buyers learn about product value from the seller’s choice of starting price or from competing bidders’ behavior. By employing variation in starting prices within matched auctions, we ensure that starting price is uncorrelated with unmeasured determinants of demand.<sup>4</sup>

We estimate the causal effect of starting price on bidder willingness to pay by comparing the distributions over ending prices, including specific moments of the distributions, between the LSPAs and HSPAs. We find the two to be virtually identical, and hence we find no evidence of bidder effects. In other words, we find that starting price has no effect on bidder willingness to pay in a private-values auction setting.

An emerging empirical approach in economics is to use different types of experimental data together to infer the generalizability of a result (e.g., List, 2006). In a similar spirit, we pair our experimental data with a new observational data set that we collected from eBay. The value of using experimental randomization to support a causal interpretation of an observation finding is well known. However, observational data can be used to test an experimental finding as well. In our case, the randomization of one factor, starting price, holding constant all other factors, isolates the causal effect of starting price. However, this key experimental feature – the controlled randomized variation – itself could introduce artificiality into the field setting. For example, bidders might view the presence of simultaneous auctions that are identical except for starting price as peculiar. With our observational data, we are able to closely reproduce our experimental findings, thereby providing support that our results are not an artifact of our experimental design. We believe our approach of combining experimental and observational data may be more widely useful.

We also note the closely related study of Schneider (2016), which we view as a companion to the current article. That study examined another recent finding of nonstandard bidder behavior on eBay, providing evidence that the nonrational limited-attention result in Malmendier and Lee (2011), in which the auction ending price often exceeds fixed-price alternatives, can also readily be explained within the standard framework.

We view the current paper as making two contributions. First, it provides what we believe is particularly clean evidence that starting price does not affect bidder willingness to pay in a private-values setting. Second, it helps to reframe the existing literature on bidder behavior. The idle reader of the literature might be under the impression that the outcomes of real-world auctions are driven by a multitude of behavioral biases. We believe this impression would not be justified based on the currently available evidence. This is of course not the same as saying that bidders strictly conform to standard behavior, and we are not suggesting this is the case. Indeed, insights from psychology and related fields have been important for understanding consumer behavior in many settings (DellaVigna, 2009), and auctions may ultimately be no different. Nevertheless, we see little evidence that nonstandard behavior is important in real-world auctions based on our analysis of eBay DVD auctions and our review of previous work on overbidding in the field setting.

Finally, while we have examined one auction market (eBay) and one product (new movie-DVDs), we believe our results can be viewed together with Lucking-Reiley et al. (2007) and Einav et al. (2015) for a more complete picture about starting-price effects. Lucking-Reiley et al. (2007) found no starting-price effects in coin auctions where coin characteristics and

<sup>4</sup> Note that we are not the first to use a matched-pair experiment on eBay. Others, with different objectives, include Katkar and Reiley (2006) and Hossain and Morgan (2006).

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