

# SEEING VALUE THROUGH THE EYES OF OTHERS: PERCEPTIONS OF VALUE AND REBIDDING IN ONLINE AUCTIONS

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## ABSTRACT

*This paper addresses social interaction and the formation of value beliefs in markets. It empirically examines value construction by analyzing rebidding behavior in online auctions, wherein individuals reassess the maximum price they would pay for a given product. Statistical analyses of more than 10,000 auctions containing more than 55,000 individual bids on the auction website eBay suggest that rebidding is positively associated with a lack of auction-internal price information and bidder inexperience. Analyses also suggest that engaging in rebidding is positively associated with an individual winning an auction. This work, therefore, helps to provide a deeper understanding about valuation, price formation, and the organization of markets. This work contributes to domains of research related to the construction of value and the emergence, evaluation, and legitimization of new products, services, and ideas.*

**Keywords:** Embeddedness; value; price; novelty; auctions; economic sociology; organization theory; strategy and entrepreneurship; social construction of markets

## INTRODUCTION

Research examining the emergence, evaluation, and legitimization of products, services, and ideas highlights that perceptions of value are malleable and are shaped by a variety of factors within markets (Bowers & Prato, 2018; Mueller,

Melwani, & Goncalo, 2012; Salganik, Dodds, & Watts, 2006; Sands, 2021; Zhou, Wang, Song, & Wu, 2017). Accordingly, strategists and entrepreneurs with novel ideas care a great deal about the conditions under which new offerings are judged by others (Piezunka & Dahlander, 2015; Reitzig & Sorenson, 2013; Sgourev, 2013). Indeed, market actors continuously have to deal with the underlying uncertainty about value since its recognition is fundamentally a social activity (Beckert, 2011; Beckert & Aspers, 2011). As such, it is especially germane that scholarship addresses how actors' value beliefs are revised due to interactions with others in the marketplace. This then directs attention to core questions about value construction – in particular, *how is value recognized? And how can value beliefs become updated?*

Value exists, either explicitly or implicitly, at the core of most investigations of markets. While scholars from diverse perspectives may approach the study of markets in different ways and with different underlying assumptions, the core contributions stemming from the literature associated with economic sociology and organization theory are predicated on the fact that the economy cannot be arbitrarily separated from the broader social environment – and perceptions of value are no exception. As Velthuis (2005, p. 10) put it: “prices do not mysteriously emerge from ‘the market,’” but instead are manifestations of contested measures of value that have been reconciled in the marketplace. Hence, value and price are inherently social constructs that form through the interaction of actors in markets (Beunza, Hardie, & MacKenzie, 2006).

As Swedberg and Granovetter (1992, p. 21) explicitly note in the introduction to their anthology on economic sociology: “There is nothing ‘natural’ about the fact that something has a price; a price, like everything else in the economy, has to be socially constructed.” The organizational and sociological stream of work on pricing, therefore, emphasizes that if one were to treat value as static then it would leave concepts like willingness-to-pay as an inherently internal and unidentifiable process (Zafrovski, 2000, p. 266). By extension, an overly fixed view of value would leave those strategists and entrepreneurs who seek to bring novel offerings into markets with relatively little insight into processes that may afford them the sort of recognition they need to achieve successful outcomes. Instead, researchers in organizational and economic sociology have focused on overcoming these sorts of limitations (Swedberg, 1994; Velthuis, 2005) by offering a perspective of value that can be better “understood with reference to social institutions, networks, and frameworks of meaning” (Beckert, 2011, p. 757).

This paper contributes to the body of research on valuation and price by developing theory on how social interactions facilitate the formation of value beliefs within auctions. In asserting that individuals do hold isolated and static views of value, this work helps to advance a constructionist perspective of markets that highlights how actors in auctions update their own accounts of value by observing the bidding behavior of others. These issues are empirically studied through an examination of bidding and rebidding behavior within 10,078 different auctions containing a total of 55,786 individual bids on the auction website eBay. The statistical evidence suggests that rebidding is positively associated with a lack of auction-internal price information, a lack of external product references, and

bidder inexperience. The results also suggest that engaging in rebidding is positively associated with an individual winning an auction.

Most fundamentally, this work highlights how value beliefs can be updated when markets are structured to facilitate actors *seeing value through the eyes of others*. This work, therefore, helps to provide a deeper understanding about the various social processes that underpin the construction of value in markets – a topic that has received a great deal of interest in recent years (e.g., Arora-Jonsson, Brunsson, & Hasse, 2020; Beckert & Musselin, 2013; Cattani, Sands, Porac, & Greenberg, 2018; Pontikes & Rindova, 2020). Better understanding the processes of value construction in this way also speaks to the stream of research that seeks to disentangle how novelty can successfully make its way into markets (e.g., Berg, 2016; Piezunka & Dahlander, 2015), despite the challenges that new or creative ideas and offerings often initially face (e.g., Cattani, Ferriani, & Lanza, 2017; Godart, Seong, & Phillips, 2020; Mueller et al., 2012; Staw, 1995).

## VALUE, PRICE, AND AUCTIONS

Understanding how value beliefs form and are updated is central to investigating the social underpinnings of economic activity. As such, value and price have been a part of organizational and sociological studies of economic life for more than a century (e.g., Dewey, 1998 [1938]; Durkheim, 2014 [1893]; Simmel, 1978 [1907]; Weber, 1922 [1978]), and research on these topics was reinvigorated amid the new economic sociology resurgence in the 1970s and 1980s (e.g., White, 1981, 2004; White & Eccles, 1987).

Today, the broader organizational and sociological agenda on value and price consists of interrelated research streams centered on topics such as calculative tools (e.g., Anthony, 2018, 2021; Callon, 1998; Callon & Muniesa, 2005; Muniesa, 2007), performativity (e.g., MacKenzie, 2008; MacKenzie & Mollo, 2003), routines and processes (e.g., Zbaracki, 2007; Zbaracki & Bergen, 2010), social meaning and institutionalized norms (e.g., Almeling, 2007; Ranganathan, 2018; Zelizer, 1978), status (e.g., Benjamin & Podolny, 1999; Roberts, Khaire, & Rider, 2011), networks and embedded ties (e.g., Godart & Claes, 2017; Ody-Brasier & Vermeulen, 2014; Uzzi & Lancaster, 2004), and prices as cultural entities (e.g., Franssen & Velthuis, 2014; Velthuis, 2005). Though displaying great diversity in topic and theoretical orientation, works in this space all extend from the underlying recognition that markets are inherently embedded in social relations and that economic outcomes are shaped by social forces. Hence, the construction of value by economic actors requires that processes of valuation and pricing be situated within the broader social context (Beckert, 2011; Beckert & Aspers, 2011; Hutter & Stark, 2015).

While work in organizations and economic sociology has explored value and price in a variety of settings, Smith's (1989) work on auctions has helped highlight unique opportunities for the study of these topics. Auctions represent a structured market design with a particular formatting of rules and processes through which market actors interact.<sup>1</sup> In contrast to fixed-price exchanges (such as purchasing items from a typical store), auctions serve as a medium of exchange for items where a transaction price is not established prior to the establishment of the market.

The auction serves to reconcile differences in value beliefs that would be derived from an individual owning a given object; thus, transaction prices are determined by allocating the object to whoever values it the most since they would have the greatest willingness-to-pay (Krishna, 2009). This places individuals' beliefs about value at center stage within auctions in a way that is not necessarily the case with fixed-price exchanges. Hence, auctions provide opportunities to observe manifestations of value beliefs and examine how these beliefs are updated. For these same reasons, a variety of issues have been examined using a sociological lens with auctions serving as an empirical setting, including reputation (e.g., Diekmann, Jann, Przepiorka, & Wehrli, 2014; Przepiorka, 2013; Przepiorka & Aksoy, 2021) and categorization (e.g., Bowers, 2015; Hannan, 2010; Koçak, Hannan, & Hsu, 2014).

One particular deviation from what would be expected per the neoclassical model of open bid auction behavior that has not been addressed from a sociological lens is *rebidding*, which is when an individual revises their maximum bid for an object in an auction. In a world in which actors are able to determine a stable and internalized value for an object, there should be no rebidding as this would conflict with the dominant strategy of the actors participating in an auction. Rebidding, however, does occur quite often in real-world auctions. This work contends that a sociological perspective of value and price construction can shed light on why this occurs. In the following sections, I theorize and empirically examine how rebidding behavior reflects the social foundations of economic activity. Accordingly, this work helps provide a deeper understanding of how new things become imbued with value and how social forces affect value beliefs in markets.

### *Bidding and Rebidding in Second-Price Open Bid Auctions*

The situation that is the primary focus of this paper is rebidding, which is when a bidder is outbid by another but then bids again. This work focuses on rebidding to help form a basis for better understanding the process of how individuals determine value for new objects. In depicting rebidding behavior as at odds with neoclassical expectations, this work follows precedent in economic sociology and behavioral economics to the extent that “theories based on the assumption that everyone is an Econ [Homo Economicus] should not be discarded. They remain useful as starting points for more realistic models” (Thaler, 2015, p. 6). Notably, this reconciliation approach to exploring socioeconomic activity has a long history in describing the real-world economy. It was through the use of neoclassical economic theories of search that Geertz (1978) was able to frame departures from rationalist approaches to better understand and describe how the bazaar economy functions (an important juncture in the development of economic sociology that was reiterated by Swedberg & Granovetter, 1992, p. 21). Likewise, this approach has already been especially fruitful in exploring how embedded relations shape outcomes in economic markets (Uzzi, 1997, p. 36).<sup>2</sup>

Let us first consider an auction composed of Homo Economicus, “hyperrational” economic actors in the neoclassical sense, who are able to accurately produce valuations in the form of an instantaneously accurate willingness to pay for all goods and services (see Henrich et al., 2001; Thaler, 2000). In second-price open

bid (hereafter, SPOB) auctions, which will also be the auction type in the empirical setting, the neoclassical perspective would contend that potential buyers determine the maximum price that they would pay for a given product such that it corresponds directly to their level of utility in receiving a given product (i.e., a bidder's "private value" (Krishna, 2009, p. 3)). From this, potential buyers establish a maximum bid where the utility gained from winning the product is equal to or greater than the amount of utility loss from payment. Thus, the dominant strategy is for bidders to place their maximum bid on a product at the start of an auction as they would accept the transaction at all prices equal to or below that price because they would have a net positive (or neutral) utility gain. Furthermore, individuals do have incentive to not purposely misrepresent their maximum bid because doing so is costly (in time/attention) and offers them no utility gain because their bid automatically increases only relative to the maximum bid of other bidders.

To help illustrate this further, let us consider a SPOB auction with two bidders: Bidder  $i$  and Bidder  $j$ . Our auction begins at time  $t = 0$  and ends at time  $t = 1$ . The current price at  $t = 0$  is  $p_0$ . Bidder  $i$  places their maximum bid,  $b_i$ , where  $b_i \geq p_0$  and becomes the current high bidder where the current price remains at  $p_0$  as price is determined by the maximum bid of the second highest bidder plus  $\tau$ , which is the minimum increment between bids. Now, Bidder  $j$  enters the auction and places a bid  $b_j$  where  $b_j \leq p_0 + \tau$ , which will update the current auction price to  $p_1$ . One of three states (A, B, or C) exist in the following period:

- (A) If  $b_i > b_j$ , then Bidder  $i$  remains the current high bidder at  $p_1 = b_j + \tau$ .
- (B) If  $b_i = b_j$ , then Bidder  $i$  remains the current high bidder at  $p_1 = b_j$ .
- (C) If  $b_i < b_j$ , then Bidder  $j$  becomes the current high bidder at  $p_1 = b_i + \tau$ .

The auction ends when  $t = 1$ , at which time the high bidder pays the current price,  $p_1$ . This basic setup can be extended to any number of bidders and bids (updating the current price to  $p_2, p_3, \dots, p_n$ ). What this example highlights is that each bid placed results in new information about the private value of other bidders. Thus, with each new bid, current and potential bidders have an opportunity to see value through the eyes of another.

This paper will now turn to cases of rebidding. This is when the bid from  $b_j$  is followed by another bid from  $b_i$  to establish a higher maximum bid price at  $p_2$ . Note again that this behavior goes against the neoclassical dominant strategy. Rather than think about rebidding as an oddity, however, this work will portray rebidding as a consequence of real-world markets being composed of socially embedded economic actors who seek to make sense of value for new objects.

In contrast to Homo Economicus, who is able to independently determine what they would be willing to pay for a given object, real people very often enter auctions without knowing what price they would be willing to pay for a particular item (Smith, 1989, p. 4).<sup>3</sup> That is, there is nothing natural about valuing something. Rebidding provides an illustration of this to the extent that it is a manifestation of an individual using the valuation activities of other actors (i.e., the bids of others) to update their beliefs about the value of a given object. As such, the

process of value construction is not happening in isolation. The interaction of market participants in auctions provides valuation information for other market actors to reference when constructing their own valuations (i.e., “interdependent values” (Krishna, 2009, p. 3)).<sup>4</sup>

While rebidding is a product of implicit market participant interaction to the extent that one bidder’s behavior leads to changes in the value beliefs of others, it is important to note that valuation is also subject to the constraints of a specific situation (Hutter & Stark, 2015). Toward that end, characteristics of the marketplace affect the behaviors of market participants, and situational forces should be expected to influence how value and price are constructed. In considering the larger socioeconomic environment, we should expect that rebidding to be more likely to occur when there are limited cues to inform value beliefs. Since the only non-bidder produced value information in an SPOB auction is the opening price, this will likely be a primary reference for actors in determining their initial valuation for an object. From this, I offer a first hypothesis:

*H1.* Rebidding is more likely to occur in auctions where the opening price conveys limited information to market participants.

Similar to expecting that rebidding would be more likely when there is limited information available to reference within the auction, one should expect that rebidding occurs more often where market interaction facilitates the construction of value more so than do outside sources of information. Just as individuals reference outside alternatives when constructing value beliefs, they can also reference past experiences. In this way, valuation can be thought of as a learned calculative activity wherein there exist differences between experienced and inexperienced actors (Callon & Muniesa, 2005). To the extent that valuation is a learned behavior, then rebidding should occur less frequently for experienced actors because they are better able to arrive at a stable valuation for an object without needing to observe the valuations of others. From this, I offer a second hypothesis:

*H2.* Rebidding is less likely to occur by individuals with more experience in auctions.

## EMPIRICAL ANALYSIS

In this section, I examine auctions conducted on the online platform eBay. Since its inception, eBay has developed a vibrant new medium for conducting auctions online. While auctions have been used to distribute goods since ancient times, eBay has helped move the auction from the periphery into a much more common form of economic exchange (e.g., Lucking-Reiley, 1999, 2000). The predominant eBay auction type is the SPOB auction. These auctions are conducted online with semi-anonymous (they have identification screen names that mask their real identities) bidders and sellers with eBay serving as a market platform allowing these sellers and buyers to exchange products. In 2016, eBay had 167 million active buyers

and exchanges of more than \$84 billion in goods (GMV), resulting in \$7.3 billion in net income (eBay Inc., 2017). Due to its inherent social dynamics, eBay and other online auction websites have been used as an empirical setting for researchers addressing a wide range of issues from different disciplinary perspectives (e.g., Bowers, 2015; Cabral & Hortacsu, 2010; Dewan & Hsu, 2004; Kocak et al., 2014; Obloj & Capron, 2011; Przepiorka & Aksoy, 2021). As with these prior works, I use eBay data to explore how real-world markets function in order to shed light onto the processes through which value is constructed.

### *Data*

These data of eBay auctions have been previously used to study bidding behavior (see Borle, Boatwright, & Kadane, 2006). Before conducting analyses, I amended the raw data by excluding auctions where there are no bids, auctions in which the bidding data are absent, and auctions that were not conducted exclusively in the SPOB auction format. With these exclusions, the dataset used in the following analyses contains 10,078 observations of SPOB auctions in which a transaction occurred, with a total of 55,786 bids placed. Table 1 provides auction level summary statistics.

As noted earlier, rebidding is quite common within these auctions. In fact, a majority of the auctions (81.91%) had at least one rebid occurring. Fig. 1 provides an illustration of the number of rebids occurring in a given auction within the dataset.

I follow Gray and Reiley's (2013, pp. 2–3) commentary in their research on late bidding wherein they contend that deviations from the neoclassical model are unlikely to be sufficiently explained by uninformed, misinformed, or confused bidders (see also Cao, Sha, Yao, Gu, & Shao (2019) and Ockenfels & Roth (2006), and Roth & Ockenfels (2002) for work on late bidding, which is also referred to as “sniping”). Indeed, eBay offers very clear depictions of how this auction market works:<sup>5</sup>

- (1) When you place a bid, you enter the maximum amount you'd be willing to pay for the item. Your maximum amount is kept confidential from other bidders and the seller.
- (2) The eBay system compares your bid to those of the other bidders.
- (3) The system places bids on your behalf, using only as much of your bid as is necessary to maintain your high bid position (or to meet the reserve price). The system will bid up to your maximum amount.
- (4) If another bidder has a higher maximum, you'll be outbid. BUT, if no other bidder has a higher maximum, you win the item. And you could pay significantly less than your maximum price!

### *Variables*

To investigate the construction of value in auctions, I incorporate different dependent and independent variables in the subsequent statistical analyses:

**Table 1.** Auction Level Summary Statistics and Correlation Matrix.

	Summary Statistics						Correlations				
	Auction Observations	Mean	SD	Minimum	Maximum		1	2	3	4	5
1. Opening Price	10,078	70.5897	340.146	0.01	9,500		1				
2. Change in Price	10,078	187.432	767.128	0	23,000	0.2502	1				
3. Duration	10,078	6.16224	1.96763	0	10	-0.007	0.0525	1			
4. Seller Reputation	10,078	685.576	1555.35	-2	20,316	-0.046	-0.0286	-0.0611	1		
5. Number of Bids in Auction	10,078	9.91248	6.98697	2	59	-0.037	0.2735	0.0594	-0.0053	1	
6. Number of Bidders in Auction	10,078	5.53542	3.20295	2	40	-0.058	0.2337	0.0409	0.0216	0.8234	1



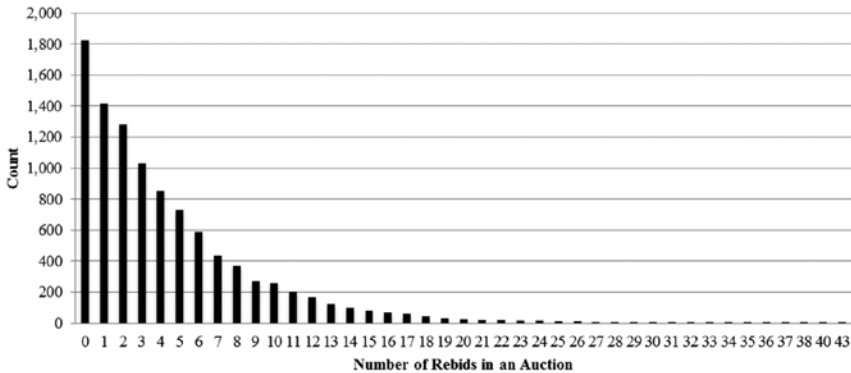


Fig. 1. Count of Rebids in a Given Auction.

Notes: Columns represent the count of auctions with a given number of rebids ( $n = 10,078$ ). The mean number of rebids in an auction is 4.38, and 82% of auctions had at least one rebid.

*Dependent Variables*

There are three different dependent variables that are used in the subsequent analyses: *Number of Rebids* is a continuous variable that counts the number of rebids that occur in a given auction. This variable is the total number of rebids that occur within an auction and includes multiple rebids by the same bidder. The second dependent variable is *Rebidding in Auction*, which is a binary variable that equals 1 if a given individual rebids within a particular auction and 0 otherwise. The third dependent variable is *Bidder Wins*. This is a binary variable that is equal to 1 if for the individual that is the winner of a given auction and 0 otherwise.

*Independent Variables*

Three of the independent variables reflect characteristics of a particular auction. *Opening Price* is the starting price of an item at the start of an auction and is set by the seller. This is the lowest possible price for which a bidder can win an item because any initial bid must be equal to or greater than this amount. *Change in Price* is the amount, in dollars, between the *Opening Price* and the ultimate closing price of an auction item, which must be greater than or equal to zero. *Duration* is the amount of time that the auction is open to bids as measured in days, which is set by the seller at the start of the auction.

Three independent variables are individual-level characteristics of auction participants. *Seller Reputation* is the number of positively reviewed sales (by the winning bidder in a prior auction) that a seller has received minus the number of unfavorable reviews of the seller by prior auction winners. *Bidder Experience* is the total count of prior auctions for which a given individual has transacted on eBay. Note that this measure is the aggregation of favorable seller reviews of a buyer and thus only considers completed transactions rather than bids that did not result in a win. *Bidder Is Rebidding* is a binary variable that is equal to 1 if a

given individual within an auction engages in rebidding by placing two or more bids throughout the duration of the auction.

Each auction item is listed, by the seller, under a particular product category, which correspond to the eBay section for which an auction appears on eBay. I use these classifications to incorporate 15 different product category controls. These controls can help account for between-category differences in bidder-types and their value beliefs about different items. For example, there may be significant differences in how potential bidders think about their willingness-to-pay for a microscope as opposed to a wristwatch. Ultimately, there are many reasons to believe that product category may impact prices, and thus these serve as important controls. The categories are listed (alphabetically) as follows: *Collectible Pottery*, *Computer Accessories*, *Desktop Accessories*, *Electric Drills*, *Golf Balls*, *Golf Club/Bags*, *Hairdryers*, *Handheld Calculators*, *Luggage Bags*, *Men's Electric Shavers*, *Neckties*, *Premium Wristwatches*, *Premium Writing Pens*, *Sunglasses*, and *Telescopes and Microscopes* (note that the category *Luggage Bags* will be left out of subsequent statistical analyses such that estimates reported in Fig. 2 are interpreted relative to this omitted category).

### Statistical Methods

Given the underlying data and the scope of the empirical investigation, I use different statistical approaches in order to address specific hypotheses. In cases where the appropriate dependent variable is the *Number of Rebids* in an auction, a Poisson regression is used. The following estimation equation can serve as a baseline for these cases:

$$E[Y = \text{Number of Rebids}_{jk}] = \alpha + \beta'x_{jk} + I_k + \epsilon \quad (1)$$

The dependent variable in Equation (1) is the count of rebids within auction  $j$  that is listed in product category  $k$ . Our constant term is  $\alpha$ ,  $\beta$  is a vector of parameter estimates,  $x_{ij}$  is a matrix of auction-level, bidder, and seller variables,  $I_k$  is a vector of product category identifying binary variables, and  $\epsilon$  is an error term.

In cases where the appropriate dependent variable is the likelihood that an individual bidder engages in *Rebidding in Auction*, logistic regression is used. The following estimation equation can serve as a baseline for these cases:

$$\Pr[\text{Rebidding}_{ijk} = 1] = \alpha + \beta'x_{ijk} + I_k + \epsilon \quad (2)$$

The dependent variable in Equation (2) is the likelihood of observing a rebid by individual  $i$ , in auction  $j$ , that is listed in product category  $k$ . As with the prior equation, our constant term is  $\alpha$ ,  $\beta$  is a vector of parameter estimates,  $x_{ij}$  is a matrix of auction-level, bidder, and seller variables,  $I$  is a vector of product category identifying binary variables, and  $\epsilon$  is an error term. In order to account for potential within-auction serial correlation, robust standard errors clustered at the auction level are used.

Where the appropriate dependent variable is the likelihood that a given *Bidder Wins* a particular auction, then logistic regression is used. The following estimation equation can serve as a baseline for these cases:

$$\Pr[\text{Bidder Wins}_{ijk} = 1] = \alpha + \beta'x_{ijk} + I_k + \epsilon \quad (3)$$

The dependent variable in Equation (3) is the likelihood that individual  $i$  provides the winning (highest) bid in auction  $j$ , that is listed in product category  $k$ . Again, the constant term is  $\alpha$ ,  $\beta$  is a vector of parameter estimates,  $x_{ij}$  is a matrix of auction-level, bidder, and seller variables,  $I$  is a vector of product category identifying binary variables, and  $\epsilon$  is an error term. Serial correlation is accounted for using robust standard errors clustered at the auction level.

### Results

The models in Table 2 are designed to investigate the factors that influence how many rebids occur in a given auction, which extends from *H1*. The statistical approach follows estimation Equation (1). Model 1 contains only *Opening Price* as an independent variable. Model 2 also includes *Product Category* controls. Models 3, 4, and 5 incorporate the variables *Change in Price*, *Duration*, and *Seller Reputation*, respectively. Note that I will use this method of a staggered introduction of independent variables in subsequent tables; though relevant as controls, the independent variables may be correlated and this helps to ensure that multicollinearity is not leading to biased estimates. Hence, we can feel more confident in our coefficient estimates to the extent that there is stability across the different model specifications within a table. I will focus on providing interpretations for the most conservative estimates that appear in a particular table.

*H1* contends that since lower opening prices provide more limited information, we should expect that rebidding is negatively associated with the opening price. Moreover, since the opening price provides limited information, particularly for auctions in which there is a large change in price (difference between the opening price and the closing price), the change in price is expected to be positively associated with rebidding. All of the model specifications in Table 1 offer support for this hypothesis. The evidence suggests a consistent and statistically significant ( $p < 0.001$ ) relationship between the auction's *Opening Price* and *Change in Price* with the *Number of Rebids* in a given auction. Interpreting the output for Model 5 with incidence rates, for example, suggests that each dollar increase in the opening price corresponds to 0.056% fewer rebids in an auction. This follows the developed theoretical framework to the extent that lower prices (consider that auctions start at \$1 or even \$0.01 fairly often; about 16% of auctions in these data have an opening price at \$1 or less, although the mean opening price is \$71) offer limited information for bidders to use in constructing their valuations. As such, there is more rebidding (i.e., cases of bidders revising their valuations) because bidders are relying more heavily on market interactions in order to construct their valuations.

The coefficient on *Change in Price* suggests there is more rebidding in auctions that experience larger changes in price, *ceteris paribus*. This indicates that the further the auction's opening price is from its closing price, the more that actors rely on market interactions to construct their valuations, consequently increasing the number of rebids within an auction. Using the transformed coefficient from Model 5, these results indicate that for each dollar of price change in an auction, there is a 0.01% increase in the number of rebids.

**Table 2.** Poisson Regression Estimates of the Number of Rebids in an Auction.

	(1)	(2)	(3)	(4)	(5)
	Number of Rebids	Number of Rebids	Number of Rebids	Number of Rebids	Number of Rebids
Opening Price	-0.00055*** (0.00001)	-0.00055*** (0.00002)	-0.00058*** (0.00002)	-0.00056*** (0.00002)	-0.00056*** (0.00002)
Change in Price			0.000094*** (0.000003)	0.000093*** (0.000003)	0.000093*** (0.000003)
Duration				0.03803*** (0.003)	0.03799*** (0.003)
Seller Reputation					-0.000001 (0.000003)
Constant	1.4801*** (0.0049)	1.2881*** (0.0252)	1.2864*** (0.0252)	1.0399*** (0.0302)	1.0407*** (0.0303)
Product Category Controls	NO	YES	YES	YES	YES
Observations	10,078	10,078	10,078	10,078	10,078
Pseudo R-Squared	0.001	0.099	0.106	0.11	0.11

Standard errors in parentheses; \*  $p < 0.05$  \*\*  $p < 0.01$  \*\*\*  $p < 0.001$ .

The statistically significant ( $p < 0.001$  for all models) positive relationship between an auction's *Duration* and the total number of rebids also reflects the expectations described in the theoretical framework: when there is more time available for bidding, then there is more time available for social interaction, and therefore there is more rebidding. Since the process of social construction necessarily involves the interaction of actors, then affording them more time would allow actors greater ability to reconsider their earlier valuations as market interactions allow them to make updates to what they would be willing to pay for an item (i.e., their maximum bid). Interpreting the coefficient from Model 5 suggests that for each additional day that an auction is active there are 3.87% more rebids.

As noted earlier, the models in Table 2 all also include controls for product categories, except for Model 1. Fig. 2 presents plots of coefficient estimates (along with 95% confidence intervals (CIs)) of rebidding that correspond to specific product categories extending from the model specification used in Model 5.

These *Product Category* effects depict significant heterogeneity for the number of rebids across product categories, even holding the other independent variables constant. Notably, using estimates from Model 5, there are statistically significant *Product Category* effects. Most commonly (for 83% of the possible combinations of the product category coefficients), there are statistically significant differences in magnitudes between categories (differences are statistically significant at the 5% level or greater and are tested using the Wald Test (Greene, 2012)). This suggests that market interactions matter in the construction of price differently for some product categories. This finding follows the theoretical framework to the extent that it is explained by the fact that certain products (and by extension product categories, provided that these products are more highly concentrated in particular categories) are rare or unique. Therefore, these product categories have less cognitively accessible substitutes for actors to generate reference information. In this case, it is precisely because rare or unique objects provide actors more limited alternatives for pricing references that rebidding is more likely to occur.

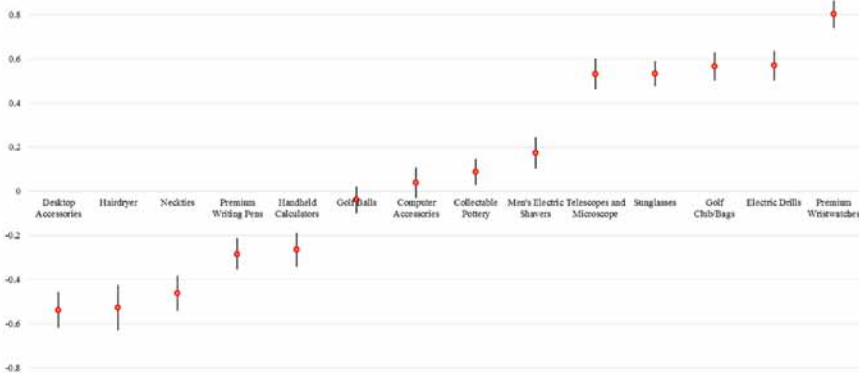


Fig. 2. Product Category Coefficients for the Number of Rebids in an Auction.

Notes: Point estimate coefficients and 95% CIs are plotted with respect to the omitted Luggage Bag product category. Coefficients correspond to Model 5 of Table 2.

Table 3 reflects our investigation of the likelihood that a given bid comes from an individual that is a rebidder within a given auction. Per H2, I place particular emphasis on bidder experience and treat this as the independent variable of interest. These analyses use logistic regression with robust standard errors clustered at the auction level.

Table 3. Logistic Regression Estimates of the Likelihood Individual Rebids in an Auction.

	(1)	(2)	(3)	(4)	(5)	(6)
	Individual Rebids	Individual Rebids	Individual Rebids	Individual Rebids	Individual Rebids	Individual Rebids
Bidder Experience	-.00136*** (0.0001)	-.00131*** (0.0001)	-.00131*** (0.0001)	-.00131*** (0.0001)	-.00131*** (0.0001)	-.00130*** (0.0001)
Opening Price			-0.000024 (0.00003)	-0.000034 (0.00003)	-0.000028 (0.00003)	-0.000031 (0.00003)
Change in Price				.000043** (0.00001)	.000042** (0.00001)	.000042** (0.00001)
Duration					.01156* (0.005)	.01095* (0.005)
Seller Reputation						-.000012* (0.00001)
Constant	-.47234*** (0.0118)	-.52301*** (0.0889)	-.52275*** (0.0889)	-.52404*** (0.0889)	-.59727*** (0.0945)	-.58899*** (0.0948)
Product Category Controls	NO	YES	YES	YES	YES	YES
Observations	55,786	55,786	55,786	55,786	55,786	55,786
Group Clusters (Auctions)	10,078	10,078	10,078	10,078	10,078	10,078
Pseudo R-Squared	0.0067	0.0101	0.0101	0.0103	0.0104	0.0104

Robust standard errors clustered at auction level in parentheses; \*  $p < 0.05$  \*\*  $p < 0.01$  \*\*\*  $p < 0.001$ .

The results from Table 3 indicate that *Bidder Experience* is negatively associated with the likelihood that an individual rebids. In line with *H2*, the coefficients on *Bidder Experience* show consistency and display high levels of statistical significance ( $p < 0.001$ ) across all model specifications. Converting these results to odds ratios, we can interpret this coefficient in Model 6 to mean that each unit increase in *Bidder Experience* corresponds to a reduction of 0.13% in the likelihood that a bidder rebids within a given auction. Just as “there is nothing ‘natural’ about the fact that something has a price” (Swedberg & Granovetter, 1992, p. 21), there is nothing natural about an individual inherently knowing what they would be willing to pay for something. As such, inexperience corresponds to rebidding in auctions because inexperienced bidders rely more heavily on social interaction to construct their value beliefs.

### *Robustness Checks*

While these results offer support for the hypotheses, there are robustness checks that can help address alternative explanations. In particular, whether or not rebidding has an effect on the likelihood that an individual wins. If it were the case that rebidding reflected simply a misunderstanding of how eBay auctions worked, rather than being a manifestation of socially constructed value beliefs, then we might not expect any relationship between rebidding and winning an auction. Accordingly, Table 4 presents analyses associated with the outcome of an auction in order to investigate if rebidding affects who wins an auction. I use logistic regression to estimate the likelihood that a given individual is the winning bidder of a particular auction per the specifications outlined in Equation (3).

In Table 4, our variable of interest is *Bidder Is Rebidding*. The regression results indicate that being a rebidder is positively associated with winning an auction, and it is statistically significant ( $p < 0.001$ ) across all model specifications. Even with our most conservative estimate (derived from Model 1, which includes no covariates), again using odds ratios, this indicates that being a rebidder corresponds to an increased likelihood of winning an auction by 46.55% (95% CI: [40.42%, 52.94%]). Ultimately, this suggests that rebidding reflects updated value beliefs such that rebidders are more likely to have the highest final bid in an auction, and it provides increased confidence in our interpretation of the earlier results.

## DISCUSSION AND CONCLUSION

This paper contributes to the body of research examining the emergence, evaluation, and legitimization of products, services, and ideas by depicting how perceptions of value are malleable and are shaped through social interaction. Through a theoretical development focusing on rebidding activity in auctions, and an analysis of over 10,000 unique auctions and more than 55,000 placed bids, this paper has offered insights into how prices form, which allows for a more complete explanation of economic activity within auctions. The evidence suggests, in

**Table 4.** Logistic Regression Estimates of the Likelihood an Individual Wins an Auction.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Individual Wins	Individual Wins	Individual Wins	Individual Wins	Individual Wins	Individual Wins	Individual Wins
Bidder is Rebidder	.3822*** (0.0218)	.4147*** (0.0222)	.4182*** (0.0222)	.4195*** (0.0223)	.4238*** (0.0223)	.4251*** (0.0223)	.4248*** (0.0223)
Bidder Experience		.00012* (0.00001)	.00012* (0.00001)	.00012* (0.00001)	.00012* (0.00001)	.00012* (0.00001)	.00012* (0.00001)
Opening Price		.00038*** (0.000004)	.00038*** (0.000004)	.00038*** (0.000004)	.00041*** (0.000004)	.0004*** (0.000004)	.0004*** (0.000004)
Change in Price					-.00016*** (0.000002)	-.0002*** (0.00002)	-.0002*** (0.00002)
Duration						-.0232*** (0.004)	-.0238*** (0.004)
Seller Reputation							-.00001* (0.00004)
Constant	-1.6167*** (0.0121)	-1.2449*** (0.0511)	-1.2554*** (0.0512)	-1.2592*** (0.0511)	-1.2559*** (0.051)	-1.1093*** (0.0576)	-1.1013*** (0.0579)
Product Category Controls	NO	YES	YES	YES	YES	YES	YES
Observations	55786	55786	55786	55786	55786	55786	55786
Group Clusters (Auctions)	10078	10078	10078	10078	10078	10078	10078
Pseudo R <sup>2</sup>	0.0055	0.0195	0.0196	0.0215	0.0227	0.023	0.023

Robust standard errors clustered at auction level in parentheses; \*  $p < 0.05$  \*\*  $p < 0.01$  \*\*\*  $p < 0.001$ .

line with a sociological perspective of value and price, that bidders continuously adjust their valuations of a product with respect to how others are valuing it. Working toward answering one of the core questions of this subfield in economic sociology – “what is being valued and by whom?” as posed by [Beckert and Aspers \(2011, p. 17\)](#) – this work suggests that rebidding reflects the value of an object being judged through the lens of other bidders within an auction. Thus, rather than operating in isolation, economic actors are better understood as embedded in social relations within a larger socioeconomic environment that underpins beliefs about value and price.

This research has provided an account of value construction that helps explain why rebidding occurs in auctions. In doing so, it also addresses [Beckert's \(1996, pp. 814–815\)](#) call for scholars “to look at those cognitive, structural, and cultural mechanisms that agents rely on when determining their actions without knowing what to do in order to maximize their outcome.” However, as this work is not the first to highlight that activity in real-world markets may be inconsistent with certain assumptions of neoclassical theory, it is appropriate to briefly address other perspectives that have considered similar topics. With respect to auctions, the behavioral perspective (used within fields such as management, marketing, psychology, and behavioral economics) has offered explanations for many of the deviations of the neoclassical model using theories such as reference points ([Dholakia & Simonson, 2005](#)), competitive arousal ([Malhotra, 2010](#)), and the endowment effect ([Wolf, Arkes, & Muhanna, 2005](#)). Thus, there may be opportunities for interdisciplinary research that can better link together the behavioral perspective with the approach outlined in this work, especially as it pertains to understanding uncertainty as a fundamental component of economic life.

It is also important to note that there are certainly supplemental explanations of the behavior that I describe in this paper. For example, I have outlined how experience should be expected to lead to less rebidding. In my explanation, I conceptualized prior experience as a reference for constructing value beliefs. However, one could also offer a complementary account of this behavior as being a process of economic socialization, just as learning or thinking about economics has been shown to make people behave more like *Homo Economicus* (e.g., [Frank, Gilovich, & Regan, 1993](#); [Molinsky, Grant, & Margolis, 2012](#); [Wang, Malhotra, & Murnighan, 2011](#)). In this way, one could contend that the more experienced actors are more likely to have learned about how rational actors should behave in auctions (in fact, and as noted earlier, guidance as how to behave in auctions is clearly posted on the eBay website) and then begin to behave accordingly. Other complementary explanations for rebidding activities may help us dig deeper into the complexities of economic life, and I expect that there is abundant space for future research to address these and related topics.

This work illustrates that value construction is a social process that extends beyond the individual in isolation. In further clarifying this point, I do not wish to propose that any buyer wants to pay more for something than they must, nor



any seller desires to sell something for a lower price than necessary. Value beliefs, however, may be strongly affected by the who, what, where, when, how, and why that contextualize different types of transactions (e.g., DiMaggio & Louch, 1998; Ranganathan, 2018). Moreover, individuals cannot be simply removed from their social world in order to independently determine how much they should pay to buy (or wish to receive, if selling) something. That is to say, value and prices do not exist abstract of the social environment – rather, they are social constructs. As such, considering the social interaction of realistic individuals is an important step in exploring how price forms in markets. By overcoming traditional “static fixtures of value and values” (Stark, 2011, p. 16), this orientation allows us to more deeply dig into the ongoing calculative process that characterizes how individuals construct value and price, embedded within the broader social environment (Callon & Muniesa, 2005).

Another contribution of this work stems from considering today’s modern digital markets with the same principles that organizational and economic sociologists would consider any market. Since digital markets are still markets, they are necessarily embedded in social relations. Just as Polanyi (1957) mischaracterized capitalistic societies as “disembedded” (Swedberg & Granovetter, 1992, p. 10), we should be cognizant as to not make the mistake of over-conceptualizing digital markets as void of social foundations. Social interaction in settings like Geertz’s (1978) bazaar is overt and a particularly salient representation of how social relations permeate markets, but we should certainly not discount the embeddedness of economic activity in our increasingly digital world.

## NOTES

1. While different auction formats may affect value construction in distinct ways, this work is primarily focused on open bid auctions (the auction type used in the empirical setting), where open bid refers to the fact that all bids are fully visible to other bidders and potential bidders. In contrast to open bid auctions, sealed bid auctions are such that bids are hidden from other bidders. Accordingly, in open bid auctions, bidders compete directly against each other such that any new bid always updates the current price, whereas in sealed bid auctions, bidders only indirectly compete since they do not necessarily know how their bid compares to the bids of others until after the auction is over. Additional details about the open bid auction process will follow in the following sections.

2. For the purposes of this paper, I am not interested in focusing on the limitations of stylized models of economic behavior – though both sociologists and economists have done interesting work in this space (e.g., Colander, 2005; Colander & Klamler, 1987; Fourcade, Ollion, & Algan, 2015; Pfeiderer, 2014; Romer, 2015; Samuelson, 1938). Rather, in this paper, I portray how economic sociology offers a rich and ultimately crucial account of valuation processes.

3. Granovetter (1988) stresses a similar point in his critique of neoclassical models of labor mobility by contrasting the inherent limitations of assuming independent individuals with the social reality where an individual’s behavior relies on the actions of others.

4. It is important to also highlight that prominent economists have drawn attention to the limits of neoclassical assumptions in explaining real-world economic outcomes; some have actively worked to incorporate sociological ideas into their models (e.g., Akerlof &

Kranton, 2000; Arrow, 1974; Becker, 1991; North, 1991; Williamson, 1975). As such, we should be mindful that the neoclassical model purposely isolates economic variables in order to model economic outcomes through a particular lens. Friedman (1953) even argues that economic theory is, in fact, well served by embracing unrealistic assumptions in some areas in order to focus on particular issues. Nonetheless, Granovetter (2017, p. 3) rejects Friedman's viewpoint. This debate aside, economic sociology offers an alternative lens through which one can explain economic outcomes and is predicated upon the notion that economic activity is inherently embedded in social relations (Granovetter, 1985).

5. This work does not address whether or not late bidding or other deviations from the dominant strategy reflect a "successful" alternative strategy. Note that Gray and Reiley (2013) investigate how late bids (bids submitted in the final 10 seconds of the auction) affect final eBay auction prices, and they only find suggestive evidence for a small average effect of late bids but without statistical significance at conventional levels (mean:  $-2.45\%$  effect of late bidding on final price;  $t = -0.74$ ; 95% CI:  $[-9.39\%, 4.13\%]$ ). Despite this lack of empirical support for late bidding being a successful strategy (with their null finding contrasting with the statistically significant effect observed by Roth & Ockenfels, 2002 and Ockenfels & Roth, 2006), Gray and Reiley do not reject the notion that a strategy is being enacted.

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