Mimetic Dominance and the Economics of Exclusion: Private Goods in Public Context

Alex Imas (Chicago Booth) and Kristóf Madarász (LSE)*

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Abstract

We propose a simple mechanism of mimetic dominance seeking whereby a person's valuation for consuming an object or possessing an attribute is increasing in others' unmet desire for it. Such mimetic preferences help explain a host of market anomalies and generate novel predictions in a variety of domains. In bilateral exchange, people exhibit a social endowment effect, and there is an increased demand for goods that become relatively more scarce. A classic monopolist earns excess profit by randomly excluding some people from being able to purchase the product. We test the predictions of the model empirically across several exchange environments. When auctioning a private good, we find that randomly excluding people from the opportunity to bid substantially increases average bids amongst those who retain this option. Furthermore, exclusion leads to greater expected revenue than increasing competition through inclusion. This effect is absent when bidders know that those who are excluded have lower desires for the good. We demonstrate that mimetic preferences matter even for basic exchange: a person's demand for a good increases substantially when others are explicitly excluded from the opportunity to buy the same kind of good. Mimetic preferences have implications for both price and non-price based methods of exclusion: the model predicts Veblen effects, rationalizes attitudes against redistribution and trade, and provides a novel motive for social stratification and discrimination.

Keywords: Mimetic Preferences, Objects of Desire, Exclusion, Trade, Competition, Inequality

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1 Introduction

"Self-love (amour de soi), which regards only ourselves, is contented when our true needs are satisfied. But amour-propre, which makes comparisons, is never content and never could be, because this sentiment, preferring ourselves to others, also demands others to prefer us to themselves, which is impossible. This is how the gentle and affectionate passions are born of self-love (amour de soi), and how the hateful and irascible passions are born of amour-propre." — Jean-Jacques Rousseau, Emile or On Education, 1762.

"If this were the place to go into details... I would prove that if one sees a handful of powerful and rich men on the pinnacle of grandeur and fortune, while the crowd grovels below in obscurity and wretchedness, it is because the former value the things they enjoy only to the extent that the others are deprived of them and because even without changing their conditions, they would cease to be happy if the other people ceased to be miserable. " – Jean-Jacques Rousseau, Discourse on the Origin of Inequality, 1755.

"Andrea: But what if this isn't what I want? I mean, what if I don't wanna live the way you live? Miranda: Oh, don't be ridiculous, Andrea. Everybody wants this. Everybody wants to be us." — The Devil Wears Prada

The value that a person attaches to an object or an attribute may often be determined not only by her intrinsic taste for it, but by aspects of social comparison as well. In this paper, we propose and provide evidence for a novel and potentially fundamental facet of such comparative values: the desires of others. In our setting, a person's pleasure from consuming a good, or possessing an attribute, increases in others' unmet intrinsic taste for it, particularly if this taste is in excess of her own. Such a motive corresponds to a form of dominance-seeking through desire, whereby the lack that an other experiences by not having an object boosts one's value from keeping and consuming this object.

We first formalize this motive – termed mimetic dominance or mimetic envy – in a simple framework. This allows us to derive a variety of predictions and empirical implications of such mimetic preferences for trade, monopoly pricing, and political economy. Mimetic preferences have ramifications in simple exchange environments, driving a wedge between those who posses a good and those who do not. In bilateral trade, it leads to a reluctance to trade even in the absence of private information. People's propensity to keep an object increases in its relatively scarcity. A monopolist producing identical copies of a good, gains from randomly refusing to sell to some buyers, and in auctioning private goods, randomly excluding a limited, but strictly positive fraction of bidders leads to both higher bids and revenue.

We provide direct experimental evidence for these predictions while ruling out a host of other factors, including direct consumption externalities, motives to signal income, variations in the scarcity of supply, as well as classic forms of social preferences (e.g., Fehr and Schmidt, 1999, Charness and Rabin, 2002), or a desire to keep up with the Joneses, whereby people want to consume (or more of) what others consume. Finally, we outline implications of mimetic preferences in driving Veblen and status effects, as well for political economy and social stratification.

In our formulation, a person's utility from consuming a good is the sum of her private consumption utility ,intrinsic taste, and a social comparative term. This comparative term corresponds to the difference between the maximal unsatisfied consumption utility of others: specifically, the largest gain in consumption utility that another individual would experience if it was he who consumed the good instead of her. This comparative term is mimetic; a person's valuation of an object mirrors others' intrinsic taste for this good. It involves dominance or envy because the boost in the valuation of a good is derived from someone else's unmet excess taste for the same good. In turn, people have a greater demand for goods that others want, but do not have.

While to the best of our knowledge such a comparative motive has not been considered explicitly in economic models, the idea that a form of dominance or superiority seeking is an important aspect of politics has a long tradition. Scholars such as St. Augustine (426), e.g., considering the notion of libido dominandi, Hobbes (1658), or Rousseau (1755) have discussed analogous motives when describing aspects of human sociability key for determining the function,

and dysfunction, of political institutions.[1] For example, in his Discourse on the Origin of Inequality, Rousseau (1755) emphasizes the role of what he considers to be the critical and potentially destructive motive of human sociability: a person's tendency to compare herself to others and engage in activities whereby she can experience her superiority over them, as is captured in the opening quote. Such amour propre, as Rousseau calls it, represents a person's concern with comparative success or failure as a social being and involves joy from feeling superior over others. Rousseau argues that such a motive emerges in groups and contrasts this with the motive of amour de soi (self interest), which corresponds to people's basic needs and has no direct social component. In this account, while the latter force compels people to come together in larger groups to benefit from the utility of exchange, the former is a rival centrifugal force which can then rip such associations apart, and requires political institutions to manage it. More recently, Dr. Martin Luther King referred to a similar motive as a universal 'Drum Major Instinct' in an eponymously titled sermon delivered on February 4, 1968 in Atlanta.[2]

We argue that economic contexts naturally generate comparative motives, or a quest for dominance over the unmet desires of others. In doing so, we draw on the work of the literary scholar René Girard (1966, 2002) who emphasizes a distinction between appetites – consumption utility in our context – and more intense desires. In his language, appetites are basic and individual. On the other hand, desires are not autonomous but inherently mimetic. It is when a person recognizes an *other's* appetite for the same object she craves that her more intense desire for this object is formed. In this account, such mimetic desire may give rise to mimetic conflict, whereby people who become each other's exemplars in determining which objects to seek also become each other's rivals in their pursuit.

Building on this idea, in our setup, the comparative utility boost that a person experiences from consuming an object arises when she believes that an other wants it but does not have it. It is the extent of others' unmet excess desire for a given object (or attribute) which intensifies her own desire to consume this object (or posses that attribute). To illustrate, consider a the following fable on sibling rivalry between Luluwa and Awan. No matter how many toys their

[1] See also, e.g., Hirschman (1979) or Hont (2015).

[2] https://kinginstitute.stanford.edu/king-papers/documents/drum-major-instinct-sermon-delivered-ebenezer-baptist-church.

parents have at home, there is always exactly one that one of the children wants to play with—the one the other child is playing with. She wants to take that away and play with that herself.

Our paper first presents a simple formulation of mimetic preferences. A person i's valuation of owning an object is a sum of two components. The first is standard private consumption utility which describes a person's own individual taste for different objects. The second is a comparative term representing mimetic dominance or 'envy.' It captures the consumption value of this object to somebody else. Specifically, a person's overall utility boost from consuming an object is proportional to the maximal difference between the consumption value of this object to someone in i's social context and person i's own consumption value of this object.

We consider a series of applications. In the context of bilateral trade, we show that mimetic preferences lead to a reluctance to trade and a gap between the seller's willingness to sell versus the buyer's willingness to buy—a 'social' endowment effect (Kahneman et al., 1990). In our framework, this endowment effect is 'social' in the sense that it depends on the owner's beliefs about the desires of others. Mimetic preferences also imply a direct preference for objects that are relatively more scarce and generate a demand for exclusion. People enjoy keeping and consuming a good more the greater is the unmet excess desire of others for this good. This exclusionary motive has a variety of implications. In the context of a monopolist selling identical copies to a pool of consumers, relative to the classic optimal mechanism of charging a common price to all potential buyers, the monopolist always benefits from randomly excluding a limited fraction of the potential buyers and denying them access to the good, random rationing, as long as there are not too few customers left.

We also show that such explicit exclusion may lead to higher revenue for the seller when selling a private good via first-price auctions. Holding constant the number of people randomly excluded from bidding, a greater number of active bidders, i.e., an increase in competition, still leads to higher average bids and higher expected revenue for the seller in our setting—the standard result holds. However, holding the number of active bidders constant, a greater number of randomly excluded bidders also leads to higher bids and revenue amongst the active bidders. This is in contrast to the standard case. For the prospective winner of the auction, the chance that an excluded individual may have excess

desire for the item, boosts her own valuation of it. As a result, randomly excluding some bidders leads to more aggressive bidding amongst those who retain the opportunity to acquire the item. We specify conditions under which excluding bidders from a given pool, up to some threshold, increases the seller's expected revenue despite the ease in competition. When mimetic envy is not too low, but not too high either, the seller's expected revenue is inverse U-shaped in the number of randomly excluded bidders from a given pool. Furthermore, exclusion from a given pool of potential bidders may be more beneficial for the seller than expanding the pool of bidders given full inclusion.

Next, we conducted two experimental studies to test key predictions of the model in exchange and valuation environments.

Our first study employs the classic first-price sealed-bid auction setup—a key competitive allocation mechanism both theoretically and in practice.[3] Participants report their bids for a unique good—a custom T-shirt designed specifically for the experiment—in one of two main treatments. In the baseline treatment, M bidders participate in the auction. In the random exclusion treatment, the experimenter publicly announces the random exclusion of K subjects from the opportunity to participate in the auction, allowing only the remaining $M - K$ individuals to bid for the good. Importantly, each bidder is aware of the total group size M, and explicitly informed of both the fact that exclusion was randomly determined and of the number of participants to whom this exclusion applies.

We first confirm the prediction that in the baseline treatment the expected revenue increases with the number of bidders M. Participants appear to respond strategically to competition: increasing the group size leads to a directional increase in both the average bids and expected revenue of the seller. This behavioral response provides credence to the validity of the paradigm. However, consistent with the predictions of mimetic preferences, we find that exclusion also leads to more aggressive bidding and increases the seller's expected revenue. Furthermore, we find that the increase in average bids due to exclusion is nearly double the effect of increasing competition in the Baseline treatment. For example, the average bids from a group of *four* active bidders in the random exclusion treatment, where two are randomly excluded from a group of six ($M - K = 4$), were nearly 60% higher than average bids from a group of *six* active participants in

[3]For a recent review of prior studies using this format, see Kagel and Levin (2014).

the baseline treatment without exclusion.

To provide further evidence for mimetic preferences and rule out alternative explanations, we ran a third treatment where participants were similarly excluded from the opportunity to bid, but the exclusion was not random. In this non-random exclusion treatment, before announcing the auction, we first elicited the extent to which participants desired the good. Each individual saw the item and indicated the extent to which they would want to own it. Participants' desire for the good was then used to determine who was excluded from the auction. When announcing the exclusion procedure, the experimenter noted that the excluded participants indicated the lowest liking for the good (without disclosing the liking scores). Other than the reason for exclusion, procedures were identical to the random exclusion treatment.

Here, mimetic dominance motives are muted since bidders know that those who lack the opportunity to obtain the good also desire it less than they do. Hence, the bidder with the highest private value is predicted to win the auction. At the same time, holding the number of active bidders constant, the seller's expected revenue may be higher than in the random exclusion treatment with equivalent M and K because bidders now come from a positively selected pool. This makes the non-random exclusion treatment a conservative test for whether the results of the random exclusion treatment were driven by mimetic preferences or from being included *per se*. For example, if the results of random exclusion were simply due to the thrill of being given the opportunity to bid, then one should expect even higher average bids in non-random exclusion compared to baseline. Results from the non-random exclusion treatment are consistent with mimetic preferences: while the directional effect of exclusion is still positive, it is no longer close to being significant and the coefficient is a fraction of the size compared to the random exclusion treatment. Expected revenue is also lower than under random exclusion, and depending on the group size, below expected revenue in the baseline treatment as well. This muted effect points to mimetic envy —rather than experimental artifacts—as the driver of increased bids in the random exclusion treatment.

In the first experiment, people competed for a single object. While the results provided support for mimetic preferences, it still remains to be seen whether people's private valuations are affected by the *unmet* desire of others. Specifically, it could be the case that differences in the auction setting are driven by mimetic

desire without an exclusionary motive; that is, a utility boost from the knowledge that others' desire for the item is in excess of one's own, irrespective of whether this desire is met or unmet. This is distinct from mimetic dominance which hinges on the notion of exclusion—that others in one's social context have a greater intrinsic taste for an object but cannot possess it. Our second experiment is also designed to distinguish between these two motives directly and further isolate the effect from alternative mechanisms.

We consider a non-competitive setting where an object is potentially available for everyone. The objects were the same as in the first study. We elicited measures of willingness to pay (WTP) for the item using an incentive compatible mechanism where reported WTP is compared to a randomly drawn common price; this mechanism is incentive compatible under mimetic preferences as well. If the WTP is above the price, the person pays this price and receives the item; if the WTP is below the price, she does not pay anything and does not get the item. This setting is simple and non-strategic, in the sense that one person's WTP does not affect another's probability of purchasing the object.

Participants are assigned to one of two treatments: baseline and random exclusion. The procedures for both treatments resemble those in the first study. In the former, all participants in a group can submit their WTP for the item; in the latter, some participants are randomly excluded from the opportunity to purchase the good. The random nature of exclusion is made clear in both verbal and written instructions, as well as the fact that exclusion is not due to actual scarcity of the item. In line with the predictions of our framework, we find that random exclusion leads to a nearly 50% increase in private valuations of the good. Additionally, we employ structural estimation to measure the extent of the mimetic dominance motive in our setting. Estimates provide further support for the theory: the weight placed on mimetic dominance is high, which rationalizes the observed results on sellers' revenues increasing in the number of excluded market participants.

Together, our findings provide support for the idea of mimetic preferences. They also point to a parsimonious explanation for seemingly anomalous methods of exclusion employed by firms. We discuss both price-based and non-price-based methods of exclusion. As we show more formally in Section 5, the motive for price-based exclusion gives rise to so-called 'Veblen effects' (Veblen,1899), where the demand for certain luxury goods goes up in response to price increases. This

seeming violation of the law of demand has typically been explained through motives to signal one's income status, e.g., Bagwell and Bernheim (1996).[4] In the setup of Bagwell and Bernheim (1996), 'Veblen effects' arise only if the standard single-crossing assumption is violated in particular ways. If it is, then the resulting signalling equilibrium is characterized by the existence of a budget brand and a luxury brand of an identical quality product, bought by the poor and the rich respectively, with the brands differing only in price.

This prediction may be counter-intuitive if the motive is strictly signaling income status, particularly in contexts where there are opportunities to conspicuously destroy wealth (e.g. in front of large online audiences) or to post one's income publicly. Mimetic dominance provides an alternative and complementary mechanism which operates irrespective of the direct observability of income status or consumption. To see the intuition, take a setting with rich and poor consumers and identical taste distributions. Poor consumers face a tighter budget constraint. By raising the price above the budget constraint, demand of the rich increases because the maximal unsatisfied consumption utility for the object jumps. This price-based exclusion increases the demand of the latter group, allowing the firm to extract profit. Because this 'Veblen effect' relies on the unmet desire of others, mimetic preferences rule out scenarios where firms market discount and full price versions of a luxury good which have very similar qualities but differ only on price. In fact, the existence of similar 'budget' alternatives destroys the mimetic dominance motive for owning luxury goods.

The use of non-price methods to artificially restrict availability of products and services are also common in a variety of domains. For example, Becker (1991) notes the lack of firm responses to excess demand, highlighting the puzzling presence of long queues for restaurants, sporting, or theatre events, and concerts. He argues that people's demand for a good is positively affected by the aggregate demand for the same good. However, he also recognizes that this assumption would not generate the unwillingness of firms to either expand supply or raise the price, as in the examples he is studying. Moreover, the allocation of these 'exclusive' goods is often based on seemingly arbitrary characteristics. Advertising takes a similar approach, attempting to exploit the psychology of exclusion in the case of purely private goods: the practice of exclusivity marketing explicitly rests on the premise that access to exclusive goods makes owners 'feel powerful' as a

[4]See also, e.g., Pesendorfer (1995).

result of obtaining something that others crave, but have to miss out on.[5] Additionally, products and organizations based around exclusion (e.g. country clubs, gated communities) continue to thrive and many 'club goods' are characterized by exclusion as a feature (rather than a bug) despite these being non-rivalrous on the margin. Indeed, Becker (1991) discusses that "the gap between what is demanded and what is supplied affects demand when consumers get utility from competing for goods that are not available to everyone who wants them—such as an exclusive club." However, despite noting its importance, he does not explicitly address this gap or the motives behind it in his framework because it would need to be assumed ad hoc.

In contrast, the mimetic mechanism provides a rationale for such exclusion through the psychological drive of mimetic dominance. In our framework, firms may artificially restrict availability so that those who end up attaining the good get a utility boost from the unmet desires of others. Thus the gap between supply and demand is intentional, with firms being aware of the fact that increasing supply may actually lead to a *drop* in demand. More broadly, this helps explain potentially key aspects of exclusion as 'included' members derive greater pleasure from consuming goods, possessing attributes, or belonging to organizations with some attractive features from which others are restricted—even if these restrictions are unnecessary from a marginal cost perspective (e.g. in case of 'club goods') or based on seemingly arbitrary criteria (e.g. in case of exclusivity marketing). As we discuss in Section 5, the demand for exclusion generated by mimetic preferences has broad implications for political economy, such as for preferences over redistribution or immigration, social stratification, and group-based discrimination. In Section 6, we also discuss how mimetic dominance can intensify what appears to be moral behavior, but through a channel distinct from those considered in the social preferences literature.

The rest of the paper proceeds as follows. Section 2 outlines the model and derives predictions for basic exchange. Section 3 develops the applications. Section 4 presents the experimental studies and rules out alternative explanations. Section 5 discusses broader implications. Section 6 concludes .

[5] See practical guides to marketing: https://sumo.com/stories/scarcity-marketing, https://blog.crobox.com/article/scarcity

2 Mimetic Preferences

2.1 Setup

To introduce our basic model of mimetic preferences, suppose first that there is a single object and two people i and j. Let their private consumption utilities (intrinsic taste) from the object be v_i and v_j respectively. Person i's overall utility from consuming the good is then given by:

$$\text{person } i\text{'s valuation} = \overbrace{v_i}^{\text{consumption utility}} + \alpha \overbrace{\max_{m \in \{i,j\}} \{v_m - v_i\}}^{\text{mimetic envy}}$$

where $\alpha \in [0, 1)$ is the strength of the mimetic envy or the drive for mimetic dominance. The case of $\alpha = 0$, corresponds to private consumption utility. If $\alpha > 0$, there is the additional presence of mimetic dominance. This is a function of the desires of others; person i enjoys a boost in her valuation of consuming the object to the extent that the other party j would have a higher consumption utility from it. Person i's valuation mirrors j's unmet intrinsic taste, particularly, if it is in excess of hers. If person i has the greater intrinsic taste for the object, then this comparative term is zero, otherwise, it is positive. The order of overall valuations is the same as the order of intrinsic tastes, but person i enjoys consuming the good more if j has an excess intrinsic taste for it.

Consider now a setting with M people, the social context, and allow for more general consumption. For simplicity, and as commonly assumed in models with a reference or comparison point, we assume that consumption utility is additively separable across hedonic dimensions.[6] Let the overall consumption vector of person i be $y_i = \{y_{i,1}, y_{i,2.....}y_{i,L}\}$, where $y_{i,l} \in \mathbb{R}$ denotes the consumption of person i of good l. Consumption utility along dimension l is given by some $u_{i,l} : Y_i \to \mathbb{R}^+$ for each l. Let $u_{i,l}$ be increasing, bounded, with $u_{i,l}(0) = 0$. Finally, let $y \in Y$ be the overall consumption in the social context. The overall utility of person i, $U_i(y, t_i) : Y \to \Re^+$, where t_i is person i's transfer, is then:

[6] Such an assumption characterizes leading models with a reference or comparison point, e.g., Koszegi and Rabin (2006), Bordalo, Gennaioli, and Shleifer (2013). In future work, we plan to discuss the relaxation of this assumption.

$$\sum_{l \in L} u_{i,l}(y_{i,l}) + \alpha \max_{m \in M \setminus i} \{u_{m,l}(y_{m,l} + y_{i,l}) - u_{m,l}(y_{m,l}) - u_{i,l}(y_{i,l}), 0\} + t_i. \qquad (1)$$

In words, person i derives utility from mimetic envy in addition to consumption utility. This corresponds, for each kind of good l, to the maximal excess consumption utility gain that someone else would experience from consuming what person i consumes of good l, in addition to what this person already consumes.

In this formulation, a person evaluates the comparative term dimension-by-dimension. While this utility boost from mimetic envy is evaluated as a portfolio vis-a-vis a maximal 'other' for each kind of good, the focal 'other' being considered is potentially different for different kinds of goods. This reflects the psychology that the mimetic motive is object based, as it relates to appreciating objects through the eyes of others, rather than focusing on a single other vis-a-vis all that this person consumes.[7]

Our formulation explicitly captures the boost in utility that comes from exclusion where the value of such exclusion is based on the desires of others. The more someone else would like to consume what one consumes, the greater is the value of such consumption. Suppose, for example, that consumption utility is increasing but exhibits diminishing 'marginal' utility. Person i then enjoys consuming $y_{i,l}$ more the less of this good others have. Indeed, suppose that each person has only a unit demand for a good along a dimension. If person i consumes the good, she then enjoys this more if there is someone who does not consume this good, but would derive more consumption utility from it. Thus, a person's utility depends not only on her own consumption, the intrinsic tastes of others, or on aggregate consumption, but also on the allocation of goods amongst others. Finally, we do not claim that mimetic dominance applies to all consumption dimensions equally—it may be affected by focus or salience. However, such potential heterogeneity will not affect the predictions evaluated in this paper.

Discussion. Note that our formulation is different from the idea of envy as is commonly expressed in the context of envy-free allocations, e.g., Varian (1976).

[7] We assume no mimetic motive over money per se because the motive is consumption based and money serves as a means of exchange. Alternatively the same holds if utility is commonly quasi-linear in money.

Specifically, envy there refers to person i preferring what j has to what she has, i.e., $u_i(y_j) > u_i(y_i)$. It relates to what *one* desires and the other has.[8] The motive of mimetic dominance seeking or mimetic envy instead refers to what the *other* desires and one has. In our setting, a person imitates the intrinsic tastes of others in her social context and derives pleasure from consuming an object or possessing an attribute that they crave more. Her utility is boosted through the unmet desires of others for what she has.

Mimetic dominance also does not simply correspond to imitative or mimetic desire, the latter referring to a motive whereby one's utility from a good is increasing in the consumption utility that others derive from such a good, *irrespective* of whether or not their consumption utility is satisfied. The extra utility from a good in our setup does not simply derive from the fact that many like the good as well. Instead, it refers to a more refined motive whereby one's utility from keeping a good is increasing in the additional consumption utility that others would derive from having this good—it mirrors the lack they experience by not having what she does.[9]

For some goods more consumption by one person means less consumption by somebody else. For other kind of goods, however, this is not the case. For goods such as cable TV, an exotic vacation, or citizenship, or a distinction or award, our logic still implies that, all else equal, a person's desire for such an object mirrors an other's intrinsic taste for it as long as the desire is unmet. The utility boost from having cable TV is present when someone else would enjoy cable TV more, but does not have it. Finally, mimetic dominance is not a matter of scarcity per se. Instead, it is a function of the unsatisfied consumption utility such comparative scarcity creates, and is a function of how a given supply is distributed.

Our formulation is purposefully simple. It corresponds to putting weight on the maximal excess taste for one's consumption by another. This formulation is sufficient for the purposes of our paper and provides a formal way of capturing

[8] For a similar treatment of envy, see also, e.g., Banerjee (1990), Kirchsteiger (1994), or Mui (1995).

[9] The boost in the desire for a Ferrari arises when others desire a Ferrari very much but do not have one. People who only have a single Ferrari may experience an intrinsic taste for a second one, but the difference between the consumption utility between two versus one of such luxury sports cars is typically much smaller than the consumption utility of one Ferrari. In our setting, a person owning a Ferrari is then unlikely to enjoy mimetic envy vis-a-vis others who already have a Ferrari, but may well do so vis-a-vis others who do not have one.

the general motive we propose. A simple alternative that may prove useful in some settings is to assume that mimetic envy is intensified by the number or fraction of people in one's context with an excess intrinsic taste for what one has. One may also generalize this comparative term to be not only about excess consumption utility, but some more general convex function of the consumption utility gain of others. We leave the evaluation of such related approaches to future work.

A primitive of our model is the comparison set M. In some applications, the comparison set arises naturally given the set of people one directly interacts with; one's set of siblings, one's high school class, set of business partners, sets of peers, personally-known Instagram or Facebook contacts, etc. As most approaches to social preferences, we do not endogenise the comparison set, but implicitly assume that such preferences are framed somewhat more narrowly and need not be global.[10]

2.2 Trade

We now turn to some basic consequences of the model for bilateral trade. Let there be two people and a single good. Suppose that each party's consumption utility is drawn i.i.d. from a strictly increasing cdf $F(v)$ defined on some bounded interval $[0, \overline{v}]$. The good is allocated randomly to one of the parties. First, let there be no private information about preferences, i.e., the realizations of the consumption values become public before trade. Suppose that any monetary transfer is possible and the parties bargain efficiently. Our first corollary shows that mimetic envy is a force against trade.

Corollary 1. *If $\alpha = 0$, trade happens with an ex-ante probability of $1/2$. If $\alpha = 1$, trade never happens. For any transaction cost $\varepsilon > 0$, the ex ante probability of trade is strictly decreasing in α.*

The logic of why trade never happens under full mimetic envy is simple. If person i were to sell the good to person j, then whatever is j's gain from the trade in terms of consumption utility, it is i's loss in terms of mimetic envy. If person j were to gain more in consumption utility than player i would lose—the

[10]The social context that defines a comparison or consideration set is a basic assumption in nearly all models of social preferences. We briefly discuss later, in the context of political economy, of how such comparison sets may be shaped.

very precondition of trade—then α fraction of this difference corresponds to the psychological loss for i. Trade is effectively zero sum.

More generally, given any positive transaction cost, the ex-ante probability of trade strictly decreases in the extent of mimetic envy and becomes zero before mimetic envy becomes full. Lastly, note that since mimetic envy concerns objects with direct consumption utility, such a 'status quo bias' is present when trading goods, but not over money per se.

Suppose now that valuations are realized privately and consider a simple exchange mechanism. A price p is drawn randomly from $(0, \overline{v})$. Both players observe this price. Subsequently, they simultaneously decide whether to say yes or no to trade at price p. These decisions are then publicly announced and trade takes place at p iff both parties said yes. We focus on Bayesian Nash Equilibria with a positive ex-ante probability of each player saying yes.

Corollary 2 (Status Quo Bias)**.** *If $\alpha = 0$, the probability that the seller says yes is the same as the probability that the buyer says no. If $\alpha > 0$, the former is strictly lower than the latter for any given price p.*

The logic of the above result is a strategic one. The seller is reluctant to say yes to trade because conditional on trade, her valuation from keeping the object may increase due to a boost from mimetic dominance. If the buyer values getting the item more, she also values keeping it more. Hence, in equilibrium the seller needs to be compensated for the loss of mimetic dominance.

To further illustrate the above, consider now the elicitation procedure of a multiple price list and, for simplicity, suppose that the density of valuations is uniform. Specifically, suppose that the full range of prices is given to each party and they have to indicate whether or not they would be willing to trade at that price. The realization of consumption utilities is again private. Then an actual price is drawn randomly and trade is implemented if both parties said yes to trade at that price. The next corollary shows that mimetic dominance leads to a wedge between the maximal willingness-to-pay and the minimal willingness-to-accept.

Corollary 3 (WTA>WTP)**.** *For any $\alpha > 0$, there exists a cutoff equilibrium where the seller's reservation price $p_s(v)$ is increasing, the buyer's reservation price $p_b(v)$ is decreasing in v with $p_s(v) > p_b(v) = v$, and the gap $p_s(v) - p_b(v)$ is increasing in α.*

As the above corollary shows, in this setting the buyer's WTP expresses the basic consumption utility for the item and the seller's WTA expresses the basic consumption utility and, in addition, the expected mimetic envy. The greater the weight placed on mimetic envy, the greater is the discrepancy between the two.

The above prediction is then consistent with the classic finding of Kahneman, Knetsch and Thaler (1990) on the endowment effect.[11] Note however, that the trading mechanism and the presence / absence of private information matters here. For example, consider the case of one-sided forced trade. In particular, consider a trading protocol whereby for a given price p, one of the parties can unilaterally decide whether or not to trade. Under such one-sided forced trade, the probability that for any given price the seller says yes matches the probability with which the buyer says no to trade. This is in contrast with a loss-aversion based explanation, Thaler (1980), or Koszegi and Rabin (2006) with the reference point being no expectation to trade, that would still predict a wedge between the seller's WTA and the buyer's WTP. In contrast, under mimetic preferences no such asymmetry is predicted.

2.3 Scarcity

Mimetic preferences also lead to an increased desire to keep goods that become relatively more scarce. To illustrate this, consider a setting where P randomly chosen people are assigned a pen each and C other randomly chosen people are assigned a cup each with $P + C < M$. Each person's consumption utility from obtaining a pen or obtaining a cup is a private i.i.d. draw from an increasing and bounded value distribution $F(c,p)$. Consumption utility is increasing with diminishing marginal utility along both the cup and the pen dimension. Suppose now that a single randomly picked person i has the right to unilaterally swap her object with a randomly picked other who is assigned the opposite object.

Corollary 4. *If i is a cup owner, then the ex-ante probability that she swaps is strictly decreasing in P and strictly increasing in C.*

The logic of the above prediction is based on the fact that as the scarcity of a good increases, the mimetic dominance motive associated with owning such a

[11] As there is no uncertainty about the value of induced-value tokens, nor is there mimetic envy over money per se, there should be no endowment effect over exchanging money.

good also increases. All else equal, the more scarce an object is, the greater is the expected mimetic dominance boost associated with owning it since the expected maximal unmet taste for such a object is larger. The same then holds for any given set of prices for the goods: all things equal, making a good relatively more scarce increases the propensity for a person to want to keep it.

2.4 Monopoly

Let us now turn to a simple market setting. We explore the consequences of mimetic preferences in a classic monopoly context. A monopolist can produce a good at constant marginal cost which we normalize to zero. Each buyer's private unit demand is drawn independently from some strictly increasing and differentiable cdf $F(v)$ over a bounded interval as before.

To first illustrate some implications when realized valuations are *observable*, consider a simple example. Suppose that consumption utilities are realized publicly. Under classic preferences the seller would want to sell to each buyer and do so at a price equal to each buyer's reservation value. In the presence of mimetic dominance, the seller may now maximize his revenue by excluding higher value buyers from the ability to purchase.

Example 1. *Suppose that there are three people with* $v_1 = v_2 = l < h = v_3$.

1. *If* $\alpha = 0$, *the seller's revenue is maximal when selling to each buyer* i *at* $p_i = v_i$.

2. *If* $\alpha > h/2(h-l)$, *the seller's optimal revenue is given by excluding the high value buyer and selling to the low value buyers at* $p = l + \alpha(h - l)$.

While the seller never gains by excluding the lowest valuation type, she gains by excluding a high valuation buyer if the level of mimetic envy is sufficiently high. Exclusion now generates an excess aggregate value that is larger than the high-valuation buyer's maximal willingness to pay. The above example also helps illustrate that the presence of mimetic preferences lead to different conclusions than a resale motive. In the absence of mimetic envy, the first point holds regardless of whether or not resale is possible. The second point, however, holds only if resale is sufficiently costly (or prohibited) for the buyers. Given the absence of private information, the low valuation buyers would want to resell

their object to the high valuation buyer. In turn, anticipating this, the overall willingness to pay would be bounded from above by $l + h$ in total.

Consider now the classic and much more realistic setting where each buyer's valuation is her private information. The classic result in this context under standard preferences is that the seller's optimal mechanism is to set a single price common to all buyers and allow each to buy, e.g., Harris and Raviv (1981). Setting such a price optimizes on the trade-off that lower valuation buyers will not be able to buy, which reduces demand, but higher valuation buyers will pay higher amounts, thereby increasing the markup. The next result claims that for any $\alpha > 0$, if the number of potential buyers is not too small, randomly excluding some buyers at the start always allows for higher revenue for the seller than setting the common optimal monopoly price to all.

Proposition 1. *For $\alpha = 0$, the seller never gains from randomly excluding a buyer and the optimal mechanism is to post some price p^*. For any $\alpha > 0$, there exists M_α such that if $M > M_\alpha$, then the seller's revenue is higher when he randomly excludes some buyers and sets an optimal price p' for the rest than setting p^* without random exclusion.*

This proposition states that the in the presence of mimetic envy, if there are not too few buyers, the seller always gains from random *exclusion*. Randomly limiting access to the good, such as making people queue for a restaurant meal with uncertainty whether they will make it to the front, or by granting random access to some but not others in a nightclub despite their being enough room for all, will benefit the seller more than raising the price. These are precisely the phenomena considered in Becker (1991), but which the framework ultimately could not accommodate. In the case of consumer goods, consider a new product being released at artificially low quantities such that this leads to public queues, e.g. a new phone model. Becker (1991) would interpret this as people enjoying the process of standing in line. Our framework posits that queues are good for firms because those waiting in line can visually see the random exclusion take place, as others who up late or have to leave the line prematurely due to exogenous events. Mimetic dominance implies that those who end up obtaining the good will have a utility boost from knowing that others may have excess desire for it, but this desire is unmet.

Note also that Proposition 1 captures motives for exclusion based on group

identity, as long as that identity is not negatively correlated with private valuations for the good. As discussed further in Section 5, this generates an incentive for firms to discriminate and for the non-excluded group to oppose anti-discrimination policies.

To see the logic of the above result, consider first the classic effect both in the absence and the presence of utility from mimetic dominance. In the classic case, random exclusion reduces demand without allowing the seller to benefit from charging a higher price to the remaining buyers. Hence, it lowers the seller's expected revenue. In turn, the seller always loses from such non-price based exclusion. In the presence of mimetic motives, however, there is a countervailing psychological effect. The buyers who are still allowed to buy now derive extra pleasure from consuming the good through mimetic dominance. The unmet excess desire of others generates a utility boost, which increases their willingness to pay for the product. Thus, even without increasing the price, the monopolist now faces greater demand for the good. Furthermore, by re-optimizing the price, the monopolist can only improve his expected payoff. The result then shows that no matter how small α is, if there are sufficiently many consumers left, randomly excluding a limited number of buyers benefits the seller.

Note that greater demand by the non-excluded group is increasing in the number of those excluded. This is true because the expected maximal unmet excess valuation is increasing in the cardinality of the set over which such a maximum is taken. In turn, the extent to which exclusion benefits the seller depends on further distributional assumptions and on the overall number of potential buyers. As the next example aims to illustrate, the seller may not benefit from randomly excluding anyone if mimetic envy is below a certain threshold; on the other hand, if it is above that threshold, he will benefit from randomly excluding a substantial fraction of consumers (even if excluding just one is not worthwhile).

Example 2. *Suppose F assigns probability $1/3$ to $v_i = 1$ and $2/3$ to $v_i = 0$. Let $M = 18$. The optimal number of buyers to randomly exclude is 5 for any $\alpha > 0.53$ and zero otherwise.*

3 Rivalry in Auctions and Exchange

Consider now the implications of mimetic preferences for the classic competitive allocation mechanism of a first-price auction. Potential buyers compete for an

indivisible good by submitting sealed-bids. All buyers are serious in that each values the good more than the seller. The person with the highest bid obtains the good in exchange for her bid. As before, person i's private valuation of the object v_i is an independent draw from a cdf $F(v)$ over $[0, 1]$. Given mimetic preferences, each bidder then maximizes her expected utility, which is given by

$$E[v_i + \alpha \max_{j \in M}\{v_j - v_i\} - b_i] \text{ in case of winning, 0 otherwise.}$$

Conditional on winning the auction, a bidder receives her private value and the expected maximal excess taste for the good of those who did not win, net her bid. We denote the number of people randomly excluded from the ability to submit a bid by K and the number of active bidders by $M - K = N \geq 2$. Finally, we assume that $f(v)$ is continuously differentiable, strictly positive, and bounded. As standard in the literature, we focus on monotone pure strategy equilibria where the lowest type makes no expected profit.

Proposition 2. *The symmetric equilibrium is characterized by strategies $b(v_i)$ such that*

1. *If $K = 0$, the bidding strategy is independent of α.*
2. *If $K > 0$, the bidding strategy and the seller's revenue are increasing in α.*
3. *Holding K constant, the bidding strategy and the seller's revenue are increasing in M for any $\alpha \geq 0$.*
4. *Holding N constant, the bidding strategy and the seller's revenue are increasing in M iff $\alpha > 0$.*

First, irrespective of the degree of mimetic envy, the seller's expected revenue is increasing in the number of competing bidders. The classic result for independent private value auctions continue to hold in our setting and all else equal, greater competition leads to higher bids and higher revenue. At the same time, exclusion also leads to an increase in bidding given any positive weight placed on mimetic envy. This effect increases smoothly as this weight increases. Finally, holding constant the active number of bidders, as long as mimetic envy is positive, bids and the seller's revenue are then increasing in the number of those excluded.

To see the logic, note first that in the absence of exclusion, the auction remains 'efficient' in the usual sense. The winner of the auction is the player with the highest realized private valuation. Hence, in equilibrium, there is no excess appetite for the item amongst the bidders and mimetic dominance motives have no bite. In contrast, in the case of exclusion, the winner of the auction may not be the person with the highest valuation for the object. Given mimetic preferences, the winner will derive a utility boost from mimetic envy since there is a chance that those excluded from bidding have an even greater valuation for the object. Holding the number of active bidders constant, this leads to more aggressive bidding by the included bidders. Furthermore, the higher is the number of bidders who are excluded, the greater is the expected maximal unmet valuation, which increases the impact of mimetic dominance.

From this, it follows that under mimetic preferences, all else equal, both more inclusion (higher N) and more exclusion (higher K) lead to higher bids. However, holding everything else constant, exclusion decreases competition, which is a negative force for revenue. It is therefore natural to ask, from an expected revenue perspective, whether it is better to *add* or *exclude* a bidder from a given pool; that is, whether a seller would be better off increasing or decreasing competition. The answer depends on the extent of mimetic dominance. For simplicity, below we assume that private valuations are drawn from a uniform distribution over a bounded interval. $\Pi(M, K)$ denotes the seller's expected revenue when K of the M potential bidders are randomly excluded at the start.

Proposition 3. *For any M, there exists $\alpha^* < \alpha_M < 1$ such that*

1. *if $\alpha < \alpha^*$, then $\Pi(M, K)$ is decreasing in K;*
2. *if $\alpha > \alpha_M$, then $\Pi(M, K)$ is increasing in K;*
3. *if $\alpha > \alpha^*$, then $\Pi(M, K) > \Pi(M, 0)$ for any $K \leq K_{M,\alpha}$ where $K_{M,\alpha}$ is increasing in α and M;*
4. *if $\alpha^* < \alpha < \alpha_M$, then $\Pi(M, K)$ is inverse U-shaped in K.*

If the extent of mimetic envy is small, the standard result holds. Excluding a potential bidder leads to lower expected revenue for the seller. For moderate levels of mimetic envy, the comparative static is non-monotone. Excluding

potential bidders, despite the ease in competition, initially raises the seller's expected revenue. The seller's expected revenue under further exclusion continues to exceed that under full inclusion as long as the fraction excluded is below a certain threshold. If the extent of exclusion crosses this threshold, the seller's revenue no longer exceeds the expected revenue under full inclusion. Furthermore, the comparative static is inverse U-shaped in exclusion. The threshold up to which random exclusion is better than full inclusion is increasing in the degree of mimetic envy and in the overall size of the group. After exclusion passes this threshold, the seller's revenue starts to decline. Finally, if mimetic envy is sufficiently high, the seller's expected revenue is strictly increasing in the number of those excluded.

To see the logic, consider first the standard effect. Exclusion decreases revenue because each bidder knows that she faces less competition. Conditional on a player being the winner, the expected second-highest valuation is decreasing in the number of competitors, hence the bidder shades more. Furthermore, even holding the bid distribution constant, there are now fewer number of bidders. In the presence of mimetic envy, this standard effect is still present. However, there is now a countervailing force. Since the winner may not be the person with the highest private valuation, this bidder experiences pleasure from mimetic dominance, the more so, the lower is her own private valuation. In turn, each participating bidder shields less. As the number of excluded individuals increases, this countervailing force becomes stronger since the expected maximal excess valuation of those left out increases as well. At the same time, there are now fewer bidders competing. If the extent of mimetic envy is moderate, the seller's revenue initially increases, then decreases. Initially, the force of mimetic dominance outweighs the standard force. This balance reverses as the number of excluded individuals reaches a threshold; past this threshold, the impact of increased mimetic dominance motives is outweighed by the impact of weaker competition in the number of competing bids submitted. In turn, further exclusion decreases bids and the seller's revenue.

Finally, if the extent of mimetic envy is sufficiently high, then in the above setting, it is not simply that the seller's revenue is increasing in exclusion, but that the seller's revenue given a reserve price and full inclusion, which entails the optimal mechanism for the selling a private good in the classic case of $\alpha = 0$, Myerson (1981), will lead to *lower* revenue than the *prior-free* mechanism of

simply running an auction without a reserve price but with random exclusion. In other words, given mimetic envy, the classic optimal mechanism, a reserve price and full inclusion, leads to a lower revenue than the detail-free mechanism of simply employing non-price based random exclusion. This follows from the following corollary which further shows that here increasing competition under full inclusion, adding a bidder to a given pool, is worse than employing random exclusion, 'subtracting' bidders, from a given pool. This is then in sharp contrast with the classic case of selling a private good in the absence of mimetic dominance motives.

Corollary 5. *Suppose that* $M \geq 4$. *If* $\alpha < 1$ *is sufficiently high, then* $\Pi(M, K) > \Pi(M+1, 0)$ *for any* $K \geq 2$.

Lowest Exclusion. The above result was based on the fact that the exclusion of K bidders was random. The act of exclusion per se thus provides no information about the private values of those excluded. Since the logic of our result is based on the fact that the winner derives a utility boost from the excess unmet valuation of others, and a randomly excluded bidder has a positive chance of having an excess intrinsic taste for the object, it follows that if those excluded from bidding are known to have lower valuations, without disclosing what these valuations are, than those allowed to participate, then mimetic envy will have no bite. If the K number of bidders excluded are commonly known to have realized valuations that are *lower* than the valuations of those included, then the winner of the auction derives no extra utility boost when obtaining the object. In turn, by Proposition 2, the equilibrium bidding strategies shall again be independent of α.

In the empirical investigation presented in Section 4, considering both random exclusion and lowest exclusion will help rule out alternative explanations, e.g. whether given the opportunity to bid, per se, leads to more aggressive bidding. Under this alternative explanation, holding the number of included and excluded bidders constant, any positive effect of exclusion shall be at least as large under lowest exclusion as under random exclusion. This is true because the opportunities to participate will be constant across the two conditions. Additionally, holding M and K constant, in the absence of mimetic envy, the standard competitive force shall imply a greater positive effect on bids under lowest exclusion due to positive selection. This is because under lowest exclusion, bidders

are positively selected on their valuations. Specifically, valuations of active bidders under lowest exclusion may be thought of as being sampled from a higher distribution in the sense of first-order stochastic dominance. In sharp contrast, mimetic dominance predicts that it is random exclusion which may well lead to a greater increase in bids than lowest exclusion. This is true because mimetic envy generates a utility boost for the winner in the case of random exclusion but not in the case of lowest exclusion.

Non-Competitive Exchange In the above auction context, people competed for a single good. In turn, the scarcity of the object in the group is always the same irrespective of exclusion. However, the above predictions hold irrespective of whether the maximal excess desire of others is met or not, that is, it holds both in the presence of desires simply being mimetic in the sense that a person's overall utility from having the good reflects, the maximal excess intrinsic taste of someone else, irrespective of whether such a desire is satisfied or not, and in the presence of mimetic envy where the boost is the result of such intrinsic taste being unmet. In turn, to provide further support, in our empirical analysis we will then consider a simple non-competitive environment where these two lead to sharply different predictions.

Consider a setting with M people and M units of an identical good, akin to the monopoly setting. We maintain the assumption that each potential buyer is serious in that each has a valuation weakly higher than that of the seller and, for simplicity, we assume that each buyer has a unit demand for the good. Consider then a simple Becker-DeGroot-Marschak (BDM) selling mechanism. Each bidder has to submit a bid. After the bids are submitted, a price is drawn randomly from $[0, \overline{v}]$. The item is sold at this *common* price to all those whose bids were weakly higher than this amount and not to others. As before, K denotes the number of potential buyers *randomly* excluded at the start.

Proposition 4. *Suppose that the price p is drawn randomly and each person who submits a bid b_i buys at this common price iff $b_i \geq p$. In a symmetric equilibrium each player bids $b_i = v_i + \alpha E \max_{j \in K}\{v_j - v_i, 0\}$.*

As the above proposition shows, in the absence of exclusion, the bids reveal the players' private values. While the bid distribution should not change with exclusion in the absence of mimetic dominance motives, if $\alpha > 0$, then bids will be monotonically increasing in the number K of those excluded from the opportunity

to purchase the good. Critically, the above difference in bids between the case with and without exclusion depends on the excess desire of others being *unmet*. If mimetic preferences were purely about excess desire, irrespective of whether these are met or unmet, then these depend only on M and not on K.

4 Experimental Studies

We now turn to our two experiments following the predictions outlined in the previous Section. Our first experiment is in the context of the auction settings outlined above. Here, people compete for a single good. Our second experiment is the context of a classic exchange mechanism where everyone can potentially attain a good. These experiments jointly allow us to pin down the proposed mechanism of mimetic dominance and distinguish it from alternative explanations.

4.1 Auctions

We begin our investigation in the auction setting for several reasons. First, our theoretical framework makes predictions on the effects of exclusion that run counter to prevailing standard theory. This allows for a clean test of our model in a setting that is both conceptually interesting and important for applications. Additionally, because the environment involves the allocation of a single good, a positive effect of exclusion would identify mimetic preferences while ruling out a host of alternative explanations such as scarcity, consumption externalities, and common forms of social preferences.

4.1.1 Method

Participants ($N = 274$) were recruited from a university-wide pool to take part in experiments on decision-making. Sessions were conducted with groups of $M \in \{4, 6, 8\}$, with each participant being assigned to an individual lab station numbered between 1 and 12. Participants earned \$15 as part of an unrelated study, and were then told that they may get the opportunity to participate in an auction. Conditional on having the opportunity, participants could use up to \$15 of the money they earned from the first study to bid on a good through a first price, sealed-bid auction. The good was a custom T-shirt created specifically for

experiments in our lab, which was shown to participants across all sessions (Appendix Figure 1).[12] Those who had the opportunity to participate in the auction would write down their bid privately on a sheet of paper. The highest bidder would receive the T-shirt and pay their bid. Everyone else would not receive the T-shirt or pay anything.

Participants took part in one of three treatments. In the Random Exclusion condition, the experimenter announced that they would roll a 12-sided die. If the outcome of the die roll matched a lab station number where a participant was sitting, that participant could not bid on the good. They would roll the die until $K = \frac{M}{2} - 1$ participants were excluded and relinquished their bid sheets, where M was the group size ($K = (1, 2, 3)$ for $M = (4, 6, 8)$ respectively). The rest of the participants would write down their bids, which were collected by the experimenter. In turn, the number of active bidders $N = M - K$.

In the Non-Random Exclusion treatment, participants arriving to the lab were told about the T-shirt, similar to the other conditions, but not about the auction. Each then indicated the extent to which she would want to own the good, on a scale of 1-10. Once these scores were collected, participants learned of the auction and that $K = \frac{M}{2} - 1$ participants would not have the opportunity to participate. However, unlike in the Random Exclusion treatment, exclusion was based on ex-ante desire for the good: the K individuals who wanted to own the T-shirt the least were not given the opportunity to bid for it. The actual liking scores of the participants was never revealed to the other participants, only that those with the lowest were the ones excluded. The number of active bidders here was thus exactly the same as in the Random Exclusion treatment, $N = M - K$.

We ran two versions of the Baseline treatment ($K = 0$). In both versions, the experimenter announced that everyone in this session would have the opportunity to bid on the shirt, i.e. $K = 0$. Participants then wrote down their bids, which were collected by the experimenter. The number of active bidders in this treatment was equal to the group size, $N = M$. The only difference between the two versions of the Baseline treatment was whether participants first indicated the extent to which they would want to own the good, matching the initial procedures of either the Random or Non-Random Exclusion treatments.

[12] We chose to use the custom T-shirt for two reasons. First, because it was created specifically for experiments in our lab, there was no salient anchor value. Second, participants who did not have the opportunity to bid for the shirt could not (easily) obtain it outside of the experiment. The second component was key for our exclusion manipulation.

This allows us to test whether reporting this measure affected bids orthogonally to the treatment variation.

It is important to stress that the nature of exclusion—whether it was random or depended on private desire—was emphasized and made common knowledge as part of the experiment. Additionally, both the group size M and number of excluded participants K was always emphasized in both written and verbal instructions as well.

At the end of the experimental session, the highest bidder was paid \$15 minus her bid and received the shirt. All others were paid \$15.

4.1.2 Results

The average bid size was \$1.41 ($SE = 0.12$). There were no significant differences in bids between the two versions of the Baseline treatment ($p > .4$), indicating that reporting one's ex-ante taste for the good did not meaningfully affect behavior. We pool data from the two versions for the analysis that follows.[13]

We first regress the number of active bidders N on bids in the Baseline treatment. The coefficient on N is $\beta = .23$, $SE = .10$ and is statistically significant ($p = .02$). This confirms the standard prediction as outlined by Proposition 2 that in the sale of private goods increased competition leads to higher bids. This provides the necessary benchmark that in our setting these results continue to apply. We now proceed to examine the effect of exclusion on average bids.

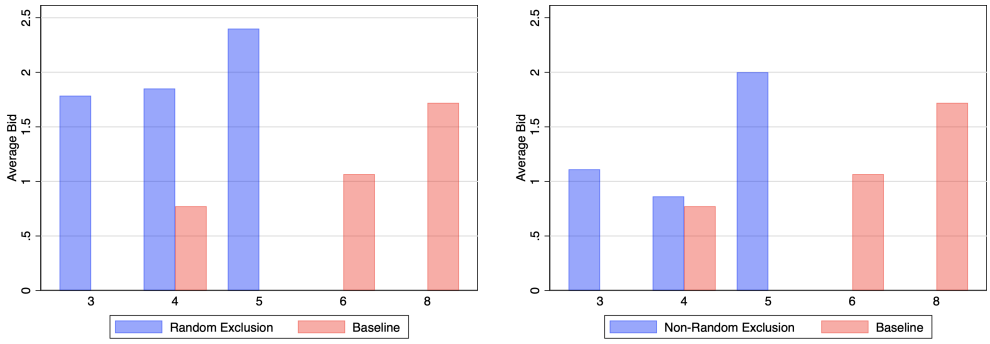
Table 1 reports results from an OLS regression with standard errors clustered at the session level. In Column 1, we regress bids on the number excluded K in the Random Exclusion treatment. Here, the exclusion effect is large and significant. This is consistent with our Proposition 2. Furthermore, each excluded individual increases average bids by roughly *double* the impact of adding additional bidders in the Baseline treatment (the competition channel). Adding dummies for the number of active bidders N in Column 3 only increases the effect of exclusion.

As outlined, when exclusion targets those with the lowest liking scores, then the channel of mimetic dominance is muted. In equilibrium the auction remains 'efficient' in that the winner has the highest realized private value in the group. At the same time, the classic effect, holding N constant, now predicts possibly *higher* bidding due to positive selection. In turn, this treatment rules out that

[13] Similar results obtain when running the analyses separately for each version of the Baseline treatment.

the positive impact of Random Exclusion on bids is due to experimental artifacts, such as a main effect of getting the opportunity to submit a bid.

Column 2 presents analogous results from the Non-Random Exclusion treatment. The impact of exclusion here is substantially smaller and not significant; controlling for the number of active bidders N in Column 4 shrinks the coefficient to essentially zero. Column 5 compares the relative impact of the two treatments, demonstrating that Random Exclusion has a larger impact on bids than Non-Random Exclusion. These results are summarized in Figures 1 which present the average bids by number of active bidders N, comparing the Random Exclusion versus Baseline (Figure 1a) and Non-Random Exclusion versus Baseline treatments (Figure 1b).



(a) Average Bids by Group Size, Random vs. Baseline

(b) Average Bids by Group Size, Non-Random vs. Baseline

Figure 1: Average Bids by Treatment

Table 2 presents analogous results as Table 1, replacing the number excluded K with a treatment dummy. Columns 1 and 3 correspond to the effects of Random Exclusion, which are large and significant even when controlling for the number of active bidders N (Column 3). On the other hand, as shown in Columns 2 and 4, the effects of Non-Random Exclusion are substantially smaller and not significant in either specification. Together, these results provide support for our hypothesis that exclusion increases average bids, but only when there is a chance that those who are excluded may value the good more than the person who obtains it.

We focused on average bids between treatments so far. But we can also use

Table 1: Effect of Exclusion (K) on Bids

	(1)	(2)	(3)	(4)	(5)
K	0.42***	0.22	0.54***	0.05	0.15
	(0.11)	(0.15)	(0.19)	(0.09)	(0.14)
Random					-0.04
					(0.20)
Random*K					0.32*
					(0.16)
Constant	1.14***	1.18***	1.25**	1.07**	1.27***
	(0.12)	(0.11)	(0.52)	(0.47)	(0.41)
Group Size Dummy	N	N	Y	Y	Y
N	210	206	210	206	274

*** : $p \leq 0.01$, ** : $p \leq 0.05$, * : $p \leq 0.1$. Standard errors clustered at the session level are reported in parentheses below each estimate. Columns 1 and 3 report results comparing Random Exclusion to Baseline; Columns 2 and 4 report results comparing Non-Random Exclusion to Baseline. Column 5 compares the relative effects of Random versus Non-Random Exclusion.

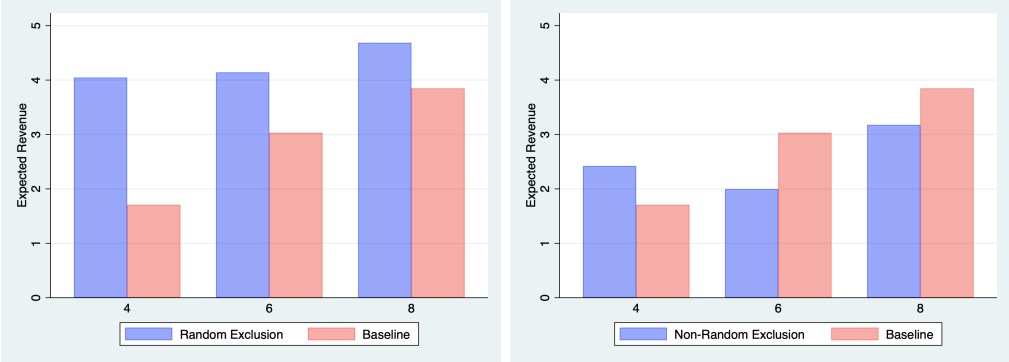
Table 2: Effect of Exclusion (binary) on Bids

	(1)	(2)	(3)	(4)
Exclusion (=1)	0.78***	0.40	1.08***	0.09
	(0.28)	(0.34)	(0.37)	(0.18)
Constant	1.12***	1.12***	0.71	1.02**
	(0.11)	(0.11)	(0.61)	(0.50)
Group Size Dummy	N	N	Y	Y
N	210	206	210	206

*** : $p \leq 0.01$, ** : $p \leq 0.05$, * : $p \leq 0.1$. Standard errors clustered at the session level are reported in parentheses below each estimate. Columns 1 and 3 report results comparing Random Exclusion to Baseline; Columns 2 and 4 report results comparing Non-Random Exclusion to Baseline.

our data to examine expected revenue. To compute expected revenue, we ran a series of Monte Carlo simulations to generate bid distributions using the measured average bid and standard deviations for each group of active bidders N by treatment. We draw N number of bids from these distributions to reproduce the type of data collected in the study, and take the maximum bid from each

set of draws. This process is repeated 10,000 for each treatment and group size combination. In-line with Proposition 3 we find that the expected revenue from the Random Exclusion versus the Baseline treatment, is: 4.68 versus 3.84 *when* $M = 8$; $4,14$ versus 3.03 *when* $M = 6$; and 4.04 versus 1.7 *when* $M = 4$. For each group size, the seller's expected revenue is considerably higher under random exclusion than under full inclusion. Finally, in the Non-Random Exclusion treatment, expected revenue is always below that in the Random Exclusion treatment and, for two out of the three different groups sizes, it is also below that in the Baseline treatment; it is 3.17 when $M = 8$; 1.99 when $M = 6$; and 2.42 when $M = 4$. Expected revenues by treatment and group size M are presented in Figure 2.



(a) Random versus Baseline

(b) Non-Random versus Baseline

Figure 2: Expected Revenue by Group Size M Across Treatments

4.2 Discussion

Our experimental design allows us to rule out a number of alternative explanations as drivers of the observed effect of exclusion. The mechanism of mimetic envy predicts that individuals will bid more aggressively when people in their social context—here, defined as the group size M—have excess desire for the object but can not get it. In order to identify this motive, we need to rule out that our manipulation does not affect the actual scarcity of the good nor the availability of opportunities to bid *per se*. The former may drive up bids if it is scarcity per se which boosts demand, while the latter may do the same if it is

the opportunity to participate per se which boosts demand.

Our design allows us to rule out these alternative explanations. First, there was only one good being auctioned off across all treatments, which implies that object scarcity was held constant. Second, the number of people excluded from being able to bid was held constant across the Random and Non-Random Exclusion treatments. This allows us to rule out the 'scarcity of opportunity *per se*' explanation. We can also rule out consumption externalities driving our results by the same token. Finally, any motive relating to signalling one's income or pure joy of winning shall either be constant or presumably represent a force which would imply more aggressive bidding in the Baseline treatment than in the Random Exclusion treatment.

Another potential though unlikely force is that our exclusion manipulation may introduce opportunities for resale. Note that whatever external resale opportunity the winner of the auction may have, this is constant across treatments. A purely hypothetical scenario is that the winner of the object can resell only *internally*, that is, amongst the randomly excluded bidders. This seems unlikely to occur in practice because bidders were anonymous and care was taken that individuals left the lab one by one. However, even if this was the case, given private values, that is, in the absence of mimetic dominance, exclusion may simply hurt the seller's revenue in sharp contrast to what we find. More generally, whatever internal resale opportunity there may be, given that valuations are private information, it follows from Myerson (1981) and Bulow and Klemperer (1996) that under private values, e.g., in the absence of mimetic dominance motives, the seller's revenue, given the standard regularity condition, would need to satisfy $\Pi(M, K) < \Pi(M+1, 0)$ a prediction which is clearly violated in our setup and in the data. Instead, this is consistent with our theoretical setup where randomly excluding bidders may well lead to a greater increase in expected revenue than expanding the number included by inviting a new bidder.

4.3 Mimetic Dominance in Basic Exchange

The first study provides support for the role of mimetic preferences by showing that random exclusion increases bids in a strategic setting where people compete for a single good. These findings are consistent with mimetic dominance , but they may also be driven by mimetic desire—that is, that a person's utility de-

pends on the maximal desire of others irrespective of whether it is met or not. This may be the case since Proposition 3 operates through the logic that winning is worse news about the maximal desire of others in the Baseline treatment than in the Random Exclusion treatment. We designed our second study to differentiate between mimetic dominance and simply mimetic desire without a potential exclusionary motive. Here, people engage in basic exchange such that obtaining an item does not involve competition with others. People submit their Willingness to Pay (WTP) for an item, and if it is above a common randomly determined threshold, then they obtain it. In this setting, a positive effect of exclusion on WTP would differentiate mimetic dominance from mimetic desire. Additionally, the simplicity of the setting allows us to structurally estimate the parameter α which corresponds to the weight placed on mimetic envy in our model.

4.3.1 Method

We recruited participants ($N = 95$) from a university-wide pool to take part in decision-making studies. Each participant was randomly assigned to an individual lab station numbered 1-12. As before, participants earned $15 as part of an unrelated study and were told that they may have the opportunity to purchase a unique good. The object was the same as in the first study—a custom T-shirt created for experiments in our lab. To measure their valuations, we elicited their maximum WTP for the object using incentive compatible mechanism described in Proposition 4, which corresponds to the classic Becker-DeGroot-Marschak (BDM) method. Here, after writing down their WTP, the experimenter randomly drew a number between 1 and 15. This number served as the common 'price' P. If P was less than a participant's WTP, then she would pay P to the experimenter and receive the object; if P was greater than the participant's WTP, she would not pay anything and not get the object.

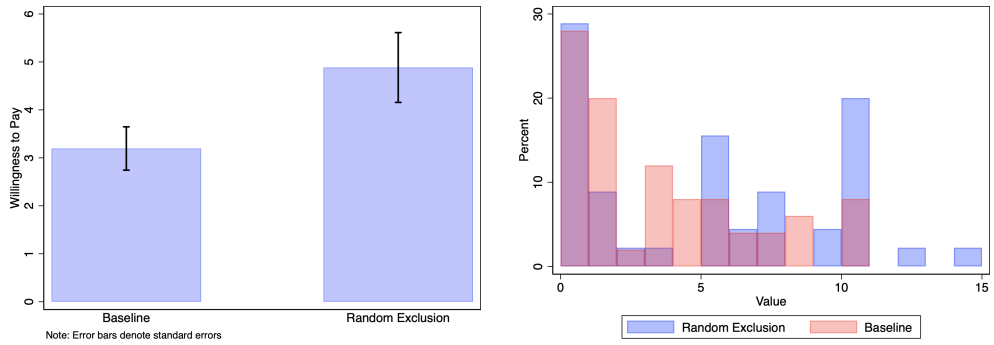
Participants were randomized into one of two treatments. In the Baseline treatment, everyone in a session was given the opportunity to submit their WTP and potentially purchase the object. In the Random Exclusion treatment, the experimenter rolled a 12-sided die and excluded participants from the opportunity to purchase the good based on their lab station number, using a similar method as in our first study. The non-excluded participants submitted their WTP as in the Baseline condition.

At the end of the experimental session, those whose WTP exceeded P were

paid $\$(15 - P)$ and received the object. Others were paid \$15.

4.3.2 Results

Figure 3 presents the means (Figure 3a) and distributions (Figure 3b) of participants' WTP for the object by treatment. The Random Exclusion treatment appears to have shifted the distribution of WTP to the right of Baseline. Consistent with this, the median WTP in the Random Exclusion treatment is \$5, double the median WTP in the Baseline treatment (\$2.50). A two-sample t-test reveals a significant difference between treatment means (\$4.88, $SD = 4.31$ versus \$3.20, $SD = 3.28$; $p = .03$). These results provide direct support for the role of mimetic dominance in private valuations: consistent with Proposition 4, people significantly increase their willingness to pay for a good if they know that there are others whose intrinsic tastes for the good may well be in excess of theirs, but that such intrinsic tastes are not met, they can not obtain the good.



(a) (b)

Figure 3: Willingness to Pay by Treatment

4.3.3 Estimating Mimetic Dominance

The simple setting of basic exchange allows us to estimate the α parameter in equation (1), which corresponds to the weight placed on mimetic envy. We do this in two ways. The first employs standard maximum likelihood estimation to compute a 95% confidence interval. The second uses Bayesian methods assuming an improper uniform prior of $\alpha \geq 0$.

Both methods yield similar estimates. The 95% confidence interval for the maximum likelihood estimator is (0.86, 1.02). The 95% confidence interval for the Bayesian estimator is (0.78, 1.04). In both cases, α is estimated to be significantly greater than 0, implying substantial weight placed on mimetic envy in our setting. Interpreting these estimates from a theoretical perspective also allows us to rationalize the strong effect of exclusion in the auction setting: the large weights placed on mimetic envy increase average bids above and beyond the forces of decreased competition, which push in the opposite direction.

4.4 Related Literature

A rich literature has considered how social concerns factor into people's preferences. A first generation of social preference models focus on consumption externalities, e.g., that people treat the consumption of others as a normal good (Becker, 1974). In these models, people prefer efficient allocations and would never destroy value regardless of how resources are split. The next wave of models attempted to explain empirical evidence on costly punishment behavior, such as in the ultimatum game, by considering preferences over *relative* allocations. Models of inequity aversion (Fehr and Schmidt, 1999) and competitive preferences (Charness and Rabin, 2002) over money assume that people dislike unequal allocations or actively prefer allocations that put them ahead, respectively.

Frank (1985) models 'keeping up with the Joneses' effects through a demand for positional goods. He posits the existence of such goods where people not only care about their personal consumption utility from them, but also the hierarchy of observable consumption amongst others. In particular, people's utility from a positional good is a function of the percentile ranking of their own consumption of the good relative to the overall population's consumption of it. If people make choices non-cooperatively, the desire to consume more than others leads them to demand more of this positional good compared to non-positional goods with similar features.

Finally, a third wave of theory considers whether prosocial or antisocial choices may be a function of imperfect information rather than just the underlying preferences. Benabou and Tirole (2006; 2011) model social behavior in the context of either self or social signaling. Here, the individual treats choices as signals about her type to either others or herself. For example, a donation decision may be treated differently depending on whether it takes place in pri-

vate or public contexts; similarly, the individual may be more or less likely to act charitably as a function of her confidence in being a moral 'type.' A related line of work explores the phenomenon of 'moral wiggle room,' where people are found to exploit uncertainty faced by others in order to achieve their preferred selfish allocation (e.g., Dana, Weber, and Kuang, 2007).

In these models, utility is defined over the consumption, money, or the beliefs of others. This is in contrast to our approach which defines utility over others' unmet desires. This distinction is important because it generates novel predictions on the effects of exclusion, which, as we demonstrate both theoretically and empirically, has important implications for markets. For example, in the auction setting the allocation of goods is the same regardless of exclusion: the winner receives the item while others do not. As a result, there are no direct consumption externalities regardless of the number of people who can participate. There are also no differences in informational asymmetries, as the allocation mechanism is common knowledge. As a result, the alternative channels described here will not predict a difference in bids or revenue as a function of exclusion, while mimetic preferences do. Notably, because the number of goods being auctioned off is the same regardless of exclusion (one item), this setting also allows us to rule out perceived scarcity as a driver of the effect. Finally, a preference for signalling income status via more aggressive bidding or a pure joy of winning is also unlikely to explain our findings since such motives should not be positively affected by lowering competition through random exclusion.

5 Broader Implications

Mimetic preferences imply a direct utility benefit from exclusion: a person enjoys a good more if there are others in her social context who desire this good in excess of her, but cannot have it. In this Section, we explore some implications of this motive for phenomena in markets and in the domain of political economy.

Veblen Goods. Economist have long considered the prevalence of so called 'Veblen effects', where the demand for certain goods increases as its price increases. The goods that display this seeming violation of the law of demand are often characterized by their luxury and exclusivity. A classic literature relates 'Veblen effects' to the propensity to signal one's income status, which presumably

has downstream non-pecuniary benefits. For example, Bagwell and Bernheim (1996) consider a setting where people allocate their income across two types of goods: observable 'conspicuous' goods, such as a sport car, and less observable non-conspicuous, goods, such as private home decor or art displayed at home. There are non-peculiar benefits from signalling high income to social contacts. A 'Veblen effect' is said to arise when rich people consume a higher priced, but otherwise equivalent version of the 'conspicuous' good.

The authors show that if preferences obey a standard single-crossing property, then such effects do not arise; 'Veblen effects' arise only if the property is violated in particular ways. However, the conditions which generate conspicuous consumption also generate fairly counter-intuitive predictions. For example, a more efficient method of signaling would be for richer people to destroy resources publicly, or post their income. The framework also suggests that firms have an incentive to produce perfect substitutes that only differ in price, creating a 'budget' product and a 'luxury' product of the same quality; the latter allows high income consumers to signal their status while the former captures the share of low income consumers. Finally, as Bagwell and Bernheim (1996) point out, the theory provides no predictive power as to which goods, assuming consumption is observable, will display 'Veblen effects' ex-ante.

Mimetic preferences provide an alternative and perhaps complementary channel to the signalling explanation. In our framework, people's demand for a luxury good may increase with its price irrespective of observability with regards to income status or one's own consumption. 'Veblen effects' arise through heterogeneity in income, such that a higher price creates exclusion. Specifically, increasing prices lead consumers who may very much desire the good to no longer being able to attain it because of budget constraints, they would buy it if their incomes were higher. Such price-based exclusion generates a utility boost through mimetic preferences amongst those who may like the good less but can still afford it. Indeed, rich consumers may have a taste for the good only if they know that some poorer consumers very much desire the product but can no longer afford it. Through this channel, raising the price of the good may increase total demand. A simple example provides intuition.

Example 3. *For simplicity, suppose that there are a continuum of rich and poor consumers in γ and $1-\gamma$ proportions, normalized to one. A monopolist produces a good at zero marginal cost. Tastes are identically distributed across the rich*

and poor with privately-known unit demand distributed according to $F(v)$ over $[0, \overline{v}]$. The only ex-ante difference between rich and poor is that poor consumers face a tighter budget constraint. For simplicity we assume that the poor cannot spend more on the good than some number $Z < \overline{v}$. This could be made stochastic / heterogeneous.

If the price of the good is less than Z, both the poor and the rich buy and the total amount bought is $(1 - F(p))$. Such demand reflects the basic willingness to pay for the product. In contrast, if the price is greater than that, there is no demand by the poor, but the overall demand is now $\gamma(1 - F(\max\{(p - \alpha\overline{v})(1 - \alpha)^{-1}, 0\}))$. This is true because those consuming the good now also derive a utility boost from mimetic envy. Thus, all rich consumers with a type $v(1-\alpha)+\alpha\overline{v} > p$ will want to buy the product. It is easy to see that demand may indeed be higher when the price is higher, emblematic of a classic 'Veblen effect.'

In the above stylized example, it follows that even if a firm could engage in third-degree price discrimination and sell to the observably rich and poor at different prices, it may prefer not to do so. This is true even if such a sale could be certified and it was clear at which price a particular good was bought. Instead, given mimetic dominance , the firm may prefer to shut down the market for poorer individuals. It would then not produce a low-priced 'budget' substitute because this would crowd out demand from the rich: the prospect of low-income individuals having access to similar goods would crowd out demand from the rich, which is partly driven by mimetic dominance . This rationalizes why luxury firms rarely advertise budget products under the same umbrella; when a firm does offer both low and high priced goods, the former is typically advertised under a different brand and stresses accessibility while the latter stresses quality (e.g. Giorgio Armani versus Armani Exchange). As in the standard model, creating a very similar 'budget' item decreases demand for the luxury item. However, unlike in the standard model, increasing the price of the luxury item when close 'budget' substitutes are not available may increase demand as a result of mimetic dominance motives.

Finally, our model also makes predictions on which types of objects are more or less likely to display 'Veblen effects.' Since 'Veblen effects' arise because of unmet desire, quality plays an important role in determining which types of goods will generate them—a Ferrari is more likely to be a Veblen good than a Nissan Altima. Specifically, a higher quality good is more likely to be associated

with a greater maximal appetite for it. In turn, higher quality goods will be linked to higher mimetic envy and will generate a larger shift in the demand of those with greater incomes. This is in contrast to signaling models where perceptions of quality may not factor into 'Veblen effects' *per se*. Additionally, our framework predicts that such luxury goods may be enjoyed in private as well, such as intimate dinners at an expensive restaurant or art collections housed in a private gallery, since perceptions of exclusion rather than observability of one's own consumption, is the key driver in our framework.

We do not claim that observability of consumption is irrelevant in the demand for luxury goods. Work by, for example Heffetz (2011) and Bursztyn, et al. (2018), has shown that visibility plays a significant role in the consumption of some premium goods. In fact, visibility may amplify mimetic envy shaping the social context. We also do not aim to minimize signaling as a potential motive. Rather, we argue that mimetic preferences provide a distinct and potentially complimentary channel and allows for predictive power.

Redistribution versus Exclusion. Redistributive policies such as progressive taxation are an effective tool for mitigating wealth and income inequality. However, political scientists and economists are often puzzled by opposition to these policies by the U.S. electorate, particularly amongst the poor and lower middle-class. Prior work has argued that such opposition stems from the "prospect of upward mobility" (e.g., Benabou and Ok, 2001) or motivated beliefs that effort will ultimately be rewarded (Benabou and Tirole, 2006).[14] Mimetic dominance seeking offers a potential complimentary and distinct motive for the opposition to redistributive policies amongst the poor-but-not-poorest individuals.

Consider the question of increasing in the minimum wage. A higher mini-

[14]Benabou and Ok (2001) formalize the "prospect of upward mobility" (POUM) hypothesis, demonstrating that attitudes against redistribution may stem from rational expectations about the prospect of moving higher up the income ladder, and thus having to pay for redistributive policies in the future. The authors argue through an empirical exercise that in the presence of risk aversion, the POUM effect is nonetheless likely to be outweighed by demand for social insurance. In the presence of mimetic dominance seeking, however, there is an additional utility benefit of moving up in the income distribution. Benabou and Tirole (2006) propose that "beliefs in a just world" may also generate opposition to redistribution. In their model, motivated beliefs about the rewards for effort counteract the influence of limited willpower: people are optimistic about hard work paying off in order to motivate themselves, or their children, to work hard. This generates an opposition to redistribution by increasing the perceived payoffs from effort.

mum wage may have positive implications for those currently earning below the minimum wage. By having more money, they can, however, also purchase goods that previously only those richer than themselves could afford. Our framework predicts why opposition to such a policy may be especially strong amongst those who earn one bracket above the current minimum wage. To see the intuition, consider the group earning just one income notch above the current minimum wage. Similar to the Veblen logic described above, this group is currently deriving a utility boost from consuming products that the lower income group—who earn at the minimum wage—cannot afford. Their utility boost comes from the mimetic dominance vis-a-vis those with tighter budget constraints. Increasing the minimum wage to the level of their income would eliminate this boost, which leads the poor-but-not-poorest earning group to oppose the policy. In fact, the negative effect of a higher minimum wage on mimetic dominance may be the largest for those who are currently just one income notch from the bottom, since others will still continue to enjoy various goods that those below them crave but cannot afford.

This is consistent with Kuziemko et al. (2014), who present survey evidence that people just one income notch above the minimum wage oppose a minimum wage increase the most. Their result holds also when controlling for instrumental reasons such as fear that the increase will lead to job loss. More generally, a policy which sustains exclusion and inequality may be more popular than a redistributive policy even for those who would gain materially from greater social insurance because it may lead to a loss of mimetic dominance.

Immigration, Economic Nationalism, and Barriers to Trade. Similarly, the mechanism described in the paper is broadly consistent with the phenomenon whereby 'natives' may want to limit the rights of immigrants, even if such exclusion comes at a material cost for the former. By restricting access to certain rights and institutions that immigrants desire most, natives can derive extra pleasure from them. This helps explain the familiar notion of 'pulling up the ladder,' whereby people who have recently immigrated oppose further immigration.[15] Even if further immigration were to increase their own material well-being, recent immigrants who know others who would also like to do the

[15] For example, a recent Pew Research survey showed that half of all foreign-born whites stated that new immigrants threaten US values rather than strengthen them. A quote from a recent immigrant (2003) sums up this sentiment "I think that enough immigrants entered this country" (https://archive.sltrib.com/article.php?id=4132971itype=CMSID).

same may oppose it because this would decrease mimetic envy.

Politicians appear aware of these fears, describing access to national institutions through the perspective and desires of those outside of the nation. Often this rhetoric takes the form of highlighting outsider desire, such as in the United Kingdom where the National Health Service is often referred to as the 'envy of the world,' or in the United States, where economic success is celebrated as the US economy 'once again, being the envy of the entire world.'[16]

Although our analysis has focused on the individual's mimetic dominance vis-à-vis her social context, such preferences can also apply to the joy of identifying with a group and the rivalry between groups. In particular, people may enjoy identifying with a group they can belong to and derive pleasures from the goods and attributes this group as a whole possesses. The value of in-group identification is amplified if that group possess attributes or consumes goods that members of another group would like, but do not have. Indeed, given the mimetic mechanism, it is the exclusion of out-group members from such goods or attributes which causes a form of pride and generates a utility boost from one's group identity. To protect the value of such group identities, maintaining exclusion is then key, which generates a barrier to inter-group trade.

Trade between groups may pose a threat to group identity since it potentially diminishes the differences from which in-group members derive utility. In turn, this generates a motive for protectionist policies despite gains from trade on the consumption dimension. For example, identification with one's own nation leads to pride and support for protectionist policies if there are others who live in different nations and cannot enjoy the same standard of living. In turn, by drawing attention to, and strengthening the exclusion of out-group members who desire but who do not have access to the privileges afforded to in-group members, a politician may increase her electorate's satisfaction and boost her popularity.[17]

In his essay 'Of the Jealousy of Trade,' David Hume presents an argument for international trade first noting though that "Nothing is more usual, among states which have made some advances in commerce, than to look on the progress

[16] e.g., https://www.telegraph.co.uk/news/2019/06/19/donald-trump-2020-us-president-launches-re-election-campaign/

[17] See Grossman and Helpman (2020) for a different non-exclusionary account of identity and its link with international trade. In their framework, low-skilled workers ceasing to identify with the nation as a whole, once income inequality within the nation increases, leads to a rise in barriers for international trade.

of their neighbours with a suspicious eye, to consider all trading states as their rivals, and to suppose that it is impossible for any of them to flourish, but at their expense." [18] In our interpretation, such an opinion is not simply the reflection of irrational suspicion, but of a feeling that trade comes with a loss of mimetic dominance as described before.

Discrimination and Social Exclusion. In a framework termed stratification economics, members of social groups compete over relative positions in exogenous social hierarchies (Darity et al., 2017; Darity et al., 2015). Higher positions within the hierarchy provide members with a number of privileges including exclusive access to a broad category of *club goods*. In this framework discrimination serves as a rational response by dominant groups to maintain access to these privileges, serving as a tool for exclusion so that their own supply is protected. This is consistent with classic examples of club goods such as country clubs or exclusive residential communities being historically marked by discrimination based on group identity.[19]

Our framework compliments this account for social exclusion with the psychological motive of mimetic dominance seeking. Specifically, majority groups may employ discriminatory policies in order to boost their own utility from consuming private goods. That is, the unmet desires of the excluded or persecuted minority yield additional utility benefits for exclusion, increasing incentives for discrimination. The logic of how mimetic dominance motives reinforce discrimination is similar to the other cases of non-price based exclusion in the preceding discussion, which has broad implications for both applied theory and policy.

6 Conclusion

Our paper proposes the idea of mimetic preferences where a person's valuation of a good is boosted by a comparative term reflecting others' unmet desire for this good. This implies a form of dominance seeking through desire and leads to a preference for exclusivity. Our model helps explain a host of market anomalies and generate novel predictions for competition and political economy. We present

[18] Hume (1758).

[19] For example, see real estate ad for properties in La Jolla, CA, a community marked by a 'gentleman's agreement' not to sell housing to Jews: "The very fact that you live in La Jolla puts you in a special class"(Stratthaus, 1996). Private golf clubs have a long history of race-based discrimination (Sawyer, 1993).

experimental evidence for the predictions of mimetic preferences across several exchange environments. Randomly excluding people from the opportunity to bid in first-price auctions for a private consumption good increases average bids and revenue. Bids are greater under exclusion than when competition is increased by allowing for more bidders— the opposite of the comparative static predicted by standard private value auctions. Mimetic dominance also generate significant frictions in basic trade: a person's demand for a good increases substantially when others are explicitly excluded from the opportunity to buy the same kind of good. Our model naturally generates 'Veblen effects' and makes novel predictions for what type of goods that may be more likely to display them. The framework provides a novel motive for attitudes against redistribution and immigration, as well as points to a novel psychological motive for inter-group discrimination.

Future research should refine and expand these predictions. It may be useful to consider factors that shape one's social context and one's that determine the domains over which mimetic dominance seeking applies most crucially including those that may shift focus from one domain to another. Similarly, it may be interesting to consider social institutions, such as systems of honour, that may also help channel mimetic dominance seeking. Additionally, we believe that the mimetic mechanism has implications for the quest for superiority in the context of moral esteem. This could potentially drive the more intense pursuit of certain moral attributes while at the same time also creating an incentive for making these attributes artificially scarce. This generates a motive for stratification across moral dimensions, where people seek moral credentials for themselves while denying the capacity for the same broadly-desired credentials in others.

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7 Appendix A: Proofs

Proof of Corollary 1. Suppose that it person 1, who has the object. If $v_1 < v_2$, an event which occurs with ex ante probability $1/2$, trade takes place iff $(1-\alpha)v_1 + \alpha v_2 - \varepsilon < v_2 - \varepsilon$. This inequality can never be satisfied if $\alpha = 1$, and the probability that it is satisfied is decreasing in α and becomes zero for any α sufficiently high. If $v_1 > v_2$, trade never occurs for any $\alpha \leq 1$. ■

Proof of Corollary 2. Consider price $p \in (0, \overline{v})$. If $\alpha = 0$, then the seller accepts iff $p \geq v_s$ and the buyer accepts iff $p \leq v_b$. Consider $\alpha > 0$. Note first that if the seller says no, the buyer's payoff is independent of whether she says yes or no since without possessing the object the buyer experiences no mimetic dominance. Furthermore, the buyer's strategy must be monotone in equilibrium. Holding the seller's strategy constant, the buyer's utility of obtaining the object is increasing in v_b for any $\alpha < 1$. Note then that if the buyer says 'no,' this affects the seller's utility, but whether the seller said 'yes' or 'no,' has no bearing on the seller's payoff. Since the buyer's strategy is given by a cutoff, the seller's value of keeping the object is increasing in v_s for any $\alpha < 1$.

Let $\underline{v}_b$ be the infimum buyer type which says yes, and let $\overline{v}_s$ be the supremum seller type which says yes. Suppose now that $\underline{v}_b < \overline{v}_s$. It must be true that $\overline{v}_s < p$ for any $\alpha > 0$ since if $\overline{v}_s > p$, then, conditional on trade, the seller would receive less utility than by keeping the object. It then follows that $\underline{v}_b < p$. This is, however impossible. Note that conditional on trade the buyer's expected utility would then be $\underline{v}_b + \alpha z - p$, where z is bounded by $\overline{v}_s - \underline{v}_b$. Hence $\underline{v}_b + \alpha z - p < (1-\alpha)\underline{v}_b + \alpha\overline{v}_s - p < (1-\alpha)(\underline{v}_b - p) < 0$. Furthermore, suppose that $\underline{v}_b = \overline{v}_s$.

Then, the seller has an incentive to deviate as long as $\alpha > 0$. Hence, $\underline{v}_b > \overline{v}_s$ must hold in equilibrium. ■

Proof of Corollary 3. Consider the case where the buyer's reservation price is $p = v_b$ and the seller's reservation price is $p_s(v_s)$ which solves $(1-\alpha)v_s + \alpha E[v \mid v > p_s] = p_s$. To show that this is an equilibrium note that since conditional on trade $v_b > v_s$, the buyer does not experience mimetic dominance . To check for the seller, note that differentiating $(1-\alpha)v_s + \alpha E[v \mid v > p_s] = p_s$ with respect to p_s the LHS has a derivative of 1 and the RHS has a derivative of $\alpha/2$ given the density. Hence, there is a unique solution for each v_s and this solution is strictly increasing in v_s and α ■

Proof of Corollary 4. Take any realization $\{v_{i,n}, v_{i,g}\}$. Let $v^+_{j,n}$ denote the value of an additional pen to player j and $v^+_{j,g}$ denote the value of an additional mug to player j. Person i who is assigned a mug switches iff $v_{i,n} - v_{i,g} \geq \alpha(E \max_{j \in M}\{v^+_{j,g} - v_{i,g}\} - E \max_{j \in M}\{v^+_{j,n} - v_{i,n}\})$. Given a concave consumption utility, an increase in P leads to a decrease in $v^+_{j,p}$, and, given random allocation, with positive probability, a strict decrease, hence a strict increase in the RHS. Similarly, an increase in M leads to a decrease in $v^+_{j,g}$, and, with positive probability, a strict decrease, hence a strict decrease in the RHS ■

Proof of Proposition 1. Given a single buyer, let the seller-optimal price be p_M and the associated expected profit, per buyer, by V. If $\alpha = 0$, the seller's profit is maximal by charging p_M to all buyers with an expected overall profit of MV. Consider now $\alpha > 0$. Excluding a single buyer always leads to an expected loss of V. At the same time, holding p_M constant, there is now an increase in the probability of participation; the probability that any given buyer buys is now raised by $q > 0$, since $p_M < \overline{v}$. Hence, all else equal, there is now also an increase in the expected profit of the seller by $(M-1)qp_M$ for the remaining $M-1$ buyers. In turn, there always exists M^*_α such that if $M > M^*_\alpha$, then the gain exceeds the loss, i.e., $(M-1)qp_M > V$. By revealed preference, the optimal price with the random exclusion of a single buyer, p'_M, which may not be the same as p_M, can only further raise the expected profit of the seller. Note finally, that since q is increasing in the number of excluded buyers, the optimal exclusion may well exceed that of a single buyer ■

Proof of Proposition 2. The logic follows Milgrom and Weber (1982). Let $b(v)$ be the symmetric and increasing bidding function. Consider player i's type v's incentive to pretend to be some other type z. Let's denote the corresponding payoff, maintaining equilibrium behavior by others, by $EU(v,z)$. Let $G(z)$ be the cdf of the highest of the remaining $N-1$ valuations and normalize $\overline{v}=1$. Consider downward deviations, i.e., $z<v$. Here,

$$EU(v,z)=G(z)[v-b(z)+\alpha\int_{v}^{\overline{v}}(x-v)h(x)dx],$$

where $H(y)$ is the cdf of the max of the private values of the excluded bidders, since, given a downward deviation, mimetic dominance can only come from the excluded bidders. The derivative of the above with respect to z is:

$$EU_z(v,z)=g(z)v-g(z)b(z)-G(z)b'(z)+g(z)\alpha\int_{v}^{\overline{v}}(x-v)h(x)dx$$

Implying an optimality condition of

$$b(v)=\frac{1}{G(v)}\int_{0}^{v}g(x)[x+\alpha K(x)]dx,$$

where, with a slight abuse of notation, $K(x)=\int_{x}^{\overline{v}}(y-x)h(y)dy$ and $K(x)\equiv 0$ if $K=0$. To show that downward deviations are not profitable, consider $EU(v,z)-EU(v,v)$ given $z<v$. Note first that this difference can be written as:

$$(G(z)-G(v))(v+\alpha K(v))+\int_{z}^{v}g(x)(x+\alpha K(x))dx.$$

Substituting terms and integrating by parts, the difference is:

$$G(z)(v-z)+\alpha G(z)(K(v)-K(z))-\int_{z}^{v}G(x)dx+\alpha\int_{z}^{v}(1-H(x))G(x)dx,$$

which, once substituting back $K(x)$, it can be further written as

$$(1-\alpha)G(z)(v-z)-(1-\alpha)\int_{z}^{v}G(x)dx+\alpha[\int_{z}^{v}G(z)H(x)dx-\int_{z}^{v}G(x)H(x)dx]<0,$$

Consider now the case where $z > v$.

$$\begin{aligned} EU(v,z) &= G(z)(v-b(z)) + \\ &\quad \alpha\int_v^z (x-v)(g(x)H(x)+G(x)h(x))dx + \alpha G(z)\int_z^1 (x-v)h(x)dx]. \end{aligned}$$

$EU_z(v,z)$, evaluated at $z=v$, we again get:

$$EU_z(v,v) = g(v)v - g(v)b(v) - G(v)b'(z) + \alpha g(v)\int_v^1 (x-v)h(x)dx.$$

Hence, the local necessary condition for optimality is the same. Consider now the difference $EU(v,z) - EU(v,v)$ given $z > v$ to check for upward deviations. Note first that this difference can be written as:

$$\begin{aligned} &G(z)(v-z) + \int_v^z G(x)dx - \alpha\int_v^z K(x)g(x)dx + \\ &+\alpha[\int_v^z (x-v)(h(x)G(x)+H(x)g(x))dx + \\ &+G(z)\int_z^1 (x-v)h(x)dx - G(v)\int_v^1 (x-v)h(x)dx], \end{aligned}$$

where we used the fact that $\int_v^z xg(x)dx = G(z)z - G(v)v - \int_v^z G(x)dx$. Note also that $\int_v^z K(x)g(x)dx = K(z)G(z) - K(v)G(v) + \int_v^z (1-H(x))G(x)dx$, since $K'(x) = -(1-H(x))$. Hence, the above can be further written as:

$$\begin{aligned} &(1-\alpha)[G(z)(v-z) + \int_v^z G(x)dx] + \\ &+\alpha[-K(z)G(z) + K(v)G(v) + \int_v^z H(x)G(x)dx + \\ &+\int_v^z (x-v)(h(x)G(x)+H(x)g(x))dx + \\ &+G(z)\int_z^1 (x-v)h(x)dx - G(v)\int_v^1 (x-v)h(x)dx - G(z)(z-v)]. \end{aligned}$$

Simplifying terms, $K(v)G(v) = G(v)\int_v^1 (x-v)h(x)dx$, and $G(z)\int_z^1 (x-v)h(x)dx = G(z)K(z) + G(z)(z-v)(1-H(z))$, the part inside the second square brackets can then be written as:

$$\begin{aligned} &\int_v^z H(x)G(x)dx + \int_v^z (x-v)(h(x)G(x)+H(x)g(x))dx + \\ &+G(z)(z-v)(1-H(z)) - G(z)(z-v)] \end{aligned}$$

which is zero. Hence, the overall expression is negative.

It follows from the above, that if $\alpha = 0$, then bids, hence, also the seller's revenue, are independent of K and depend only on N. If $K = 0$, then bids are independent of α. Note that $b(v)$ can be written as

$$v + \alpha K(v) - \int_0^v \frac{G(x)}{G(v)}[1 - \alpha(1 - H(x))]dx,$$

where $1-\alpha(1-H(x)) > 0$ and is independent of N. Hence, holding K constant, bids are increasing in N. Similarly, holding N, constant, bids are increasing in K since $K(v)$ increases in K and $H(x)$ is decreasing in K for any $x < 1$. In turn, holding N constant, the seller's revenue increases in K, and holding K constant, the seller's revenue is increasing in N ■

Proof of Proposition 3. From the proof of Proposition 2 it follows that:

$$\begin{aligned} b(v) &= \frac{1}{G(v)} \int_0^v g(y)(x + \alpha K(y))dx \\ b(v) &= (1-\alpha)\frac{N-1}{N}v + \alpha\frac{K}{K+1} + \alpha(1 - \frac{K}{K+1})(\frac{N-1}{K+N})v^{K+1} \end{aligned}$$

$\Pi(M, K)$ is thus:

$$\frac{M-K-1}{M-K+1}(1-\alpha) + \alpha\frac{K}{K+1} + \alpha(1 - \frac{K}{K+1})(\frac{M-K-1}{M})\frac{M-K}{M+1}.$$

Ignoring integer constraints, consider $\Pi_K(M, K, \alpha)$. Note that $\Pi_K(M, K, 0) < 0$ and $\lim_{\alpha\to 1} \Pi_K(M, K, \alpha) > 0$, with $\Pi_{K,\alpha}(M, K, \alpha) > 0$ and $\Pi_{K,K}(M, K, \alpha) < 0$. It follows, that there exists α_M such that if $\alpha > \alpha_M$, then $\Pi(M, K)$ is globally increasing in $K < M - 2$. Simple calculations show that $\Pi(M, 1) > \Pi(M, 0)$ iff $\alpha > \alpha^*$ where $\alpha^* < \alpha_M$. If $\alpha > \alpha^*$, there then exists $K_{M,\alpha}$ such that $\Pi(M, K) > \Pi(M, 0)$ when $K \leq K_{M,\alpha}$ where $K_{M,\alpha}$ is increasing in α, since $\Pi_{K,\alpha}(M, K, \alpha) > 0$. In turn, for $\alpha \in (\alpha^*, \alpha_M)$, $\Pi(M, K)$ is inverse U-shaped in K. Finally, to show that $K_{M,\alpha}$ is increasing in M, note that $sign\{\Pi(M, K) - \Pi(M, 0)\} = sign\{\alpha(1 - K) + M(3\alpha - 2)\}$. In turn, if for a given α and K, this difference is positive at some M, it is also positive for any

$M' > M$. Corollary 5 follows from the above and the discussion then follows from the classic result of Bulow and Klemperer (1996). ■

Proof of Proposition 4. If $\alpha = 0$, then $b_i = v_i$ is the unique equilibrium. Note that for any given p, holding the other players' strategies constant, the payoff from 'winning' the object is increasing in v as long as $\alpha < 1$. Hence, $b_i(v)$ must be monotone since it does not directly affect the price only the probability of winning. In turn, given symmetric strategies, mimetic envy can only come from the excluded ones and in a symmetric equilibrium $b_i = v_i + \alpha E \max_{j \in K}\{v_j - v_i, 0\}$ holds. ■

1. Every participant who walks in either gets a number between 1 and 12 or sits down at a lab station with a number.

2. Participants will first read the instructions. The bid sheets will be on their desks.

3. If running the **Random Exclusion** treatment, once everyone reads the instructions, the experimenter will announce that they will roll a 12 sided die. They will roll the die to determine which participants will not have the opportunity to bid on the T-shirt.

- If there are 4 participants, the experimenter will roll the die until one participant is eliminated. For example, if they roll a 3, the participant with the assigned number 3 cannot participate.
- If there are 6 participants, the experimenter will roll the die until two participants are eliminated. For example, if they roll a 3, the participant with the assigned number 3 cannot participate. They will then roll the die again, if they get 4, the participant assigned number 4 cannot participate. Roll again if either there are no participants at that number or the participant with the number has already been eliminated.
- If there are 8 participants, the experimenter will roll the die until 3 participants are eliminated.

4. In the **Random Exclusion** treatment, the experimenter should take away the bid sheets from the participants who are eliminated.

4. In the **Baseline** treatment, the experimenter will announce that everyone has the opportunity to bid.

5. Everyone who can bid should then write down their bids.

6. After this the experimenter will collect the bid sheets, determine the winner, and pay everyone accordingly.

7. After the experiment is over, the RAs should write down the treatment, date and time on the bids and staple them together so it will be easy to tell what data is from what session.

Instructions

Please enter your Lab Station Number ___

Today you may get the chance to participate in an auction. If you are able to participate in the auction, you will have the opportunity to use up to $15 of the money you earned in the previous task to bid on a good. If you are selected as the highest bidder, this will be the final sale. No returns, exchanges or refunds are possible.

In the auction, you will have the opportunity to bid to win a custom T-shirt.

The custom T-shirt is designed specifically for this experiment. You cannot get this t-shirt anywhere else! The shirt is available in all sizes.

If you are given the opportunity to bid on the T-shirt, you will write down your bid on the form and wait for the experimenter to collect all of them. If you are the highest bidder, you will receive the T-shirt and your bid will be subtracted from your earnings in the previous experiment. If you are not the highest bidder, you will not get the T-shirt and nothing will be subtracted from your earnings.

If you are not given the opportunity to bid in the auction, the experimenter will collect your instructions before proceeding with the auction.

Please wait while the experimenter announces who will have the opportunity to participate in the auction.

1. Every participant who walks in either gets a number between 1 and 12 or sits down at a lab station with a number.

2. Participants will first read the instructions. The bid sheets will be on their desks.

3. Participants are asked to fill out the Liking Sheet. The RA collects the sheets.

4. If running the **Exclusion** treatment, once everyone reads the instructions, the experimenter will announce who in the room will **not** be able to bid on the T-shirt. As noted in the instructions, not everyone will have the opportunity to bid on the T-shirt. The experimenter will announce that the "People will have the opportunity to bid on the T-shirt based on how much they wanted to own it. Those who wanted to own it *least*, will not have the opportunity to bid on the T-shirt."

- If there are 4 participants, the experimenter will select the person with the lowest Liking rating and say that this lab station cannot bid on the T-shirt.
- If there are 6 participants, the experimenter will select the two people with the lowest Liking ratings and say that these lab stations cannot bid on the T-shirt.
- If there are 8 participants, the experimenter will select the three people with the lowest Liking ratings and say that these lab stations cannot bid on the T-shirt.

4. In the **Exclusion** treatment, the experimenter should take away the bid sheets from the participants who are eliminated.

4. In the **Baseline** treatment, the experimenter will announce that everyone has the opportunity to bid.

5. Everyone who can bid should then write down their bids.

6. After this the experimenter will collect the bid sheets, determine the winner, and pay everyone accordingly.

7. After the experiment is over, the RAs should write down the treatment, date and time on the bids and staple them together so it will be easy to tell what data is from what session.

Please enter your Lab Station Number

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On a scale of 1-10, please rate the extent to which you would like to own the T-shirt (1 *do not want to own* to 10 *very much want to own*):

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1. Every participant who walks in either gets a number between 1 and 12 or sits down at a lab station with a number. Each lab station number should have a:
    a. Instructions
    b. Willingness to Pay Sheet

2. Participants will first read the instructions. The RA will read the instructions as well, and holds up the T-shirt so everyone can see it.

3. If running the **Exclusion** treatment, once everyone reads the instructions, the experimenter will announce who in the room will **not** be able to bid on the T-shirt. The experimenter will announce that the "People will have the opportunity to purchase the T-shirt based on the outcome of a dice roll. I will roll a 12-sided die to determine who will be not be able to purchase the T-shirt."

- If there are 4 participants, the experimenter will roll the die until one participant is eliminated. For example, if they roll a 3, the participant with the assigned number 3 cannot participate.
- If there are 6 participants, the experimenter will roll the die until two participants are eliminated. For example, if they roll a 3, the participant with the assigned number 3 cannot participate. They will then roll the die again, if they get 4, the participant assigned number 4 cannot participate. Roll again if either there are no participants at that number or the participant with the number has already been eliminated.
- If there are 8 participants, the experimenter will roll the die until 3 participants are eliminated.

4. In the **Exclusion** treatment, the experimenter should take away the payment sheets from the participants who are eliminated.

4. In the **Baseline** treatment, the experimenter will announce that everyone can bid.

5. Everyone who can write down a willingness to pay should do so.

6. After this the experimenter will collect the sheets.

7. After the experiment is over, the RAs should write down the treatment, date and time on the bids and staple them together so it will be easy to tell what data is from what session.

Instructions

Please enter your Lab Station Number ___

Today you may get the chance to purchase an item. If you are given this opportunity, you will be able to use up to $15 of the money you earned in this experiment to purchase a good. Specifically, you will have the opportunity to purchase a custom T-shirt.

The custom t-shirt is designed specifically for this experiment. You cannot get this t-shirt anywhere else! The shirt is available in all sizes.

If you are given the opportunity to purchase the T-shirt, you will write down the maximum you would be willing to pay for it and wait for the experimenter to collect all of the forms from everyone.

To determine whether or not you will actually purchase the T-shirt, the experimenter will randomly pick a number X between 1 and 15. If the number X is the same or smaller than the most you are willing to pay for the T-shirt, you will receive the T-shirt and $X will be subtracted from your earnings in the experiment. If the number X is larger than the most you are willing to pay for the T-shirt, you will not get the T-shirt and nothing will be subtracted from your earnings.

This method is used to ensure that it is in your best interest to report your true maximum willingness to pay for the shirt.

If you are not given the opportunity to purchase the shirt, the experimenter will collect your instructions before proceeding.

Please wait while the experimenter announces who will have the opportunity to purchase the shirt.