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When to Use Markets, Lines, and Lotteries: How Beliefs About Preferences Shape Beliefs About Allocation

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Franklin Shaddy and Anuj K. Shah

Abstract

When allocating scarce goods and services, firms often either prioritize those willing to spend the most resources (e.g., money, in the case of markets; time, in the case of lines) or simply ignore such differences and allocate randomly (e.g., through lotteries). When do these resource-based allocation rules seem most appropriate, and why? Here, the authors propose that people are more likely to endorse markets and lines when these systems increase the likelihood that scarce goods and services go to those who have the strongest preferences—that is, when they help sort preferences. This is most feasible when preferences are dissimilar (i.e., some consumers want something much more than others). Consequently, people are naturally attuned to preference variance: when preferences for something are similar, markets and lines seem less appropriate, because it is unlikely that the highest bidders or those who have waited the longest actually have the strongest preferences. However, when preferences are dissimilar, markets and lines seem more appropriate, because they can more easily sort preferences. Consumers thus react negatively when firms use resource-based allocation rules in situations where preferences cannot be easily sorted (e.g., when preferences are similar).

Keywords

allocation, customer segmentation, fairness, lines, lotteries, markets, queues, scarcity

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When allocating scarce goods and services, there are many ways to determine who gets what (Roth 2015). Often, however, firms either prioritize those willing to spend the most resources (e.g., money, in the case of markets; time, in the case of lines) or simply ignore such differences and allocate randomly (e.g., through lotteries). For example, Live Nation, a concert promoter, auctions tickets to the highest bidders (i.e., to those willing to spend the most money; "Ticketmaster Auctions"). In contrast, its chief rival, AEG, administers lotteries, selling face-value tickets to randomly selected fans ("Fair AXS"). Or consider the television network NBC, which allocates advance tickets to tapings of *Saturday Night Live* via lottery before the start of each season. After the start of the new season, however, it allocates standby tickets via lines (i.e., to those willing to spend the most time).

Given the considerable differences between these systems, when do markets, lines, and lotteries seem most appropriate, and why?

The economics of market design (e.g., auction theory [Milgrom and Weber 1982], matching theory [Roth and Sotomayor 1992]) offers a rich toolkit for determining which allocation rules are optimized for different goals, but it does not provide guidance for which the public will most readily endorse or regard as most fair. Yet, this is a critical issue for marketing theory and practice: beliefs about fairness not only pose a fundamental psychological question for researchers but also place significant constraints on firms (Kahneman, Knetsch, and Thaler 1986b; Roth 2007).

In this research, we suggest that people more strongly endorse markets and lines when they believe these resource-based allocation rules increase the likelihood that scarce goods and services will go to the consumers who have the strongest preferences—that is, when markets and lines can help sort preferences. Critically, people believe this is most feasible when

Franklin Shaddy is Assistant Professor of Marketing, Anderson School of Management, University of California, Los Angeles, USA (email: franklin.shaddy@anderson.ucla.edu). Anuj K. Shah is Associate Professor of Behavioral Science, Booth School of Business, University of Chicago, USA (email: anuj.shah@chicagobooth.edu).

preferences are dissimilar (i.e., some consumers want something much more than others). So, for example, it might seem more appropriate for concert promoters and television networks to use a market or line when tickets are broadly available to the general public (where preferences are dissimilar) but less appropriate when tickets are available only to a fan club (where preferences are similar).

Beliefs About Markets and Lines

There are many reasons why markets might seem appropriate for determining who gets what. Markets facilitate price discovery. They can help supply meet demand. They might also encourage innovation and entrepreneurship and are generally viewed as legitimate and just (Jost et al. 2003). In addition, the norms of exchange underlying markets in consumer contexts are a basic feature of social relationships more broadly (Fiske 1992). As a result, markets have sprung up in many unconventional settings. For example, some food banks bid on donations (Prendergast 2017), some college students bid on classes (Budish and Cantillon 2012), and even some prisoners of war invented currency to bid on rations (Radford 1945).

Likewise, there are many reasons why lines, queues, or first-come, first-served policies might seem appropriate. Firms benefit when lines signal positive product or firm characteristics, particularly when demand exceeds supply (Banerjee 1992; Becker 1991), and consumers benefit from their inherent egalitarianism. They require people to spend time, a resource believed to be more equally distributed than money (Shaddy and Shah 2018).

Yet there are also many compelling reasons why these allocation rules might seem inappropriate, particularly with respect to markets. For example, people believe it is taboo to exchange resources such as money for something sacred, such as human organs (Fiske and Tetlock 1997; McGraw and Tetlock 2005; Tetlock et al. 2000). Moreover, consumers are wary of the possibility that markets will generate unfair profits (Kahneman, Knetsch, and Thaler 1986b; Okun 1981) or incentivize actions inconsistent with social good (Bhattacharjee, Dana, and Baron 2017). Meanwhile, because waiting can be aversive, lines sometimes trigger negative reactions from customers, including frustration, anxiety, and boredom (Davis and Vollmann 1990; Efrat-Treister, Daniels, and Robinson 2020; Larson 1987; Taylor 1994; Zhou and Soman 2003).

Prior research has therefore identified many specific *instances* in which people endorse or resist markets and lines, but there is not yet a systematic framework for understanding these beliefs more broadly. Indeed, even studies that directly compare these allocation rules with each other (e.g., Frey and Pommerehne 1993; Kahneman, Knetsch, and Thaler 1986a; Savage and Torgler 2010) primarily describe consumer attitudes without explaining why they hold them. Furthermore, prior work does not predict *when* one approach might seem more appropriate than another. Our theory aims to address this gap.

Beliefs About Preferences

We assert that beliefs about when to use markets and lines depend on the extent to which these allocation rules can help sort preferences. This assertion is based on prior research, which shows that people care a great deal about distributive efficiency, or the allocation of goods and services to those with the strongest preferences (Lerner 1944; Leventhal 1980; Leventhal, Karuza, and Fry 1980; Yaari and Bar-Hillel 1984). Moreover, recent work demonstrates that people view allocation rules as fairer when they make it possible for consumers to signal their preferences clearly (Shaddy and Shah 2018). So, although there are many goals that markets and lines can potentially help achieve, people seem particularly focused on whether these allocation rules ensure that scarce goods and services go to those who want them the most. But when and how is this possible?

We suggest that the answer depends on beliefs about preference variance, which, in turn, shape attitudes about whether preference sorting is feasible. In particular, we propose that when people believe everyone has dissimilar preferences for something (e.g., some consumers want it much more than others), they anticipate that it will be easier for a market or line to sort those with stronger preferences from those with weaker preferences; conversely, when consumers believe everyone has similar preferences (e.g., all consumers want something to roughly the same degree), they anticipate that sorting them will be more difficult.

This reasoning suggests that consumers will view markets and lines as less appropriate (and less fair) when preferences are similar and more appropriate (and fairer) when they are not. This is because when preferences are similar, people will doubt that the highest bidders or those who wait the longest actually have the strongest preferences. In other words, preference sorting seems less feasible. So, it might seem fairer to simply ignore these trivial differences, which would be difficult to accurately detect anyway. Instead, it could seem more appropriate to allocate randomly (i.e., use a lottery). However, when preferences are dissimilar, it will seem more plausible that the highest bidders or those who wait the longest actually have the strongest preferences. Now, preference sorting seems more feasible, and ignoring those nontrivial differences in preferences (e.g., by using a lottery) would seem unfair, because someone with very weak preferences would have the same chance at acquiring something as someone with very strong preferences.

It is worth noting that it is mechanically the case that a market or line can more easily sort preferences when they are dissimilar. Yet it is unclear whether consumers acknowledge or appreciate this basic economic insight, much like they fail to acknowledge or appreciate others. For example, people often do not recognize the positive gains from trade (instead assuming exchanges are zero sum; Baron and Kemp 2004; Hiscox 2006; Johnson 2018) or the incentive value of profit (instead viewing it harmful to society; Bhattacharjee, Dana, and Baron 2017).

Beliefs about the appropriateness of markets and lines could be more strongly tied to any number of other factors aside from their ability to sort preferences. For example, they could depend on which allocation rule reflects the status quo (Kimes 1994), whether prices reflect quality (Chernev and Carpenter 2001; Lichtenstein and Burton 1989; Tellis and Wernerfelt 1987), reference transactions (Anderson and Simester 2008; Gershoff, Kivetz, and Keinan 2012; Kahneman, Knetsch, and Thaler 1986b), or religious and moral views (Fiske and Tetlock 1997; McGraw and Tetlock 2005; Tetlock et al. 2000). But if our assertion holds, then people's intuitions about preference sorting may represent a key way in which lay economic beliefs align with textbook economic principles.

Hypotheses and Studies

First, we propose that the distribution of preferences will influence endorsement of markets, lines, and lotteries—as well as perceptions of fairness (because we assume that people endorse allocation rules they regard as fair).

H_1: Consumers are more likely to endorse and regard as fair resource-based allocation rules (e.g., markets and lines) when they believe preferences are dissimilar.

Second, intuitions about preference sorting will play an explanatory role.

H_2: The belief that resource-based allocation rules (e.g., markets and lines) help sort preferences mediates the effect of preference variance on endorsement of resource-based allocation rules.

Several theoretical and managerial implications follow from these predictions (Figure 1). First, implicit in H_1 and H_2 is the assumption that willingness to spend resources and preferences are correlated (if sometimes imperfectly; e.g., Soman 1999; Sunstein 2007; Warren, McGraw, and Van Boven 2011; Zhou and Soman 2003). Therefore, factors that undermine this correlation should attenuate the effect. One such variable is inequality salience. For example, people find that it is easier to infer preferences from the amount of time someone is willing to spend to acquire something than from the amount of money they are willing to spend. This is, in part, because time is believed to be more equally distributed than money (Shaddy and Shah 2018). So, if inequality in the distribution of a resource were salient, it might reduce the perceived ratio of signal (e.g., preferences) to noise (e.g., spending uncorrelated with preferences). This, in turn, would render preference sorting less feasible—even if preferences were dissimilar. As such, moderation by inequality salience would corroborate our proposed preference sorting mechanism.

H_3: Inequality in the distribution of a resource, when salient, moderates the effect, attenuating endorsement of resource-based allocation rules.

Second, there may be certain goods or services that people simply think should never be allocated on the basis of willingness to spend resources. For example, people treat wants (learned desires) differently than needs (basic requirements; Berry 1994; Dhar and Wertenbroch 2000; Kivetz and Simsonson 2002; Maslow 1970), which are protected by sacred values (Baron and Ritov 2009; Tetlock 2003) and governed by moral reasoning (Bartels 2008; Iliev et al. 2009; Tanner, Douglas, and Iliev 2008). As a result, people are often uncomfortable with using markets to allocate needs (Baron and Spranca 1997; McGraw, Schwartz, and Tetlock 2012; Shaddy, Fishbach, and Simonson 2021), especially when the neediest have the fewest resources. This suggests that even if preferences for something construed as a need were dissimilar—and furthermore even if those preferences *could* be sorted by a market or line—people would nevertheless prefer a different basis for allocation (likely one sensitive to differences in need, rather than want). So, for needs, preference sorting should no longer matter.

H_4: The type of good or service, when perceived as a need, moderates the effect, attenuating endorsement of resource-based allocation rules.

Finally, when firms misapply these allocation rules (i.e., choose the option regarded as less appropriate), the resulting perceptions of unfairness will yield negative downstream consequences. This is consistent with work showing that consumers are less likely to patronize businesses believed to have engaged in unfair practices (Campbell 1999a; Guo and Jiang 2016). Perceptions of unfairness reduce willingness to pay (WTP; Bolton, Warlop, and Alba 2003), trigger complaints (Huppertz, Arenson, and Evans 1978), decrease satisfaction (Haws and Bearden 2006; Oliver and Swan 1989), and can even arouse a desire for vengeance (Bechwati and Morrin 2003).

H_5: Misapplication of these allocation rules (e.g., use of a resource-based allocation system when preferences are similar) reduces purchase intentions.

We conducted a total of 13 studies ($N = 5{,}159$; Table 1) to explore this account, and we report all variables tested. For studies that included instructional manipulation checks (Oppenheimer, Meyvis, and Davidenko 2009), we excluded failures prior to analysis. Data, stimuli, and code are publicly available.[1]

Specifically, in Pilots A and B, we examine the relationship between beliefs about preference variance and endorsement of markets, lines, and lotteries for 25 real-world products and services. We then manipulate preference variance directly (Studies 1a and 1b) and indirectly (i.e., leaving participants to infer it; Studies 2a and 2b). Next, to probe our proposed mechanism, we explore whether intuitions about preference sorting

[1] See https://osf.io/9eg8u/.

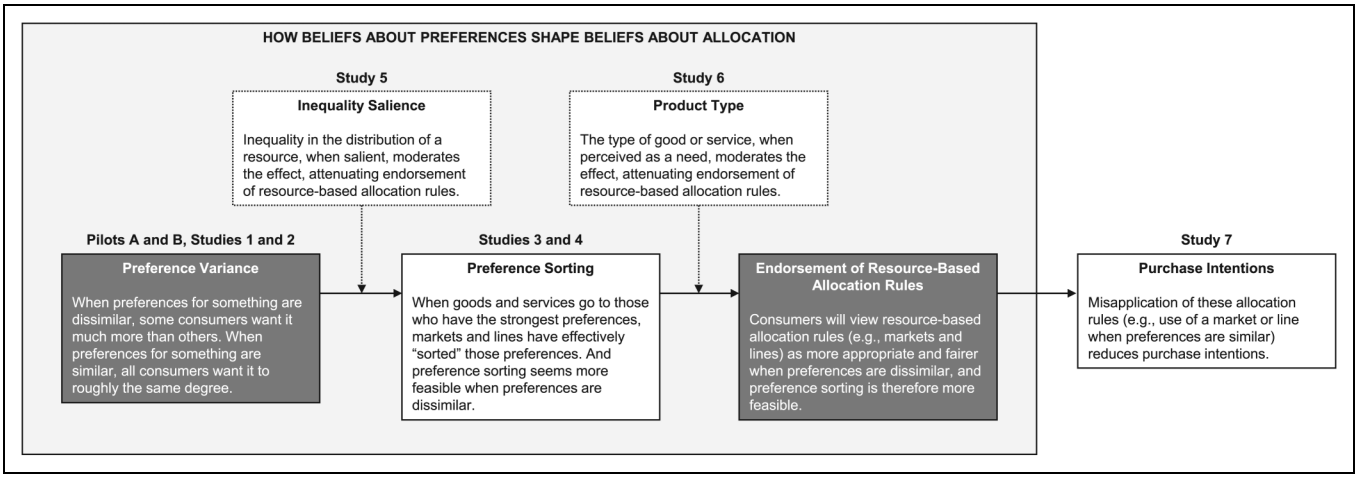

Figure 1. Conceptual framework.

mediate the effect (Studies 3 and 4) and test two theoretically derived moderators: inequality salience (Study 5) and product type (Study 6). Finally, to highlight managerial implications, we examine whether misapplication of these allocation rules reduces purchase intentions (Study 7).[2]

Pilots A and B: Beliefs About Real-World Policies

We first tested whether beliefs about preference variance predict endorsement of markets (Pilot A) and lines (Pilot B) for allocating 25 real-world goods and services.

Method

For Pilot A, we recruited 200 Amazon Mechanical Turk (MTurk) participants ($M_{age} = 32.81$ years; 84 women, 116 men); for Pilot B, we recruited 199 MTurk participants ($M_{age} = 34.96$ years; 82 women, 117 men). Both pilots employed a within-subject design, in which participants evaluated 25 items along two dimensions, in two counterbalanced blocks: preference variance and endorsement of markets (vs. lotteries; Pilot A) or endorsement of lines (vs. lotteries; Pilot B).

We measured preference variance by asking participants "whether people differ in how much they want or need 25 different products and services." Specifically, for each item (presented in random order), we asked, "For [item], what do you think is generally the case?" (1 = "Some people want/need to purchase [item], while some people do not want/need to purchase [item]," and 7 = "Everyone wants/needs to purchase [item].").

We measured endorsement of markets, lines, and lotteries by asking participants "how 25 different products and services should be allocated." Specifically, for each item (presented in random order), we asked, "Imagine that at the current price there are not enough available [item] for everyone who wants or needs them. How should the [item] be allocated?" One option was a lottery: "Use a lottery (i.e., select people randomly) to decide who gets to purchase the [item]. The people selected can get [item] at the current price. The people not selected will not be able to get [item]." In Pilot A, the alternative was a market: "Sell the [item] to the people who will pay the most. The people willing to pay the most will get [item] at the price they offer. The people willing to pay the least will not be able to get [item]." In Pilot B, the alternative was a line: "Use a first-come, first-served policy to decide who gets to purchase the [item]. The people who are the first to request (or have spent the most time waiting) will be able to get [item]. The people who are the last to request (or have spent the least time waiting) will not be able to get [item]."

Results and Discussion

We reverse-coded preference variance ratings for ease of explication (so higher numbers correspond to greater preference variance). We then calculated the correlation between preference variance and endorsement of a market (market = 1, lottery = 0) or a line (line = 1, lottery = 0) across all items (i.e., using 25 pairs of observations). We observed a positive relationship in both pretests (Pilot A: $r = .86$, $p < .001$; Pilot B: $r = .77$, $p < .001$; Figure 2).

We further analyzed this relationship at the participant level. We fit a random-effects logistic regression (to account for repeated measurement) with preference variance as the independent variable and allocation decision as the dependent variable.

[2] We note that in all studies, we compare endorsement of markets with lotteries and lines with lotteries, but we do not compare markets with lines. Much prior work (e.g., Frey and Pommerehne 1993; Kahneman, Knetsch, and Thaler 1986a; Savage and Torgler 2010) has already shown that that lines are generally believed to be fairer than markets (while not the focus of our hypotheses, our studies empirically confirm this). We designed our experiments in this way because we are primarily interested in understanding when people endorse resource-based allocation rules, which sort preferences. Consequently, this framework should potentially apply to any resource-based allocation rule (in addition to markets and lines; see the "General Discussion" section).

Table 1. Overview of Studies.

Study	N	Hyp.	Contribution	Main Finding	Endorsement of Markets and Lines		
					High Pref. Variance	Low Pref. Variance	Sig.
Pilot A	200	H_1	Establishes correlation	Beliefs about the distribution of preferences for 25 real-world items were correlated with endorsement of a market for allocating them.	—	—	***
Pilot B	199	H_1	Establishes correlation	Beliefs about the distribution of preferences for 25 real-world items were correlated with endorsement of a line for allocating them.	—	—	***
1a	525	H_1	Establishes causal effect	When preferences were dissimilar, participants endorsed a market.	47%	31%	***
1b	602	H_1	Establishes causal effect	When preferences were dissimilar, participants endorsed a line.	59%	35%	***
2a	405	H_1	Reveals that consumers try to infer preference variance (without prompting)	Participants more strongly endorsed a market for allocating concert tickets to the general public (dissimilar preferences) than a fan club (similar preferences).	3.66	2.43	***
2b	222	H_1	Reveals that consumers try to infer preference variance (without prompting)	Participants more strongly endorsed a line for allocating concert tickets to the general public (dissimilar preferences) than a fan club (similar preferences).	4.80	3.89	***
3	366	H_2	Tests mediation by preference sorting; examines fairness	Participants more strongly endorsed a market or line for allocating beer when preferences were dissimilar, due to preference sorting.	3.51	2.07	***
4	202	H_2	Tests mediation by preference sorting; presents a consequential choice	Participants cast consequential votes for allocating a prize to the highest bidder (e.g., use a market) when preferences for it were dissimilar.	53%	37%	*
5	566	H_3	Shows that inequality salience breaks the link between preference variance and preference sorting	When preferences for an electric truck were dissimilar, participants endorsed a market for allocating it, but not when inequality was salient.	3.43	2.49	***
6	376	H_4	Shows that product type breaks the link between preference sorting and endorsement of resource-based allocation rules	When families differed according to how much they wanted rental cabins, participants endorsed market for allocating them, but not when families differed according to how much they needed rental cabins.	4.01	3.05	**
7	508	H_5	Documents implications for purchase intentions	Misapplication of these allocation rules (e.g., using a market when preferences are similar) reduced purchase intentions.	3.64	3.05	*
Supp. 1a	493	H_1	Extends causal effect	When WTP for basketball tickets varied, participants endorsed a market.	37%	22%	***
Supp. 1b	495	H_1	Extends causal effect	When willingness to wait for basketball tickets varied, participants endorsed a line.	88%	78%	**

*$p < .05$.
**$p < .01$.
***$p < .001$.

We observed a positive relationship between preference variance and both endorsement of a market ($z = 21.61$, $p < .001$) and endorsement of a line ($z = 11.06$, $p < .001$).

These initial findings characterize a strong, positive relationship between beliefs about preference variance and endorsement of resource-based allocation rules. However, this could simply be a feature of the particular set of products and services that we tested. And, of course, these pilots are correlational. Do beliefs about preference variance actually have a *causal* effect?

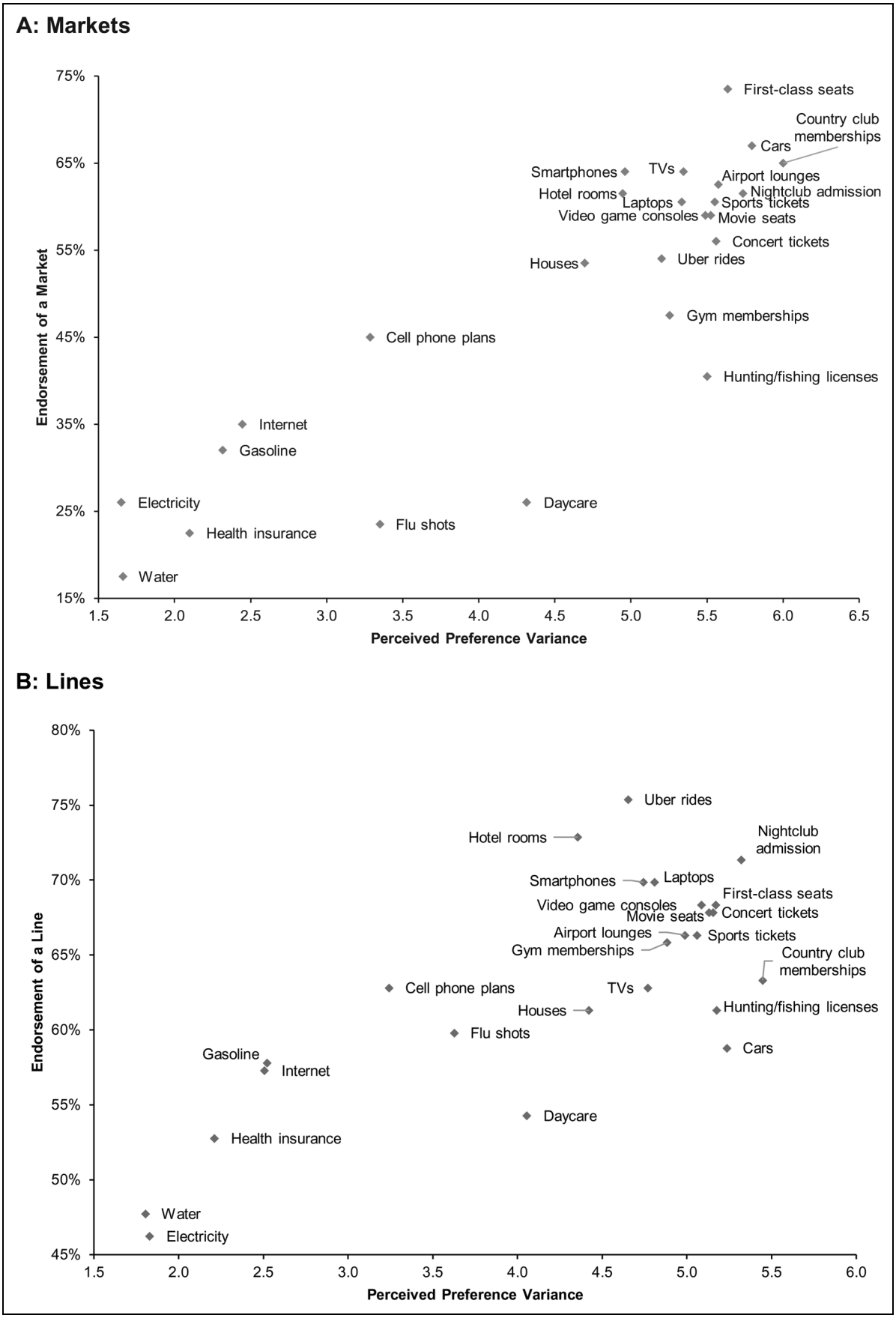

Figure 2. Pilots A and B: Perceived preference variance for a product or service correlates with endorsement of markets and lines for allocating that product or service.

Studies 1a and 1b: Preference Variance Increases Endorsement of Markets and Lines

Study 1 tests whether beliefs about preference variance increases endorsement of both markets (Study 1a) and lines (Study 1b) (H_1).

Method

For Study 1a, we recruited 525 MTurk participants ($M_{age} = 35.77$ years; 313 women, 212 men); for Study 1b, we recruited 602 MTurk participants ($M_{age} = 37.16$ years; 286 women, 316 men). Both studies employed a single-factor (condition: variance vs. no variance—high vs. no variance—low), between-subjects design. Participants were randomly assigned to a condition and one of two scenarios (product vs. ticket). In the product scenario, participants read that "a retailer has a limited supply of a very popular product, and there is just one item left." In the ticket scenario, participants read that "a venue has a limited supply of tickets for a very popular upcoming event, and there is just one ticket left."

In the variance condition, we told participants that "three people all want the [product/ticket] to varying degrees" and that Persons A, B, and C, respectively, were "extremely," "moderately," or "only a little [interested in the product/excited about the event]." In the no variance—high condition, we told participants "three people all want the [product/ticket] to the same extent" and that Persons A, B, and C were all "extremely [interested in the product/excited about the event]." The no variance—low condition was identical to the no variance—high condition, but Persons A, B, and C were all "only a little [interested in the product/excited about the event]." We included the no variance—low condition to account for the possibility that consumers are simply uncomfortable using markets for allocation when demand is uniformly high (Bhattacharjee, Dana, and Baron 2017; Kahneman, Knetsch, and Thaler 1986b).

We then asked participants to choose between a resource-based allocation rule versus random allocation (counterbalanced). In Study 1a, participants selected either "choose someone randomly" (lottery) or "choose the person who is willing to pay the most money" (market). In Study 1b, participants selected either "choose someone randomly" (lottery) or "choose the person who is willing to wait the longest in line" (line).

Results and Discussion

For these analyses, we collapsed across the product and ticket scenarios (and note that the effects did not vary by scenario). In Study 1a, participants were more likely to endorse a market, relative to a lottery, in the variance condition (47%, 95% confidence interval [CI]: [40%, 55%]; Figure 3) than in both the no variance—low condition (32%, 95% CI: [26%, 39%]; $z = 2.93$, $p = .003$, $\Phi_c = .16$) and the no variance—high condition (30%, 95% CI: [23%, 37%]; $z = 3.38$, $p = .001$, $\Phi_c = .18$). In Study 1b, participants were more likely to endorse a line, relative to a lottery, in the variance condition (59%, 95% CI: [52%, 65%]) than in both the no variance—low condition (36%, 95% CI: [30%, 43%]; $z = 4.41$, $p < .001$, $\Phi_c = .22$) and the no variance—high condition (33%, 95% CI: [27%, 40%]; $z = 5.00$, $p < .001$, $\Phi_c = .25$).

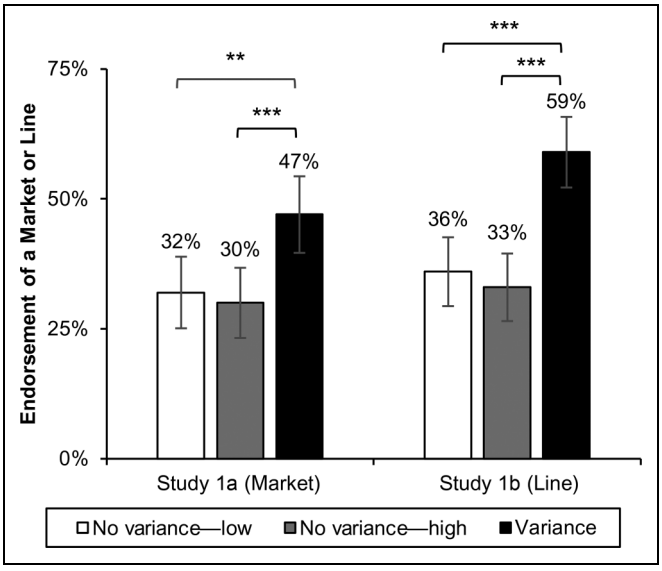

Figure 3. Studies 1a and 1b: Preference variance increases endorsement of markets and lines.
Notes: Bars represent 95% confidence intervals.

These results illustrate that when some consumers have much stronger preferences than others, markets and lines seem more appropriate. We also find a similar effect when participants view only proxies for preferences (e.g., WTP, wait times) that vary a lot or a little (see Supplemental Studies 1a and 1b in the Web Appendix). However, in these initial studies, we explicitly gave participants this information. Do people naturally attend to preference variance in the absence of such prompting?

Studies 2a and 2b: Inferences About Preferences

Because different consumers maintain different preferences (Goodman et al. 2013; Spiller and Belogolova 2017), what "works" for one group might not for another. We predicted that endorsement of resource-based allocation rules would depend on whether participants thought about a group that they *inferred* had similar or dissimilar preferences (H_1).

Method

For Study 2a, we recruited 405 MTurk participants ($M_{age} = 37.46$ years; 204 women, 201 men); for Study 2b, we recruited 222 participants from the behavioral laboratory at a West Coast business school ($M_{age} = 22.05$ years; 169 women, 53 men). Both studies employed a single-factor (condition: general public vs. fan club), between-subjects design. We described a scenario in which the band Radiohead was playing "a

one-night-only show in Los Angeles" and made tickets available either to "the general public" or to "members of its Los Angeles fan club." We expected that participants would infer lower preference variance within the fan club than among the general public.

In Study 2a, we asked whether the band should allocate tickets, at face value, via "a lottery" or "sell the tickets," at their stated price, to those "willing to pay the most" (1 = "Definitely use a lottery," and 7 = "Definitely sell the tickets to the people willing to pay the most"). In Study 2b, we asked whether the band should allocate the tickets, at face value, via "a lottery" or "sell the tickets," at face value, to those "willing to wait the longest in line" (1 = "Definitely use a lottery," and 7 = "Definitely sell the tickets to the people willing to wait the longest").

Finally, as a manipulation check, we measured inferences about preference variance: "Among members of the [general public (i.e., everyone in the city of Los Angeles)/members of the Los Angeles fan club (i.e., die-hard fans)], what do you think is generally the case?" (1 = "Everyone is interested in the tickets to a similar degree," and 7 = "Some are not interested in the tickets at all, some are moderately interested in the tickets, and some are extremely interested in the tickets").

Results and Discussion

Confirming the effect of the manipulation, in Study 2a, participants inferred greater preference variance in the general public condition (M = 5.97, 95% CI: [5.76, 6.18]) than in the fan club condition (M = 3.58, 95% CI: [3.28, 3.87]; t(403) = 13.00, $p < .001$, d = 1.29). In Study 2b, participants inferred greater preference variance in the general public condition (M = 6.06, 95% CI: [5.84, 6.29]) than in the fan club condition (M = 4.50, 95% CI: [4.13, 4.86]; t(220) = 7.24, $p < .001$, d = .97).

Moreover, in Study 2a, participants were more likely to endorse a market, relative to a lottery, in the general public condition (M = 3.66, 95% CI: [3.34, 3.97]) than in the fan club condition (M = 2.43, 95% CI: [2.16, 2.70]; t(403) = 5.88, $p < .001$, d = .58). In Study 2b, participants were more likely to endorse a line, relative to a lottery, in the general public condition (M = 4.80, 95% CI: [4.46, 5.14]) than in the fan club condition (M = 3.89, 95% CI: [3.51, 4.27]; t(220) = 3.55, $p < .001$, d = .48).

These additional analyses corroborate our claim that the appropriateness of markets, lines, and lotteries depends not only on what is being allocated, but *to whom*. What explains this pattern, though? We propose that consumers endorse markets and lines when they believe these resource-based allocation rules increase the likelihood that those who want or need something the most will get it—that is, when they help sort preferences. In addition, thus far we have asked participants what *should* be done, rather than what would be the *fairest* thing to do. While our account implies beliefs about the latter shape beliefs for the former, we have yet to test this assumption empirically.

Study 3: Intuitions About Preference Sorting Mediate the Effect

Study 3 offers initial process evidence for our account by testing whether intuitions about preference sorting explain why preference variance increases both endorsement and the perceived fairness of markets and lines (H_1). We predicted that these intuitions would play a mediating role (H_2).

Method

We recruited 366 MTurk participants (M_{age} = 43.80 years; 186 women, 180 men). Study 3 employed a 2 (condition: variance vs. no variance) × 2 (resource: money vs. time), between-subjects design. All participants read, "A local craft brewery has just released a new, limited-edition beer. This new beer is an India pale ale (IPA), and there are only 10 available cases. The brewery announced the release in a Facebook post to its 100 followers."

In the variance condition, participants read, "All 100 followers would be willing to purchase a case, but some of these followers are more excited than others (i.e., some love IPAs, while others only somewhat like IPAs)." In the no-variance condition, participants read, "Because the company is known for its IPAs, all 100 followers are extremely excited and would be willing to purchase a case (i.e., they all love IPAs)."

We then explained, "One option is to enter all 100 followers into a lottery. The 10 cases would be sold to 10 randomly selected people (at the standard price)." In the money condition, we said, "Another option is to offer the available cases to those who are willing to pay the most. The 10 cases would be sold to the 10 people willing to pay the most (at their stated price)." In the time condition, we said, "Another option is to offer the available cases on a first-come, first-served basis. The 10 cases would be sold to the 10 people willing to wait in line the longest."

We asked (counterbalanced), "What should the brewery do?" and "What would be the fairest thing for the brewery to do?" (money condition: 1 = "Definitely use a lottery," and 7 = "Definitely sell the cases to those who are willing to pay the most"; time condition: 1 = "Definitely use a lottery," and 7 = "Definitely sell the cases to those who are willing to wait in line the longest").

Finally, we measured intuitions about preference sorting: "If the brewery sold the available cases to [those who are willing to pay the most/wait in line the longest], how likely is it that the available cases would end up going to the people who want them the most?" (1 = "Not at all likely," and 7 = "Extremely likely").

Results and Discussion

Beliefs about what the brewery "should" do and what would be the "fairest thing for the brewery to do" did not meaningfully differ ($\alpha = .89$), so we formed a composite by taking the average. An analysis of variance (ANOVA) of this composite

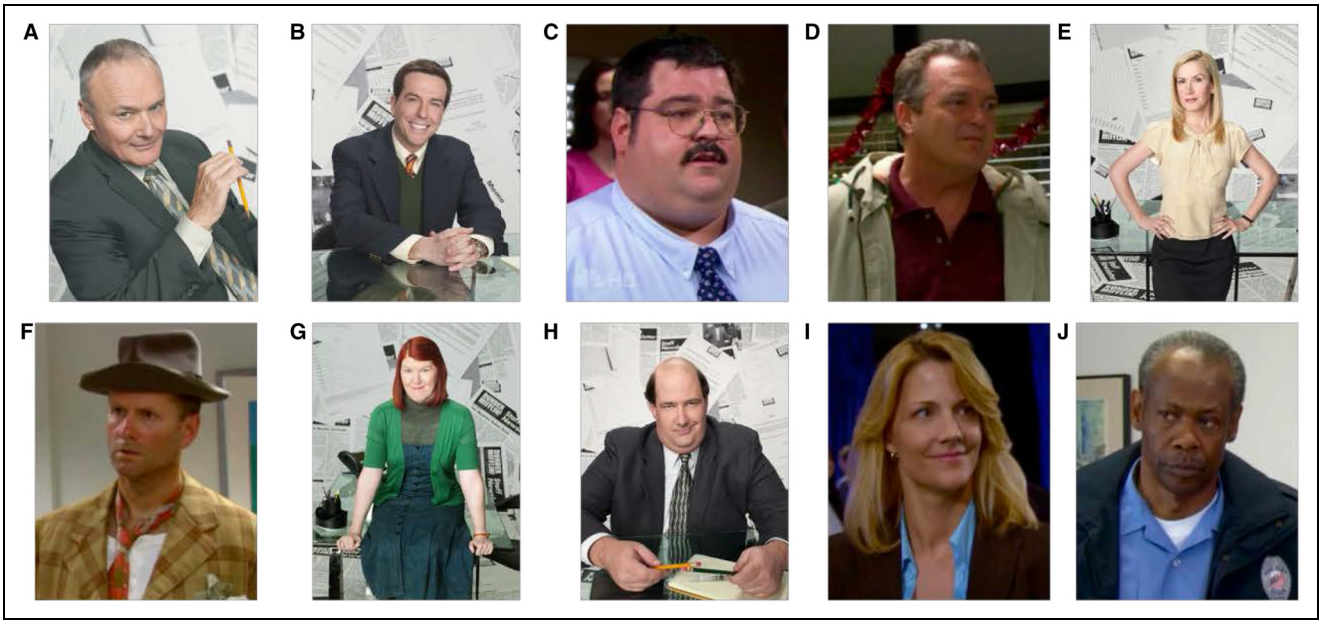

Figure 4. Study 4: Trivia Game Stimuli.

on condition, resource, and their interaction revealed only a main effect of preference variance ($F(1, 362) = 49.43$, $p < .001$, $d = .68$), such that participants were more likely to endorse a market or line, relative to a lottery, in the variance condition ($M = 3.51$, 95% CI: [3.18, 3.84]) than in the no-variance condition ($M = 2.07$, 95% CI: [1.82, 2.32]). The simple effect of condition was significant for each resource (money condition: $F(1, 362) = 15.83$, $p < .001$; time condition: $F(1, 362) = 35.70$, $p < .001$).

We next examined beliefs about preference sorting. An ANOVA of these beliefs on condition, resource, and their interaction revealed a main effect of preference variance ($F(1, 362) = 30.94$, $p < .001$, $d = .52$), such that participants believed that a market or line would do a better job sorting preferences in the variance condition ($M = 5.66$, 95% CI: [5.45, 5.87]) than in the no-variance condition ($M = 4.82$, 95% CI: [4.57, 5.06]). The simple effect of condition was significant for each resource (money condition: $F(1, 362) = 16.80$, $p < .001$; time condition: $F(1, 362) = 14.17$, $p < .001$). We also observed a main effect of resource ($F(1, 362) = 9.65$, $p = .002$, $d = .25$), such that participants believed that preference sorting was more likely in the time condition ($M = 5.44$, 95% CI: [5.22, 5.65]) than in the money condition ($M = 5.04$, 95% CI: [4.79, 5.29]).

Finally, we tested for mediation. Indeed, beliefs about preference sorting mediated the effect of condition on endorsement of a market or line, relative to a lottery (based on 10,000 bootstrapped resamples: indirect effect = .32, SE = .07, 95% CI: [.193, .486]).

This result supports the notion that consumers believe preference sorting is a basic function of markets and lines, and this is why they seem both more appropriate and fairer when preferences are dissimilar. All of the studies thus far have been hypothetical, however. Next, we test whether these findings hold when participants face real consequences for their allocation decisions. We note that although our framework applies to both markets and lines, in the remaining studies we focus specifically on attitudes toward markets and market pricing (predicting conceptually similar results for first-come, first-served policies).

Study 4: Consequential Allocation Decisions

Study 4 tests whether preference variance affects real decisions for how something should be allocated. We predicted that when participants believed that preferences for a prize varied, they would be more likely to cast votes for a market (vs. a lottery). We again predicted intuitions about preference sorting would play a mediating role (H_2).

Method

We recruited 202 MTurk participants ($M_{age} = 35.82$ years; 72 women, 130 men). Study 4 employed a single-factor (condition: high variance vs. low variance), between-subjects design. We first told all participants that they would be participating in a trivia game and that their goal would be to identify characters from a popular television show (*The Office*). We also told participants they would have the chance to win a prize, depending on their performance.

After reviewing these instructions and launching the trivia game, participants had 45 seconds to evaluate ten photos (Figure 4). They were asked to indicate which photo depicted each of ten characters that were listed below the table in random order.

After completing the trivia game participants read, "We have one (1) *The Office*-theme card game (see below) to offer as a gift to participants in this study." We displayed the prize and asked,

"How much of your base pay ($1.00) would you be willing to exchange for this gift?" Participants responded on a sliding scale, ranging from 0 to 100 cents.

In the high-variance condition, we told participants, "All participants, regardless of their score, will be eligible to receive this gift. And we are asking all participants, regardless of their score, to vote on how this gift will be awarded." In the low-variance condition, we told participants, "Only those participants who earned a perfect score will be eligible to receive this gift. But we are asking all participants, regardless of their score, to vote on how this gift will be awarded." We then asked, "Should we choose [someone/one of these die-hard fans] randomly, or should we 'sell' it to the highest bidder (i.e., the participant who is willing to give up the most of his/her $1.00 base pay)? Note that we will actually tally these votes and use the outcome to decide how to award this gift" ("Choose randomly" or "'Sell' it to the highest bidder").

Finally, after casting a vote, participants responded to four follow-up questions. First, to test our proposed mechanism, we captured intuitions about preference sorting: "If we 'sold' it to the highest bidder (among [everyone who scored between 0%–100%/only those who scored 100%]), would that make it more likely or less likely that the person who wants this card game the most will be able to get it?" (1 = "Less likely," 4 = "Neither," and 7 = "More likely"). We also asked participants to guess how many characters they correctly identified (0–10) and to indicate whether they were familiar with (1 = "Not at all familiar," and 7 = "Very familiar") and a fan of (1 = "Definitely not," and 7 = "Definitely") the television show.

Results and Discussion

Participants were likelier to vote for a market (i.e., sell the prize to the highest bidder), relative to a lottery, in the high-variance condition (53%, 95% CI: [43%, 62%]) than in the low-variance condition (37%, 95% CI: [28%, 47%]; $\chi^2(1) = 5.18$, $p = .023$, $\Phi_c = .16$).[3] Participants also indicated that they believed a market would make it more likely that the person who wanted the card game the most would be able to get it (i.e., sort preferences) in the high-variance condition (M = 5.80, 95% CI: [5.52, 6.08]) than in the low-variance condition (M = 5.42, 95% CI: [5.12, 5.72]; t(200) = 1.86, $p = .064$, d = .26). Furthermore, these beliefs mediated the effect of condition on voting for a market (based on 10,000 bootstrapped resamples: indirect effect = .02, SE = .02, bias-corrected 95% CI: [.001, .066]).

It is also worth pointing out that unlike in the previous studies, participants here voted for an allocation rule to which they, themselves, would be subjected. Interestingly, objective performance and endorsement of a market were weakly but negatively correlated (r = −.13, $p = .06$). In other words, those with low scores—those less likely to be fans of the show and consequently those with lower WTP—nevertheless tended to believe the prize *should* be "sold" to the highest bidder, possibly recognizing the potential to improve distributive efficiency (even though allocation through market pricing would mean they, themselves, were unlikely to win).

Studies 3 and 4 reveal that people more strongly endorse resource-based allocation rules when preferences are dissimilar, *because* markets and lines are likelier to allocate scarce goods and services to those with the strongest preferences (i.e., sort preferences). Next, we turn to two theoretically derived moderators of our basic model.

Study 5: Moderation by Inequality Salience

Previous research has found that inequality in the distribution of a resource makes it difficult to clearly signal preferences (Shaddy and Shah 2018). So, when inequality is salient, preference variance should no longer matter because there is no reliable way to sort those differences (H_3).

Method

We recruited 566 Prolific participants ($M_{age} = 37.71$ years; 279 women, 287 men). Study 5 employed a 2 (condition: variance vs. no variance) × 2 (inequality: salient vs. baseline), between-subjects design. All participants first reviewed a vignette describing the introduction of "a new, highly anticipated, all-electric pickup truck." We explained that because "the company can only produce a limited supply," potential buyers would need to submit a waitlist application that included contact information, a description of their interest, and a refundable deposit.

In the variance condition, participants read, "The people on the waitlist each have dramatically different levels of desire for the truck." In the no-variance condition, participants read, "The people on the waitlist all have exactly the same level of desire for the truck." Participants in the inequality-salient condition were told, "The people on the waitlist each earn dramatically different incomes." In the baseline condition, participants read nothing else. Finally, we asked, "How should the company allocate the available trucks?" (1 = "Choose people randomly [and sell at list price]," and 7 = "Choose the people willing to pay the most money [and sell at the offered price]").

Results and Discussion

An ANOVA of allocation rule on condition, inequality, and their interaction revealed a main effect of condition ($F(1, 562) = 7.10$, $p = .008$), which was qualified by an interaction ($F(1, 562) = 7.93$, $p = .005$). Decomposition revealed a simple effect of condition at baseline ($F(2, 562) = 15.46$, $p < .001$, d = .45; Figure 5), replicating the basic effect: participants were more likely to endorse a market, relative to a lottery, in the variance condition (M = 3.43, 95% CI: [3.10, 3.75]) than in the

[3] Because there were more votes overall for the lottery (111) than the market (91), we randomly chose a participant as the winner. We offered to either (a) purchase and send the prize to the winner or (b) issue an MTurk bonus in the amount of the retail price of the prize. The winner chose option (b).

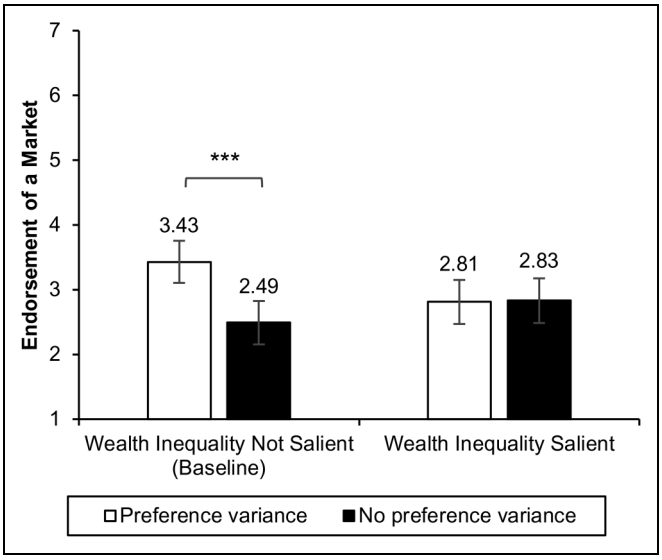

Figure 5. Study 5: Inequality salience attenuates the effect of preference variance on endorsement of markets.
Notes: Bars represent 95% confidence intervals.

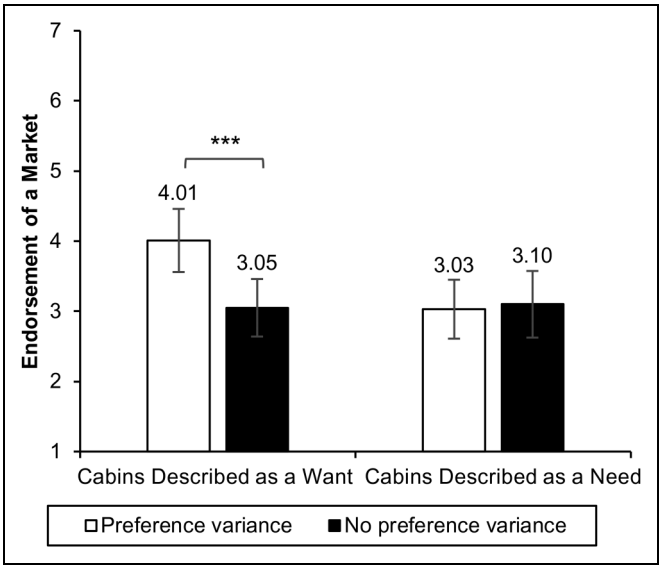

Figure 6. Study 6: Preference variance increases endorsement of resource-based allocation rules for wants, but not for needs.
Notes: Bars represent 95% confidence intervals.

no-variance condition (M = 2.49, 95% CI: [2.16, 2.83]). However, there was no such simple effect of condition when inequality was salient (F(2, 562) = .01, p = .916, d = .01; $M_{variance}$ = 2.81, 95% CI: [2.47, 3.15]; $M_{no\ variance}$ = 2.83, 95% CI: [2.49, 3.18]).

Study 5 confirms that when inequality is salient, preference sorting seems less feasible—even when preferences are dissimilar—so resource-based allocation rules seem less appropriate. The next study tests whether there are certain goods or services that people simply think should never be allocated on the basis of willingness to spend resources.

Study 6: Moderation by Product Type (Wants vs. Needs)

People often disapprove of resource-based allocation rules for allocating needs, which can impose taboo trade-offs (Baron and Spranca 1997; McGraw, Schwartz, and Tetlock 2012). We therefore expected that for something people need (as opposed to merely want), resource-based allocation rules seem less appropriate (H_4).

Method

We recruited 376 MTurk participants (M_{age} = 34.59 years; 167 women, 209 men). Study 6 employed a 2 (condition: variance vs. no variance) × 2 (type: want vs. need), between-subjects design. All participants first read: "Throughout the country, the U.S. Forest Service maintains a number of restricted-use cabins on protected land. These cabins are not typically open to the public, but are rather used for operational purposes."

In the want condition, we explained that "the agency has decided to make these cabins available for short-term rental to people who are interested in vacationing at these sites." In the need condition, we explained that because "forest fires near one residential neighborhood have significantly diminished air quality and now pose a serious safety hazard, … the Forest Service is making some cabins available for short-term rental." Participants then read, "There is now only one cabin left and several families still [want/need] it." In the variance condition, we told participants, "These families, however, each have dramatically different levels of [need/desire] for the cabin." In the no-variance condition, we told participants, "These families, however, all have exactly the same level of [need/desire] for the cabin."

Finally, we asked (counterbalanced), "What should the Forest Service do?" and "What would be the fairest thing for the Forest Service to do?" (1 = "Choose a family randomly," and 7 = "Choose the family willing to pay the most money for it").

Results and Discussion

Beliefs about what the Forest Service "should" do and what would be the "fairest thing for the Forest Service to do" did not meaningfully differ (α = .88), so we formed a composite by taking the average. An ANOVA of this composite on condition, type, and their interaction revealed main effects of condition (F(1, 372) = 4.09, p = .044) and type (F(1, 372) = 4.53, p = .034), which were qualified by an interaction (F(1, 372) = 5.40, p = .021). Decomposition revealed a simple effect of condition for wants (F(1, 372) = 9.38, p = .002; d = .43), replicating the basic effect: participants were more likely to endorse a market, relative to a lottery, in the variance condition (M = 4.01, 95% CI: [3.56, 4.46]) than in the no-variance condition (M = 3.05, 95% CI: [2.64, 3.46]) (Figure 6). However, there was no such simple effect of condition for needs (F(1, 372) = .05,

$p = .831$; $d = .03$; $M_{variance} = 3.03$, 95% CI: [2.61, 3.45]; $M_{no\ variance} = 3.10$, 95% CI: [2.62, 3.57]).

Study 6 reveals that even when preferences for something construed as a need are dissimilar—and furthermore even when those preferences *could* be sorted by a market—people still resist resource-based allocation rules. This could be due to hesitance regarding taboo trade-offs, which possibly shift people from consequentialist moral reasoning (see the "General Discussion" section). Or it may be that in these situations people prefer a different basis for allocation (likely one sensitive to differences in need, rather than want). In our final study, we examine how consumers respond when they cannot choose the allocation rule themselves (as is typically the case), underscoring the managerial implications of our theory.

Study 7: Implications for Purchase Intentions

An expansive body of literature has documented the numerous negative consequences that result from perceptions of unfairness in the marketplace (e.g., Bechwati and Morrin 2003; Bolton, Warlop, and Alba 2003; Campbell 1999a; Guo and Jiang 2016; Haws and Bearden 2006; Huppertz, Arenson, and Evans 1978; Oliver and Swan 1989). This suggests that firms may be penalized for choosing allocation rules that our framework characterizes as inappropriate (H_5).

Method

We recruited 508 MTurk participants ($M_{age} = 40.17$ years; 272 women, 236 men). Study 7 employed a 2 (condition: variance vs. no variance; within-subjects) × 2 (system: market vs. lottery; between-subjects) mixed design. All participants first read, "The U.S. Centers for Disease Control and Prevention (CDC) recommends wearing face masks to help slow the spread of the coronavirus." While "surgical masks and cloth masks are widely available," N95 respirators "are still in short supply."[4] We then explained that the "largest domestic manufacturer of N95 respirators is 3M, which also makes a wide array of other products, including sticky notes, tape, bandages, air filters, water filters, sponges, and much more."

We then described two cities, one with greater preference variance than the other: "In the city of Springfield, each resident has dramatically different desire for an N95 respirator"; alternatively, "In the city of Greenville, all residents have identical desire for an N95 respirator." Preferences for N95s, therefore, varied in Springfield, but not in Greenville.

Those assigned to the market system indicated how fair it would be "if 3M used an auction to allocate its available N95s to the highest bidders (at their stated price)" in each of Springfield and Greenville (counterbalanced). Those assigned to the lottery system indicated how fair it would be "if 3M used a lottery to allocate its available N95s randomly (at list price)" in each of Springfield and Greenville (counterbalanced; for both questions, 1 = "Extremely unfair," and 7 = "Extremely fair").

On the next page, we measured purchase intentions (counterbalanced): "If 3M used [an auction/a lottery] to allocate N95s in Springfield, would that affect your willingness to purchase 3M products?" And: "If 3M used [an auction/a lottery] to allocate N95s in Greenville, would that affect your willingness to purchase 3M products?" (for both questions, 1 = "It would make me less likely to purchase other 3M products," and 7 = "It would make me more likely to purchase other 3M products").

Results and Discussion

A mixed ANOVA of fairness on system (between-subjects), variance (within-subjects), and their interaction revealed a main effect of system ($F(1, 467) = 100.30$, $p < .001$) and a main effect of variance ($F(1, 467) = 37.68$, $p < .001$), which were qualified by an interaction ($F(1, 467) = 141.02$, $p < .001$). Decomposition revealed that participants believed it was fairer to use a market to allocate the available N95s in the city where preferences varied (i.e., Springfield; $M = 3.62$, 95% CI: [3.38, 3.86]) than in the city where preferences did not vary (i.e., Greenville; $M = 3.04$, 95% CI: [2.81, 3.28]; $F(1, 467) = 16.21$, $p < .001$, $d = .30$) (Figure 7). By contrast, participants believed it was fairer to use a lottery to allocate the available N95s in the city where preferences did not vary (i.e., Greenville; $M = 5.64$, 95% CI: [5.43, 5.84]) than in the city where preferences varied ($M = 3.82$, 95% CI: [3.57, 4.06]; $F(1, 467) = 164.70$, $p < .001$, $d = .89$).

A mixed ANOVA of purchase intentions on system (between-subjects), variance (within-subject), and their interaction revealed a main effect of system ($F(1, 467) = 86.12$, $p < .001$) and a main effect of variance ($F(1, 467) = 3.78$, $p = .052$), which were qualified by an interaction ($F(1, 467) = 45.82$, $p < .001$). Decomposition revealed that participants were less likely to purchase other 3M products if the company used a market to allocate the available N95s in the city where preferences did not vary (i.e., Greenville; $M = 2.87$, 95% CI: [2.68, 3.05]) than in the city where preferences varied (i.e., Springfield; $M = 3.16$, 95% CI: [2.99, 3.34]; $F(1, 467) = 11.46$, $p < .001$, $d = .20$) (Figure 7). By contrast, participants were less likely to purchase 3M products if the company used a lottery to allocate the available N95s in the city where preferences varied (i.e., Springfield; $M = 3.72$, 95% CI: [3.57, 3.87]) than in the city where preferences did not vary (i.e., Greenville; $M = 4.23$, 95% CI: [4.08, 4.39]); $F(1, 467) = 38.54$, $p < .001$, $d = .47$).

This final study demonstrates that when a company fails to apply the more appropriate allocation rule (as characterized by our framework), purchase intentions suffer. However, we acknowledge the possibility that participants could have made different inferences about the two cities (given our within-subject design), though it is not clear in what direction this would have systematically affected judgments. For example,

[4] Note that we chose to test N95 respirators specifically because they are extremely effective at preventing transmission (and therefore should be carefully allocated when supply is limited); however, they are not strictly a necessity (e.g., as in Study 6), due to the availability of other types of masks and preventative measures.

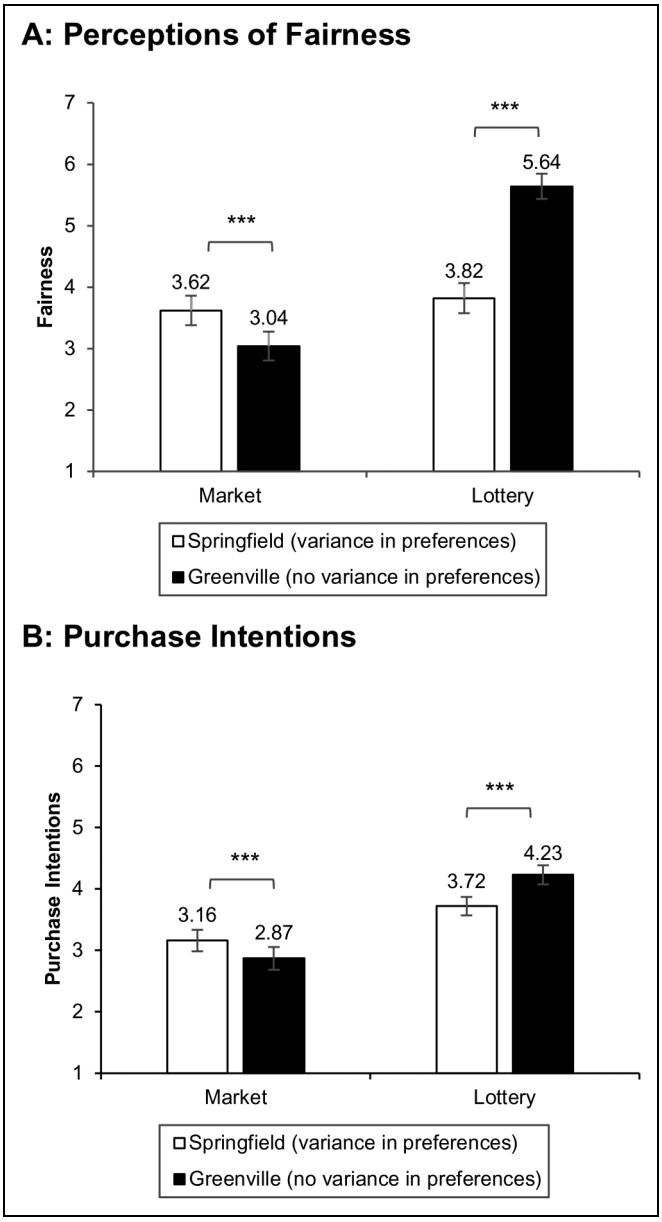

Figure 7. Study 7: Misapplication of these allocation rules (e.g., use of a market when preferences are similar) reduces perceptions of fairness and purchase intentions.
Notes: Bars represent 95% confidence intervals.

residents of a city might express uniformly high desire for N95 respirators because their public health infrastructure is poorly equipped (and thus lacks supplies) or well equipped (reflecting a citizenry that enthusiastically adopts new mitigation tactics). Nevertheless, the findings here highlight the importance of anticipating how the appropriateness of allocation rules for some products can potentially affect downstream purchase intensions for *other* products.

General Discussion

In this research, we offer a general account of when and why people favor the use of markets, lines, and lotteries. We believe that understanding these lay economic beliefs is of broad theoretical interest. Yet these intuitions also have practical consequences, as they shape perceptions of fairness in the marketplace. To that end, our account builds on prior work showing that consumers care deeply about distributive efficiency (Lerner 1944; Leventhal 1980; Leventhal, Karuza, and Fry 1980). Perhaps as a result of this, we find that people are naturally attuned to how preferences are distributed. And thus their views about when to use markets, lines, and lotteries depend on the extent to which they believe preferences vary.

Theoretical and Practical Implications

Of course, preference variance is not the only factor that shapes views about how to allocate things. For example, Study 5 demonstrates that inequality reduces support for resource-based allocation rules. People are uncomfortable with inequality in general (Fehr and Schmidt 1999), but our results reveal that at least some of this discomfort stems from skepticism about whether resource-based allocation rules can improve distributive efficiency when spending is uncorrelated with preferences. In addition, inequality may furthermore affect perceptions of unfairness simply because people regard any form of inequality as unfair (e.g., Farmer, Kidwell, and Hardesty 2020; Kuziemko et al. 2015; Norton and Ariely 2011; Stiglitz 2012; Walasek, Bhatia, and Brown 2018).

It is further plausible that the source of inequality could matter as well. For example, inequality arising from differences in work ethic probably attenuate the effect less than inequality arising from differences in inheritance (Chow and Galak 2012). And resources themselves can often be exchanged for each other (e.g., paying money to jump a queue and save time), suggesting another potential moderator future research might explore.

More broadly, our findings enrich the literature exploring when people most readily adopt preference-based versus other allocation norms. For example, prior work has argued that people especially desire improvements in distributive efficiency when there is an insufficient supply of something and preferences vary (Deutsch 1975; Skitka and Tetlock 1992; Yaari and Bar-Hillel 1984). Our conceptual framework reveals that these are necessary, but not sufficient, conditions: people also need to believe that stated preferences (signaled by the resources consumers are willing to spend) are appropriate for determining who should get what and that resources spent reliably signal those preferences.

We believe that our work yields several additional theoretical insights. We identify a novel source of market aversion. For example, previous work has found that market aversion can occur when people attach moral value to things (Tetlock et al. 2000) or react negatively to profit-taking (Bhattacharjee, Dana, and Baron 2017; Kahneman, Knetsch, and Thaler 1986b; Okun 1981). Here, we propose that market aversion can also be traced to views about the *very purpose* of markets to begin with. That is, consumers seem to believe that a primary function is to help sort preferences—identifying those

who most want something and allocating accordingly. And so they will exhibit market aversion when this goal is infeasible (because preferences are too similar).

This basic insight might apply to other allocation rules in nonconsumer contexts, as well. For example, a primary function of admissions committees at elite universities can be viewed as "merit sorting"—allocating limited seats in each freshman class to the most qualified applicants. However, merit sorting should be similarly infeasible when, in this case, qualifications are too similar. This has led some experts to call for lottery admissions for applicants who meet certain academic thresholds (Bellafante 2020; Conley 2018; Hess 2019). To the extent that many other potential bases for allocation exist—for example, differences in need (e.g., Study 6), future potential (Tormala, Jia, and Norton 2019), and emotional resonance (Goenka and Van Osselaer 2019; Liang, Chen, and Lei 2016)—our framework might similarly apply.

It is also likely that there exist other moderators for the model described here. For example, one interpretation of Study 6 is that the prospect of allocating wants versus needs shifts people from consequentialist moral reasoning (wherein they think about the costs and benefits of using markets and lines) to deontological moral reasoning (wherein they adhere to simple ethical rules and heuristics; Bartels 2008; Iliev et al. 2009; Tanner, Douglas, and Iliev 2008). If true, then the numerous other factors that have been shown to shift reliance on consequentialist versus deontological moral reasoning (e.g., whether outcomes are framed as gains vs. losses or benefits vs. harms; Baron and Ritov 2009; Gamez-Djokic and Molden 2016) might further moderate the effects we document.

More practically, highlighting preference variance might soften some resistance to market pricing. For example, during emergencies, demand for certain products or services can increase dramatically. When prices follow suit, firms are often accused of price gouging (Ferguson, Scholder, and Herrera 2011), a practice that people seem to oppose uniformly (Campbell 1999b; Kahneman, Knetsch, and Thaler 1986b). However, our findings suggest some potential nuance: consumers might actually tolerate raising prices if they appreciate that doing so can help direct scarce goods and services to those who will make the best use of them—that is, improve distributive efficiency through preference sorting. Indeed, previous work has argued that while raising the price of hotel rooms in the path of a hurricane "does not literally increase the supply of hotel rooms, it increases the *available* supply" (Zwolinski 2008, p. 363).

Implications for segmentation are worth highlighting, as well. As underscored by Studies 2a and 2b, preference variance between segments often differs, suggesting another consideration marketers should weigh with respect to their pricing tactics. To adapt a classic example: business travelers usually pay higher fares for flights than leisure travelers with the exact same itinerary. Airlines are able to price discriminate thusly because business travelers typically make purchases much later than leisure travelers (and fares tend to increase over time). However, flights are often oversold, requiring airlines to set prices for *not* completing a trip as planned (i.e., compensating a traveler for instead taking the next available flight). Here, preference variance among business travelers, who probably have tighter schedules, is likely lower than preference variance among leisure travelers, who are less likely to have appointments to keep. So, when deciding whom to leave behind, it could make more sense to use random allocation (e.g., a lottery) for the business segment and a resource-based allocation rule (e.g., a market based on willingness to accept) for the leisure segment.

Finally, although consumers generally view lines as a fairer alternative to markets (Frey and Pommerehne 1993; Kahneman, Knetsch, and Thaler 1986a; Savage and Torgler 2010), our theory cautions against their uncritical adoption. We find that the same conditions that give rise to market aversion also dampen support for first-come, first-served policies: if consumers believe lines cannot accurately sort preferences (because they are too similar), then they will resist using them all the same.

Conclusion

People often disagree about how to allocate things fairly, and it can sometimes seem like these disagreements stem from intractable differences in moral convictions or political philosophies (e.g., socialism vs. capitalism). However, our work suggests a more flexible view. People actually seem to earnestly try to discern the nature of preferences and choose an allocation rule that fits. It thus reveals an interesting way in which people apply their lay economic beliefs. Consumers desire distributive efficiency in that they believe things should go to those who want them the most, but psychology shapes views about when this goal is possible and how best to achieve it.

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ORCID iD


Franklin Shaddy https://orcid.org/0000-0002-1153-4839

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