THE MASKED MAJORITY: UNDERPREDICTION OF WIDESPREAD SUPPORT FOR
COVID-19 SAFETY POLICIES.

Oleg Urminsky, (oleg.urminsky@chicagobooth.edu)^{1a}

Abigail Bergman, (abigail.bergman@chicagobooth.edu)^{1a*}

^aUniversity of Chicago, Booth School of Business, 5807 S Woodlawn Ave, Chicago, IL 60637

*** First Version: NOVEMBER 2020***

*** This Version: FEBRUARY 2021***

*** PLEASE CONTACT AUTHORS FOR NEW VERSION***

*** BEFORE CITING OR CIRCULATING***

¹Both authors contributed equally.

Classification: Social Sciences/Psychological and Cognitive Sciences

Key words: prediction, COVID-19, masks, public health policy, norms

Data and code available at

https://osf.io/j39ek/?view_only=10199051c8f74e869ef92c1a0db06519

Abstract

The unprecedented COVID-19 pandemic in the US required organizations to make their own decisions regarding prevention policies, such as whether to require and enforce mask wearing, in the absence of regulations and norms. In five pre-registered studies, we investigate whether people support strict COVID-19 prevention policies and whether that support is underestimated, across business types, types of policy cues (stated and viral videos), and types of policies (required mask-wearing and vaccination). We consistently find that people strongly favor organizations with strict policies, such that the risks of both losing customers and of negative consumer perceptions are higher for lax policies (e.g., recommended mask-wearing) than for strict policies (requiring and enforcing mask-wearing). Nevertheless, customers and managers alike underestimate public support for strict policies, with negative consequences for word-of-mouth behavior. The underappreciation of support for public health measures that we document can impede the establishment of norms and the adoption of strict policies, undermining efforts to combat public health crises such as COVID-19.

Significance Statement

Mask-wearing has been the most effective tool for combatting COVID-19 but has not been established as a shared social norm or effectively mandated, with many organizations reluctant to adopt mask requirements. We find widespread support among customers for strict policies and perceptions of stricter organizations as more competent and warmer. However, customers and managers consistently underpredict popular support for strict mask requirements, impeding the formation of accurate descriptive norms. The underprediction of popular support for strict

policies generalizes to hospital vaccination requirements, and predicts reluctance to inform others, further impeding the establishment of norms. The findings demonstrate how asymmetrically-biased beliefs hamper implementation of popular and effective health policies.

In the context of the unprecedented impact of the COVID-19 pandemic, particularly in the United States, wearing a facial mask covering one's nose and mouth has been identified as an effective means for reducing the spread of the virus (Eikenberry et al., 2020; Howard et al., 2021; Mitze et al., 2020) and has been recommended by experts, especially in indoor spaces such as airplanes and retail stores (Brooks et al., 2020; Khanh et al., 2020). However, the lack of a centralized pandemic strategy in the U.S. has resulted in inconsistent mask policies, with many localities leaving it up to individual organizations, including businesses, to decide which policies to implement. This has placed many organizations in the unusual position of having to make their own decisions regarding public health (Budd et al., 2020).

As a result of the lack of centralized policy, some businesses have required customers to wear masks, while others have only recommended them (Brombach, 2020; Friedman, 2020; Jiang & Cain, 2020; Markowitz, 2020), a less effective policy (Betsch et al., 2020). Even when businesses adopted a policy requiring mask-wearing, some customers complied while others openly flouted the rules (Meyersohn, 2020), and employees have often been left to make potentially risky decisions whether to enforce the policy (Reyes, 2020). Some businesses have failed to enforce their policies, even when other customers complained. Other businesses have enforced the policies, in some cases preventing customers from entering, or evicting non-mask-wearing customers, angering the mask non-wearers (Shannon, 2020). Mask non-wearers have recorded and publicly complained about enforcement of mask-wearing (Rivera, 2020; Tyko, 2020a, 2020b), presumably under the assumption that others would agree with them. In turn, concerns that instituting or enforcing mask policies would result in public backlash have led some businesses to either not adopt, not enforce or to even reverse mask-wearing requirements (Hanbury, 2020).

People rely on perceived norms to inform their decisions (Cialdini et al., 1990; Reid et al., 2011), such as whether to institute, enforce, comply with or complain about preventative health policies such as mask-wearing requirements, particularly in the absence of legal requirements (Haischer et al., 2020) or overt guidance. Prescriptive norms about the desirability of behavior are widely shaped by perceived descriptive norms, people's beliefs about the prevalence of behaviors, across cultures and originating in childhood (Brauer & Chaurand, 2010; Eriksson et al., 2015; Roberts et al., 2017). Thus, for a norm such as required mask-wearing to take hold and be sustained, it is important that people not only support the norm, but also believe that others support it as well.

When the majority of people prefer a policy, failure to recognize that the majority do in fact favor that policy can impede adoption of the policy as a norm, particularly when decision-making is decentralized and ad hoc. For organizations, underestimating support among their constituencies (e.g., a store's customers) for a strict mask policy would impede effective decision-making about the consequences of adopting and strictly enforcing such a policy for both customer patronage and more general brand perceptions. For consumers, failure to recognize that a majority prefer mask-wearing, when that is the case, may impede the mask-wearers in the majority from communicating and enforcing the social norm and may embolden mask opponents to complain about and refuse to comply with mask-requirement policies, further skewing perceptions and policy decisions. These belief-based dynamics are not limited to mask-wearing but may become increasingly important in the context of vaccination policies, as COVID-19 vaccines become more widely available, for example.

We investigate whether people's beliefs about preferences for required mask-wearing, a key input into the formation of norms, are accurate or understate support. While this aspect of the

social response to the pandemic has largely been neglected, the prior literature suggests several competing predictions. Some theories have proposed that everyday cognitive judgments are well calibrated and follow optimal statistical principles in incorporating information, resulting in well-calibrated beliefs (Griffiths & Tenenbaum, 2006).

However, research on projection and pluralistic ignorance suggests that people are often poorly calibrated due to systematic biases in belief formation (Allport, 1924; Halbesleben et al., 2004; Katz et al., 1931; Miller & McFarland, 1987). Pluralistic ignorance, the tendency to assume that others' inaction is due to agreement with the status quo, has been implicated in inaccurate beliefs about support for a wide range of social issues, including racial segregation (O'Gorman, 1975), affirmative action (Boven, 2000), female labor force participation, (Burszтын et al., 2018), college alcohol use (Prentice & Miller, 1993) and wind energy (Sokoloski et al., 2018). In the context of mask-wearing, for example, both those who support and oppose mask requirements may assume that people they see wearing masks when required actually oppose the policy and are only complying out of necessity.

Prior research points to important potential sources of errors in people's beliefs. People may project their own point of view onto others, leading to systematic misestimation for those in the minority. The majority projection model (Krueger & Clement, 1997) predicts that people believe themselves to be in the majority, whether or not they are, resulting in overall underestimation of the more popular position and larger errors in the predictions of minority group members (who are not in fact in the majority). Given politicization of the COVID-19 pandemic in the United States (Halpern, 2020; Sherling & Bell, 2020), Democrats are more likely to support strict mask policies, on average, than Republicans (Bird & Ritter, 2020; Cheng, 2020), which may contribute to differences in beliefs.

Certain people, taking a “customer is always right” point of view (Geyser, 1981; Reyes, 2020; Zarroli, 2020), may view organizations’ COVID-19 prevention policies as infringing on customers’ rights and beyond the business’ purview, and therefore predict low support.

Perceptions of strict policies as an overly controlling step on the part of businesses may hurt perceptions of organizations, particularly in terms of perceived warmth (i.e., as opposed to competence: Aaker et al., 2012; Fiske et al., 2007; Fournier & Alvarez, 2012; Kervyn et al., 2012, 2013), impeding adoption and enforcement.

In five pre-registered studies, we investigate whether support for strict COVID-19 prevention policies is underestimated, across business types, information sources (stated policies and viral videos), and types of policies (required mask-wearing and vaccination). We consistently find that people strongly favor organizations with strict COVID-19 prevention policies, such that the risks of losing customers and of negative consumer perceptions are higher for lax policies (e.g., recommended mask-wearing) than for strict policies (requiring and enforcing mask-wearing). Nevertheless, customers and managers alike underestimate the support for strict policies. We discuss the degree to which potential social-cognition mechanisms explain our findings and the implications for public health initiatives.

Study 1

Air travel was one of the first industries in which highly publicized mask policies were implemented by firms during the COVID-19 pandemic in the U.S., with the goal of increasing consumer confidence in the safety of flying (IATA, 2020; Lamb et al., 2020; Shepardson & Rucinski, 2020). Respondents recruited from a U.S. national panel (N=546) in August of 2020 made a series of choices between a ticket on an airline that required mask-wearing or on another

that only recommended mask-wearing, with price differences varying across the choices.

Respondents then predicted other respondents' choices between equally priced airline tickets.

Respondents selected the mask-required airline most often, in 69% of the choice pairs (versus 50%, $t(545)=12.58$, $p<.001$, $d=0.538$) and were willing to pay \$27 more on average ($t(427)=13.52$, $p<.001$, $d=0.653$) for a ticket on the mask-required airline. Although the majority of respondents selected the mask-required airline when both tickets were equally priced (70%, $z=84.66$, $p<.001$), respondents predicted, on average, that only 60% of other respondents would choose the stricter option. Thus, consumers significantly underestimated how many other people shared the majority preference for the stricter policy (error=-10%, bootstrapped 95% CI of difference: [-13.55%, -6.22%], $p<.001$). Prediction accuracy did not significantly differ by demographics. While Democrats were more likely to choose the strict-mask-requirement airline than were Republicans (85.1% vs. 56.7%, $\chi^2(1, N=395)=37.33$, $p<.001$), prediction error direction and magnitude did not significantly vary by political party.

The underestimation can be understood in terms of the differences in beliefs between those who preferred the stricter policy and those who did not. Overall, we find significant evidence of projection: people who chose the airline with the stricter mask policy estimated a higher percentage of others would also choose the stricter airline ($M_s=65\%$ vs. 47%, $t(544)=8.61$, $p<.001$, $d=0.80$). The subset of respondents who preferred the lax policy airline (i.e., selecting it in the equal-price choice) were poorly calibrated, with 86% underestimating preference for the strict policy (vs. 10% over-estimating and 4% correct; error=-22.6%, bootstrapped 95% CI of difference: [-27.76%, -17.60%], $p<.001$). By contrast, the respondents who favored the strict-policy airline were better calibrated, with 53% underestimating preference for the strict policy (vs. 41% over-estimating support and 7% accurate). Nevertheless, the pro-

strict-policy respondents likewise underestimated preferences for the strict policy, albeit more weakly (error=-4.46%, bootstrapped 95% CI of difference: [-8.96%, 0.002%], $p=.050$).

These findings cannot be fully explained in terms of either general projection of one's preferences (Katz et al., 1931; Krueger & Clement, 1994) or a more specific tendency to see oneself as in the majority (e.g., majority projection, Krueger and Clement 1997). In fact, while 62% of the pro-strict-policy respondents accurately saw their preference as the majority preference, only 36% of the anti-strict-policy respondents saw their preference as in the majority ($\chi^2(1, N=546)=30.74, p<.001$). Instead, anti-strict-policy respondents were more likely to see others' preferences as split (41%) than were pro-strict-policy respondents (24%, $\chi^2(1, N=546)=14.84, p<.001$). The underestimation of preference for requiring mask-wearing arises from the combination of people who prefer the strict-policy airline underestimating agreement with their own preference, and those who favor the airline with a lax policy seeing their preference as more common than it is.

These results highlight a problem for policy makers. On the one hand, potentially life-saving mask-wearing requirements enjoy broad support, such that consumers will even pay a premium for airlines that implement such a policy, on average. On the other hand, the public sees mask requirement as more controversial than it is, undercutting the perceived social consensus for firms to institute such policies, and risking that consumers will have negative perceptions of businesses with strict mask policies, as overstepping their bounds.

One possibility is that the minority of consumers who prefer the lax policy may also be those who are more willing to be in public during a pandemic, engaging in discretionary travel, which exacerbates the risk for firms of backlash from the subset of consumers currently in the marketplace. In the next study, we test a broader range of businesses, and design the choice

options to account for the possibility that risk-averse consumers may refrain from in-person patronage, regardless of mask policy.

Studies 2a & 2b

Respondents were recruited from a U.S. national panel (Study 2a: N=499, September and October 2020) and as a nationally representative sample from a crowdsourcing marketplace (Study 2b: N=497, October 2020). Respondents were randomly assigned to one type of business (bakery, pharmacy, movie theater, hair salon, or gym, between subjects), and either chose between two equally convenient options (one that required mask-wearing and another that only recommended mask-wearing) or indicated they would not patronize either business. Each respondent was asked to predict what the other respondents had chosen, and attitudes towards the businesses were also measured in Study 2b. By including the non-visit option, this design accounts for the possibility that consumers who are in favor of strict mask policies during a pandemic may also be more likely to self-quarantine, and therefore the subset of available customers may disproportionately be those who prefer laxer mask policies.

Across all scenarios, the majority of respondents selected the stricter mask-required option (Study 2a: 62%, $Z=26.97$, $p<.001$, Study 2b: 73%, $Z=106.44$, $p<.001$), compared to the lax mask-recommended option (Study 2a: 22%, Study 2b: 15%) or abstaining (Study 2a: 16%, Study 2b: 12%). The same respondents significantly underpredicted how many others would choose the stricter option overall (Study 2a: mean prediction=47.42%, error = -14.31% bootstrapped 95% CI of difference: [-18.19, -10.31,], $p<.001$; Study 2b: mean prediction=55%, error = -18.65, bootstrapped 95% CI of difference: [-22.42, -14.87], $p<.001$) as well as separately nine out of ten of the business types in each sample (Figure 1).

Figure 1. Choices and predictions by business type for Studies 2 and 3.

While prediction accuracy did not significantly differ by either demographics or political party in Study 2a, Democrats estimated greater preference for the strict-policy business and were more accurate in Study 2b ($ps < .004$). In Study 2b, where consumer entitlement was measured (Boyd and Helms 2005), we found no differences in either preferences for stricter mask policies or in the underestimation of other consumers' preference by entitlement. These results suggest that the underestimation is not explained either by motivating reasoning among political partisans, or by entitled consumers projecting their views of businesses' role on others. Instead, the underestimation can again be understood in terms of the differences in beliefs between those who preferred the stricter policy and those who did not.

Respondents who chose the lax mask-recommended business were poorly calibrated, underestimating preferences for businesses with the strict policy (Study 2a: 95% underestimating, error=-26.24%, bootstrapped 95% CI of difference: [-31.46%, -20.86%], $p < .001$; Study 2b: 89% underestimating, mean error=-27.44%, bootstrapped 95% CI of difference: [-33.51%, -21.36%], $p < .001$). While the respondents who chose to visit the strict mask-required store were better calibrated, they nevertheless likewise underestimated preferences for the strict policy (Study 2a: 64% underestimating, error=-5.77%, bootstrapped 95% CI of difference: [-10.80%, -0.73%], $p = 0.026$; Study 2b: 77% underestimating, error=-15.17%, bootstrapped 95% CI of difference: [-19.46%, -10.83%] $p < .001$). Respondents who chose to visit neither store were also poorly calibrated and underestimated preferences for the strict policy (Study 2a: 94% underestimating, error=-30.56%, bootstrapped 95% CI of difference: [-36.86%, -24.24%], $p < .001$; Study 2b: 73% underestimating, error=-28.89%, bootstrapped 95% CI of difference: [-35.01%, -22.52%], $p < .001$). Thus, projection did not fully explain the underestimation, because all groups underestimated, and the respondents would have in fact been more accurate had they projected more (Hoch 1987).

Our analyses thus far have focused on choices between stores. An additional risk facing businesses is that even when consumers prefer those with a strict mask-requirement, instituting such a requirement may harm consumers' perceptions of the business. In particular, if strict mask requirements are seen as necessary but authoritarian, businesses instituting a strict requirement may be seen as more competent, but also suffer a loss of reputation for warmth. The potential harm to brand reputation and loss of brand value may dissuade businesses from unilaterally implementing strict mask-requirements unless required to do so by regulators.

This reasonable concern turns out to be misplaced. Based on additional attitudinal measures included in Study 2b, we find no evidence that stricter mask policies have a negative effect on consumers' overall perceptions of the businesses. In fact, respondents rated the businesses with the mask required policy significantly more favorably, on both competence ($M_{\text{required}}=5.93$, $M_{\text{recommended}}=3.80$, $t(496)=21.93$, $p<.001$, $d=1.490$) and warmth ($M_{\text{required}}=5.13$, $M_{\text{recommended}}=4.43$, $t(496)=7.03$, $p<.001$, $d=.498$). Likewise, businesses with stricter mask policies were seen as more caring ($M_{\text{required}}=6.13$, $M_{\text{recommended}}=3.32$, $t(496)=26.20$, $p<.001$, $d=1.819$) and were more trusted ($M_{\text{required}}=5.80$, $M_{\text{recommended}}=2.91$, $t(496)=25.61$, $p<.001$, $d=1.850$). We find the same results restricting the analysis to likely customers (i.e., those who rated themselves as likely to visit the given business type).

Study 3

Retail managers are often the employees most responsible for the challenge of enforcing store policies (Corkery, 2020; Repko, 2020; Segarra, 2020) and therefore might have better information and be better calibrated than consumers about actual customer behavior.

Additionally, managers' views are often directly relevant to whether policies are adopted, and how those policies are enforced once adopted. Next, we examine the accuracy of a sample of retail managers when asked to predict the consumer preferences measured in Study 2.

We recruited 183 U.S. managers who were presented with a description of either the Study 2a sample (including a demographic summary) or the Study 2b nationally representative sample and predicted consumers' choices in all five business scenarios. The managers consistently underpredicted consumers' preferences for patronizing businesses with strict mask-required policies (Study 2a sample: 53% predicted vs. 62% actual, $\text{error}=-8.76$, bootstrapped

95% CI of difference: [-13.54, -4.00], $p < .001$; Study 2b sample: 49% predicted vs. 73% actual, error = -23.74, bootstrapped 95% CI of difference: [-28.74, -19.78], $p < .001$). At the level of the individual scenarios, the managers significantly underpredicted consumers' preferences for the stricter policy business in eight out of ten tests.

Overall, managers had positive personal views of masks. The vast majority of managers stated that they believe that everyone should wear a face mask indoors (88%), strongly supported a national mask mandate (63%) and believed that most people underestimate the risks posed COVID-19 (60%). However, managers underestimated support for mask policies regardless of their own personal views. Pooling predictions across the two samples, managers strongly underestimated preferences for the strict policy whether they personally agreed that masks should be worn indoors (estimate = 51.0%; error = -15.5%, bootstrapped 95% CI of difference: [-18.78%, -12.31%], $p < .001$) or not (estimate = 46.5%; mean error = -20.9%, bootstrapped 95% CI of difference: [-26.88%, -15.12 %], $p < .001$). In fact, a substantial number of both pro-mask (50.3%) and anti-mask (58.9%) managers failed to predict that a majority of customers preferred to visit the businesses with strict mask policies. These results suggest that the managers are not simply projecting their own views about masks onto consumers, but instead generally underestimated support for mask requirements in a way that is consistent with the consumers own perceived lack of consensus.

Study 4

When norms are not well-established, people may promote their point of view, in an attempt to shape the norm. “Viral” videos of consumer confrontations in stores regarding mask-wearing have become a common occurrence (Zhang, 2020). We examined the effect and

accuracy of preferences in reaction to two contrasting actual videos filmed at two Walmart stores during the COVID-19 pandemic. The videos show a customer not wearing a mask, with either other customers complaining about non-enforcement of the mask policy or employees removing the mask non-wearer from the store. We investigate whether people are well-calibrated about how the contrasting behavior of the employees shown in the two videos (despite a consistent mask-requirement corporate policy) influence consumer preferences.

After respondents (N=173) viewed the two videos, they either chose one of the two stores to shop in (the stricter store that enforced the mask-wearing requirement or the lax store that did not) or chose not to shop in either store, and then predicted the choices of others. More respondents selected the stricter store (shown in the video enforcing the policy) than the lax non-enforcing store (70.1% vs. 29.9%, $\chi^2(1, N=134)=21.8, p<.001$). Replicating Study 2b, respondents rated the Walmart with the stricter policy significantly higher on both warmth ($M_{\text{stricter}}=4.34, M_{\text{less-strict}}=3.98, t(172)=2.35, p=.020, d = .24$) and competence ($M_{\text{stricter}}=5.00, M_{\text{less-strict}}=3.75, t(172)=6.03, p<.001, d=.73$), as well as caring ($M_{\text{stricter}}=4.93, M_{\text{less-strict}}=3.63, t(172)=6.06, p<.001, d=.71$), and trust ($M_{\text{stricter}}=4.69, M_{\text{less-strict}}=3.50, t(172)=5.79, p<.001, d=.64$). Therefore, videos showing strict enforcement of the mask policy at a given store, instead of harming that store's reputation, resulted in more choices of that store and beneficial perceptions of the business, including both competence and warmth, compared to a video showing nonenforcement.

Figure 2. Choices and predictions of each option in study 4.

Nevertheless, respondents underpredicted the degree to which other consumers would share an overall preference for the stricter store (mean prediction: 39.9% vs. 54.3% actual, error=-14.43, bootstrapped 95% CI of difference: [-20.52, -8.60], $p < .001$). The underprediction was driven by respondents who had chosen the lax store (mean error=-29.21%, bootstrapped 95% CI of difference: [-38.03%, -20.59%], $p < .001$) and respondents who had chosen to visit neither store (mean error = -30.17, bootstrapped 95% CI of difference: [-39.37, -20.66], $p < .001$). By contrast, the respondents who chose the policy-enforcing store made relatively accurate predictions, on average (error=-1.79%, bootstrapped 95% CI of difference: [-6.45%, 9.85%], $p = .686$). These results were not moderated by consumer entitlement and held when we analyzed only likely Walmart customers. In this study, unlike the prior studies, we did find an effect of political partisanship, with Democrats having lower estimation errors overall ($b = -2.14$, $SE = 0.77$, $p = .006$), perhaps because of partisan mask protests.

Overall, these results suggest that consumers hold more favorable views of a store after viewing store employees enforce (vs. fail to enforce) a mask-wearing requirement policy, but underestimate the effect on others. In particular, anti-mask individuals overestimate how many consumers will agree with them, potentially motivating them to protest at stores and to create and share viral videos objecting to mask enforcement. Managers, in turn, may be overly fearful of the impact of these videos on the perception of their stores, underestimating the harm to their reputation from customers instead complaining about lack of enforcement.

Study 5

After the first COVID-19 vaccines were approved in the US by the FDA in December of 2020, vaccination became an increasingly important tool for combating the coronavirus in both community and healthcare settings, with healthcare workers given highest priority for vaccination. However, the lack of a centralized government policy requiring vaccination again left organizations, such as hospitals and nursing homes, to set their own policies regarding employees who prefer not to be vaccinated (Fischer & Semple, 2020; Orecchio-Egresitz, 2020). Unlike mask-wearing, client preferences regarding vaccination requirements in healthcare at this stage of vaccine rollout are about requirements imposed only on others (employees), rather than themselves.

Participants (N=196) read a scenario in which they needed a surgical procedure and had a choice between two hospitals, one requiring employees to be vaccinated against COVID-19 and the other only recommending that employees be vaccinated, or could choose to delay the procedure until later and live with some pain in the meantime. We also examined the potential consequences of beliefs about descriptive norms regarding staff vaccination policies on word of

mouth (Anderson, 1998; Buttle, 1998), measured as the willingness to tell another person about the hospitals' policies.

The majority of respondents selected the stricter vaccine-requiring hospital over the lax non-requiring hospital (77.04% vs. 19.89%, $\chi^2(2, N=196)=176.8$, $p<.001$), with very few (3.06%) opting to delay. As in the previous studies, respondents rated the hospital with the required-vaccine policy significantly higher on both warmth ($M_{\text{vaccine-required}}=4.56$, $M_{\text{vaccine-not-required}}=5.04$, $t(195)=3.64$, $p<.001$, $d=0.34$) and competence ($M_{\text{vaccine-required}}=5.94$, $M_{\text{vaccine-not-required}}=4.75$, $t(195)=7.82$, $p<.001$, $d=0.75$).

Respondents again underpredicted the degree to which other respondents would prefer the stricter hospital (mean prediction: 63.76% vs. 77.04% actual, error=-12.28%, bootstrapped 95% CI of difference: [-18.33%, -7.95%], $p<.001$). The underprediction in this case was driven by respondents who had chosen the non-required vaccine hospital (mean prediction: 40%, mean error=-36.71%, bootstrapped 95% CI of difference: [-46.27%, -26.67%], $p<.001$). The respondents who chose the vaccine-required hospital only marginally underestimated, on average (mean prediction: 70%, error=-6.70%, bootstrapped 95% CI of difference: [-13.51%, 0.20%], $p=.058$).

Controlling for own choice, weaker perceived descriptive norms (i.e., a lower estimated percentage of people the respondent expected to agree with them) predicted a lower likelihood of warning a friend about the hospitals' policies ($b=0.004$, $SE=0.001$, $p<.001$). Among those preferring the vaccinations-required hospital, the fewer other people the respondent thought would share their preference, the less likely they were to warn a friend who was planning to go to the other hospital ($b=0.003$, $SE=0.001$, $p=.004$). Political affiliation and demographics did not

significantly predict choice of the vaccine-required hospital, predictions, prediction errors or likelihood of warning a friend.

Overall, these results demonstrate not only underestimation of the majority-preference to get treatment at a hospital that requires employees to be vaccinated, but that underestimating the descriptive norm may have consequences for people's word-of-mouth behavior. Specifically, the correlational results suggest that underestimating the degree to which other people favor hospitals' vaccine-requirements may demotivate those who favor vaccination requirements from warning others about hospitals that only recommend vaccination, while emboldening those who oppose vaccination requirements to warn others about hospitals that require vaccination. This relationship between misprediction of descriptive norms and word-of-mouth intentions may further undermine perceived descriptive norms.

Discussion.

We consistently find that a majority of consumers prefer businesses with strict mask-requirement policies, but consumers and managers alike generally underestimate preferences for strict policies. These results were not consistently driven by political partisanship or consumer entitlement. Instead, we find that the strongest predictor of both estimates and the accuracy of those estimates is an individual's personal preference between organizations with strong and weak policies.

Our findings are partially consistent with pluralistic ignorance and the majority projection model. However, a substantial share of respondents, particularly those who favored businesses with less strict mask policies, saw opinions as evenly divided. This suggests that, contrary to Krueger & Clement's (1997) claim that people believe their view is in the majority, the

underprediction we observe is best explained by few people believing that they hold the minority opinion (averaging across the studies, less than a quarter of either those in the majority or in the minority). In fact, across the studies, approximately 40% of those in the majority fail to recognize they are in the majority.

The simultaneous high level of support for businesses having strict policies and underestimation of support for these policies may have important implications for public health. As a result of underestimating how many others agree with them, customers who prefer strict policies but mistakenly assume the lack of a shared norm may be reticent to complain when these policies are not in place or not enforced, which may further reinforce others' misperceptions. People who oppose required-mask policies, on the other hand, who most egregiously underestimated support for those policies in our studies, may feel particularly emboldened to flout mask rules and even post videos depicting their opposition, despite actually being in the minority.

Organizations put in the unfamiliar position of making their own public health policy decisions are likely to overestimate the risks to consumer perceptions and their bottom line of setting and enforcing strict policies and underestimate the higher risk they face from customer complaints about failing to have or enforce strict policies. Overall, the underestimation of support for required COVID-19 prevention measures among both consumers and organizations may further reinforce a climate in which individuals and businesses are hesitant to advocate for strict policies, impeding the establishment of crucial social norms, with costly consequences for public health.

Methods

Study 1

A total of 548 participants completed the experiment as part of a longer survey, recruited from Lucid Theorem (a nationally representative panel), between August 7 and 14, 2020. After excluding duplicate IP addresses, we had 546 adult participants ($M_{age}=44.82$, $Range_{age}=18$ to 86, 43.4 % female). Recruiting and exclusion criteria were preregistered at AsPredicted.org, # 45901 (see Appendix).

Participants were told to imagine that they needed to travel for an urgent matter next week that was too far to drive. They were told they had a choice between two airlines (“Airline A” and “Airline B”), one that required mask-wearing and one that recommended (but did not require) mask-wearing (names and order randomized between subjects). Participants made a series of eleven choices between the two airlines, at prices that varied from \$50 for Airline A and \$100 for Airline B to \$100 for Airline A and \$50 for Airline B, at \$10 intervals, with an equally priced option in the middle of the choices. On the next page, participants were asked to indicate how many people, out of 100 survey takers, chose each of the two airline options when both were equally priced at \$100.

To estimate differences in willingness to pay, we calculated the indifference point for each respondent between the differently priced flight options. Respondents lacking an identifiable indifference point (i.e., because of inconsistent responses) were excluded from the WTP analysis ($N=118$) and those always choosing the same airline were assumed to have a \$55 premium for their preferred airline.

To assess the accuracy of the predictions, in this and the subsequent studies, bootstrapped confidence intervals for the difference between the average estimated proportion and the actual

proportion were computed, by drawing 10000 samples, and computing the mean estimate and the actual proportion in each sample.

Study 2a

In Study 2a, a total of 1628 participants, across three waves of data collection in September, October, and November 2020, completed the experiment as part of a longer survey on Lucid Theorem. After excluding duplicate IP addresses, we were left with a final sample of 1408 adult participants ($M_{\text{age}}=45.80$, $\text{Range}_{\text{age}}=18$ to 89, 53.5% female). Recruiting and exclusion criteria for the first and third waves were preregistered at AsPredicted.org, #48176 and #51819. Because data from the first wave ($N=499$) served as the benchmark for Study 3, we report only those results in this paper. We found similar results in the second and third waves, which are reported in detail in the Appendix.

We tested consumers' preferences and their beliefs about other consumers' preferences in five between-subjects scenario conditions (bakery, pharmacy, movie theater, hair salon, and gym). In each condition, participants were asked to make a choice between visiting one of two equally convenient businesses that required vs. recommended mask-wearing or choosing not to patronize either business. On the following screen, participants were asked to estimate how many other participants out of 100 would choose each option.

Study 2b

A total of 498 participants, recruited as a nationally representative sample on age, gender, and ethnicity, completed the experiment on Prolific in October 2020. After excluding duplicate IP addresses, we were left with a final sample of 497 adult participants ($M_{\text{age}}=45.51$,

Range_{age}=18 to 77, 50.5% female). Recruiting and exclusion criteria were preregistered at AsPredicted.org, #48826.

In study 2b, we measured preferences and estimates of others' preferences for the same between-subject scenarios, exactly as in Study 2a. We additionally asked participants to assess the warmth and competence of each business using an abbreviated warmth/competence scale adapted from Kervyn, Fiske, and Yzerbyt (2013), rate the trustworthiness and perceived caring of each business, and provide an open-ended response explaining why they chose the given business. Additionally, we asked participants to rate the likelihood that they would actually visit each of the types of businesses in the following week and fill out a consumer entitlement scale adapted from Boyd and Helms (2005).

Study 3:

Retail managers were recruited using Prolific's prescreening survey to identify U.S. panelists who indicated that they had "experience being in a management position" and who reported working in "hospitality & tourism", "marketing & sales", or "retail". A total of 267 participants completed the experiment on Prolific. After excluding duplicate IP addresses and any participants who failed an attention check or who self-reported that they did not either work in retail or as a manager, we had a final sample of 183 adult retail managers ($M_{age}=35.40$, Range_{age}=18 to 66, 50.8% female) out of 267 completed surveys. Similar results were found when weakening these exclusions (see Appendix). Recruiting and exclusion criteria were preregistered at AsPredicted.org, #48829.

Retail manager participants were shown one of two scenario introductions to describe the sample of respondents whose behavior they were to predict, either a national sample with

demographic details specified (Study 2a) or a nationally representative sample collected concurrently (study 2b). All participants read:

“On the following pages, we will show you several scenarios that we showed a **national sample of survey respondents** last week. Participants in this national survey were recruited from among all 50 states.”

Managers in the “national sample” condition (N=90) additionally saw:

“The sample had the following characteristics: 38% Republican, 20% Independent, and 39% Democrat, 49% Male and 51% Female, age ranged from 18 to 88 years old, with an average age of 45.”

Managers in the “representative sample” condition (N=93) saw:

“The sample had the following characteristics: The participants in the sample match the age, gender and ethnicity of Americans nationwide.”

Participants in both conditions were asked to indicate how many participants out of 100 made each choice (i.e., how many chose the business with the mask-required policy, the business with the mask-recommended policy, or neither business) in all five scenarios (bakery, pharmacy, movie theater, hair salon, and gym) shown to participants in studies 2a and 2b. Participants were also asked whether their workplace currently had a mask policy, whether they had received customer complaints about masks, several questions about their personal support of mask mandates, and general COVID-related beliefs, as well as an attention check.

Study 4

A total of 200 participants completed the experiment on Amazon Mechanical Turk. After excluding duplicate IP addresses and anyone who failed an attention check, we were left with a

final sample of 173 adult participants ($M_{age}=36.01$, $Range_{age}=20$ to 70 , 32% female). Recruiting and exclusion criteria were preregistered at AsPredicted.org, # 50878.

Figure 4. Screen shots from the nonenforcement video (left) and strict enforcement video (right).

Participants first viewed two videos that had been filmed at actual Walmart stores and posted online (order counterbalanced). Participants were then told to imagine that they needed to shop in person at a Walmart store and could either choose one of the two stores in the videos to visit, or choose not to go to either store. On the following page, participants were asked to estimate how many participants out of 100 would choose each option. Participants also assessed the warmth, competence, trustworthiness and caring of each pharmacy using the same scales as

in Study 2b, provided open-ended explanations and indicated their likelihood of visiting a Walmart in the next week.

Study 5

A total of 197 participants completed the experiment on Amazon Mechanical Turk. After excluding duplicate IP addresses and anyone who failed an attention check, we were left with a final sample of 196 adult participants (43% female). Recruiting and exclusion criteria were preregistered at AsPredicted.org, #55046.

In each condition, participants were asked to choose between having a surgical procedure at a hospital that required employees to be vaccinated against COVID-19, or at a hospital that recommended employees be vaccinated or not having the procedure at either hospital but enduring pain. Participants were told that both hospitals were equally convenient and were covered by their insurance. On the following page, participants were asked to estimate how many other participants out of 100 would choose each option. Participants were then told that their friend had just told them that they were going to have a procedure at the opposite hospital than the one the participant selected, and participants were asked whether they would warn the friend about each hospital's vaccine policy.

We also asked participants to assess the warmth and competence of each hospital using the warmth/competence scale used in Study 2b and provide an open-ended response explaining why they chose the given hospital and whether and why they warned their friend, and measured attitudes towards vaccination and the pandemic.

Bibliography

- Aaker, J. L., Garbinsky, E. N., & Vohs, K. D. (2012). Cultivating admiration in brands: Warmth, competence, and landing in the “golden quadrant.” *Journal of Consumer Psychology*, 22(2), 191–194. <https://doi.org/10.1016/j.jcps.2011.11.012>
- Allport, F. H. (1924). The Group Fallacy in Relation to Social Science. *American Journal of Sociology*, 29(6), 688–706. <https://doi.org/10.1086/213647>
- Anderson, E. W. (1998). Customer Satisfaction and Word of Mouth. *Journal of Service Research*, 1(1), 5–17. <https://doi.org/10.1177/109467059800100102>
- Baker, P., & Haberman, M. (2020, October 2). Trump Tests Positive for the Coronavirus—The New York Times. *New York Times*.
<https://www.nytimes.com/2020/10/02/us/politics/trump-covid.html>
- Betsch, C., Korn, L., Sprengholz, P., Felgendreiff, L., Eitze, S., Schmid, P., & Böhm, R. (2020). Social and behavioral consequences of mask policies during the COVID-19 pandemic. *Proceedings of the National Academy of Sciences*, 117(36), 21851–21853.
<https://doi.org/10.1073/pnas.2011674117>
- Boven, L. V. (2000). Pluralistic Ignorance and Political Correctness: The Case of Affirmative Action. *Political Psychology*, 21(2), 267–276. <https://doi.org/10.1111/0162-895X.00187>
- Brauer, M., & Chaurand, N. (2010). Descriptive norms, prescriptive norms, and social control: An intercultural comparison of people’s reactions to uncivil behaviors. *European Journal of Social Psychology*, 40(3), 490–499. <https://doi.org/10.1002/ejsp.640>
- Brombach, G. (2020, September 25). Which retailers require customers to wear face masks? | U.S. PIRG. UNITED STATES PUBLIC INTEREST RESEARCH GROUP.
<https://uspirg.org/blogs/blog/usp/which-retailers-require-customers-wear-face-masks>

- Brooks, J. T., Butler, J. C., & Redfield, R. R. (2020). Universal Masking to Prevent SARS-CoV-2 Transmission—The Time Is Now. *JAMA*, 324(7), 635–637.
<https://doi.org/10.1001/jama.2020.13107>
- Budd, C., Calvert, K., Johnson, S., & Tickle, S. O. (2020). Assessing Risk in the Retail Environment during the COVID-19 Pandemic. *ArXiv:2011.09277 [Physics, q-Bio]*.
<http://arxiv.org/abs/2011.09277>
- Bursztyn, L., González, A. L., & Yanagizawa-Drott, D. (2018). *Misperceived Social Norms: Female Labor Force Participation in Saudi Arabia* (No. w24736). National Bureau of Economic Research. <https://doi.org/10.3386/w24736>
- Buttle, F. (1998). Word of mouth: Understanding and managing referral marketing. *Journal of Strategic Marketing*, 6, 241–254. <https://doi.org/10.1080/096525498346658>
- Cialdini, R. B., Reno, R. R., & Kallgren, C. A. (1990). A focus theory of normative conduct: Recycling the concept of norms to reduce littering in public places. *Journal of Personality and Social Psychology*, 58(6), 1015–1026. <https://doi.org/10.1037/0022-3514.58.6.1015>
- Corkery, M. (2020, July 29). Mandatory Masks, but Limited Enforcement, at Walmart and Other Stores—The New York Times. *New York Times*.
<https://www.nytimes.com/2020/07/29/business/coronavirus-masks-stores-walmart.html>
- Eikenberry, S. E., Mancuso, M., Iboi, E., Phan, T., Eikenberry, K., Kuang, Y., Kostelich, E., & Gumel, A. B. (2020). To mask or not to mask: Modeling the potential for face mask use by the general public to curtail the COVID-19 pandemic. *Infectious Disease Modelling*, 5, 293–308. <https://doi.org/10.1016/j.idm.2020.04.001>

- Eriksson, K., Strimling, P., & Coultas, J. C. (2015). Bidirectional associations between descriptive and injunctive norms. *Organizational Behavior and Human Decision Processes*, 129, 59–69. <https://doi.org/10.1016/j.obhdp.2014.09.011>
- Fischer, S., & Semple, K. (2020, December 30). As U.S. Vaccine Drive Lags, Fast-Moving Coronavirus Variant Is Making Inroads. *The New York Times*.
<https://www.nytimes.com/live/2020/12/30/world/covid-19-coronavirus-updates>
- Fiske, S. T., Cuddy, A. J. C., & Glick, P. (2007). Universal dimensions of social cognition: Warmth and competence. *Trends in Cognitive Sciences*, 11(2), 77–83.
<https://doi.org/10.1016/j.tics.2006.11.005>
- Fournier, S., & Alvarez, C. (2012). Brands as relationship partners: Warmth, competence, and in-between. *Journal of Consumer Psychology*, 22(2), 177–185.
<https://doi.org/10.1016/j.jcps.2011.10.003>
- Friedman, G. (2020, July 24). McDonald’s Joins Walmart and Dozens of Other Chains With Mask Mandates. *The New York Times*. <https://www.nytimes.com/article/which-stores-require-masks.html>
- Geyser, S. (1981). Retail customer satisfaction and dissatisfaction. In *Theory in Retailing: Traditional and Nontraditional Sources* (pp. 64–70). Marketing Classics Press.
- Griffiths, T. L., & Tenenbaum, J. B. (2006). Optimal predictions in everyday cognition. *Psychological Science*, 17(9), 767–773. <https://doi.org/10.1111/j.1467-9280.2006.01780.x>
- Haischer, M. H., Beilfuss, R., Hart, M. R., Opielinski, L., Wrucke, D., Zirgaitis, G., Uhrich, T. D., & Hunter, S. K. (2020). Who is wearing a mask? Gender-, age-, and location-related

- differences during the COVID-19 pandemic. *PLOS ONE*, 15(10), e0240785.
<https://doi.org/10.1371/journal.pone.0240785>
- Halbesleben, J. R. B., Ronald Buckley, M., & Sauer, N. D. (2004). The Role of Pluralistic Ignorance in Perceptions of Unethical Behavior: An Investigation of Attorneys' and Students' Perceptions of Ethical Behavior. *Ethics & Behavior*, 14(1), 17–30.
https://doi.org/10.1207/s15327019eb1401_2
- Halpern, L. W. (2020). The Politicization of COVID-19. *AJN The American Journal of Nursing*, 120(11), 19–20. <https://doi.org/10.1097/01.NAJ.0000721912.74581.d7>
- Hanbury, M. (2020, July 17). Dollar Tree reverses its policy on mandatory masks for shoppers—Business Insider. *Business Insider*. <https://www.businessinsider.com/dollar-tree-reverses-mandatory-mask-policy-for-shoppers-2020-7>
- Howard, J., Huang, A., Li, Z., Tufekci, Z., Zdimal, V., Westhuizen, H.-M. van der, Delft, A. von, Price, A., Fridman, L., Tang, L.-H., Tang, V., Watson, G. L., Bax, C. E., Shaikh, R., Questier, F., Hernandez, D., Chu, L. F., Ramirez, C. M., & Rimoin, A. W. (2021). An evidence review of face masks against COVID-19. *Proceedings of the National Academy of Sciences*, 118(4). <https://doi.org/10.1073/pnas.2014564118>
- IATA. (2020). Air Passenger Market Analysis. *International Air Transport Association*.
- Jiang, I., & Cain, A. (2020, July 27). List of chains requiring customers wear masks: McDonald's, Walmart—Business Insider. *Business Insider*.
<https://www.businessinsider.com/list-of-chains-requiring-customers-wear-masks-walmart-starbucks-2020-7#dollar-tree-and-family-dollar-6>
- Katz, D., Allport, F. H., & Jenness, M. B. (1931). *Students' attitudes; a report of the Syracuse University reaction study* (pp. xxviii, 408). Craftsman Press.

- Kervyn, N., Fiske, S. T., & Malone, C. (2012). Brands as intentional agents framework: How perceived intentions and ability can map brand perception. *Journal of Consumer Psychology*, 22(2), 166–176. <https://doi.org/10.1016/j.jcps.2011.09.006>
- Kervyn, N., Fiske, S. T., & Yzerbyt, V. Y. (2013). Integrating The Stereotype Content Model (Warmth And Competence) And The Osgood Semantic Differential (Evaluation, Potency, And Activity). *European Journal of Social Psychology*, 43(7), 673–681. <https://doi.org/10.1002/ejsp.1978>
- Khanh, N. C., Thai, P. Q., Quach, H.-L., Thi, N.-A. H., Dinh, P. C., Duong, T. N., Mai, L. T. Q., Nghia, N. D., Tu, T. A., Quang, L. N., Quang, T. D., Nguyen, T.-T., Vogt, F., & Anh, D. D. (2020). Transmission of Severe Acute Respiratory Syndrome Coronavirus 2 During Long Flight. *Emerging Infectious Diseases Journal - CDC*, 26(11). <https://doi.org/10.3201/eid2611.203299>
- Krueger, J., & Clement, R. W. (1997). Estimates of social consensus by majorities and minorities: The case for social projection. *Personality and Social Psychology Review: An Official Journal of the Society for Personality and Social Psychology, Inc*, 1(4), 299–313. https://doi.org/10.1207/s15327957pspr0104_2
- Krueger, Joachim, & Clement, R. W. (1994). The truly false consensus effect: An ineradicable and egocentric bias in social perception. *Journal of Personality and Social Psychology*, 67(4), 596–610. <https://doi.org/10.1037/0022-3514.67.4.596>
- Lamb, T. L., Winter, S. R., Rice, S., Ruskin, K. J., & Vaughn, A. (2020). Factors that predict passengers willingness to fly during and after the COVID-19 pandemic. *Journal of Air Transport Management*, 89, 101897. <https://doi.org/10.1016/j.jairtraman.2020.101897>

- Markowitz, A. (2020, November 13). Face Masks Required at 10 Biggest Chains, Including Walmart. *AARP*. <http://www.aarp.org/health/healthy-living/info-2020/retailers-require-face-masks-coronavirus.html>
- Meyersohn, N. (2020, July 26). Walmart and others will still serve customers who refuse to wear masks, despite new rules. *CNN*. <https://www.cnn.com/2020/07/24/business/masks-walmart-home-depot-lowes-cvs/index.html>
- Miller, D. T., & McFarland, C. (1987). Pluralistic ignorance: When similarity is interpreted as dissimilarity. *Journal of Personality and Social Psychology*, 53(2), 298–305. <https://doi.org/10.1037/0022-3514.53.2.298>
- Mitze, T., Kosfeld, R., Rode, J., & Wälde, K. (2020). Face masks considerably reduce COVID-19 cases in Germany. *Proceedings of the National Academy of Sciences*. <https://doi.org/10.1073/pnas.2015954117>
- O’Gorman, H. J. (1975). PLURALISTIC IGNORANCE AND WHITE ESTIMATES OF WHITE SUPPORT FOR RACIAL SEGREGATION. *Public Opinion Quarterly*, 39(3), 313–330. <https://doi.org/10.1086/268231>
- Orecchio-Egresitz, H. (2020, December 16). Houston doctor says half the nurses won’t get COVID-19 vaccine—Business Insider. *Business Insider*. <https://www.businessinsider.com/houston-doctor-half-the-nurses-wont-get-covid-19-vaccine-2020-12>
- Prentice, D. A., & Miller, D. T. (1993). Pluralistic ignorance and alcohol use on campus: Some consequences of misperceiving the social norm. *Journal of Personality and Social Psychology*, 64(2), 243–256. <https://doi.org/10.1037//0022-3514.64.2.243>

- Reid, A. E., Cialdini, R. B., & Aiken, L. S. (2011). Social norms and health behavior. In *Handbook of behavioral medicine: Methods and applications* (pp. 263–274). Springer Science - Business Media.
- Repko, M. (2020, July 17). With wave of mask requirements, Walmart and other retailers face challenge: How to enforce the rules. *CNBC*. <https://www.cnn.com/2020/07/17/with-mask-requirements-retailers-face-challenge-enforcing-the-rules.html>
- Reyes, J. F. (2020, September 21). ‘I’m not TSA. I’m a bartender’: Workers say they’re defenseless when customers don’t wear masks. *Https://Www.Inquirer.Com*. <https://www.inquirer.com/news/retail-workers-customers-masks-coronavirus-20200921.html>
- Rivera, J. (2020, July 2). Woman spits on 7-Eleven counter after being asked to wear a mask. *USA TODAY*. <https://www.usatoday.com/story/money/2020/07/02/7-eleven-mask-incident-viral-video-spits-counter/5368869002/>
- Roberts, S. O., Gelman, S. A., & Ho, A. K. (2017). So It Is, So It Shall Be: Group Regularities License Children’s Prescriptive Judgments. *Cognitive Science*, 41(S3), 576–600. <https://doi.org/10.1111/cogs.12443>
- Segarra, M. (2020, July 27). Retailers are requiring customers to wear masks. Who should enforce it? In *Marketplace*. <https://www.marketplace.org/2020/07/27/who-responsible-for-enforcing-mask-requirements/>
- Shannon, J. (2020, July 12). Should I wear a mask? You’ll soon face growing pressure, experts say. *USA Today*. <https://www.usatoday.com/story/news/nation/2020/07/12/coronavirus-should-i-wear-mask-pressure-fines-rules/5378625002/>

- Shepardson, D., & Rucinski, T. (2020, April 30). American Airlines, Delta, United to require facial coverings on U.S. flights | Reuters. *Reuters*. <https://www.reuters.com/article/us-health-coronavirus-usa-airlines/american-airlines-delta-united-to-require-facial-coverings-on-u-s-flights-idUSKBN22C3QZ>
- Sherling, D., & Bell, M. (2020). Masks, Seat Belts, and the Politicization of Public Health. *Journal of Hospital Medicine*, 15(11). <https://doi.org/10.12788/jhm.3524>
- Slodysko, B. (2020, November 7). EXPLAINER: Why AP called the 2020 election for Joe Biden. *AP NEWS*. <https://apnews.com/article/why-did-AP-call-election-for-Biden-fe79276cd9175fffc7cf4fb58045fcf9>
- Sokoloski, R., Markowitz, E. M., & Bidwell, D. (2018). Public estimates of support for offshore wind energy: False consensus, pluralistic ignorance, and partisan effects. *Energy Policy*, 112, 45–55. <https://doi.org/10.1016/j.enpol.2017.10.005>
- Tyko, K. (2020a, June 27). Trader Joe’s mask requirement: Woman refuses to wear mask, kicked out. *USA Today*. <https://www.usatoday.com/story/money/2020/06/27/mask-requirement-trader-joes-viral-twitter-video/3271625001/>
- Tyko, K. (2020b, July 6). Target shopper wearing “\$40,000 Rolex” destroys face mask display, while Costco shopper protests mask policy. *USA TODAY*. <https://www.usatoday.com/story/money/2020/07/06/mask-rant-shoppers-protest-face-coverings-target-costco/5382837002/>
- Zarrol, J. (2020, July 14). The Customer Is Always Right. Except When They Won’t Wear A Mask. *NPR*. <https://www.wbur.org/npr/889721147/the-customer-is-always-right-except-when-they-wont-wear-a-mask>

Zhang, J. G. (2020, July 6). The Irresistible Spectacle of Grocery Store Freakout Videos—Eater.
Eater. <https://www.eater.com/2020/7/6/21314926/the-spectacle-of-grocery-store-coronavirus-mask-freakouts>

Supplemental Information for The Masked Majority: Underprediction Of Widespread Support for Covid-19 Safety Policies.

APPENDIX.

Table of Contents

Appendix A: Study Materials

Study 1 Materials

Study 2 Materials

Study 3 Materials

Study 4 Materials

Study 5 Materials

Appendix B: Additional analyses for studies in the paper

Study 1 Additional Analyses

Study 2a Additional Information and Analyses

Study 2b Additional Analyses

Study 3 Additional Analyses

Study 4 Additional Analyses

Study 5 Additional Analyses

Appendix C: Additional Studies

Additional Study 1: Airline preference

Additional Study 2: Preferences and predictions across different types of businesses

Additional Study 3: The impact of online reviews on consumers' preferences and predictions

Appendix A

Study 1 materials

Imagine that you needed to travel next week for an urgent matter that required you to be there in person. It is too far to drive, so you need to fly. You have a choice between two airlines.

[Airline A/Airline B] is one of the four largest airlines in the US. [Airline A/Airline B] **requires** all passengers to wear face masks, and **removes passengers** who take their masks off.

[Airline B/Airline A] is also one of the four largest airlines in the US. [Airline B/Airline A] **recommends** that all passengers wear face masks, but **does not remove passengers** who take their masks off.

On each row below, imagine that those were the two equally convenient flight options you had, and choose which of the two you would buy.

	I would purchase...		
	1 (1)	2 (2)	
Airline A for \$50	☐	☐	Airline B for \$100
Airline A for \$60	☐	☐	Airline B for \$100
Airline A for \$70	☐	☐	Airline B for \$100
Airline A for \$80	☐	☐	Airline B for \$100
Airline A for \$90	☐	☐	Airline B for \$100
Airline A for \$100	☐	☐	Airline B for \$100
Airline A for \$100	☐	☐	Airline B for \$90
Airline A for \$100	☐	☐	Airline B for \$80
Airline A for \$100	☐	☐	Airline B for \$70
Airline A for \$100	☐	☐	Airline B for \$60
Airline A for \$100	☐	☐	Airline B for \$50

Page Break

Think about how the other people answering this survey chose between:
"Airline A for \$100" and "Airline B for \$100".

Out of 100 people who took this survey, how many do you think chose each option?

(Your numbers need to add up to 100.)

This many people chose "Airline A for \$100" : _____ (1)

This many people chose "Airline B for \$100" : _____ (2)

Total : _____

Study 2 Materials

TABLE 1. Embedded variables for study 2.

Embedded Data Field					
scenario	Bakery	Pharmacy	Gym	Hair Salon	Movie Theater
patron	shoppers	shoppers	visitors	customers	visitors
action	go shop at	go shop at	go exercise at	get a haircut at	see a movie at
a_an	a	a	a	a	a
plural	Bakeries	Pharmacies	Gyms	Hair Salons	Movie Theaters

Imagine that you wanted to $\{e://Field/action\}$ $\{e://Field/a_an\}$ $\{e://Field/scenario\}$. You have a choice between two $\{e://Field/plural\}$. You would need to go in person.

$\{e://Field/scenario\}$ A **requires** all $\{e://Field/patron\}$ to wear face masks, **does not allow** in $\{e://Field/patron\}$ without masks, and **bans** any $\{e://Field/patron\}$ who take their masks off in the $\{e://Field/scenario\}$.

$\{e://Field/scenario\}$ B **recommends** that all $\{e://Field/patron\}$ wear face masks, but **allows** in all $\{e://Field/patron\}$ and **does not ban** $\{e://Field/patron\}$ who take their masks off in the $\{e://Field/scenario\}$.

On each row below, imagine that those were the two equally convenient $\{e://Field/scenario\}$ options you had.

What would you choose to do?

- $\{e://Field/scenario\}$ A (1)
- $\{e://Field/scenario\}$ B (2)
- Not go to either $\{e://Field/scenario\}$ (3)

Page Break

Think about how the other people answering this survey chose between:

$\{e://Field/scenario\}$ A and $\{e://Field/scenario\}$ B.

Out of 100 people who took this survey, how many do you think chose each option?

(Your numbers need to add up to 100.)

This many people chose " $\{e://Field/scenario\}$ A" : _____ (1)

This many people chose " $\{e://Field/scenario\}$ B" : _____ (2)

This many people chose "Not use to either $\{e://Field/scenario\}$ " : _____ (3)

Total : _____

Page Break

To recap, you were told:

Imagine that you wanted to $\{e://Field/action\}$ $\{e://Field/a_an\}$ $\{e://Field/scenario\}$. You have a choice between two $\{e://Field/plural\}$. You would need to go in person.

$\{e://Field/scenario\}$ [A/B] **requires** all $\{e://Field/patron\}$ to wear face masks, **does not allow in** $\{e://Field/patron\}$ without masks, and **bans** any $\{e://Field/patron\}$ who take their masks off in the $\{e://Field/scenario\}$.

$\{e://Field/scenario\}$ [B/A] **recommends** that all $\{e://Field/patron\}$ wear face masks, but **allows in** all $\{e://Field/patron\}$ and **does not ban** $\{e://Field/patron\}$ who take their masks off in the $\{e://Field/scenario\}$.

trust_A How much do you trust $\{e://Field/scenario\}$ A?

- Trust a great deal (7)
- Trust a moderate amount (6)
- Trust a little (5)
- Neither Trust nor distrust (4)
- Distrust a little (3)
- Distrust a moderate amount (2)
- Distrust a great deal (1)

How much do you trust $\{e://Field/scenario\}$ B?

- Trust a great deal (7)
- Trust a moderate amount (6)
- Trust a little (5)
- Neither Trust nor distrust (4)
- Distrust a little (3)
- Distrust a moderate amount (2)
- Distrust a great deal (1)

Page Break

To recap, you were told:

Imagine that you wanted to $\{e://Field/action\}$ $\{e://Field/a_an\}$ $\{e://Field/scenario\}$. You have a choice between two $\{e://Field/plural\}$. You would need to go in person.

$\{e://Field/scenario\}$ [A/B] **requires** all $\{e://Field/patron\}$ to wear face masks, **does not allow in** $\{e://Field/patron\}$ without masks, and **bans** any $\{e://Field/patron\}$ who take their masks off in the $\{e://Field/scenario\}$.

$\{e://Field/scenario\}$ [B/A] **recommends** that all $\{e://Field/patron\}$ wear face masks, but **allows in** all $\{e://Field/patron\}$ and **does not ban** $\{e://Field/patron\}$ who take their masks off in the $\{e://Field/scenario\}$.

How much do you think $\{e://Field/scenario\}$ A cares about $\{e://Field/patron\}$?

- Extremely caring (1)
- Moderately caring (2)
- Slightly caring (3)
- Neither caring nor uncaring (4)
- Slightly uncaring (5)
- Moderately uncaring (6)
- Extremely uncaring (7)

How much do you think $\{e://Field/scenario\}$ B cares about $\{e://Field/patron\}$?

- Extremely caring (1)
- Moderately caring (2)
- Slightly caring (3)
- Neither caring nor uncaring (4)
- Slightly uncaring (5)
- Moderately uncaring (6)
- Extremely uncaring (7)

Page Break

To recap, you were told:

Imagine that you wanted to $\{e://Field/action\} \{e://Field/a_an\} \{e://Field/scenario\}$. You have a choice between two $\{e://Field/plural\}$. You would need to go in person.

$\{e://Field/scenario\}$ [A/B] requires all $\{e://Field/patron\}$ to wear face masks, does not allow in $\{e://Field/patron\}$ without masks, and bans any $\{e://Field/patron\}$ who take their masks off in the $\{e://Field/scenario\}$.

$\{e://Field/scenario\}$ [B/A] recommends that all $\{e://Field/patron\}$ wear face masks, but allows in all $\{e://Field/patron\}$ and does not ban $\{e://Field/patron\}$ who take their masks off in the $\{e://Field/scenario\}$.

How warm do you believe each $\{e://Field/scenario\}$ to be?

	Extremely warm (1)	Moderately warm (2)	Slightly warm (3)	Neither warm nor cold (4)	Slightly cold (5)	Moderately cold (6)	Extremely cold (7)
$\{e://Field/scenario\}$ A	☐	☐	☐	☐	☐	☐	☐
$\{e://Field/scenario\}$ B	☐	☐	☐	☐	☐	☐	☐

How friendly do you believe each $\{e://Field/scenario\}$ to be?

	Extremely friendly (1)	Moderately friendly (2)	Slightly friendly (3)	Neither friendly nor unfriendly (4)	Slightly unfriendly (5)	Moderately unfriendly (6)	Extremely unfriendly (7)
$\{e://Field/scenario\}$ A	☐	☐	☐	☐	☐	☐	☐
$\{e://Field/scenario\}$ B	☐	☐	☐	☐	☐	☐	☐

How competent do you believe each $\{e://Field/scenario\}$ to be?

	Extremely competent (1)	Moderately competent (2)	Slightly competent (3)	Neither competent nor incompetent (4)	Slightly incompetent (5)	Moderately incompetent (6)	Extremely incompetent (7)
$\{e://Field/scenario\}$ A (2)	☐	☐	☐	☐	☐	☐	☐
$\{e://Field/scenario\}$ B (4)	☐	☐	☐	☐	☐	☐	☐

capable_A_req How capable do you believe each $\{e://Field/scenario\}$ to be?

	Extremely capable (1)	Moderately capable (2)	Slightly capable (3)	Neither capable nor incapable (4)	Slightly incapable (5)	Moderately incapable (6)	Extremely incapable (7)
$\{e://Field/scenario\}$ A (2)	☐	☐	☐	☐	☐	☐	☐
$\{e://Field/scenario\}$ B (4)	☐	☐	☐	☐	☐	☐	☐

Page Break

To recap, you were told:

Imagine that you wanted to $\{e://Field/action\}$ $\{e://Field/a_an\}$ $\{e://Field/scenario\}$. You have a choice between two $\{e://Field/plural\}$. You would need to go in person.

$\{e://Field/scenario\}$ [A/B] requires all $\{e://Field/patron\}$ to wear face masks, does not allow in $\{e://Field/patron\}$ without masks, and bans any $\{e://Field/patron\}$ who take their masks off in the $\{e://Field/scenario\}$.

$\{e://Field/scenario\}$ [B/A] recommends that all $\{e://Field/patron\}$ wear face masks, but allows in all $\{e://Field/patron\}$ and does not ban $\{e://Field/patron\}$ who take their masks off in the $\{e://Field/scenario\}$.

And you selected

$\{e://Field/choice_A_req\}$

Please explain why you chose $\{e://Field/choice_A_req\}$?

Page Break

How likely are you to do the following in the next week:

Extremely likely (1)	Moderately likely (2)	Slightly likely (3)	Neither likely nor unlikely (4)	Slightly unlikely (5)	Moderately unlikely (6)	Extremely unlikely (7)
-------------------------	--------------------------	------------------------	---------------------------------------	--------------------------	----------------------------	---------------------------

Shop at a bakery

Exercise at a gym

Go to a movie theater

Go to a hair salon

Shop at a pharmacy

Page Break

Please indicate the extent to which you agree with the following:

Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
-----------------------------	-----------------	-----------------------------	---	-----------------------	-----------	-----------------------

1. In some real sense, I feel that a store's personnel should cater to my every whim.
2. In this modern age of technology, I should be able to ask a salesperson any question and have it answered instantly.
3. As a valuable customer, I have earned the right to deal exclusively with a store's most talented staff members.
4. I don't care if a store clerk is a rookie, he or she ought to know how well a given product works.
5. I desire absolute empathy from a store clerk when I have a problem.
6. With all the money stores spend on advertising, I expect my merchandise to be perfect.
7. At all times, I want store clerks to address me in a formal manner (e.g., sir or ma'am).
8. I deserve to be taken to where a particular item is in a store and not told "well, it's on Aisle 3."
9. I absolutely believe in the saying "the customer is always right."

Study 3 Materials

On the following pages, we will show you several scenarios that we showed a **national sample of survey respondents** last week.

Participants in this national survey were recruited from among all 50 states. The sample had the following characteristics:

38% Republican, 20% Independent, and 39% Democrat
49% Male and 51% Female
Age ranged from 18 to 88 years old, with an average age of 45.

We will ask you to tell us how you think they responded.

On the following pages, we will show you several scenarios that we are showing a **national sample of survey respondents** currently.

Participants in this national survey were recruited from all 50 states. The sample had the following characteristics:

The participants in the sample match the age, gender and ethnicity of Americans nationwide.

We will ask you to tell us how you think they responded.

Page Break

Participants were shown the following scenario:

"Imagine that you wanted to get something from a bakery. You have a choice between two bakeries. Neither bakery makes deliveries, so you would need to go in person.

[Bakery A/Bakery B] **requires** all shoppers to wear face masks, **does not allow in** shoppers without masks, and **bans** any shoppers who take their masks off in the store.

[Bakery B/Bakery A] **recommends** that all shoppers wear face masks, but **allows in** all shoppers and **does not ban** shoppers who take their masks off in the store.

On each row below, imagine that those were the two equally convenient bakery options you had.

What would you choose to do?"

Page Break

Think about how the **participants in the national survey** chose between:
Bakery A and Bakery B.

Out of 100 people who took the survey, how many do you think chose each option?

(Your numbers need to add up to 100.)

This many people chose "Go to Bakery A" : _____ (1)

This many people chose "Go to Bakery B" : _____ (2)

This many people chose "Not go to either bakery" : _____ (3)

Total : _____

Participants were shown the following scenario:

"Imagine that you wanted to get something from a pharmacy. You have a choice between two pharmacies. Neither pharmacy makes deliveries, so you would need to go in person.

[Pharmacy A/Pharmacy B] **requires** all shoppers to wear face masks, **does not allow in** shoppers without masks, and **bans** any shoppers who take their masks off in the store.

[Pharmacy B/Pharmacy A] **recommends** that all shoppers wear face masks, but **allows in** all shoppers and **does not ban** shoppers who take their masks off in the store.

On each row below, imagine that those were the two equally convenient pharmacy options you had.

What would you choose to do?"

Page Break

Think about how the **participants in the national survey** chose between:
Pharmacy A and Pharmacy B.

Out of 100 people who took the survey, how many do you think chose each option?

(Your numbers need to add up to 100.)

This many people chose "Pharmacy A" : _____ (1)

This many people chose "Pharmacy B" : _____ (2)

This many people chose "Not go to either pharmacy" : _____ (3)

Total : _____

Participants were shown the following scenario:

"Imagine that you wanted to get a haircut at a hair salon. You have a choice between two hair salons. You would need to go in person.

[Hair salon A / Hair salon B] **requires** all customers to wear face masks, **does not allow in** customers without masks, and **bans** any customers who take their masks off in the salon.

[Hair salon B / Hair salon A] **recommends** that all customers wear face masks, but **allows in** all customers and **does not ban** customers who take their masks off in the salon.

On each row below, imagine that those were the two equally convenient hair salon options you had.

What would you choose to do?"

Page Break

Think about how the **participants in the national survey** chose between:
Hair Salon A and Hair Salon B.

Out of 100 people who took this survey, how many do you think chose each option?

(Your numbers need to add up to 100.)

This many people chose "Hair Salon A" : _____ (1)

This many people chose "Hair Salon B" : _____ (2)

This many people chose "Not go to either hair salon" : _____ (3)

Total : _____

Participants were shown the following scenario:

"Imagine that you wanted to go see a movie at a movie theater. You have a choice between two movie theaters. You would need to go in person.

[Movie theater A/ Movie theater B] **requires** all visitors to wear face masks, **does not allow in** visitors without masks, and **bans** any visitors who take their masks off in the theater.

[Movie theater B/ Movie theater A] **recommends** that all visitors wear face masks, but **allows in** all visitors and **does not ban** visitors who take their masks off in the theater.

On each row below, imagine that those were the two equally convenient movie theater options you had.

What would you choose to do?"

Page Break

Think about how the **participants in the national survey** chose between:
Movie Theater A and Movie Theater B.

Out of 100 people who took this survey, how many do you think chose each option?

(Your numbers need to add up to 100.)

This many people chose "Movie Theater A" : _____

This many people chose "Movie Theater B" : _____

This many people chose "Not go to either movie theater" : _____

Total : _____

Participants were shown the following scenario:

"Imagine that you wanted to go exercise at a gym. You have a choice between two gyms. You would need to go in person.

[Gym A/Gym B] **requires** all visitors to wear face masks, **does not allow in** visitors without masks, and **bans** any visitors who take their masks off in the gym.

[Gym B/Gym A] **recommends** that all visitors wear face masks, but **allows in** all visitors and **does not ban** visitors who take their masks off in the gym.

On each row below, imagine that those were the two equally convenient gym options you had.

What would you choose to do?"

Page Break

Think about how the **participants in the national survey** chose between:
Gym A and Gym B.

Out of 100 people who took this survey, how many do you think chose each option?

(Your numbers need to add up to 100.)

This many people chose "Gym A" : _____

This many people chose "Gym B" : _____

This many people chose "Not go to either gym" : _____

Total : _____

Which of the following were you asked to do in this survey?

- Predict how I think others have responded
- Choose how I would response
- Finish as fast as possible

Please enter your job title:

Page Break

Which of the following does your job involve:

- ☐ Interacting with customers
- ☐ Selling merchandise
- ☐ Fielding customer complaints
- ☐ Selling food items
- ☐ Managing staff
- ☐ Enforcing workplace policies

Page Break

Does your workplace currently have a mask policy?

- ☐ Yes
- ☐ No
- ☐ Other (Please explain) _____

Have you received customer complaints about the following at your workplace?

	Yes	No
Customers refusing to wear masks	☐	☐
Workplace mask rules	☐	☐
Employees wearing masks	☐	☐

Do you have experience in retail management?

- ☐ Yes
 - ☐ No
-

Please briefly describe your management experience:

Page Break

Which of these is closest to your opinion about people wearing a face mask (that covers their nose and mouth) when they are away from home, around other people?

- Everyone should wear a face mask
 - Everyone should wear a face mask indoors, but it is not necessary outdoors
 - People should choose whether or not they want to wear a face mask but it should not be required
 - People can wear a face mask if they want but there is no good reason to do so
 - Only people who are currently sick should wear a face mask
 - It is bad to wear a face mask
 - Other opinion (please specify)
-

Page Break

Would you support or oppose a national mandate to wear a face mask?

- Strongly support
- Somewhat support
- Somewhat oppose
- Strongly oppose

Page Break

How worried are you about Coronavirus?

- Very worried
- Somewhat worried
- Not very worried
- Not at all worried

Page Break

Are you more concerned about getting COVID-19 yourself, or spreading COVID-19 to others?

- Much more concerned about myself
- Somewhat more concerned about myself
- Equally concerned about myself and others
- Somewhat more concerned about others
- Much more concerned about others

Page Break

How would you describe the way most Americans are dealing with coronavirus?

- Most are underestimating the risks
- Most are behaving appropriately
- Most are overreacting to the actual risks

Study 4 Materials

This survey will require you to watch videos with sound and answer questions about them. Please confirm that you will be able to view videos with sound on your device.

- I will be able to view videos with sound
- No, exit survey

Page Break

We are going to ask you to watch two videos, each filmed at a different actual Walmart store.

The following video was filmed at **Walmart B** recently, an actual Walmart store:
[<https://abc30.com/martinez-walmart-face-mask-caught-on-camera-viral-video/6328388/>]

Page Break

The following video was filmed at Walmart A recently, an actual Walmart store:
[https://www.youtube.com/watch?v=sUaQ-_nP3FQ]

Imagine that you need to shop at a Walmart store. You need to go in person and have a choice between two equally convenient stores. Your two options are the stores in the videos that you just watched.

Recall that you need to shop at a Walmart store. You need to go in person.

You have a choice between the two equally convenient nearby Walmart stores that you just watched videos about (shown above).

What would you choose to do?

- Walmart A
- Walmart B
- Not go to either Walmart

Page Break

Think about how the other people answering this survey chose between:
Walmart A and Walmart B.

Out of 100 people who took this survey, how many do you think chose each option?

(Your numbers need to add up to 100.)

This many people chose "Walmart A" : _____

This many people chose "Walmart B" : _____

This many people chose "Not use to either Walmart" :

Total : _____

Recall the two Walmart stores that you watched videos about:

How much do you think each Walmart cares about customers?

	Extremely caring (7)	Moderately caring (6)	Slightly caring (5)	Neither caring nor uncaring (4)	Slightly uncaring (3)	Moderately uncaring (2)	Extremely uncaring (1)
Walmart A	☐	☐	☐	☐	☐	☐	☐
Walmart B	☐	☐	☐	☐	☐	☐	☐

How much do you trust each Walmart?

	Trust a great deal (7)	Trust a moderate amount (6)	Trust a little (5)	Neither trust nor distrust (4)	Distrust a little (3)	Distrust a moderate amount (2)	Distrust a great deal (1)
Walmart A	☐	☐	☐	☐	☐	☐	☐
Walmart B	☐	☐	☐	☐	☐	☐	☐

How warm do you believe the employees of each Walmart to be?

	Extremely warm (7)	Moderately warm (6)	Slightly warm (5)	Neither warm nor cold (4)	Slightly cold (3)	Moderately cold (2)	Extremely cold (1)
Walmart A	☐	☐	☐	☐	☐	☐	☐
Walmart B	☐	☐	☐	☐	☐	☐	☐

How friendly do you believe the employees of each Walmart to be?

	Extremely friendly (7)	Moderately friendly (6)	Slightly friendly (5)	Neither friendly nor unfriendly (4)	Slightly unfriendly (3)	Moderately unfriendly (2)	Extremely unfriendly (1)
Walmart A	☐	☐	☐	☐	☐	☐	☐
Walmart B	☐	☐	☐	☐	☐	☐	☐

How competent do you believe the employees of each Walmart to be?

	Extremely competent (7)	Moderately competent (6)	Slightly competent (5)	Neither competent nor incompetent (4)	Slightly incompetent (3)	Moderately incompetent (2)	Extremely incompetent (1)
Walmart A	☐	☐	☐	☐	☐	☐	☐
Walmart B	☐	☐	☐	☐	☐	☐	☐

How capable do you believe the employees of each Walmart to be?

	Extremely capable (7)	Moderately capable (6)	Slightly capable (5)	Neither capable nor incapable (4)	Slightly incapable (3)	Moderately incapable (2)	Extremely incapable (1)
Walmart A	☐	☐	☐	☐	☐	☐	☐
Walmart B	☐	☐	☐	☐	☐	☐	☐

Page Break

You selected **#{e://Field/choice}**

Please explain why you chose **#{e://Field/choice}**:

Please explain why you predicted that out of 100 people who took this survey:

chose to go to Walmart A

chose to go to Walmart B

chose to go to neither Walmart

Page Break

How likely are you to do the following in the next week:

	Extremely likely (7)	Moderately likely (6)	Slightly likely (5)	Neither likely nor unlikely (4)	Slightly unlikely (3)	Moderately unlikely (2)	Extremely unlikely (1)
Shop at a bakery	☐	☐	☐	☐	☐	☐	☐
Exercise at a gym	☐	☐	☐	☐	☐	☐	☐
Go to a movie theater	☐	☐	☐	☐	☐	☐	☐
Shop at a Walmart	☐	☐	☐	☐	☐	☐	☐
Shop at a pharmacy	☐	☐	☐	☐	☐	☐	☐

Page Break

In general, who do you think is more likely to complain publicly?

- ☐ People who think that retailers' mask policies are too strict.
- ☐ People who think that retailers' mask policies are not strict enough.
- ☐ Both equally

Study 5 Materials

Imagine that you need to have an elective surgical procedure. You have a choice between two hospitals.

[Hospital A/Hospital B] **requires** all employees to be vaccinated against COVID-19.

[Hospital B/Hospital A] **recommends** that all employees be vaccinated against COVID-19, but **allows** employees to continue to work without being vaccinated.

Imagine that those were the two equally convenient hospital options you have that are covered by your health insurance. You can also choose to defer your procedure to a later date, but you will have recurring pain until you have the surgery.

What would you choose?

- Hospital A (1)
- Hospital B (2)
- Not go to either Hospital (3)

Page Break

Think about how the other people answering this survey chose between:

Hospital A and Hospital B.

Out of 100 people who took this survey, how many do you think chose each option?

(Your numbers need to add up to 100.)

This many people chose "Hospital A" : _____ (1)

This many people chose "Hospital B" : _____ (2)

This many people chose "Not go to either Hospital" : _____ (3)

Total : ____

Page Break

Imagine that you have a friend who just told you that they are going to have a surgical procedure at **[Hospital A/Hospital B]**. *this is the opposite of the chosen hospital

Do you tell them that [Hospital A/Hospital B] **requires** all employees to be vaccinated against COVID-19 while [Hospital B/Hospital A] **recommends** that all employees be vaccinated against COVID-19, but allows employees to continue to work without being vaccinated?

- Yes, I would tell my friend about both hospitals' policies (1)
- No, I would not tell my friend (2)

Page Break

To recap, you were told:

Imagine that you need to have an elective surgical procedure. You have a choice between two hospitals.

[Hospital A/Hospital B] requires all employees to be vaccinated against COVID-19

[Hospital B/Hospital A] recommends that all employees be vaccinated against COVID-19, but allows employees to continue to work without being vaccinated.

Imagine that those were the two equally convenient hospital options you have that are covered by your health insurance. You can also choose to defer your procedure to a later date, but you will have recurring pain until you have the surgery.

How warm do you believe each hospital to be?

	Extremely warm (7)	Moderately warm (6)	Slightly warm (5)	Neither warm nor cold (4)	Slightly cold (3)	Moderately cold (2)	Extremely cold (1)
Hospital A	○	○	○	○	○	○	○
Hospital B	○	○	○	○	○	○	○

How friendly do you believe each hospital to be?

	Extremely friendly (7)	Moderately friendly (6)	Slightly friendly (5)	Neither friendly nor unfriendly (4)	Slightly unfriendly (3)	Moderately unfriendly (2)	Extremely unfriendly (1)
Hospital A	○	○	○	○	○	○	○
Hospital B	○	○	○	○	○	○	○

How competent do you believe each hospital to be?

	Extremely competent (7)	Moderately competent (6)	Slightly competent (5)	Neither competent nor incompetent (4)	Slightly incompetent (3)	Moderately incompetent (2)	Extremely incompetent (1)
Hospital A	☐	☐	☐	☐	☐	☐	☐
Hospital B	☐	☐	☐	☐	☐	☐	☐

How capable do you believe each hospital to be?

	Extremely capable (7)	Moderately capable (6)	Slightly capable (5)	Neither capable nor incapable (4)	Slightly incapable (3)	Moderately incapable (2)	Extremely incapable (1)
Hospital A	☐	☐	☐	☐	☐	☐	☐
Hospital B	☐	☐	☐	☐	☐	☐	☐

Page Break

To recap, you were told:

Imagine that you need to have an elective surgical procedure. You have a choice between two hospitals.

[Hospital A/Hospital B] requires all employees to be vaccinated against COVID-19

[Hospital B/Hospital A] recommends that all employees be vaccinated against COVID-19, but allows employees to continue to work without being vaccinated.

Imagine that those were the two equally convenient hospital options you have that are covered by your health insurance. You can also choose to defer your procedure to a later date, but you will have recurring pain until you have the surgery.

And you selected

`#{e://Field/choice_A_req}`

Please explain why you chose `#{e://Field/choice_A_req}`?

Page Break

Please explain why you said " [\\${Areq_choseB/ChoiceGroup/SelectedChoices}](#) ", when asked whether you would tell your friend.

Page Break

Please consider the time when an FDA-approved vaccine for COVID-19 is free and available to everyone.

To what extent do you favor or oppose **other people** getting the vaccine?

- Strongly favor other people getting the vaccine
- Somewhat favor other people getting the vaccine
- No preference
- Somewhat oppose other people getting the vaccine
- Strongly oppose other people getting the vaccine (5)

Please consider the time when an FDA-approved vaccine for COVID-19 is free and available to everyone.

To what extent do you favor or oppose **you** getting the vaccine?

- Strongly favor getting the vaccine myself
- Somewhat favor getting the vaccine myself
- No preference
- Somewhat oppose getting the vaccine myself
- Strongly oppose getting the vaccine myself

Page Break

deal How would you describe the way most Americans are dealing with coronavirus?

- Most are underestimating the risks
- Most are behaving appropriately
- Most are overreacting to the actual risks

Appendix B: Extra analyses for studies in the paper

TABLE 1. Percentage of participants believing their choice aligns with the majority (i.e., predicting that over 50% chose the same as them) or minority (predicting that less than 50% chose the same as them).

Overall Study	1	2a	2b	4	5
Think_Majority	54%	43%	50%	44%	72%
Think_Minority	16%	42%	35%	35%	22%
Prefer Strict Study	1	2a	2b	4	5
Think_Majority	62%	52%	59%	49%	81%
Think_Minority	14%	34%	25%	34%	14%
Anti Strict Study	1	2a	2b	4	5
Think_Majority	36%	30%	32%	36%	49%
Think_Minority	23%	49%	59%	28%	46%
Prefer Neither Study	1	2a	2b	4	5
Think_Majority	----	29%	12%	41%	17%
Think_Minority	----	63%	70%	43%	83%

Study 1 Additional Information and Analyses

There was no difference between the two ordered versions of the scenario (required first versus recommended first, $t(544) = 0.25$, $p = .80$) and the rest of the analyses were collapsed across versions.

Political Affiliation

We examined the predictions by political affiliation. The majority, 69.78%, of participants selected the stricter airline option. Republicans ($N = 194$) significantly underpredicted the percentage choosing the stricter option (bootstrapped 95% CI of difference: [-15.56%, -5.40%], $p < .001$). Democrats ($N = 201$) also significantly underpredicted the percentage choosing the

stricter option (bootstrapped 95% CI of difference: [-12.77%, -2.40%], $p = .006$). Additionally, Independents ($N = 134$) significantly underpredicted the percentage choosing the stricter option (bootstrapped 95% CI of difference: [-16.98%, -6.38%], $p < .001$).

Individual Differences and Prediction Magnitude

Older individuals estimate higher support for mask policies ($b = 0.28$, $SE = 0.058$, $p < .001$), while individuals who believe that others are over-reacting to the pandemic estimate lower support for mask policies ($b = -1.51$, $SE = 0.62$, $p = .0148$). Gender ($b = -3.673$, $SE = 2.073$, $p = .077$) and political affiliation ($b = 0.66$, $SE = 0.66$, $p = .32$) did not significantly impact prediction magnitude.

Individual Differences and Prediction Error

Prediction error did not significantly differ by age ($b = -0.044$, $SE = 0.036$, $p = .223$), gender ($b = 2.43$, $SE = 1.256$, $p = .0532$), or political affiliation ($b = 0.028$, $SE = 0.398$, $p = .945$).

Respondents who were more opposed to mask usage in general had larger absolute prediction errors ($b = 1.24$, $p = .012$).

Study 2a Additional Information and Analyses

Description of Sample Time Points

Data for Study 2a ($N = 507$) was collected between September 24th, 2020 and October 1st, 2020 prior to any announcement regarding President Donald Trump's COVID-19 diagnosis.

We also collected replication data in two additional waves. Data for the first replication wave ($N = 617$) was collected between October 2nd and October 6th 2020, immediately following President Donald Trump's October 1st announcement that he and the first lady had tested positive for COVID-19 (Baker & Haberman, 2020)

Data for the second replication wave ($N = 504$) was collected between November 10th 2020 and November 13th 2020, following the Associated Press calling the 2020 election (Slodysko, 2020).

Scenario-specific results

Comparing choices and predictions, respondents significantly underpredicted preferences for the stricter policy in four out of five scenarios: bakery (bootstrapped 95% CI of difference: [-27.39%, -10.43%], $p < .001$), pharmacy (bootstrapped 95% CI of difference: [-16.53%, -1.61%], $p = .019$), gym (bootstrapped 95% CI of difference: [-27.25%, -10.39%], $p < .001$), and hair salon (bootstrapped 95% CI of difference: [-25.02%, -8.68%], $p < .001$), with non-significant results for the movie theater scenario (bootstrapped 95% CI of difference: [-17.34, -2.02%], $p = .120$).

Political Affiliation

We also examined the predictions by political affiliation. Overall, 63.42% of all participants selected the stricter option across scenarios. Republicans (N = 190) significantly underpredicted the percentage choosing the stricter option (bootstrapped 95% CI of difference: [-19.27%, -8.27%], $p < .001$). Democrats (N = 196) also significantly underpredicted the percentage choosing the stricter option (bootstrapped 95% CI of difference: [-19.32%, -8.35%], $p < .001$). Additionally, Independents (N = 100) significantly underpredicted the percentage choosing the stricter option (bootstrapped 95% CI of difference: [-22.98%, -9.95%], $p < .001$).

Democrats were not more likely to choose the strict-mask-requirement business than were Republicans (63.8% vs. 60.5%, $\chi^2(1, N = 386) = 0.31$, $p = 0.58$) and political affiliation did not predict the estimated rate of other people choosing the stricter-policy business ($b = 0.048$, $SE = 0.67$, $p = .943$) and estimation accuracy did not vary significantly by political affiliation ($b = -0.33$, $SE = 0.43$, $p = .438$).

Analyses of Replication Data

We did not find meaningful differences between Study 2a and the replication waves or between the two replication waves (despite the intervening events) and we report here the results, corresponding to the results of Study 2a, for the two replication waves combined.

Method

1121 participants completed the experiment in two waves as part of a larger study on Lucid Theorem. After excluding duplicate IP addresses, and participants under 18 years old, we were left with a final sample of 909 participants ($M_{\text{age}} = 45.74$, $\text{Range}_{\text{age}} = 18$ to 89, 55.2% female).

We asked exactly the same questions as in Study 2a, regarding preference and beliefs in five scenario conditions (bakery, pharmacy, movie theatre, hair salon, and gym), assigning participants randomly to one of five conditions. In each condition, participants were asked to make a choice between a business that required masks and a business the recommended mask or choose to patronize neither business. On the following page, participants were asked to allocate how many participants out of 100 would choose each option. In all scenarios, participants were told that both options were equally convenient.

Results

Across all scenarios, the majority of respondents selected the stricter mask-required option (64%, $Z=74.38$, $p<.001$), compared to the lax mask-recommended option (19%) or abstaining (16%). The same respondents significantly underpredicted how many others would choose the stricter option overall (mean prediction=48.48%, bootstrapped 95% CI of difference: [-18.68%, -13.03%], $p<.001$) as well as separately for each of the business types in each sample.

The results also replicated when we restrict our analysis to likely customers (i.e., those indicating they were “Moderately likely” or “Extremely likely” to visit that type of business in the next week, $N = 487$). Across all scenarios, the majority of likely customers selected the stricter option

(60.16%), but the same sample of people under-predicted how many people would choose the stricter option (mean prediction: 46.87%), a statistically significant difference (bootstrapped 95% CI of difference: [-17.13%, -9.43%], $p < .001$), which addresses the concern that respondents may have had likely customers in mind when making their estimates.

Prediction accuracy did not significantly differ by either demographics or political party, despite more preference for mask-requiring businesses among Democrats than Republicans ($ps < .001$).

Respondents who chose the lax mask-recommended business were poorly calibrated, underestimating preferences for businesses with the strict policy (89% underestimating, mean error=-27.39%, bootstrapped 95% CI of difference: [-31.73%, -23.08%], $p < .001$). While the respondents who chose to visit the strict mask-required store were better calibrated, they nevertheless likewise underestimated preferences for the strict policy (62% underestimating, error=-7.81 %, bootstrapped 95% CI of difference: [-11.42%, -4.10%], $p < .001$). Respondents who chose to visit neither store were also poorly calibrated and underestimated preferences for the strict policy (95% underestimating, error=-33.95%, bootstrapped 95% CI of difference: [-38.58%, -29.17%], $p < .001$). Thus, projection did not fully explain the underestimation, because all groups underestimated, and the respondents would have in fact been more accurate had they projected more (Hoch 1987).

Study 2b Additional Analyses

Respondents significantly underpredicted preferences for the stricter policy in all five scenarios: bakery (bootstrapped 95% CI of difference: [-27.46, -11.00], $p < .001$), pharmacy (bootstrapped 95% CI of difference: [-30.64, -15.03], $p < .001$), gym (bootstrapped 95% CI of difference: [-26.08, -8.75], $p < .001$), hair salon (bootstrapped 95% CI of difference: [-28.52, -12.86], $p < .001$), and movie theater (bootstrapped 95% CI of difference: [-22.20, -3.80], $p = .006$).

The results also replicated when we restrict our analysis to likely customers (i.e., those indicating they were “Moderately likely” or “Extremely likely” to visit that type of business in the next week, $N = 119$). Across all scenarios, the majority of likely customers selected the stricter option (75.63%), but the same sample of people under-predicted how many people would choose the stricter option (mean prediction: 57.95%), a statistically significant difference (bootstrapped 95% CI of difference: [-25.05, -10.08], $p < .001$), which addresses the concern that respondents may have had likely customers in mind when making their estimates.

Democrats were more likely to choose the strict-mask-requirement business than were Republicans (80.0% vs. 59.3%, $\chi^2(1, N = 368) = 17.35$, $p < .001$) and unlike in the prior studies, Democrats estimated greater preference among others for the stricter-policy business ($b = 1.86$, $SE = 0.62$, $p = .003$) and were significantly more accurate than republicans ($b = -1.72$, $SE = 0.50$, $p < .001$).

Predictions by political party

Participants indicated their political party affiliation as part of the demographics section. Our sample was 21.72% republican or lean republican (N = 108), 22.33% independent (N = 111), 52.31% democrat or lean democrat (N = 260), and 3.62% other (N = 18). We split the predictors by political party affiliation but used the whole sample of participants as the actual preference to be estimated.

Across scenarios, 73.24 % of all participants selected the stricter option. Republicans (N = 108) significantly underpredicted the percentage choosing the stricter option (bootstrapped 95% CI of difference: [-27.69, -16.66], $p < .001$). Democrats (N = 260) also significantly underpredicted the percentage choosing the stricter option (bootstrapped 95% CI of difference: [-20.98, -11.87], $p < .001$). Additionally, Independents (N = 111) significantly underpredicted the percentage choosing the stricter option (bootstrapped 95% CI of difference: [- 26.07, -15.07], $p < .001$).

Predictions by consumer entitlement

We measured consumer entitlement using a scale adapted from Boyd and Helms (2005), which resulted in a score ranging from 1 (low entitlement) to 7 (high entitlement). We split the predictors by entitlement affiliation, but used the whole sample of participants as the “choosers”. For low-entitlement predictors (N = 241), there was a significant difference between choices and predictions (bootstrapped 95% CI of difference: [-23.76, -14.60], $p < .001$). For high-entitlement predictors (N = 245), there was a significant difference between choices and predictions (bootstrapped 95% CI of difference: [-22.75, -13.36], $p < .001$). However, we found no moderation by entitlement, suggesting that the underprediction is not driven specifically by high-entitlement consumers opposing mask requirements and projecting that view onto others.

Warmth and Competence among likely customers

We find the same results among likely customers, who also rated the businesses with the required policy significantly higher on warmth ($M_{\text{required}} = 5.07$, $M_{\text{recommended}} = 4.55$, $t(118) = 2.35$, $p = 0.02$, $d = 0.34$), competence ($M_{\text{required}} = 5.97$, $M_{\text{recommended}} = 4.15$, $t(118) = 23.39$, $p < .001$, $d = 1.23$), caring ($M_{\text{required}} = 6.19$, $M_{\text{recommended}} = 3.76$, $t(118) = 10.44$, $p < .001$, $d = 1.54$), and trust ($M_{\text{required}} = 5.82$, $M_{\text{recommended}} = 3.51$, $t(118) = 8.86$, $p < .001$, $d = 1.38$).

Study 3 Additional Analyses

Managers judging the Study 2a sample significantly underpredicted consumers' preferences for the stricter policy in four out of the five scenarios: bakery (bootstrapped 95% CI of difference: [-23.63, -2.82], $p = .012$), gym (bootstrapped 95% CI of difference: [-26.50, -5.20], $p = .003$), hair salon (bootstrapped 95% CI of difference: [-25.46, -4.68], $p = .005$), with a non-significant differences in the movie theater scenario (bootstrapped 95% CI of difference: [-8.09, 13.75], $p = .572$) and pharmacy scenario (bootstrapped 95% CI of difference: [-14.00, 6.79], $p = .509$).

Similarly, managers judging the Study 2b sample significantly underpredicted consumers' preferences for the stricter policy in all five scenarios: bakery (bootstrapped 95% CI of difference: [-35.51, -16.44], $p < .001$), pharmacy (bootstrapped 95% CI of difference: [-30.93, -13.95], $p < .001$), gym (bootstrapped 95% CI of difference: [-37.86, -18.63], $p < .001$), hair salon (bootstrapped 95% CI of difference: [-31.94, -13.03], $p < .001$), and movie theater (bootstrapped 95% CI of difference: [-30.06, -9.58], $p < .001$). Thus, across the scenario-specific tests, we find significant underprediction in eight out of ten.

Study 4 Additional Analyses

Predictions by political party

Participants indicated their political party affiliation as part of the demographics section. Our sample was 29.5% republican or lean republican (N = 51), 24.3% independent (N = 42), 44.4% democrat or lean democrat (N = 77), and 1.7% other (N = 3). We split the predictors by political party affiliation, but used the whole sample of participants as the “choosers”.

Overall, 54.34% of all participants selected the stricter option across scenarios. Republicans (N = 51) significantly underpredicted the percentage choosing the stricter option (bootstrapped 95% CI of difference: [-27.73, -7.95], $p < .001$). Democrats (N = 77) also significantly underpredicted the percentage choosing the stricter option (bootstrapped 95% CI of difference: [-20.72, -3.34], $p = .004$). Additionally, Independents (N = 42) significantly underpredicted the percentage choosing the stricter option (bootstrapped 95% CI of difference: [- 25.19], -4.83], $p = .004$).

Likely Walmart customers

Among likely Walmart customers, more customers selected the store portrayed in the video as having stricter enforcement compared to non-enforcement (63.0% vs 37.0%, $\chi^2(1, 73) = 4.95$, $p = .026$). Similar attitudinal preferences for the strict-enforcement store were observed among the sub-sample of likely Walmart customers as were observed among the full sample (see appendix F). The under-prediction was also observed among likely Walmart customers (mean prediction: 42.1%, bootstrapped 95% CI of difference: [-28.44, -12.21], $p < .001$).

Likely customers also rated the Walmart with the stricter policy significantly higher competence ($M_{\text{stricter}} = 5.21$, $M_{\text{less-strict}} = 4.01$, $t(72) = 3.74$, $p < .001$, $d = 0.68$), caring ($M_{\text{stricter}} = 5.11$, $M_{\text{less-strict}} = 3.96$, $t(72) = 3.51$, $p < .001$, $d = 0.61$), and trust ($M_{\text{stricter}} = 5.18$, $M_{\text{less-strict}} = 3.96$, $t(72) = 3.91$, $p < .001$, $d = 0.69$), but was not significantly different on warmth ($M_{\text{stricter}} = 4.60$, $M_{\text{less-strict}} = 4.33$, $t(72) = 0.62$, $p = .27$, $d = 0.18$).

Complaint Likelihood

A majority of respondents (61.8%) said that people who think that retailers' mask policies are too strict are more likely to complain. Nevertheless, there was no difference in either estimate ($b = -1.45$, $SE = 1.93$, $p = .453$) or absolute error of estimate ($b = 1.32$, $SE = 1.33$, $p = .323$) based on whether respondents thought anti-maskers were more, equally or less likely to complain. This suggests that the misestimation is not due to a failure to recognize that salient cues (customer complaints) may not be representative.

Study 5 Additional Analyses

Political affiliation did not significantly predict choice of the vaccine-required hospital ($b = -0.016$, $SE = 0.021$, $p = 0.462$), predictions ($b = -0.47$, $SE = 1.28$, $p = 0.712$), prediction errors ($b = -0.734$, $SE = 0.96$, $p = 0.45$) or likelihood of warning a friend ($b = -0.024$, $SE = 0.017$, $p = 0.163$). Education did not significantly predict choice of the vaccine-required hospital ($b = -0.005$, $SE = 0.018$, $p = .974$), predictions ($b = -1.19$, $SE = 1.05$, $p = 0.258$), prediction errors ($b = 0.974$, $SE = 0.80$, $p = 0.226$) or likelihood of warning a friend ($b = 0.002$, $SE = 0.014$, $p = 0.876$). Income did not significantly predict choice of the vaccine-required hospital ($b = -0.008$, $SE = 0.009$, $p = .378$), predictions ($b = 0.181$, $SE = .537$, $p = 0.737$), prediction errors ($b = -0.142$, $SE = 0.411$, $p = 0.73$) or likelihood of warning a friend ($b = -0.007$, $SE = 0.007$, $p = 0.356$). Gender did not significantly predict choice of the vaccine-required hospital ($b = -0.098$, $SE = 0.061$, $p = .107$), predictions ($b = 1.399$, $SE = 3.596$, $p = 0.698$), prediction errors ($b = -1.347$, $SE = 2.75$, $p = 0.625$) or likelihood of warning a friend ($b = 0.012$, $SE = 0.048$, $p = 0.801$).

Appendix C: Additional Studies

We briefly report here three additional studies, for the sake of completeness and transparency. These studies are of limited relevance, because Study A1 did measure beliefs and Studies A2 and A3 had errors in the stimuli. Nevertheless, to the extent that the results are meaningful, they are generally consistent with the findings of the studies reported in the paper.

Additional Study 1: Pilot study of airline preferences

This pilot study investigated preferences between airlines based on mask policy, finding similar results as in Study 1, but did not measure people's beliefs about others' preferences.

Method

460 participants completed the experiment as part of a larger study on Lucid Theorem. Data was collected between June 18 and July 9, 2020. After excluding duplicate IP addresses, and participants under 18 years old, we were left with a final sample of 460 participants ($M_{\text{age}} = 44.67$, $\text{Range}_{\text{age}} = 18 \text{ to } 92$, 51.74% female).

We asked participants to imagine that they needed to travel and had a choice between driving for 10 hours or flying for 2 hours. They were presented with three airline policy scenarios (masks required, masks recommended, no mask policy) in semi random order: the first scenario was shown on its own page and randomized between participants, the second and third scenarios were shown on the same page in random order. Participants were asked to indicate the likelihood that they would take each flight on a scale from 1 to 5 ("Definitely take the airplane flight" to "Definitely drive by car").

Results.

In within-subjects analyses, participants were more likely to take the flight when masks were required ($M = 3.03$, $SD = 1.46$) compared to when they were recommended ($M = 3.47$, $SD = 1.37$, $t(459) = 7.19$, $p < .001$) and compared to when there was no policy ($M = 3.69$, $SD = 1.41$, $t(459) = 9.23$, $p < .001$). Participants were also more likely to take the flight when masks were recommended compared to when there was no policy ($t(459) = 4.42$, $p < .001$).

In between-subjects analyses of the first question asked, pairwise comparisons revealed that participants were significantly more likely to say that they would take the flight when face masks were required ($M = 3.07$, $SD = 1.55$) compared to when there was no policy ($M = 3.73$, $SD = 1.41$, $t(309) = 3.95$, $p < .001$, $d = 0.45$) or only a recommended policy ($M = 3.42$, $SD = 1.38$, $t(296) = 2.06$, $p = .0041$, $d = 0.24$). Participants were also significantly more likely to take the flight when face masks were recommended ($t(309) = 1.97$, $p = 0.0493$, $d = 0.22$) compared to when there was no policy.

Figure A1. Likelihood of taking the flight for each policy type.

Additional Study 2: Preferences and predictions across different types of businesses

In this study, we tested five different scenarios to assess generalizability of the misprediction across contexts and we specifically included several non-transportation contexts. Note that there was an error in one of the scenarios (bus). The results are generally similar to those found in Studies 2a and 2b.

Method

A total of 503 Respondents completed the experiment as part of a longer survey on Lucid Theorem in August 2020. After excluding duplicate IP addresses and Respondents under 18 years old, we were left with a final sample of 413 Respondents ($M_{age} = 48.12$, $Range_{age} = 18$ to 83, 57.6% female). Recruiting and exclusion criteria were preregistered at AsPredicted.org, #46321, (<https://aspredicted.org/blind.php?x=uz4my8>).

We measured respondents' preferences and their beliefs about others' preferences in five scenario conditions (airline, concert, restaurant, grocery and bus, between-subjects). There was an error in the bus scenario. Respondents were randomly assigned to one of five conditions. In each condition, Respondents were asked to make a single choice between two businesses, one that required mask-wearing and one that recommended mask-wearing. On the following page, Respondents were asked to estimate how many Respondents out of 100 would choose each option. In all scenarios, Respondents were told that both options were equally convenient, and price was not mentioned. In the bus scenario, there was an error where participants were told they needed to take a trip by bus but that they had "a choice between two airlines."

Results

Across all scenarios, the majority of people selected the stricter option (68.8%), but the same sample of people under-predicted how many other respondents would choose the stricter option (mean prediction: 58.5%), a statistically significant difference (bootstrapped 95% CI of difference: [-14.50, -5.82], $p < .001$). Comparing choices and predictions, respondents significantly underpredicted preferences for the stricter policy in three of the five scenarios: airline (bootstrapped 95% CI of difference: [-23.41, -2.43], $p = .020$), bus (bootstrapped 95% CI of difference: [-24.76, -7.44], $p = .001$), concert (bootstrapped 95% CI of difference: [-28.12, -11.08], $p < .001$), with non-significant differences in the other two scenarios (grocery store and restaurant). Choices of the stricter business differed marginally by political affiliation (75.3% Democrat vs 64.3% Republican, $\chi^2(1, 294) = 3.27$, $p = .070$, but we find no differences in estimates of others' choices of strict-policy businesses ($b = -0.30$, $SE = 0.72$, $p = .681$) or in estimation accuracy ($b = 0.010$, $SE = 0.49$, $p = .983$) by political affiliation.

Figure A2. Predicted and actual percentage of respondents choosing the stricter option in additional study 2. (Note that there was an error in the text of the bus scenario.)

Additional Study 3: The impact of online reviews on consumers' preferences and predictions

This study was intended to examine how consumers react to safety policies inferred from online reviews without explicit knowledge, and how such reviews impact their beliefs about others. In this study, we measure consumers' preferences and their predictions of others' preferences, after viewing the online reviews of two hypothetical pharmacies. However, there was a mistake in the stimuli that precludes drawing clear conclusions, as described in the methods.

Method

A total of 200 Respondents completed the experiment on Prolific. After excluding duplicate IP addresses, Respondents under 18 years old, and anyone who failed an attention check, we were left with a final sample of 199 Respondents ($M_{\text{age}} = 29.65$, $\text{Range}_{\text{age}} = 18$ to 64, 51% female). Recruiting and exclusion criteria were preregistered at AsPredicted.org, # 50594, (<https://aspredicted.org/blind.php?x=4vc3ib>).

Respondents were randomly assigned to one of two review conditions (enforcement complaint vs. non-enforcement complaint). In each condition, Respondents read four reviews (two positive, two negative, randomly assigned) for each of two hypothetical pharmacies ("Pharmacy A" and "Pharmacy B"), described as equally convenient. In both conditions, one of the negative reviews for "Pharmacy B" complained about a mask-related issue in the store. In the enforcement-complaint condition, the negative mask review read:

"The entire process of picking up my prescriptions felt very stressful. The staff were all wearing face masks and just because I didn't want to wear a mask, the staff didn't respect my preference and told me to leave. If this is how you treat your **loyal** customers, you

will not stay in business long. I will take my business elsewhere.”

[emphasis added, not in the original]

In the nonenforcement-complaint condition, the negative mask review read:

“The entire process of picking up my prescriptions felt very stressful. The staff were all wearing face masks but there was another customer who refused to wear a face mask and the staff refused to do anything or tell them to leave. If this is how you treat your customers, you will not stay in business long. I will take my business elsewhere.”

Note that due to an error, there was a potential confound, as the word “loyal” was omitted in the nonenforcement-complaining condition.

Respondents were first asked to rate the usefulness of each review, then selected which pharmacy they would choose to shop at or could choose not to shop at either pharmacy. On the following page, respondents were asked to estimate how many Respondents out of 100 would choose each option. Additionally, we asked Respondents to assess the warmth and competence of each pharmacy using an abbreviated warmth/competence scale adapted from Kervyn, Fiske, and Yzerbyt (2013), rate the trustworthiness and perceived caring of each pharmacy, and provide open-ended responses explaining why they chose the given pharmacy and why they made their given prediction. We also asked respondents to rate the likelihood that they would visit a pharmacy in the next week and fill out a consumer entitlement scale adapted from Boyd and Helms (2005).

Results

Overall, the review complaining about enforcement of mask-wearing was not more harmful to the business than a matched review complaining about insufficient enforcement. There was no difference between the usefulness ratings of the mask reviews ($p > 0.80$).

Consumers were directionally (but not significantly) more likely to choose pharmacy B when the complaint involved enforcement rather than non-enforcement (59.0% in the enforcement condition vs. 48.5%, in the nonenforcement condition ($\chi^2(2, N = 199) = 2.43, p = .295$).

Comparing perceptions of the mask-complaint pharmacy across conditions, there was no significant difference in perceptions of warmth, competence, caring, or trustworthiness between the mask-enforcement and non-enforcement condition (all $ps > .70$). Comparing ratings of Pharmacy B (mask review) to Pharmacy A (control) within each condition also did not reveal significant differences in perception of warmth, competence, caring, or trustworthiness ($ps > .30$). Overall, we do not find evidence that reading reviewer complaints about enforcement damaged brand perceptions of the pharmacy, relative to either complaints about non-enforcement (between-subjects) or to similarly negative reviews unrelated to mask-wearing (within-subjects).

Respondents' errors about other consumers' preferences were affected by the reviews. In the enforcement-complaint condition, the majority of respondents selected Pharmacy B (i.e., that had a review describing employees removing a customer for refusing to wear a mask) but the same sample of people under-predicted how many others would choose the same option (mean prediction: 44.5% vs actual 58.6%), a statistically significant difference (bootstrapped 95% CI of difference: [-22.13, -6.62], $p < .001$). By contrast, in the non-enforcement-complaint condition, the respondents did not significantly underpredict choices of the mask-complaint Pharmacy B (mean prediction: 42.8% vs. actual 48.7%, bootstrapped 95% CI of difference: [-14.25, -2.95], $p = .196$). Overall, these results suggest that while the mask-complaint reviews tested had little impact on consumers' preferences, consumers mistakenly believed that the enforcement-complaint review would have a negative impact, underestimating how many other consumers would choose to shop there after reading the enforcement-complaint review.