THE UNIVERSITY OF CHICAGO

Pandemic Behavior:
Social Comparison and Miscalibration

By

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In 2020, the disease known as COVID-19 became a global pandemic. In response, the world has slowly lurched towards a new normal. Policy makers have been using multiple strategies to attempt to minimize its impact, including the rollout of vaccines. One important component to account for is the way people behave during the pandemic. Actions such as entering the public sphere are inherently risky, while adhering to guidelines by wearing masks or maintaining social distancing can counterbalance these risks. Generally, much of the population has attempted to adhere to these guidelines.

While most people are trying, the continuation of the pandemic suggests that adherence has fallen short of the ideal. Perhaps the problem is, at least partly, that people don't know that they are not adhering to guidelines as well as they could. After all, it's difficult to improve one's performance on a task without an accurate idea of how well one is already doing. For example, consider someone who desires to effectively follow the guidelines. If they believe that they are already doing a good job, they won't seek to improve. That's fine if they're doing well, but if they are actually doing a poor job (e.g., wearing their mask beneath their nose), then their distorted self-perception could be preventing them from making improvements.

How do people determine how well they are adhering to Covid guidelines? Social psychology has an answer – they compare themselves to others. Oftentimes, however, this evaluation can go wrong. For example, in my first-year paper I found that people who go out the most tend to adhere the least to Covid protocols. When you go out in public the people you see will be those who tend to be the least careful. This could easily create a misconception that you are an especially careful person, when in fact you only reached that conclusion because you

are comparing to the subset of others who are the least careful. Furthermore, if you really care about stopping Covid, you will want to see yourself in a positive light. Under these conditions, it's very possible to distort your memories when thinking about your lapses, which allows you to feel even better about yourself when comparing to others.

In this paper I will explore how vaccinated individuals might fall victim to these kinds of biases. The consequence is that they will be overconfident, believing themselves to be following guidelines better than they truly are. Similarly, I will explore how non-vaxxers won't necessarily be motivated to make these sorts of comparisons and will have a more accurate view of how they compare to others.

Literature Review

Merriam Webster's Dictionary defines overconfidence as 'confidence that is not justified'. While colloquially useful, this definition isn't quite specific enough to be used scientifically. In fact, academics recognize three distinct (although interrelated) types of overconfidence. These are overestimation, overplacement, and overprecision (Moore and Schatz, 2017). Overestimation is defined as 'thinking you are better than you are'. Overplacement is defined as 'the exaggerated belief that you are better than others'. Finally, overprecision is defined as 'being too sure that you know the truth'. This paper will be primarily focused on Overplacement.

Overplacement, the most relevant overconfidence type to this study, is typically studied by asking people the expected percentile of their performance on a given task. There are two basic results: the better-than-average effect and the Dunning-Kruger effect. The better-than-average effect describes cases where the typical individual believes themselves to be better

than average. Perhaps the most famous example of this was a study by Svenson (1981), which found that 93% of participants rated themselves as being in the top half of driving skill. Naturally, it's impossible that 93% of individuals would be above the 50th percentile. In a recent book on overconfidence, Don Moore (2021) considered several possible explanations for this result. One is that individuals may have been lying to experimenters to make themselves seem more impressive. Another is that drivers were deluding not the experimenters, but rather themselves. They just could not bring themselves to admit their true skill level. Yet another explanation is that as there is no objective criteria for driving skill; participants may have different ideas about what constitutes "good driving."

This last explanation has a surprising level of truth to it. When asked about specific objective subskills of driving, such as "alertness, patience, checking for blind spots, using car mirrors, braking, speeding, and signaling," participants had much lower levels of overplacement than they did for general driving ability (Roy & Liersch, 2013). When there are objective standards, there is much less wiggle room for people to reach charitable conclusions about themselves. For example, when taking an online standardized test, it would be difficult to squint and claim a different percentile than the one revealed on the results screen.

One possible explanation for the better-than-average effect was proposed by Dunning and Kruger (1999). They found that the effect was mainly driven by those participants in the bottom quartile of skill. They claimed that people who have a low level of skill on a particular task not only perform poorly, but also have difficulty recognizing their poor performance. For example, consider a person who believes themself to be a good driver, but they never use their turn signals, which can be hazardous and lead to accidents. However, they're unable to weight

this flaw into their self-rating of driving skill because they simply don't know that it's important to use turn signals. This example shows how skill and metacognitive skill can be tied together, as Krueger and Dunning had claimed.

This explanation was challenged by Burson, Larrick, and Klayman (2006). They proposed a noise-and-bias model, which asserts that people, regardless of skill level, have difficulty estimating their relative performance, leading to only a weak positive relationship between true and judged percentiles of performance. According to this explanation, those with higher skill levels do not have more advanced metacognition. Rather, their overplacement is lower due to their high estimate of relative skill level happening to coincide with their actual performance. In support of the noise-and-bias model, most individuals view themselves as having performed better for easy tasks (resulting in the better-than-average effect) and worse on difficult tasks (resulting in a worse-than-average effect). Consequently, on easy tasks, high performers are accurate and low performers overplace themselves. However, on especially hard tasks (e.g., riding a unicycle), the reverse holds such that underperformers are accurate and high performers underplace themselves.

Overplacement is, fundamentally, what happens what an individual compares themselves more favorably to others than they should. To understand why people tend to be biased toward overplacement, it is important to understand the processes of social comparison. Social psychologists have long been interested social comparison and have documented several different motivations for why people compare themselves to others (Crusius, Corcoran, & Mussweiler, 2022). Festinger (1954) suggested that it is a method of gauging one's own abilities for tasks with no objective standard. Some tasks are simple to gauge performance on, such as

practicing personal hygiene which can be easily judged by checking whether one smells. Other

tasks, such as writing books, are much more difficult to judge. Are longer books better? Or is it

books which use more complex verbiage? Perhaps other elements, such as characterization or

prose are important. Comparison to others makes these kinds of judgments much simpler to

perform.

This kind of comparison was initially believed to be an intellectually honest exercise.

However, it was eventually acknowledged that individuals would often prefer to make

downward comparisons and view themselves as better than others for a particular ability or

task (Wills, 1981). This kind of motive is generally thought of as "self-enhancement". People

enjoy having a positive self-image and making downward comparisons with others allows them

to reinforce this image. For example, many breast cancer patients use downward comparisons

to other cancer patients as a coping strategy (Wood, Taylor, & Lichtman, 1985).

A third reason for making social comparisons is that it allows people to learn what is

normative among a given group (Baldwin & Mussweiler, 2018). There are a couple reasons why

an individual might want to know this. One is that it's oftentimes a signal of what is best in a

given situation. For example, imagine that you go to a bar and see that most of the other

patrons have ordered a margarita. A reasonable assumption might be that the margarita at this

bar is especially good and is what one should order. A common question asked to children is "if

all of your friends were to jump off a bridge, what would you do?" If that scenario were to ever

unfold, it would be likely that your friends know something that you don't and you might want

to strongly consider jumping too!

The other reason to learn from others is to get an idea of what the normative behavior for a particular group is. This would give one the tools necessary to signal membership in the group by respecting its norms. This sort of signaling, by copying the necessary normative behaviors for a group, allows one to gain or maintain acceptance in the group (Berger & Heath, 2007). For example, consider the movie *Mean Girls* (Waters, 2004). When the protagonist, Cady, joins a friend group she's instructed, "On Wednesdays we wear pink". This shows how it's important to engage in certain behavioral patterns in order to signal membership in a given group.

Many social comparisons have elements of all these factors. For example, consider the posters hanging at Booth featuring Nobel-laureate Richard Thaler. In them, Thaler is depicted wearing a mask with the quote "Because wearing a mask nudges others to do likewise." This suggests that people look to others as a guide to both what is healthy and also what is socially appropriate behavior. If others are observed to wear masks and socially distance, then they will want to do so too. Furthermore, they will want to compare themselves positively to the others, and thus be better than average at these risk-minimizing behaviors. Social comparison nudges have been shown to be an effective way to encourage pro-social behavior (Myers & Souza, 2020).

Social comparison can be distorted, however, when a psychological process known as "motivated reasoning" causes people to interpret ambiguous information to suit their own purposes (Kunda, 1990). For example, consider someone who often wears a mask but doesn't when they're with their friends. In order to be charitable to themselves, they might not think that those instances "count" as their friends are "safe" (thereby following the spirit of the rules)

and consequently rate their level of mask wearing as above average. It's important to note that the subject isn't intentionally being dishonest – rather they interpret facts in a way which allows them to be make downward social comparisons.

This effect isn't quite as straightforward as it might seem. Normative behavior can be different across different groups. This can be observed in the context of the pandemic. One year into the pandemic, United States governmental agencies such as the CDC, health care officials, and most of the scientific community strongly advised (or in some cases mandated) vaccination, mask wearing, social distancing, and limitation of public outings. These behaviors quickly became normative for large swaths of the population, especially liberals. These individuals tended to practice these normative beliefs. Based on the aforementioned theory, they would be predicted to overplace themselves on these behaviors as well.

However, many conservatives and those opposed to vaccines opposed the regulations. Many in these groups believed that the dangers of Covid were exaggerated and felt that the government was violating their right to the freedom to make their own decisions. For these people, the normative behavior would be the opposite – they opposed mask wearing and social distancing. This is shown in my research paper from my first year of the MACSS program (Soll, 2021). I ran a nationally representative study with 2,283 participants in which I asked individuals what percentage of the time they wore a mask and what percentage of the time they socially distanced while engaged in various activities. The y-axis in Figure 1 shows the percentage of time (adherence) that individuals reported wearing mask and social distancing as a function of how often they went out per week and their vaccination status. The figure shows that non-vaxxers (the Intend NO group) took these precautions less frequently than other

groups. The reported patterns of behavior for the other three groups (fully vaccinated

individuals, partially vaccinated individuals, and those who were unvaccinated yet intended to

receive one) were similar, so later in this paper I group them together as vaxxers.

Figure 1. Relationship between Adherence and Frequency, by Vaccination Status
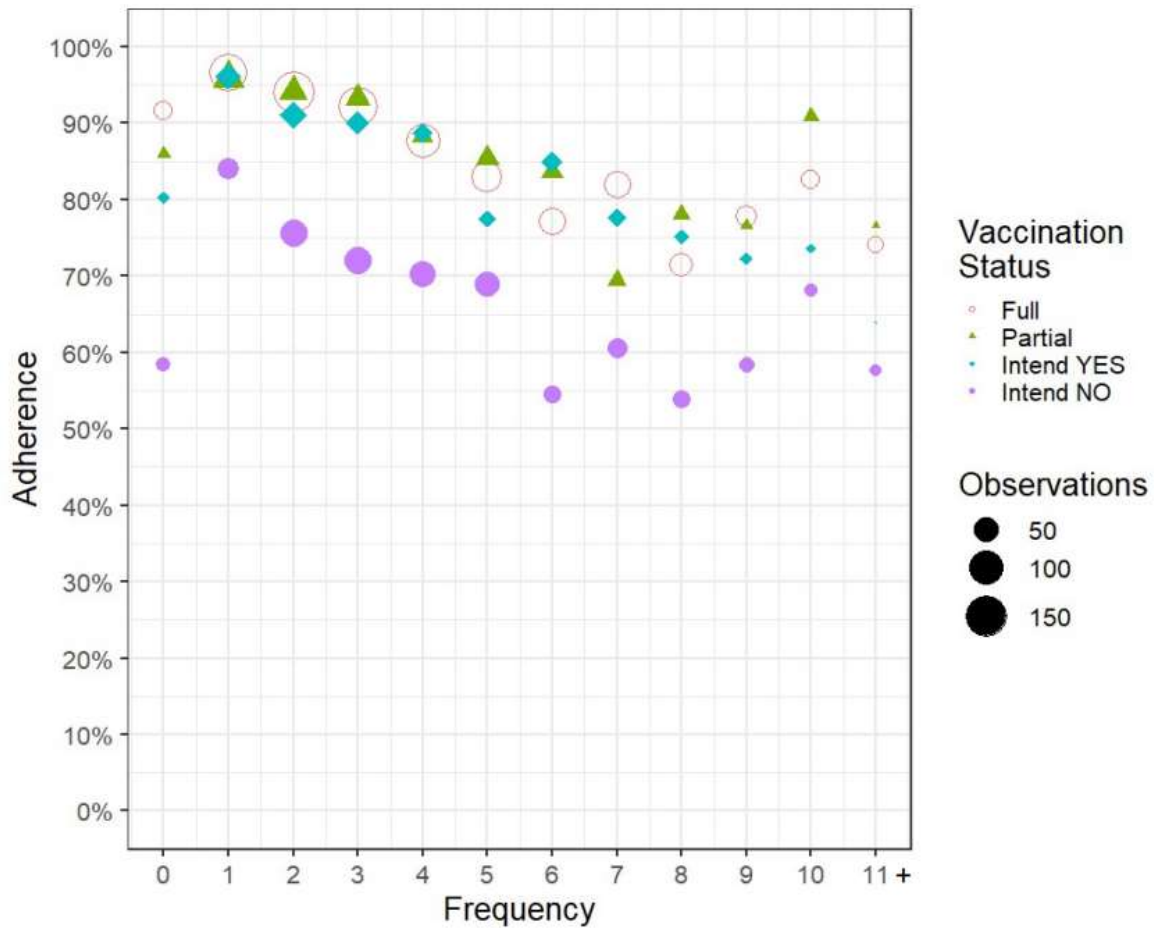
Aside from gauging one's own ability and promoting self-esteem, social comparison also serves to promote behaviors which are valued by one's group. Moreover, conforming to a specific set of norms, and voicing one's conformity on social media, for example, can be a form of social signaling that one is affiliated with the group. Engaging in these normative behaviors can lead to acceptance if one conforms and ostracism if one does not. The drive for belonging and affiliation can fuel what otherwise might appear to be irrational behavior, such as ignoring public health advice by avoiding vaccination or not wearing a mask (Cruwys, Stevens, and Greenaway, 2020).

This discussion allows us to make more nuanced predictions about overconfidence and Covid-mitigating behaviors such as mask-wearing. Those who chose to get the vaccine would view these Covid-mitigating behaviors as normative, and thus be motivated to exaggerate their behavior. Non-vaxxers would possibly view these behaviors neutrally and give an accurate assessment of their performance relative to others. Perhaps they would even view these behaviors negatively and be motivated to underplace themselves in order to signal their membership in this oppositional group.

When examining Figure 1, one finds a negative relationship between frequency of going out and adherence to regulations. This relationship exists for both vaxxers and non-vaxxers . My first-year paper suggests that this is due to complacency. Generally, when people learn the frequency of events through experience, they tend to perceive rare events as less common than they actually are (Hertwig, 2015). As Covid is a rare event, this research implies that people are liable to underestimate their risk (Erev, Plonsky, and Roth, 2020). This effect is further magnified by the availability bias (Tversky and Kahneman, 1973) and recency bias (Hogarth and Einhorn, 1992). Because they are ill, symptomatic people tend to go into public less often than asymptomatic or uninfected people. This means that healthy individuals are observed more frequently in public than their true proportion. This would naturally lead to individuals believing that the proportion of sick people, and thus the risk of catching Covid, is much lower than the reality.

The recency bias also contributes to underestimating the risk of Covid. The recency bias means that as most individuals wouldn't have had a recent exposure to Covid, the bias towards overweighting recent events would further diminish most individuals' sense of risk. Zohar and

Erev (2007) observed this effect with respect to workplace accidents. Covid is both a rare event and individuals aren't likely to have had a recent exposure to it, causing individuals to further underweight its prevalence.

Furthermore, people tend to weight their personal experience more heavily than what they read or hear about (Loewenstein, Weber, Hsee, & Welch, 2001). If an individual frequently enters the public sphere and manages to avoid getting infected, this will cause them to update their beliefs about the likelihood of sickness much more than they should. They are likely to believe that they have disproportionately low odds of getting infected, and thus will take fewer precautions. Taken together, these various effects suggest that individuals will tend to become complacent over time, and as a result adhere less to guidance to wear masks and socially distance.

The relationship between frequency and adherence in Figure 1, which is there for vaxxers and non-vaxxers alike, creates a selection effect. The people who go out the most frequently would also be the same group of people which adhere the least. Now imagine going out and observing others around you at a restaurant, grocery store, or gym. Because of the selection effect, these people will tend to be those who adhere to measures less frequently than the average person. Without mentally correcting for selection, a perceiver would likely make an inaccurate judgment about the population as a whole, thinking that others wear masks and socially distance less often than they actually do.

Theory Development

In this paper, I will work with the same measures of frequency and adherence that are depicted in Figure 1. In addition to these, I will also consider how people rate themselves

relative to others on each of these dimensions. There are two primary mechanisms which will inform my predictions – the self-enhancement aspect of social comparison, and selection effects. The selection effect is important because people draw inferences from comparing to what they see, regardless of how different that might be from the general population. For example, someone who goes to the pub at midnight would have a very different impression of pub patrons than someone who goes at dinner time would have. A key driver of the availability bias is that we quickly derive judgments from known information without considering what information might be unknown (Kahneman, 2011). As an example, consider how during World War II the Navy ran an analysis to see where they would need to add armor to their planes. The analysis looked at returned planes, and suggested adding armor where bullet holes tended to be observed. Statistician Abraham Wald pointed out the fallacy – the study was only looking at the planes which made it back, and the armor should be concentrated on the areas lacking bullet holes since planes shot in those regions never returned (Mangel & Samaniego, 1984). Kahneman (2011) calls this bias WYSIATI, which stands for 'What You See Is All There Is'.

Based on the above analysis, I propose six hypotheses for how I expect the combination of social comparison and selection effects to impact the perceptions of relative standing among both vaxxers and non-vaxxers for three different types of behavior: frequency of going out, mask wearing, and social distancing.

Frequency of Going Out

The selection effect will mean that those whom we observe in the outside world will be those who tend to go out a lot – we would rarely see those who tend to stay home. Even those who go out frequently might perceive their friends to be out much more frequently, as they

only notice their friends being out and not so much when their friends stay at home. This effect will push everybody into believing that they go out relatively less frequently than others do.

Based on the self-enhancement motive of comparison, I predict vaxxers to underplace their frequency of going out relative to that of others, and non-vaxxers to overplace this. The norms for vaxxers is that people should try to comply with public health guidelines, which, as the time of my survey in April 2021, often emphasized staying at home. In order to feed their self-image, they will try to be charitable and believe that they go out less frequently than others do. Conversely, non-vaxxers are more likely to believe that those who comply with the public health guidelines are sheep and that it's an act of independence to flout the rules. Thus they would be expected to boost their self-perception by believing themselves to be going out more frequently than others do. I expect the impact of self-enhancement comparisons to be relatively muted – frequency of going out is an objective standard which is relatively easy to observe. It's difficult to distort how often one goes out.

> **H1a.** Vaxxers will underplace how often they go out, and as a group exhibit a "less-than-average" effect. This is because the selection effect and the self-enhancement motive would both lead to them believing that they go out less frequently compared to others than they truly do.

> **H1b.** Non-vaxxers will report accurately how often they go out relative to others. The selection effect would push them to underplace while the self-enhancement motive and their self-enhancement motive effect would lead them to overplace, which balance each other out.

Mask-wearing

The selection effect means that those who we observe the most in the outside world are those who adhere to mask-wearing guidelines the least. This is due to the negative relationship I found between adherence and frequency. Encountering this biased sample will naturally create the belief that people don't wear masks as often as they truly do.

Based on the self-enhancement motive I expect vaxxers to overplace their adherence to mask-wearing guidelines and non-vaxxers to underplace their adherence. This is because vaxxers will perceive wearing a mask to be a good thing, due to messaging from governmental authorities, and thus would like to believe themselves to be someone that does a good job of wearing a mask. Similarly, many non-vaxxers believe wearing a mask to be unnecessary, and may want to see themselves as people who don't wear masks that frequently. Many of these people lean to the right on the political spectrum, and therefore may want to forsake masks for ideological reasons. However, my demographics suggest that this split isn't universal. Adherence to mask-wearing guidelines can be easily distorted, which helps people place themselves. For example, a vaxxer might not wear masks with his friends, and choose to believe that time "didn't count" because he was with friends. Similarly, a non-vaxxer might wear a mask when she goes to a concert and choose to believe that didn't count because she was forced to by the concert's admittance policy.

> **H2a.** Vaccinated individuals will overplace how often they wear a mask compared to others, and as a group exhibit a "better-than-average" effect. This is because the selection effect and the self-enhancement motive would lead vaxxers to believe that they wear a mask more often than they truly do.

H2b. Non-vaxxers will be generally accurate about how often they wear a mask

compared to others. This is because while the selection effect would lead them to

believe that they wear a mask more often than they truly do, the self-enhancement

motive would allow them to distort their view of reality in the other direction, which

should balance each other out.

Social Distancing

The selection effect means that those who we observe the most in the outside-world

are those who adhere to social-distancing guidelines the least. This is due to the negative

relationship I found between adherence and frequency. Encountering this biased sample will

naturally create the belief that people don't maintain a six-foot distance from others as often as

they truly do.

Based on the self-enhancement motive, I expect vaxxers to overplace their adherence to

social distancing guidelines and non-vaxxers to underplace their adherence. This is because

vaxxers will perceive social distancing as a good thing, due to messaging from governmental

authorities, and thus would like to believe themselves to be someone that does a good job of

socially distancing. Similarly, many non-vaxxers believe social distancing to be unnecessary, and

some may want to see themselves as people who don't socially distance that frequently for

ideological reasons. Much like with mask-wearing, adherence to social distancing guidelines can

be easily distorted, which allows people to easily misjudge themselves. For example, consider a

vaxxer who goes to an outdoor barbecue with their friends. They would perceive it to be

"outside and with safe people," therefore the lapse in distancing didn't count. Meanwhile an

non-vaxxer might perceive that same situation as successfully flouting governmental overreach and count it as a time in which they didn't socially distance.

H3a. Vaxxers will overplace themselves, and as a group exhibit a "better-than-average" effect. This is because the selection effect and self-enhancement motive would allow them to believe that they socially distance more than others do.

H3b. Non-vaxxers will have a relatively accurate view of their level of social distancing. This is because while the selection effect would lower how often they believe others are socially distancing, the self-enhancement motive would cause them to also lower how often they perceive themselves to be socially distancing.

My overarching predictions hold that with respect to frequency, we should expect to see roughly similar effects for everyone. This is because how often one goes out is objective behavior, which is difficult to self-enhance in a particular way, and selection effects would cause everyone to underestimate how often they go out relative to others, regardless of their attitude toward vaccination. Outside of that, I expect to see strong overplacement effects for vaccinated individuals for mask-wearing and social distancing as both the self-enhancement and selection effects would push them in the same direction. We'd expect to see much weaker effects for non-vaxxers as the effects would move in opposite directions. In the study I asked participants about their behavior and self-perceptions with respect to three domains of activity: entertainment, shopping, and exercise. I expect to see similar results for all three domains as there don't exist consistent regulations which would set any of them apart from the others in terms of adherence.

Methodology

I ran a nationally representative survey consisting of 2,283 US participants through the market research firm ROI Rocket. The data was collected April 22-27, 2021. Thirty five participants skipped one or more of the demographic questions and thus were excluded from the main analysis, resulting in N=2,248.

It's important to note what the government guidelines were at the time. At the federal level, social distancing was suggested (CDC, n.d.). Furthermore, the CDC recommended that all people wear a mask when outside of the home. This recommendation was relaxed for fully vaccinated individuals – they could gather indoors without a mask. It's unlikely that the difference in messaging among vaccinated and unvaccinated people made any behavioral differences which could impact this study – as seen in Figure 1 the behavior among those who intended to be vaccinated, those who only had one vaccine dose of two, and those who were fully vaccinated were similar. As a result, for the purposes of this behavior I merged the aforementioned groups into the vaxxer category.

Table 1. Demographic Information

	Non-vaxxer	Vaxxer
Sample Size	529 (23%)	1754 (77%)
Gender		
Male	34%	47%
Female	66%	52%
Age		
18 to 34	34%	26%
35 to 54	40%	35%
55 to 64	15%	18%
65+	10%	21%
Mean	44.1	48.8
SD	*14.1*	*16.2*
Party		
Democrat	20%	45%
Republican	38%	23%
Independent	31%	25%
Other	11%	8%
Region		
Midwest	19%	19%
Northeast	13%	19%
South	47%	39%
West	20%	22%

One may view the demographics of the survey above, in Table 1. As my analysis deals with comparing vaxxers and non-vaxxers, I show the relative demographic differences among the two groups. Overall, the vaxxers were more male, older, more Democrat, and less Southern than the non-vaxxers.

Participants were asked to say how many times a week they left their homes for each of three domains, dining/entertainment (DE), shopping/errands (SE), and exercise/sports (ES). For each of these, they were also asked what percentage of the time they wore a mask and what percentage of the time they maintained a 6-foot distance from others while engaged in the activity. Additionally participants were asked what percentage of other adults with the same vaccination status they engaged in the activity more than for frequency of activity, mask-wearing, and social-distancing for each of the three domains. In this way, we were able to collect their self-reported percentiles.

Participants were also asked to fill out the mini big-5 quiz, which I used to score them on the Big 5 traits. These traits are Openness to Experience, Conscientiousness, Extraversion, Agreeableness, and Neuroticism. They also filled out the 30 item DOSPERT risk preferences scale. Each question on the scale asked them to use a seven-point scale to indicate the likelihood that they would perform a specified risky activity. I used these data to assess their attitudes towards risk in the domains of Ethical, Financial, Health/Safety, Recreational, and Social risks.

Participants also answered a set of demographic questions that asked about political beliefs, gender, age, placement on the subjective socioeconomic status ladder, education, state, and type of community (city, town, suburb, or rural area). This process included collecting information about vaccination status and whether they have had covid. There were four possible categories for vaccination status: fully-vaccinated, partially vaccinated, not yet vaccinated but intends to be, and not yet vaccinated and doesn't intend to be. While these are depicted in Figure 1, for the purposes of this paper I combined the first three categories, which

had positive views on vaccination, into the vaxxer group. The complete survey can be seen in the Appendix.

In order to conduct my analysis, I also needed to know the true percentile, in addition to their self-judged percentile, of the respondents for each of the categories. I calculated this through working with the raw data they provided about their how often they went out and complied with the guidelines. In some cases, multiple respondents reported the same answer. This begs the question as to how percentile should be determined. Should I consider the percentile of individuals someone giving a certain answer to be the percent of individuals who gave a lower answer than that, or the percent of individuals who didn't give a higher answer? I decided that the most representative way to answer this question would be to split the difference, counting half the individuals for a given answer as having answered lower. For example, if 20% of people went out shopping zero times, the formula would assign those individuals to the 10th percentile. Using this logic, suppose for a given question there are T ordered categories (e.g., if people went out between 0 to 15 times in a week, there are 16 ordered categories , starting with 0). The percentile for the k*th* category can be expressed as

$$100 * \left(\sum_{t=1}^{k} n_t - \frac{1}{2} n_k \right),$$

where n_t is the number of people in category t, and $t = 1$ corresponds to the bottom category in the dataset. For my percentile calculations for a given individual I only included others in that same vaccination category. This was done so that my true percentiles would be consistent with the self-judged percentiles, as participants were asked to compare themselves only with others in their same category.

Results

I will first discuss results related to the better-than-average effect. A group exhibits a better-than-average effect if people rate themselves, on average, as being above the 50th percentile on a desirable attribute (or below the 50th percentile on an undesirable attribute). The desirability of an attribute can, of course, vary by group. My analysis can be viewed in Figure 2. This shows in bar graph format what the mean judged percentiles were for vaxxers and non-vaxxers in each of the three domains, split across frequency of going out, mask-wearing, and social distancing. The horizontal dotted line indicates the 50th percentile, which should be roughly where the mean percentiles land if everyone's self-report is unbiased. In order to assess the levels of bias, I constructed 95% confidence intervals based on the mean and standard error within each group. These are centered on the mean and extend for two standard error units in each direction, which means that we can have approximately 95% confidence that the interval range contains the population mean for that group.

Figure 2.
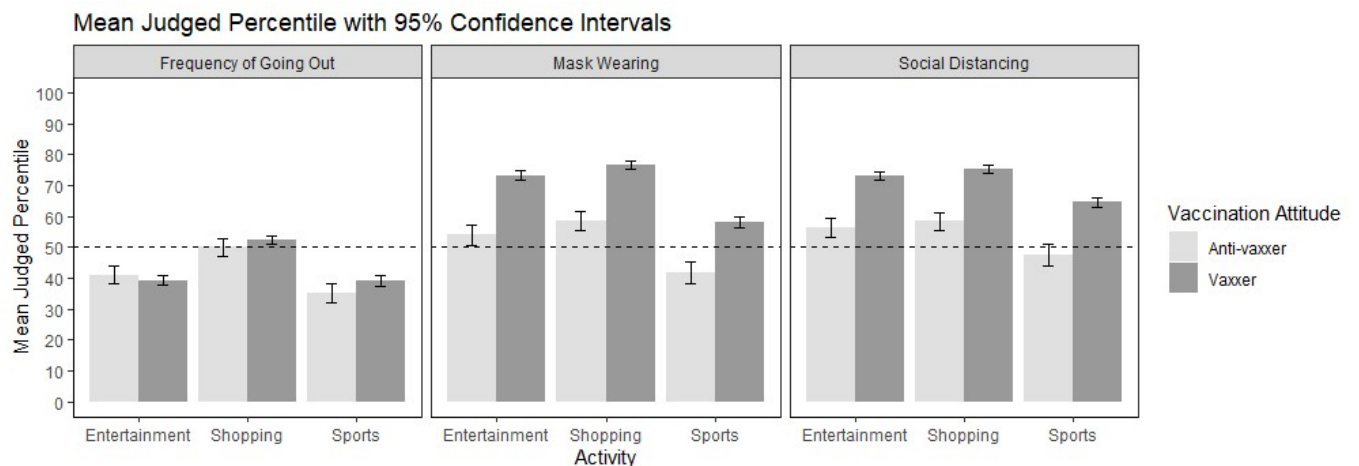
The leftmost chart in Figure 2 shows the frequency of going out. We can observe that for the entertainment and sports domains, but not the shopping domain, both the non-vaxxer and vaxxer intervals fall entirely below the 50th percentile indicator. This means that we can reject the null hypothesis and conclude that the average person believes that they go out less than most others with the same vaccination status as themselves for these two domains. These results support hypothesis H1a, which says that vaxxers exhibit a less-than-average effect for frequency. However, they do not support H1b, because non-vaxxers also thought they went out less than average compared to other non-vaxxers.

The next two panels show the mean judged percentiles for mask-wearing social distancing. We can generally observe a better-than-average effect. Both vaxxers and non-vaxxers tend to believe that they adhere more to guidelines than the median person in their vaccination category. We can also see that the effect for non-vaxxers is much smaller than that for vaxxers. On average across domains, non-vaxxers reported adhering more than 53% of their fellow non-vaxxers, whereas vaxxers reported adhering more than 70% of their fellow vaxxers. These results make sense because while both groups would see the selection effect drive up their internal view of their placement, non-vaxxers have this attenuated by not having a need to make self-serving downward social comparisons. Vaxxers, on the other hand, would likely self-enhance, which exacerbates the impact of the selection effect. This creates the clearly visible overplacement for the vaxxers.

In Figure 3, I depict the relationship between the true percentile and the judged percentile for frequency of going out for each of the three domains. The left graph shows the

relationships for non-vaxxers while the right graph shows them for vaxxers. The solid black line

going from the bottom-left to the top-right corner of each graph is the identity line – it shows

every point where the judged percentile is the same as the true percentile. If people were

accurate about how they ranked relative to others with respect to frequency then the blue lines

(local regression smoother curves) would entirely overlap with the identity line. This graph lets

us draw two conclusions. One is that since the curves are all much flatter than the identity line,

participants' estimates are regressive to the mean. Secondly, we can notice that the

entertainment and sports curves generally lie below the identity line. This is consistent with

Figure 2 which showed that regardless of vaccination status participants tended to believe they

went out less frequently than the median person with their same attitude toward vaccination.

Figure 3.

Frequency of Going Out: Judged vs. True Percentiles
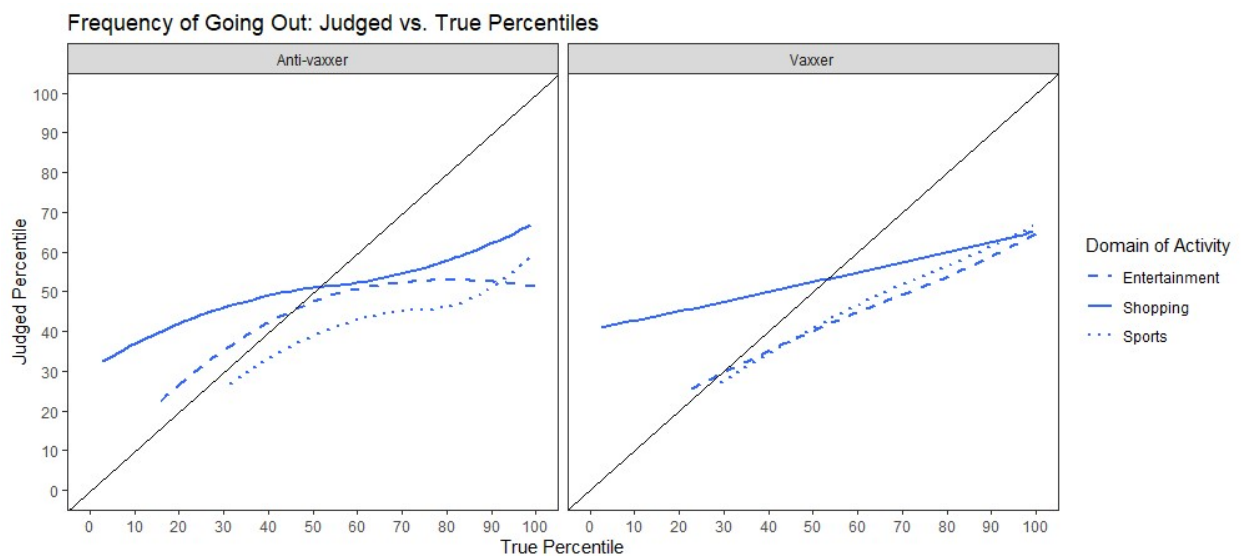
In order to test these data, I ran two regression models with the judged percentile of going out as the dependent variable, shown in Table 2. For these models, I averaged across the three activity domains: entertainment, shopping, and sports. I also adjusted both the judged and the true percentile by subtracting 50 from each of those measures. This means that a 0 on my new scale for percentile corresponds to the median frequency of going out.

Table 2. Regression Models of Judged Percentile of Going Out

| Predictors	Model 1		Model 2	
	Estimates	*std. Error*	*Estimates*	*std. Error*
Intercept	-7.869 ***	1.150	-7.470 ***	1.111
Percentile	0.439 ***	0.059	0.343 ***	0.056
Vaxxer	1.668	1.309	1.016	1.268
Vaxxer x Percentile	0.100	0.067	0.078	0.064
Gender	0.830	0.580	-0.219	0.589
Age	-0.092 *	0.037	-0.006	0.038
Extraversion			3.626 ***	0.617
Agreeableness			0.084	0.736
Conscientiousness			1.279	0.759
Neuroticism			0.270	0.665
Openness			-1.525 *	0.737
Risk att. [social]			-2.677 ***	0.482
Risk att. [financial]			3.055 ***	0.620
Risk att. [health]			0.287	0.622
Risk att. [recreation]			0.756	0.522
Risk att. [ethical]			3.678 ***	0.742
Observations	2259		2257	
R^2 / R^2 adjusted	0.138 / 0.136		0.231 / 0.226	

* p<0.05 ** p<0.01   *** p<0.001

Model 1's independent variables are the true percentile of frequency of going out (after

subtracting 50), vaccination status (coded as 0 = non-vaxxer, 1 = vaxxer), the interaction term

between the two, gender (coded as 1 = male, -1 = female), and age (mean-centered at 47). Of these terms, age and the true percentile are statistically significant. The intercept is statistically significant, which means that all else being equal, respondents judged themselves as below the 50th percentile in going out (note that vaxxers did not differ from non-vaxxers). I found a strong positive relationship between true percentile and judged percentile, which indicates that those who go out more often tend rate themselves in a higher percentile. This shows that people do have some insight into where they stand relative to others, despite the overall negative bias. Interestingly, holding true percentile constant, the negative coefficient on age shows that the older one is, the larger the negative bias.

Model 2 includes my terms for model 1, but also includes as predictors the Big 5 personality traits and the five DOSPERT categories of risk taking (each of these is mean-centered). Of the personality traits, extraversion and openness to experience are statistically significant. The more extraverted an individual is, the more they think they've gone out relative to others, whereas openness to experience has a negative impact on judged percentile. As the actual percentile is already included in the model, these results suggest that different personality traits are associated with different types of misperceptions about how one compares oneself to others. For the risk-taking attitudes, the regression model shows that those who are more prone to taking social risks believe they go out less frequently than they truly do compared to others, while those who are more prone to financial and ethical risks believe that they go out more frequently.

Figure 4.

Adherence: Judged vs. True Percentiles
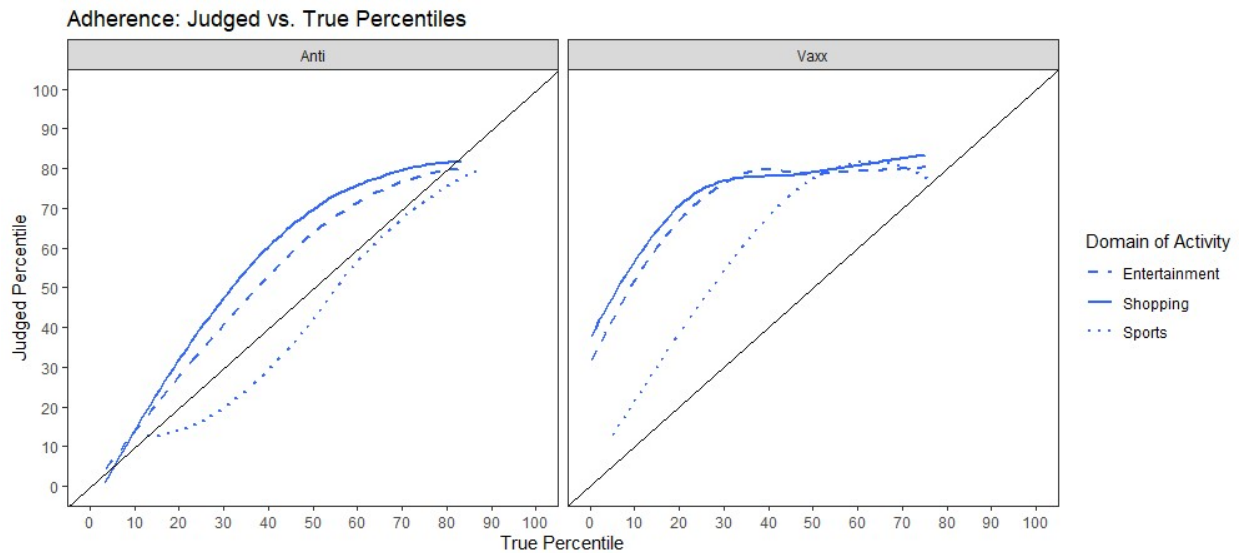
In figure 4, I depict the relationship between the true percentile and the judged

percentile for adherence in each of the three domains. As mask-wearing and social distancing

are both measures of adherence and they are strongly correlated with each other (r = .83), I

averaged them into the single measure called adherence. The left graph shows the

relationships for non-vaxxers while the right graph shows them for vaxxers. The solid black line

going from the bottom-left to the top-right corner of each graph is the identity line – it shows

every point where the true percentile is the same as the judged percentile. If people were

accurate about how they ranked relative to others with respect to adherence, then the blue

lines (local regression smoother curves) would entirely overlap with the black line. We can see

that the non-vaxxer lines are slightly biased upward. However, the vaxxers have a much larger

effect and their lines are all much farther above the identity line. This shows that there is a very

strong better-than average effect for vaxxers.

In order to test the data, I ran two regression models with the judged percentile of adherence as the dependent variable. These are represented in Table 3. For these models, I averaged across the three activity domains: entertainment, shopping, and sports. As before, I adjusted both judged and true percentile by subtracting 50, and the coding is the same as in models 1 and 2.

Model 3's positive intercept shows a small overplacement effect for non-vaxxers. There is a large positive effect for vaxxers, which indicates that vaxxers tend to overplace themselves. The significance of the interaction term between vaxxers and percentile indicates that the vaxxers have a shallower slope than non-vaxxers. This is consistent with the self-enhancement effect wherein vaxxers are less sensitive to their true percentile because they are trying to see themselves in a positive light. Furthermore, age is significant, which means that all else being equal, older people see themselves as adhering to regulations less than younger people do.

Model 4 repeats the regression from model 3, but also finds factors in the Big 5 personality traits as well as the five DOSPERT risk categories (all of which I mean-centered). I found a strong positive relationship between extraversion and judged percentile of adherence, which means that all else being equal an extraverted individual will believe that they adhere relatively more to guidelines than they really do. Openness to experience is also significant, in that those who are more open believe that they have relatively lower levels of adherence than others. Of the risk categories, social, financial, and ethical risk were statistically significant. Social risk proclivity had a negative relationship with believed levels of adherence – those who are more prone to taking social risks will, all else being equal, believe themselves to adhere less

compared to others. There is a positive relationship between financial and ethical risk taking

and self-judged percentile of adherence.

Table 3. Regression Models of Judged Percentile of Adherence

Predictors	Model 3		Model 4	
	Estimates	std. Error	Estimates	std. Error
Intercept	2.380 *	0.980	2.715 **	0.979
Percentile	1.126 ***	0.042	1.121 ***	0.041
Vaxxer	17.931 ***	1.116	17.433 ***	1.117
Vaxxer x Percentile	-0.449 ***	0.050	-0.416 ***	0.049
Gender	-0.249	0.494	-0.773	0.517
Age	-0.118 ***	0.031	-0.079 *	0.033
Extraversion			1.600 **	0.534
Agreeableness			-0.273	0.651
Conscientiousness			1.130	0.669
Neuroticism			0.280	0.586
Openness			-1.326 *	0.649
Risk att. [social]			-1.446 ***	0.425
Risk att. [financial]			1.568 **	0.545
Risk att. [health]			-0.505	0.555
Risk att. [recreation]			-0.061	0.459
Risk att. [ethical]			2.917 ***	0.653
Observations	2259		2257	
R^2 / R^2 adjusted	0.415 / 0.413		0.442 / 0.438	

*$p<0.05$ **$p<0.01$ ***$p<0.001$

Discussion

In this paper I examined people's self-perceptions of their relative standing on the frequency of going out and adhering to pandemic guidelines in the activity domains of entertainment, shopping, and sports. In order to accomplish this, I ran a survey which gathered information about participant's self-judged percentiles as well as their behavior in these categories, from which I was able to calculate true percentiles. I also collected demographic and personality information and found that these also play into self-perceptions.

The findings can be grouped into those pertaining to frequency and those pertaining to adherence. For frequency, I found that both vaxxers and non-vaxxers underestimate their relative frequency of going out. This means that generally people think that they go out less often relative to others than they truly do. This tracks with H1a, as I predicted that both a selection effect and a self-enhancement motive would lead vaxxers to underplace themselves, creating a less-than-average effect. Interestingly, my results don't map well onto H1b, as non-vaxxers on average thought that they went out less than other non-vaxxers. Given that that both vaxxers and non-vaxxers underestimated how often they go out relative to others, the self-enhancement motive probably did not play a large role for judgments of relative frequency. This could be because governmental messaging was not as consistent and forceful for frequency as it was for wearing masks and social distancing, and thus people may not have seen frequency as a measure that speaks to their Covid-related behavior. On the other hand, my results suggest that selection had a large role in determining people's judgments of frequency. People see others who are out and judge from that sample that others must be going out a lot. After all – they aren't able to see all the people who are staying at home. Note that the

'selection bias' isn't something that participants can correct on their own – one cannot account for unknown information. Regardless, it still leads to biased judgements.

For adherence, I found that both vaxxers and non-vaxxers overestimate the rate at which they follow guidelines. Interestingly, this effect is much larger for vaxxers than it is for non-vaxxers. This tracks with H2a and H3a, which predict that vaxxers will significantly overplace themselves due to the selection effect and self-enhancement motives working in concert. The mildness of the effect for non-vaxxers suggests that either non-vaxxers weren't affected by the self-enhancement motive, or the self-enhancement motive worked in the opposite direction but was overpowered by the selection effect.

I also found some interesting results with respect to personality. Holding all else equal, extraverts view themselves as going out relatively more frequently than introverts do. It is important to point out that the regression model controls for the number of times one actually goes out. One possible explanation for this result is that extraverts treat going out as part of their self-image, and through self-enhancement inflate their perceived frequency. I also found that greater willingness to take social risks has a negative impact on the self-perception of relative frequency of going out. This result can be understood by looking to the questions for social risk taking on the DOSPERT scale. For example, people who rate high on social risk taking reported greater willingness for "admitting that your tastes are different from those of a friend" and "speaking your mind about an unpopular issue in a meeting at work." This suggests that social risk takers are more willing to not conform to the expectations of others. Consequently, they might feel less pressure to say that they go out compared to others (to the extent that such pressure exists).

For adherence, I found that non-vaxxers slightly overestimate their relative level of adherence while vaxxers substantially overestimate their relative level. This is consistent with H2a and H3a, which suggest that vaxxers will overplace themselves on adherence measures because both the selection effect and the self-enhancement motive work in concert. For vaxxers, doing well on mask wearing and social distancing is important to their self-concept, and moreover behaviors on these activities are ambiguous (e.g., "that looks like about a 6-foot distance"). The ingredients are present here for a strong self-enhancement effect.

For non-vaxxers, I expected that the self-enhancement motive would run in the other direction. In other words, non-vaxxers might prefer to see themselves as rebelling against the guidelines. However, contrary to H2b and H3b, it appears that any self-enhancement effect did not completely wipe out the selection effect. There was still a small more-than-average effect for non-vaxxers on adherence. This could have happened because the selection effect was stronger than self-enhancement for this group. However, another possibility could be that the selection effect on its own is small and that self-enhancement was negligible for the non-vaxxers.

Self-perceptions of adherence also depended on personality and risk-attitudes. For example, extraverted individuals judged themselves as having adhered more than others. This could be because extraverted individuals go out more often, and thus are impacted more by the selection effect. However, extraversion has correlated with overconfidence in past research as well, so there are likely other reasons for this effect (Schaefer, Williams, Goodie, & Campbell, 2004). Likewise, I found that people who score higher on Openness to Experience judge themselves as having adhered less than others. Additionally, people who take social risks see

themselves as having adhered less. As discussed before, high social risk taking is a non-conforming trait, so they are less susceptible to pressure from authority. This might reduce the strength of the self-enhancement motive, as a good deal of the propaganda to adhere to precautions comes from authority.

Naturally, my study has a few limitations. In all cases participants were asked to compare their frequency and adherence with others in the same group. Given the question asked, I drew my true comparison data from comparing each individual with those in the same group. However, the question may have been difficult for participants to answer, as they wouldn't necessarily be able to tell which other people are in their vaccination group. It is in fact possible that their responses were in comparison to the general population rather than their specific group. If that were the case, it's possible that vaxxers are not truly as biased as I found.

Secondly, my study relies on self-reports of frequency, mask-wearing, and social distancing. It's possible that these self-reports could also be overestimates in addition to the percentile assessments. Fortunately, if this is the case, then the effect is even more present in reality than it is in the study. Also, note that participants may have different definitions of adherence than I do. To counter this, I made sure to ask no questions involving the word adherence, and instead only asked about specific behaviors. However, there is a possibility that participants interpreted the question to be about whether they wore masks when they were supposed to. If this was the case, it could have added some noise to my data.

To conclude, in this paper I analyzed the relationship between people's true percentile and judged percentile for following Covid guidelines. I found that perceptions were distorted. People, especially those who have chosen to vaccinate themselves, generally believe themselves to be better at adhering to guidelines compared to the rest of the population than they truly are.

References

Baldwin, M., & Mussweiler, T. (2018). The culture of social comparison. *Proceedings of the National Academy of Sciences*, *115*(39), E9067-E9074.

Berger, J., & Heath, C. (2007). Where consumers diverge from others: Identity signaling and product domains. *Journal of consumer research*, *34*(2), 121-134.

Burson, K. A., Larrick, R. P., & Klayman, J. (2006). Skilled or unskilled, but still unaware of it: how perceptions of difficulty drive miscalibration in relative comparisons. *Journal of personality and social psychology*, *90*(1), 60.

Centers for Disease Control and Prevention (n.d.). *CDC Museum COVID-19 Timeline*. Retrieved April 25, 2022, from https://www.cdc.gov/museum/timeline/covid19.html

Cruwys, T., Stevens, M., & Greenaway, K. H. (2020). A social identity perspective on COVID-19: Health risk is affected by shared group membership. *British Journal of Social Psychology, 59*(3), 584-593.

Crusius, J., Corcoran, K., & Mussweiler, T. (2022). Social comparison: A review of theory, research, and applications. *Theories in social psychology (2nd ed.). Wiley*.

Erev, I., Plonsky, O., & Roth, Y. (2020). Complacency, panic, and the value of gentle rule enforcement in addressing pandemics. *Nature Human Behaviour, 4*(11), 1095-1097.

Festinger, L. (1954). A theory of social comparison processes. *Human relations*, *7*(2), 117-140.

Goethals, G. R., Messick, D. M., & Allison, S. T. (1991). The uniqueness bias: Studies of constructive social comparison. In J. Suls & T. A. Wills (Eds.), Social comparison:

Contemporary theory and research (pp. 149–176). Hillsdale, NJ, England: Lawrence

Erlbaum.

Kruger, J., & Dunning, D. (1999). Unskilled and unaware of it: how difficulties in recognizing

one's own incompetence lead to inflated self-assessments. *Journal of personality and social

psychology*, *77*(6), 1121.

Kunda, Z. (1990). The case for motivated reasoning. *Psychological bulletin*, *108*(3), 480.

Loewenstein, G. F., Weber, E. U., Hsee, C. K., & Welch, N. (2001). Risk as feelings. *Psychological

bulletin*, *127*(2), 267.

Mangel, M., & Samaniego, F. J. (1984). Abraham Wald's work on aircraft survivability. *Journal of

the American Statistical Association, 79*(386), 259-267.

Moore, D. A. (2020). *Perfectly confident: How to calibrate your decisions wisely*. HarperCollins.

Moore, D. A., & Schatz, D. (2017). The three faces of overconfidence. *Social and Personality

Psychology Compass*, *11*(8), e12331.

Myers, E., & Souza, M. (2020). Social comparison nudges without monetary incentives:

Evidence from home energy reports. *Journal of Environmental Economics and

Management*, *101*, 102315.

Schaefer, P. S., Williams, C. C., Goodie, A. S., & Campbell, W. K. (2004). Overconfidence and the

big five. *Journal of research in Personality*, *38*(5), 473-480.

Soll, J. A. (2021). Pandemic Behavior: A Look into Social Compliance. *UChicago MACSS working paper.*

Svenson, O. (1981). Are we all less risky and more skillful than our fellow drivers?. *Acta*

Psychologica, *47*(2), 143-148.

Roy, M. M., & Liersch, M. J. (2013). I am a better driver than you think: Examining self-

enhancement for driving ability. *Journal of applied social psychology*, *43*(8), 1648-1659.

Tversky, A., & Kahneman, D. (1973). Availability: A heuristic for judging frequency and probability.

Cognitive psychology, *5*(2), 207-232.

Waters, M. S. (Director). (2004). Mean girls [Film]. Paramount Pictures Corporation.

Wills, T. A. (1981). Downward comparison principles in social psychology. *Psychological Bulletin,*

90(2), 245–271.

Wood, J. V., Taylor, S. E., & Lichtman, R. R. (1985). Social comparison in adjustment to breast

cancer. *Journal of personality and social psychology*, *49*(5), 1169.

Appendix

Consent and Survey Questions

Consent Form for Research Participation

<u>**Key Information**</u>
Study Number: Duke Protocol #2021-0468, Chicago Protocol #IRB21-0613
Study Title: Pandemic behavior
Researcher(s): Justin Soll, Benjamin Soltoff, Jack Soll
Collaborating Institutions: University of Chicago, Duke University

Description: We are researchers at Duke University and the University of Chicago. We are doing a research study on people's activities during the pandemic, such as dining out and wearing a mask. You will first be asked whether you have been vaccinated and whether you have had covid. To complete this survey, you will have to provide that information. Next, you will be asked about your own activities and your perceptions of others. You will also be asked some questions about your preferences and how you see yourself. Finally, the survey will include some questions about your political views and demographic questions.

We expect that this survey will take you about <u>10-15 minutes</u> to complete. Participation is <u>voluntary</u> and you may withdraw at any time by simply closing your browser. However, in order to be compensated by your survey company, you will need to progress to the end of the survey and click "Submit".

Incentives: You will be compensated in accordance with the details communicated to you in the recruitment email you received from your survey company. You need to complete the survey to the end and click on SUBMIT to receive your compensation.

Risks and Benefits: Your participation in this study does not involve any risk to you beyond that of everyday life. Taking part in this research study may not benefit you personally, but we may learn new things that could help others.

Confidentiality: Your responses to this survey are completely anonymous. The researchers will not have access to any information that can identify you, and the survey company will not have access to your answers to this survey. Although data may be shared with other researchers, no information will be collected that would allow someone to link your responses in this survey to you personally. If you decide to withdraw from this study, any data already collected up to the point of withdrawal may still be included in the analysis.

Contacts & Questions: If you have questions or concerns about the study, you can contact Jack Soll at jsoll@duke.edu, 919-660-7858, Benjamin Soltoff at soltoffbc@uchicago.edu, or Justin Soll at jsoll1@uchicago.edu. If you have any questions about your rights as a participant in this research, feel you have been harmed, or wish to discuss other study-related concerns with someone who is not part of the research team, you can contact the University of Chicago Social & Behavioral Sciences Institutional Review Board (IRB) Office by phone at (773) 702-2915, or by email at sbs-irb@uchicago.edu. You may also contact Duke University's human research protection program by emailing ors-info@duke.edu or calling 919-684-3030. Please refer to protocol # 2021-0468.

Consent: Participation is voluntary. Refusal to participate or withdrawing from the research will involve no penalty or loss of benefits to which you might otherwise be entitled.

By clicking "Agree" below, you confirm that you have read the consent form, are at least 18 years old, and agree to participate in the research. Please print or save a copy of this page for your records.

    ◯ I agree to participate in the research

    ◯ I do NOT agree to participate in the research. Selecting this option will lead to an exit screen that thanks you for you considering the survey.

For this research, we will need to know about your vaccination status and whether or not you have had covid.

What is your vaccination status against covid?

    ◯ Fully vaccinated (had all the required shots)

    ◯ Partially vaccinated (1 of 2 required shots)

    ◯ Not vaccinated yet, but plan to be

    ◯ I do not plan to be vaccinated

    ◯ Prefer not to answer (exits survey)

- -

Have you had covid?

    ◯ I had covid in the past

    ◯ I have covid now

    ◯ I have not had covid

    ◯ I don't know

    ◯ Prefer not to answer (exits survey)

End of Block: Status

Start of Block: Transition

Thanks for providing that information. We will now continue with the main part of the survey.

Please click below to advance the survey.

The questions below all refer to your activities during the past year, during the pandemic.

About how many times in a typical week do you **go out to eat or be entertained**? Examples include trips to restaurants, bars, theaters, concerts, sporting events, and social gatherings with friends.

▼ 0 (never) ... 15 or more

When you go out to eat or be entertained, what percentage of the time do you....

	never	always
	0 10 20 30 40 50 60 70 80 90 100	
wear a mask?		
keep a 6-foot distance from others?		

End of Block: Own entertainment

Start of Block: Own shopping

X→

The questions below all refer to your activities during the past year, during the pandemic.

About how many times in a typical week do you **go shopping or run errands** in person? Examples include trips to the grocery, pharmacy, mall, bank, and post office.
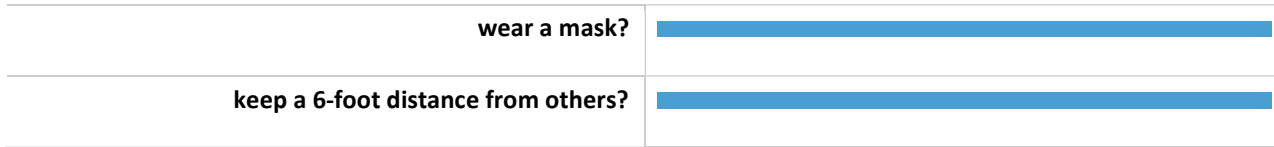
▼ 0 (never) ... 15 or more

When you go shopping or run errands, what percentage of the time do you....

	never					always				
	0	10	20	30	40	50	60	70	80	90	100

wear a mask?	▬▬▬▬▬▬▬▬▬▬
keep a 6-foot distance from others?	▬▬▬▬▬▬▬▬▬▬

End of Block: Own shopping

Start of Block: Own sports

X→

The questions below all refer to your activities during the past year, during the pandemic.

About how many times in a typical week do you **do sports or exercise** where others are present? Examples include trips to the gym, playing basketball, or running/walking on the street.

▼ 0 (never) … 15 or more

When you do sports or exercise, what percentage of the time do you....

	never					always				
	0	10	20	30	40	50	60	70	80	90	100

wear a mask?	▬▬▬▬▬▬▬▬▬▬
keep a 6-foot distance from others?	▬▬▬▬▬▬▬▬▬▬
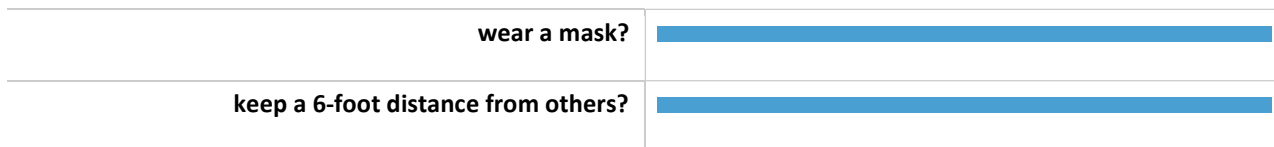
End of Block: Own sports

Start of Block: Others entertainment

The questions below pertain to **going out to eat or being entertained**. Examples include trips to restaurants, bars, theaters, concerts and social gatherings with friends.

Consider all the other adults in the United States with the <u>same vaccination status as yourself.</u>

These days, I go out to eat or be entertained more often than ____% of others with the same vaccination status as myself.

	0 10 20 30 40 50 60 70 80 90 100
Select a number out of 100	▬▬▬▬▬▬▬▬▬▬▬▬▬

- -

When I go out to eat or be entertained...

	0 10 20 30 40 50 60 70 80 90 100
I wear a mask more often than ___ % of others with the same vaccination status as myself	▬▬▬▬▬▬▬▬▬▬▬▬▬
I keep a 6 foot distance more often than ___ % of others with the same vaccination status as myself	▬▬▬▬▬▬▬▬▬▬▬▬▬

End of Block: Others entertainment

Start of Block: Others shopping

The questions below pertain to **shopping and running errands**. Examples include trips to the grocery, pharmacy, mall, bank, and post office.

Consider all the other adults in the United States with the <u>same vaccination status as yourself.</u>

These days, I go shopping or run errands more often than ____% of others with the same vaccination status as myself.

	0	10	20	30	40	50	60	70	80	90	100
Select a number out of 100											

- -

When I go shopping or run errands...

	0	10	20	30	40	50	60	70	80	90	100
I wear a mask more often than ___ % of others with the same vaccination status as myself											
I keep a 6 foot distance more often than ___ % of others with the same vaccination status as myself											

End of Block: Others shopping

Start of Block: Others sports

The questions below pertain to **sports and exercise**. Examples include trips to the gym, playing basketball, or running/walking on the street.

Consider all the other adults in the United States with the <u>same vaccination status as yourself.</u>
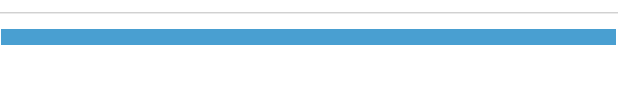
These days, I go out to do sports or exercise more than _____% of others with the same vaccination status as myself.

	0 10 20 30 40 50 60 70 80 90 100
Select a number out of 100	▬▬▬▬▬▬▬▬▬▬▬

- -

When I do sports or exercise...

	0 10 20 30 40 50 60 70 80 90 100
I wear a mask more often than ___ % of others with the same vaccination status as myself	▬▬▬▬▬▬▬▬▬▬▬
I keep a 6 foot distance more often than ___ % of others with the same vaccination status as myself	▬▬▬▬▬▬▬▬▬▬▬

End of Block: Others sports

Start of Block: Mini Big 5 scales

This next part of the survey asks you to rate your personal preferences and how you see yourself as you relate to others. Everyone is different and there are no right or wrong answers.

	1	2	3	4	5
I am the life of the party *1 = Disagree, 5 = Agree*					
I sympathize with others' feelings *1 = Disagree, 5 = Agree*					
I get chores done right away *1 = Disagree, 5 = Agree*					
I have frequent mood swings *1 = Disagree, 5 = Agree*					
I have a vivid imagination *1 = Disagree, 5 = Agree*					
I don't talk a lot *1 = Disagree, 5 = Agree*					
I am not interested in other people's problems *1 = Disagree, 5 = Agree*					
I often forget to put things back in their proper place *1 = Disagree, 5 = Agree*					
I am relaxed most of the time *1 = Disagree, 5 = Agree*					
I am not interested in abstract ideas *1 = Disagree, 5 = Agree*					
I talk to a lot of different people at parties *1 = Disagree, 5 = Agree*					
I feel others' emotions *1 = Disagree, 5 = Agree*					
I like order *1 = Disagree, 5 = Agree*					
I get upset easily *1 = Disagree, 5 = Agree*					
I have difficulty understanding abstract ideas *1 = Disagree, 5 = Agree*					
I keep in the background *1 = Disagree, 5 = Agree*					
I am not really interested in others *1 = Disagree, 5 = Agree*					
I make a mess of things *1 = Disagree, 5 = Agree*					
I seldom feel blue *1 = Disagree, 5 = Agree*					
I do not have a good imagination *1 = Disagree, 5 = Agree*					

For each of the following statements, please indicate the **likelihood** that you would engage in the described activity or behavior if you were to find yourself in that situation.

           1   2   3   4   5   6   7

Admitting that your tastes are different from those of a friend *1 = extremely unlikely I would do it 7 = extremely likely I would do it*	
Going camping in the wilderness *1 = extremely unlikely I would do it 7 = extremely likely I would do it*	
Betting a day's income at the horse races *1 = extremely unlikely I would do it 7 = extremely likely I would do it*	
Investing 10% of your annual income in a moderate growth diversified fund *1 = extremely unlikely I would do it 7 = extremely likely I would do it*	
Drinking heavily at a social function *1 = extremely unlikely I would do it 7 = extremely likely I would do it*	
Taking some questionable deductions on your income tax return *1 = extremely unlikely I would do it 7 = extremely likely I would do it*	
Disagreeing with an authority figure on a major issue *1 = extremely unlikely I would do it 7 = extremely likely I would do it*	
Betting a day's income at a high-stake poker game *1 = extremely unlikely I would do it 7 = extremely likely I would do it*	
Having an affair with a married man/woman *1 = extremely unlikely I would do it 7 = extremely likely I would do it*	
Passing off somebody else's work as your own *1 = extremely unlikely I would do it 7 = extremely likely I would do it*	
Going down a ski run that is beyond your ability *1 = extremely unlikely I would do it 7 = extremely likely I would do it*	
Investing 5% of your annual income in a very speculative stock *1 = extremely unlikely I would do it 7 = extremely likely I would do it*	
Going whitewater rafting at high water in the spring *1 = extremely unlikely I would do it 7 = extremely likely I would do it*	
Betting a day's income on the outcome of a sporting event *1 = extremely unlikely I would do it 7 = extremely likely I would do it*	
Engaging in unprotected sex *1 = extremely unlikely I would do it 7 = extremely likely I would do it*	
Revealing a friend's secret to someone else *1 = extremely unlikely I would do it 7 = extremely likely I would do it*	
Driving a car without wearing a seat belt *1 = extremely unlikely I would do it 7 = extremely likely I would do it*	
Investing 10% of your annual income in a new business venture *1 = extremely unlikely I would do it 7 = extremely likely I would do it*	

Taking a skydiving class *1 = extremely unlikely I would do it 7 = extremely likely I would do it*	▬▬▬▬▬▬▬▬▬▬▬▬
Riding a motorcycle without a helmet *1 = extremely unlikely I would do it 7 = extremely likely I would do it*	▬▬▬▬▬▬▬▬▬▬▬▬
Choosing a career that you truly enjoy over a more secure one *1 = extremely unlikely I would do it 7 = extremely likely I would do it*	▬▬▬▬▬▬▬▬▬▬▬▬
Speaking your mind about an unpopular issue in a meeting at work *1 = extremely unlikely I would do it 7 = extremely likely I would do it*	▬▬▬▬▬▬▬▬▬▬▬▬
Sunbathing without sunscreen *1 = extremely unlikely I would do it 7 = extremely likely I would do it*	▬▬▬▬▬▬▬▬▬▬▬▬
Bungee jumping off a tall bridge *1 = extremely unlikely I would do it 7 = extremely likely I would do it*	▬▬▬▬▬▬▬▬▬▬▬▬
Piloting a small plane *1 = extremely unlikely I would do it 7 = extremely likely I would do it*	▬▬▬▬▬▬▬▬▬▬▬▬
Walking home alone at night in an unsafe area of town *1 = extremely unlikely I would do it 7 = extremely likely I would do it*	▬▬▬▬▬▬▬▬▬▬▬▬
Moving to a city far away from your extended family *1 = extremely unlikely I would do it 7 = extremely likely I would do it*	▬▬▬▬▬▬▬▬▬▬▬▬
Starting a new career in your mid-thirties *1 = extremely unlikely I would do it 7 = extremely likely I would do it*	▬▬▬▬▬▬▬▬▬▬▬▬
Leaving your young children alone at home while running an errand *1 = extremely unlikely I would do it 7 = extremely likely I would do it*	▬▬▬▬▬▬▬▬▬▬▬▬
Not returning a wallet you found that contains $200 *1 = extremely unlikely I would do it 7 = extremely likely I would do it*	▬▬▬▬▬▬▬▬▬▬▬▬

End of Block: Dospert

Start of Block: Politics

Thanks! There are just a couple of short sections left to the survey. In this next part, please tell us about your political views.

Your answers to the questions on this page will be very valuable to us in our research and much appreciated! If you prefer not to answer, you can skip them and still advance to the end of the survey.

Which of the following political parties or orientations best represents your views?

○ Republican

○ Democratic

○ LIbertarian

○ Independent

○ Prefer not to answer

○ Other _____

How would you describe your political orientation on on a scale of 1 = *very liberal* to 9 = *very conservative* on the issues below?

	Very Liberal					Very Conservative			
	1	2	3	4	5	6	7	8	9
Economic Issues									
Social Issues									

For this next question, imagine that the ladder below shows how your society is set up.

Think of this ladder as representing where people stand in the United States. At the top of the ladder (rung 10) are the people who are the best off -- those who have the most money, the most education, and the most respected jobs. At the bottom of the ladder (rung 1) are the people who are the worst off -- who have the least money, least education, and the least respected jobs or no job. The higher up you are on this ladder, the closer you are to the people at the very top; the lower you are, the closer you are to the people at the very bottom.

Now think about yourself. Please tell use where you think you would be and choose the number of rung that you think best represents where your position is on this ladder.

	1	2	3	4	5	6	7	8	9	10

My ladder rung [██████████████████████████████]

End of Block: Politics

Start of Block: Demographics

You're almost done with the survey. We have just a few more questions for you.

Your answers to the questions on this page will be very valuable to us in our research and much appreciated! If you prefer not to answer, you can skip them and still advance to the end of the survey.

What is your gender?

○ Male

○ Female

○ Non-binary / third gender

○ Prefer not to answer

What is your age?

▼ 18 … 115

What is your race? Please select as many as apply.

☐   Black/African-American

☐   Hispanic/Latino/Hispanic-American

☐   Asian/Asian-American

☐   White/Caucasian-American

☐   Other _____

☐   Prefer not to answer

What is the highest level of school you have completed or the highest degree you have received?

▼ Less than high school degree … Prefer not to answer

In which state do you currently reside?

▼ Alabama … Prefer not to answer

What type of community do you live in?

○ Large city

○ Small city or town

○ Suburb near a large city

○ Rural area

○ Prefer not to answer

- -

Are you a frontline essential worker? *Examples include workers in health care, law enforcement, corrections, fire service, grocery stores, food/agriculture, manufacturing, public transit, education, and daycare.*

○ Yes

○ No

○ I don't know

○ Prefer not to answer

End of Block: Demographics

Start of Block: Debrief

Thank you for completing our survey! We are interested in better understanding the predictors of behavior during the pandemic, and how people view their own behavior compared to the behavior of others.

The pandemic is a serious public health crisis. Please stay safe and take precautions. In public spaces, we strongly encourage you to wear a mask, socially distance by staying at least 6 feet away from others, and follow the guidelines of the CDC and your local public health authorities.

To exit the survey and register your responses, please click **SUBMIT** below.

Optional: If you wish, you may leave a comment for the researchers in the text box below. If you found something confusing or noticed any glitches, we would appreciate you letting us know so that we can fix the survey for others.