The Relationship Between Socioeconomic Background and COVID-19 Precautions

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<u>Introduction</u>

The COVID-19 pandemic is ongoing and its effects are still being felt in our everyday lives, so people feel as strongly about it as they ever have. There are those who feel that wearing masks is essential to keeping everyone safe and healthy. But there are also those who feel that mask mandates are immoral and that the freedom of choice is important for the livelihood of all. There are those who feel that the vaccine has opened the door for the return to normality, hoping to return to their old social lives and businesses. Still, there are others who feel uncomfortable with taking the vaccine, often citing the short period in which the vaccine was developed, or previous medical tests performed on citizens (primarily minorities) by the government. The goal of the project is to find how demographics and socioeconomic backgrounds relate to how strictly people followed pandemic guidelines and recommendations, as well as some of the reasons why. These opinions have polarized many across the nation, so it is natural to wonder whether or not, and to what degree, a person's background affects how they feel about these issues.

With this project, we hope to determine what one's demographics indicate about their willingness to follow COVID-19 guidelines, as well as some of the reasons for their beliefs. We will consult with Dr. Bryan Carter, a professor at the University of Arizona with the College of Humanities, as an expert.

We hypothesize that respondents who identify as democrats will be more likely to wear masks and follow social distancing guidelines. In addition we hypothesize that democrats will prefer the current government's handling of the pandemic to that of the previous government.

The opposite should be true for republicans. In addition, we hypothesize that democrats will be more likely to think that individuals in their lives handled the pandemic poorly. Finally, we hypothesize that the opinions of white participants will be more closely aligned with republican opinions, and the opinions of other races will be more closely aligned with democratic opinions.

Methods

To collect data for our experiment, we created a google form asking participants about their age, political party, and race. We also asked them, on a 1 to 5 scale, how often they practiced social distancing and how often they wore a mask. In addition, we asked how well they thought the current and previous government administrations handled the pandemic and how well they thought the individuals in their lives handled the pandemic. A link to the form is attached below:

https://docs.google.com/forms/d/e/1FAIpQLScgy1vQ4zNKy-_jNJv9jW5oD1DWBwVJeKHKp1AEDRl7JVfLLw/viewform?usp=sf_link

We exported the data from the google form to a google sheet, which we used to create a csv file. We'll analyze each of the 5 opinion questions we asked by political party as well as by race. To keep it simple, we'll divide the races into white and other, since 48% of our respondents were white. We are still unsure of which statistical test we are going to conduct. For now, we will probably conduct a t-test, but as we still haven't learned about ANOVA or chi-squared tests so we are unsure if they will be more appropriate.

Unfortunately, our sampling method was not perfect and probably introduced some bias. The google form was sent to members of our statistics class as well as members of the electrical and computer engineering (ECE) discord channel, and I believe most of our responses were from

the ECE discord, which means that our sample probably mostly consists of University of

Arizona ECE students. However, our sample size is fairly large, and we have been able to collect

84 responses so far.

Results

Given our age, status as students, and use of social media, it is unsurprising that the vast

majority (roughly 70%) of the respondents were between the ages of 18 and 21. Because of this,

our results regarding the correlation between age and our dependent variables are inconclusive at

best.

Of our 84 respondents, 16 mostly agreed with the Republican party and 68 mostly agreed

with the Democratic party. The following chart depicts the average answer for each of these

groups, with the questions listed below:

	Question 1	Question 2	Question 3	Question 4	Question 5
Republican	3.5625	3.1825	1.9375	2.625	3.5
Democrat	3.9706	4.4118	2.7206	1.6765	3.5

Question 1: How often did you practice social distancing during the pandemic?

Question 2: How often did you wear a mask during the pandemic?

Question 3: How well do you think the current government administration handled the pandemic?

Question 4: How well do you think the previous government administration handled the pandemic?

Question 5: How well do you think individuals in your life handled the pandemic?

**Each question was answered with a score between 1 (weakest) and 5 (strongest).

These responses indicate that our hypotheses were mostly correct: those who identified with the Republican party reported taking less precautions, and those who identified with the Democratic party reported taking more precautions while believing that the current administration has done a better job of handling the pandemic.

Of the 84 respondents, 15 identified as Asian or Pacific Islander, 3 identified as Black or African American, 18 identified as Hispanic or Latino, 5 identified as Middle Eastern or North African, 5 identified as Multiracial or Biracial, 40 identified as White or Caucasian, and 1 did not specify their race/ethnicity. The following chart depicts the average answer for each of these groups, with the same questions listed above:

	Question 1	Question 2	Question 3	Question 4	Question 5
Asian or Pacific Islander	3.733	3.813	1.938	2.625	3.5
Black or African American	4	4.667	2.333	1.333	2.667
Hispanic or Latino	3.611	4.389	2.889	2.167	3.722
Middle Eastern or North African	3.611	4.389	2.889	2.167	3.722
Multiracial or Biracial	4	4.2	2.2	2.2	3.8
White or Caucasian	4.05	4.325	2.425	1.65	3.425
unspecified	5	5	1	1	2

The degree to which our hypotheses are supported by these results varies greatly among the different questions. Our belief that White or Caucasian individuals would report less cautious behavior was correct, but the difference is not nearly as significant as we had imagined prior. Additionally, our belief that the results from these individuals would reflect the results of Republicans was false: individuals of every race/ethnicity were less critical of the previous administration, and White or Caucasian individuals were more critical of both administrations compared to the other races/ethnicities.
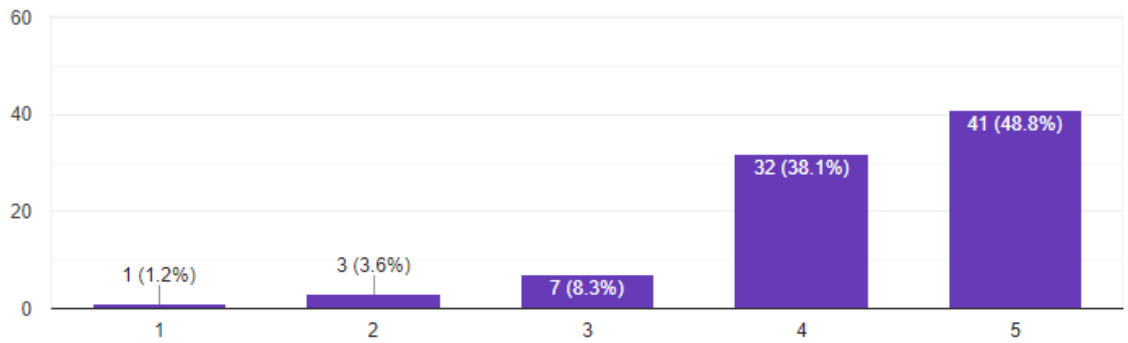
The overall results can be seen in the statistics of the survey as a whole:
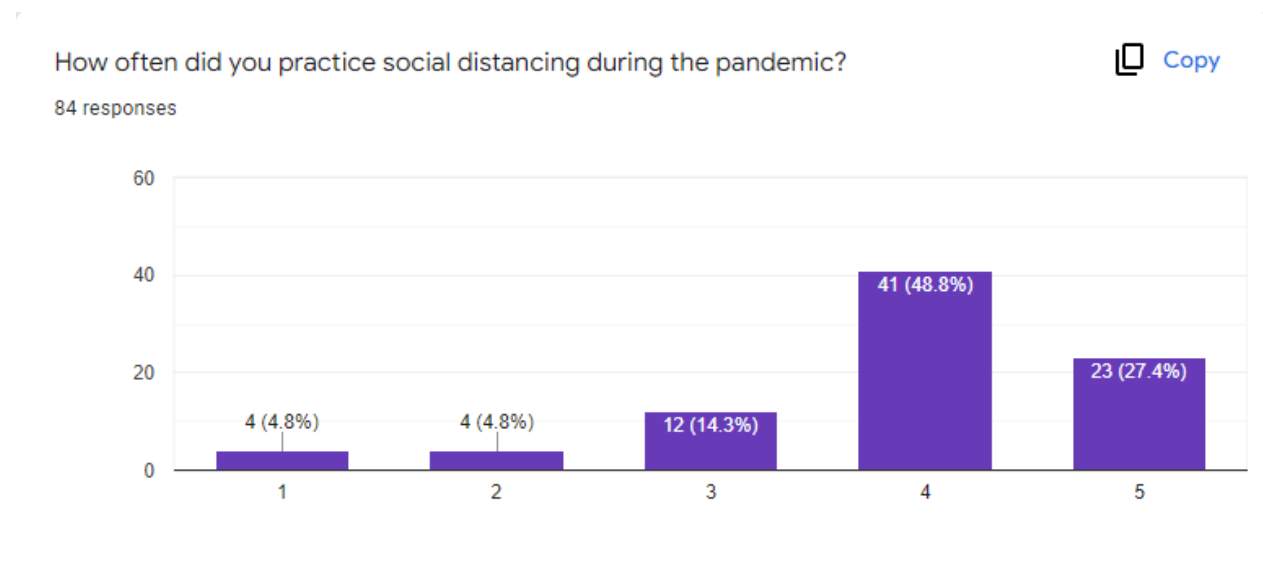
How often did you practice social distancing during the pandemic?   Copy
84 responses
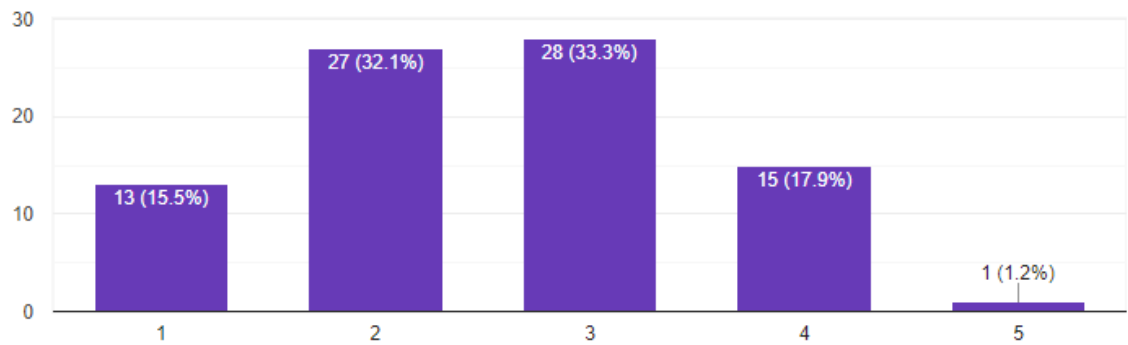
How often did you wear a mask during the pandemic?

84 responses

How well do you think the current government administration handled the pandemic?
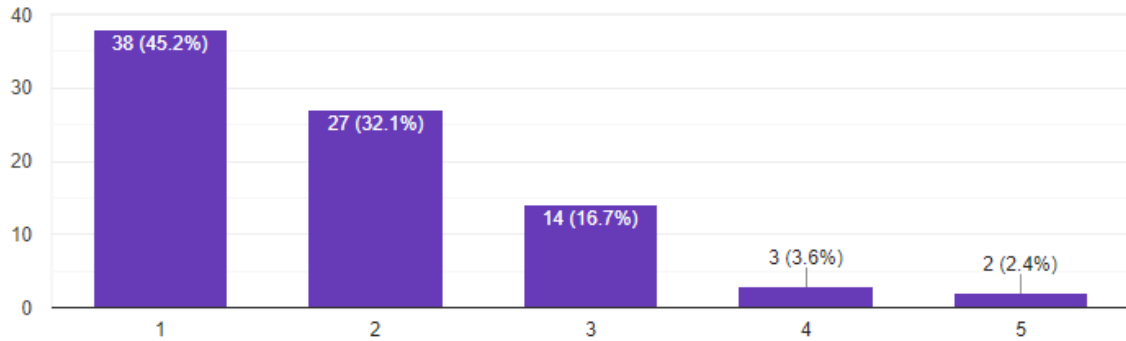
84 responses

How well do you think the previous government administration handled the pandemic?

84 responses

How well do you think individuals in your life handled the pandemic?

84 responses
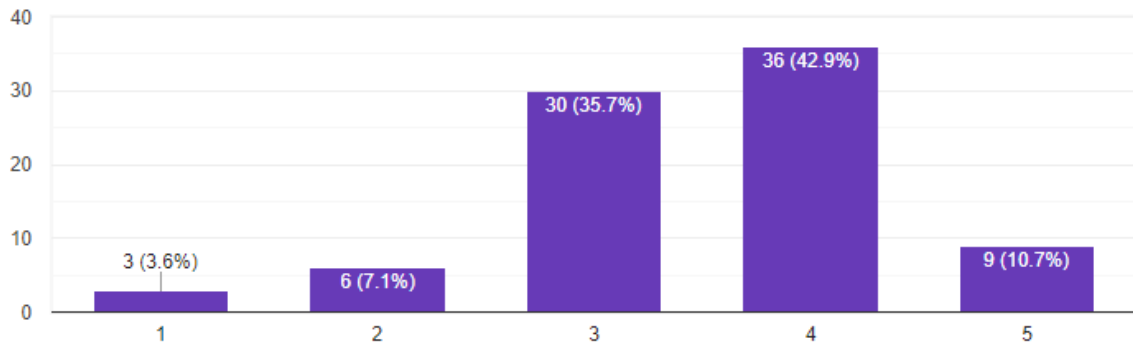
Something of note that we did not address in our hypotheses is that individuals from every category of race/ethnicity indicated that they and their everyday acquaintances were cautious, and that they all share the belief that both administrations have handled the pandemic poorly, as depicted in these charts. As mentioned, we currently believe we will use a t-test to conduct our analysis in the future.

Analysis

       In this analysis, we will conduct a 2 sample t-test for each of the 5 questions. For questions 1 through 3, our hypothesis is as follows:

$$H_0: \mu_R \le \mu_D, \qquad H_1: \mu_R > \mu_D$$

In this case μ is defined as the average response to the question (from 1 to 5). μ_R is the average response for republicans and μ_D is the average response for democrats. We expect that democrats will have a higher average response for these questions.

       For questions 4 and 5, our hypothesis is the opposite because we expect that republicans will have a higher response:

$$H_0: \mu_R \ge \mu_D, \qquad H_1: \mu_R < \mu_D$$

By plugging in the values of our means and standard deviations into a calculator, we can conduct a t-test for each question. Shown below are the results of the t-tests. We will use the standard α value of 0.05.

Q1:

$t = -1.214$, $p = 0.88 > 0.05$ so we fail to reject the null hypothesis

Q2:

$t = -2.052$, $p = 0.973 > 0.05$ so we fail to reject the null hypothesis

Q3:

$t = -3.743$, $p = 0.99964 > 0.05$ so we fail to reject

Q4:

$t = 2.875$, $p = 0.995 > 0.05$ so we fail to reject

Q5:

$t = 0$, $p = 0.5 > 0.05$ so we fail to reject

We failed to reject the null hypothesis in all five cases, which shows that our data was not enough to show that Republicans answered higher for questions 1-3, or that Democrats answered higher for questions 4-5, which are the alternative hypotheses. The p-value for the first 4 questions was very large, which means that it is very unlikely for our null hypothesis to be false, but for the fifth question our p-value wasn't as large and the mean values were exactly the same (see appendix), which indicates that republicans are probably just as likely as democrats to think the people in their lives handled the pandemic well.

After that, we move on to the analysis by race. As we did before, we will conduct a 2 sample t-test for each of the 5 questions. For questions 1 through 3, our hypothesis is as follows:

$$H_0: \mu_W \leq \mu_{NW}, \quad H_1: \mu_W > \mu_{NW}$$

μ_W is the average response for white participants and μ_D is the average response for non white participants. We expect that non white participants will have a higher average response for these questions.

For questions 4 and 5, our hypothesis is the opposite because we expect that non white participants will have a higher response:

$$H_0: \mu_W \geq \mu_{NW}, \quad H_1: \mu_W < \mu_{NW}$$

Basically, we expect white participants views to align with republicans and non-white participants' views to align with democrats. The results of our t-tests are shown below:

Q1:

t = 1.4948, p = 0.0693 > 0.05 so we fail to reject the null hypothesis

Q2:

t = 0.371, p = 0.356 > 0.05 so we fail to reject the null hypothesis

Q3:

t = -1.486, p = 0.929 > 0.05 so we fail to reject the null hypothesis

Q4:

t = -2.0109253, p = 0.02388 < 0.05 so we reject the null hypothesis

Q5:

t = -0.903719, p = 0.1845 < 0.05 so we fail to reject the null hypothesis

These results show that there isn't enough evidence to suggest that non-white participants answers are more aligned with republicans for questions 1, 2, 3, and 5, so we did not reject our null hypothesis. However, for question 4, we reject the null hypothesis, which means that non-white participants were more likely to think that the previous government administration handled the pandemic well, aligning with republican views.

The low p-value of question one indicates that there isn't strong evidence that white participants' views were more aligned with republicans when it came to social distancing. The high p-value in question 3 shows that there is strong evidence to suggest that non-white people viewed the current government's handling of the pandemic more favorably than their white counterparts.

Conclusions

Using our Google Form survey, we were able to reach a large number of people in a short amount of time. Using the results from the survey, we were able to find trends, but not definitive evidence, showing a few things:

1) Republican participants were less likely to wear masks and social distance and more likely to favor the previous administration over the current administration,

2) Democrat participants were more likely to wear masks and social distance and more likely to favor the current administration over the previous administration,

3) White/Caucasian participants were less likely to take precautionary measures, and were more critical of both administrations than participants of other races/ethnicities.

Unfortunately, we were unable to come up with any significant data or conclusions in regards to age because the overwhelming majority (over 64%) were between the ages of 19 and 21.

This brings up the primary issue with our study: due to our social circles and environments, it is likely that most of the participants were students at the University of Arizona, which limits how well the results can reflect the beliefs and behaviors of the general public population. Aside from the age statistics, this issue can also be seen when observing the political leanings of the participants: an astonishing 81% identified with the Democratic party. Our results are valuable when observing the smaller population of Arizona students, but far less so when observing those of the American population.

In the future, it would be helpful to spread the survey more randomly and to a variety of communities. This could be done using social media platforms and various news outlets, and would reach a larger, more diverse audience.

The entire world has experienced this unique situation, and it is important to understand not only how to react to and deal with these issues, but how people have and believe they should behave during times like these. It is imperative that we analyze the beliefs and trends among different populations, since these give us a better idea of the reasons for which certain things occur, such as lockdowns, subsequent protests, and political divisions.

Appendix

Statistics used for Analysis

Overall (84):

	Question 1	**Question 2**	**Question 3**	**Question 4**	**Question 5**
Mean	3.892857143	4.297619048	2.571428571	1.857142857	3.5
Standard deviation	1.01812321	0.8612090395	0.997414903	0.9835129702	0.9117704213

Democrats (68):

	Question 1	**Question 2**	**Question 3**	**Question 4**	**Question 5**
Mean	3.970588235	4.411764706	2.720588235	1.676470588	3.5
Standard deviation	0.9458564505	0.7577518618	1.005144799	0.818465555	0.8011186209

Republicans (16):

	Question 1	**Question 2**	**Question 3**	**Question 4**	**Question 5**
Mean	3.5625	3.8125	1.9375	2.625	3.5
Standard deviation	1.263262971	1.108677891	0.6800735254	1.258305739	1.316561177

Asian or Pacific Islander (15):

	Question 1	**Question 2**	**Question 3**	**Question 4**	**Question 5**
Mean	3.733333333	3.933333333	2.8	2.133333333	3.666666667
Standard deviation	1.222799287	1.162919151	1.014185106	1.060098827	0.8164965809

Black or African American (3):

	Question 1	Question 2	Question 3	Question 4	Question 5
Mean	4	4.666666667	2.333333333	1.333333333	2.666666667
Standard deviation	1	0.5773502692	1.154700538	0.5773502692	0.5773502692

Hispanic or Latino (18):

	Question 1	Question 2	Question 3	Question 4	Question 5
Mean	3.611111111	4.388888889	2.888888889	2.166666667	3.722222222
Standard deviation	1.036900863	0.8498365856	0.9633818429	1.098126747	0.8264420947

Middle Eastern or North African (2):

	Question 1	Question 2	Question 3	Question 4	Question 5
Mean	3.611111111	4.388888889	2.888888889	2.166666667	3.722222222
Standard deviation	1.036900863	0.8498365856	0.9633818429	1.098126747	0.8264420947

Multiracial or Biracial (5):

	Question 1	Question 2	Question 3	Question 4	Question 5
Mean	4	4.2	2.2	2.2	3.8
Standard deviation	0.7071067812	1.303840481	0.8366600265	1.643167673	0.8366600265

White or Caucasian (40):

	Question 1	Question 2	Question 3	Question 4	Question 5
Mean	4.05	4.325	2.425	1.65	3.425
Standard deviation	0.9857965671	0.6938373415	1.009887021	0.8022404525	0.9841695705

NOT White or Caucasian (also not including unspecified) (44):

	Question 1	Question 2	Question 3	Question 4	Question 5
Mean	3.720930233	4.255813953	2.744186047	2.069767442	3.604651163
Standard deviation	1.031078524	1.002212392	0.9535153819	1.09968283	0.8205554125

Unspecified (1):

	Question 1	Question 2	Question 3	Question 4	Question 5
Mean	5	5	1	1	2
Standard deviation	–	–	–	–	–