Asian American Discrimination: COVID-19

Spring 2021 - W241 Final Report

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Introduction

Asian Americans are one of the many minority ethnic groups in America, but they occupy a special position. While historically Asians have been discriminated against in America, they have also been praised as the “model minority” for their ability to work hard and be economically successful. However, recent political events under President Donald Trump including the US-China Trade War have once again raised racial tensions. Now with the advent of the COVID-19 pandemic that originated from Wuhan, China along with the increasing numbers of COVID infected Americans, Asian American discrimination and racially motivated violence in America is quickly on the rise. This research project aims to see if **reading personal stories from our treatment, personal stories on Asian American hate crimes, lead to more awareness of Asian American discrimination during the COVID-19 pandemic.**

Hypothesis

We hypothesize that our subjects will be more aware about Asian Americans facing discrimination in the US due to COVID-19 after receiving the treatment.

The article chosen, TIME: COVID-19 (Appendix A), not only provides statistical evidence of more Asians being targeted after the start of the pandemic, but also includes personal encounters of discrimination that Asian Americans has faced during the pandemic. We predict that by reading the provided excerpts, subjects will be more aware of the discrimination that Asian Americans are facing today, as well as awaken a sense of empathy towards what the Asian community is going through.

Experimental Details

Comparison of Potential Outcomes:

	Study Design	Potential Outcome
Experimental Group	R X O	$Y_i(1)$
Control Group	R - O	$Y_i(0)$

Table 1: *Study design and potential outcomes organization table.*

As shown in Table 1 above, participants in our study will be randomly assigned into treatment and control groups. The treatment group will receive the treatment before answering the survey questions related to our outcome measurement, while the control group will not receive any treatment and proceed directly to the survey questions related to our outcome measurement. We will be comparing the potential outcome of the treatment group given that they received the treatment against the potential outcome of those in the control group given that they did not receive any treatment. This comparison of potential outcomes will provide us with an intention-to-treat estimate (ITT) to measure and analyze.

Randomization Process

We created our survey and implemented our randomization process through Qualtrics. Our survey participants are randomly assigned to our treatment and control groups equally upon entering the survey. We also decided to randomize our post treatment questions to reduce survey bias. This was done to eliminate the chance that the specific order of our survey questions does not affect the survey participant's answers.

To gather survey participants for this study, we distributed our survey through Berkeley's Xlab. This involved combining our survey with questions and treatments from other survey groups within the W241 Class of Spring 2020. We also observed that another team also had a survey on COVID-19 which was presented to survey participants before our survey. We are unsure whether this has an effect on our survey results and analysis.

Treatment:

Our treatment was a TIME article titled 'I Will Not Stand Silent.' 10 Asian Americans Reflect on Racism During the Pandemic and the Need for Equality. The article goes into general statistics of how discrimination and hate crimes have increased this past year and gathered personal experiences of discrimination from multiple sources. Each of the stories include a detailed encounter of a hate crime and their thoughts about the situation. Due to the length of the article, a 10 minute read, we decided to only include 2 excerpts for our treatment, but still gave subjects the option to read the full article by providing a link. We also added in two comprehensive questions to check for any non-compliers as shown in Appendix B.

Observed Outcome Variable

Out of all of our post treatment questions, our team decided to use “To what extent do you agree with the statement: ‘Asian Americans are being targeted due to COVID-19.’?” as our outcome variable. Subjects were presented with a 5 point Likert scale, which we operationalized into an ordinal variable by assigning a range from 1-5 with 1 being “strongly disagree” and 5 being “strongly agree”.

CONSORT document:

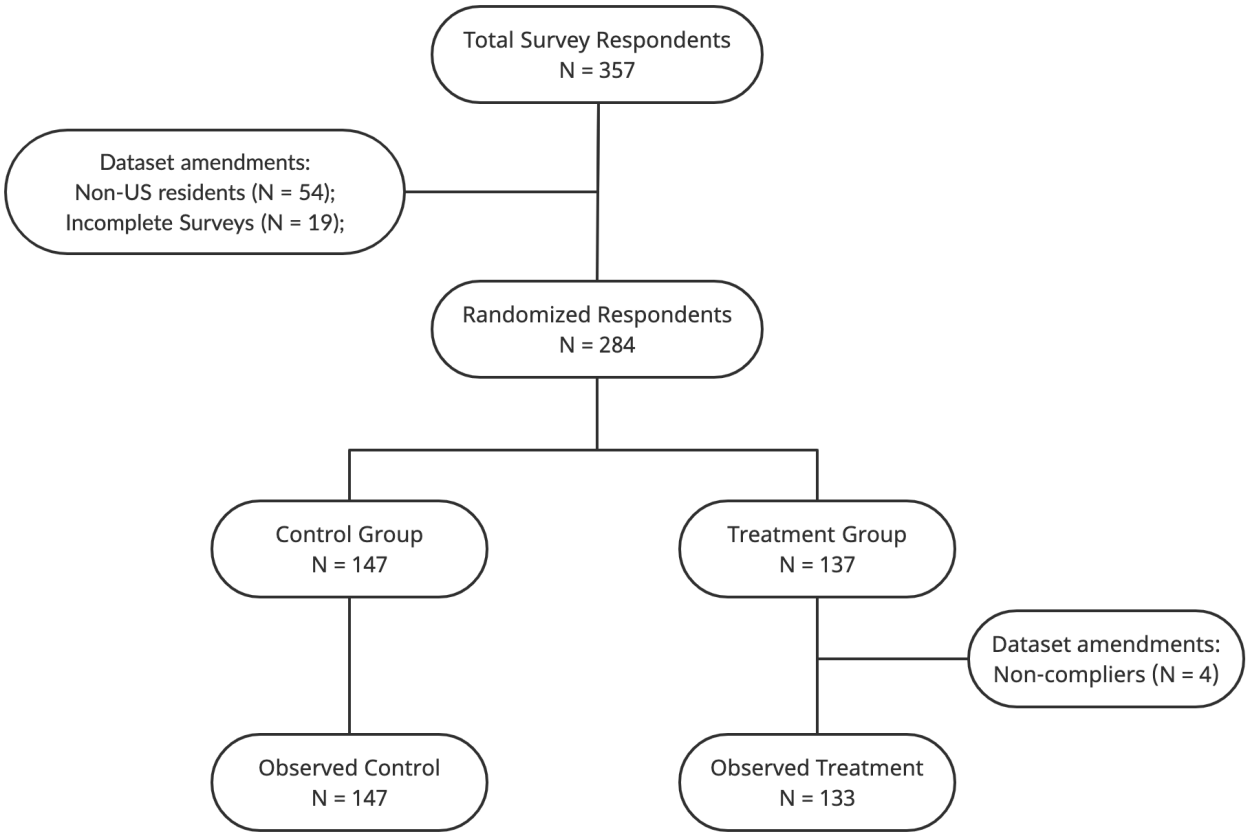

Figure 1: *CONSORT document detailing randomization and inclusion/exclusion of respondents.*

The CONSORT document shown in Figure 1 above gives an accurate representation of how our survey data was cleaned. The flow diagram shows the progress of all the subjects throughout the trial. From the Berkeley Xlab survey, we received a total of 357 responses. Of these responses, we removed non-US residents because we are interested in studying the US populace and Asian discrimination occuring specificially in the US. We also removed those who did not complete our portion of the survey, which includes those who did not answer the question for our outcome variable and those who chose not to disclose their race. This left us with 284 respondents that were randomized between control and treatment groups. In our treatment group, we included 2 simple comprehension questions after receiving the treatment and identified non-compliers as those who answered both comprehension questions incorrectly. Given our compliance rate was 97%, we decided to estimate the average treatment effect as the ITT, as the difference for the adjusted CACE was negligible.

Power Calculation:

```
     Two-sample t test power calculation

              n = 100
          delta = 0.5
             sd = 1
      sig.level = 0.05
          power = 0.9404272
    alternative = two.sided

NOTE: n is number in *each* group
```

Figure 2: *Pre-test power calculation using the "pwr" package in R.*

We conducted a pre-experiment power analysis of our potential outcome using the "pwr" package in R and based our power calculation on the two-sample t-test. Through our study design, we estimated that we would roughly have about 100 survey participants in treatment and another 100 in control. We believed, prior to collecting survey participants and conducting exploratory data analysis, that people were not aware of the rising Asian American discrimination due to COVID-19 and would be shocked when reading the treatment articles. Thus, we hypothesized that our treatment would have a medium effect size and therefore used a Cohen's d effect size of 0.5 for the power calculation. We have 0.94 power to correctly reject the null hypothesis of our treatment having no effect at the 0.05 significance level (Figure 2).

Experimental Result and Analysis

	Est.	S.E.	t value	p
(Intercept)	4.381	0.07398	59.22	4.087e-161
assignedTreatment	0.1008	0.1012	0.996	0.3201

Table 2: *Estimated coefficients table of the linear regression model fitting the assigned treatment indicator variable to the outcome variable.*

Our key estimate for this project is that our treatment has led to an ITT of 0.1008. With a p-value of 0.3021 and a 95% confidence interval of (0.089, 0.113), this estimate cannot be taken as statistically significant (Table 2). While our 95% confidence interval is slightly above zero, our results indicate that we have a minimal to no treatment effect.

Thus, we must fail to reject the null hypothesis that our **subjects will not be more aware about Asian Americans facing discrimination in the US due to COVID-19 after receiving treatment.**

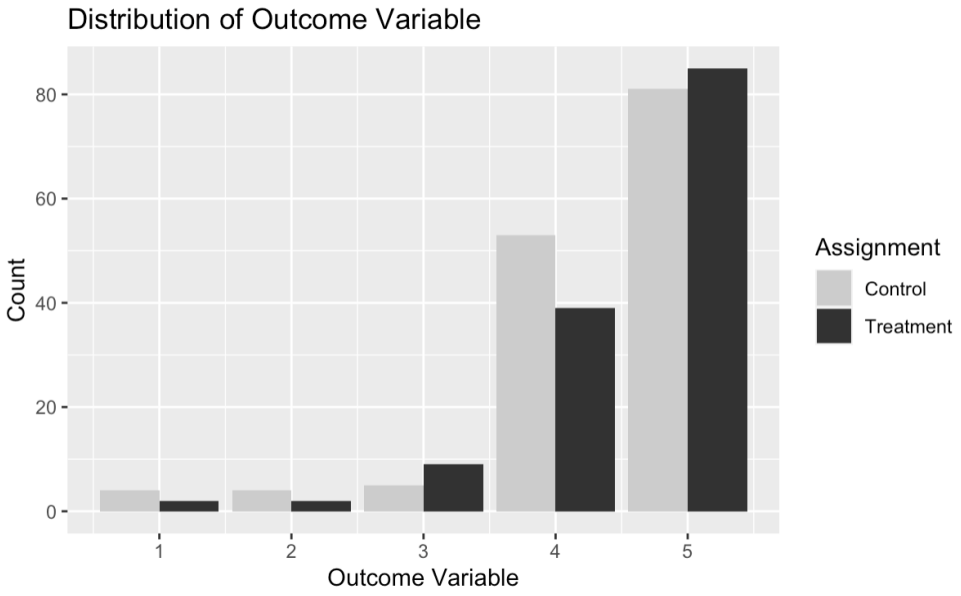

***Figure 3**: Graph displaying the observed distribution of our outcome variable for survey respondents in both the control and treatment groups.*

We speculate that our small ITT was linked to the recent spotlight of Asian American discrimination and hate crimes presented on mainstream news. The Berkeley Xlab survey was being filled out by survey participants on April 6 through April 12, 2020. But on March 17, 2020, the mainstream news reported a man going on a shooting rampage at three Asian-owned massage businesses in Cherokee Country, Georgia. After this tragic event, there were several marches and rallies in major US cities, including Chicago, San Francisco, and Los Angeles, through the end of March. These rallies raised the issue of Asian American discrimination caused by the pandemic into the national spotlight and increased awareness throughout the country. Figure 3 suggest that our survey participants were already likely aware of Asian American discrimination from the COVID-19 pandemic prior to entering our study. If there was a significant effect from our treatment, it would require a follow up study with a significantly larger sample size to potentially observe such an effect.

Exploratory Data Analysis

		Asian	Hispanic or Latino	Non-Hispanic White	Other	Total
Control	No	71	11	34	14	130
	Yes	8	2	4	3	17
	Total	79	13	38	17	147
Treatment	No	70	11	33	6	120
	Yes	7	4	4	2	17
	Total	77	15	37	8	137
Total		156	28	75	25	284

Table 3: *Reports the number of respondents based on the subgroups of interest. Columns on the left split subgroups by treatment vs. control and infected by COVID-19 ("Yes") vs. not infected by COVID-19 ("No"). Columns on the top split subgroups by race. Aggregated totals are presented on the rightmost column and bottom row.*

In addition to our estimate of the ITT calculated from our basic linear regression model, we were interested in conducting further exploratory analysis of the data of two covariates: whether participants were infected by COVID-19 and their self-reported race. We were curious as to whether these two covariates would lead to a heterogeneous treatment effect. We believe that if participants were previously infected with COVID-19, they might respond differently to our treatment compared to people who were not infected.

Since our study was on whether our treatment would lead to more awareness of Asian American discrimination due to the pandemic, we had a prior belief that Asian Americans would respond to the treatment differently compared to the other races. This led to our motivation for wanting to see how each racial category would respond to the treatment. We started with seven categories of race: Asian, Hispanic and Latino, Non-Hispanic White, Black or African American, Native Hawaiian or Pacific Islander, Native American, and Other. Due to the small sample size that we received from Black or African American, Native Hawaiian or Pacific Islander, Native American, we combined these participants under Other. Thus, reducing our categories to Asian, Hispanic and Latino, Non-Hispanic White, and Other (Table 3).

Furthermore, given that COVID-19 has disproportionately impacted minorities in the US, we wanted to create a triple interaction model to investigate whether an interaction between treatment, infected by COVID, and race exist. Due to the complexity

of interpreting such a model, we decided to first create two treatment-covariate interaction models.

Heterogeneous Treatment Effect with Participants Infected with COVID-19:

```
Analysis of Variance Table

Model 1: targeted ~ assigned + infected
Model 2: targeted ~ assigned + infected + assigned * infected
  Res.Df    RSS Df Sum of Sq      F Pr(>F)
1    281 204.24
2    280 203.30  1   0.94127 1.2964 0.2559
```

Figure 4: *Results from an ANOVA F-test comparing a model with the assigned indicator plus an indicator for whether the participant was infected with COVID vs. the same model, but with an additional interaction variable.*

We had a strong prior belief that participants would respond to the treatment differently if they have been personally infected with COVID-19. As such, we performed an ANOVA F-test to determine whether a heterogeneous treatment effect exists. Figure 4 reveals that this interaction is statistically insignificant with a p-value of 0.2559 and we fail to reject the null hypothesis that being infected with COVID-19 does not lead to a heterogeneous treatment effect.

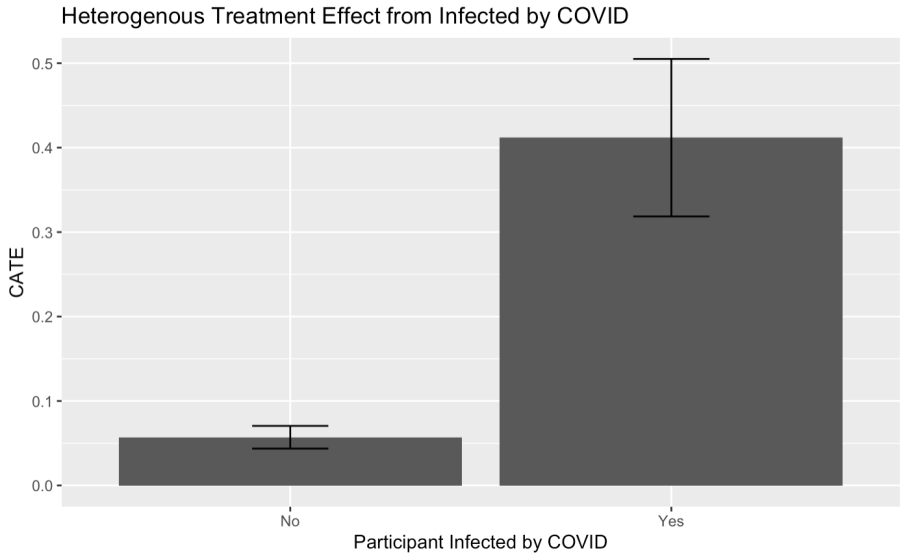

Figure 5: *Bar plot presenting heterogeneous treatment effect by COVID infected along with the 95% confidence intervals.*

However, looking at the calculated CATE suggests that this insignificance is due to a lack of power. Figure 5 presents that participants infected with COVID have a CATE of 0.412 with a relatively large 95% confidence interval of (0.318, 0.505). Meanwhile, participants that are not infected have a CATE of 0.057 with a 95% confidence interval of (0.044, 0.070). The large confidence interval is due to this study only having 34 survey respondents infected with COVID. In contrast, 250 survey respondents were not infected with COVID which leads to a smaller confidence interval. The practical significance of this finding suggests that there is an interaction effect and participants infected by COVID-19 are more responsive to the treatment. However, we recommend that future studies will need to be conducted, with a larger balanced sample size, before concluding the presence of this heterogeneous treatment effect.

Heterogeneous Treatment Effect with Race:

Race <chr>	Number_of_Participants <int>	CATE <dbl>	Standard_Deviation <dbl>
Asian	156	0.10110143	0.1401353
Hispanic or Latino	28	-0.03589744	0.1956654
Non-Hispanic White	75	0.27667141	0.1977083
Other	25	-0.60294118	0.4126266

Table 4: *Reporting the conditional average treatment effect by racial group. Respondents identified as either Asian, Hispanic or Latino, Non-Hispanic White, or Other.*

Similarly, while conducting our exploratory analysis, we had prior intuition that the treatment would have varying effects depending on which race the respondent identified as. Given the nature of the outcome variable on explicit discrimination beliefs, we hypothesized that due to the different experiences with discrimination that each racial group in America has experienced, the treatment effect for respondents may vary by race. We found that the estimated CATE for Non-Hispanic Whites was 0.277 with a 95% confidence interval of (0.232, 0.321), which is larger than our estimated ITT of 0.101. The estimated CATE for Asians of 0.101 with a 95% confidence interval of (0.079, 0.123) was very similar to the estimated ITT. For Other respondents, the estimated CATE was -0.603 with a 95% confidence interval of (-0.765, -0.441) which was a large negative contrast to the ITT. The estimated CATE for Hispanic or Latino respondents was -0.036 with a 95% confidence interval of (-0.108, 0.037) which indicated a lack of a treatment effect for this subgroup (Table 4).

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Analysis of Variance Table

Model 1: targeted ~ assigned + agg_race
Model 2: targeted ~ assigned + agg_race + assigned * agg_race
  Res.Df    RSS Df Sum of Sq      F Pr(>F)
1    279 200.19
2    276 196.82  3    3.3733 1.5768 0.1952
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Figure 6: *Results of an ANOVA F-test comparing regression models including the treatment assignment indicator and race indicators for the analysis of the treatment-by-race interactions.*

We then ran an ANOVA F-test to determine the significance of this heterogeneous treatment effect. The p-value 0.1952 of the F-test shown in Figure 6 indicates that the interaction term is statistically insignificant. We are unable to reject the null hypothesis that the treatment-by-race interaction does not produce a heterogeneous treatment effect.

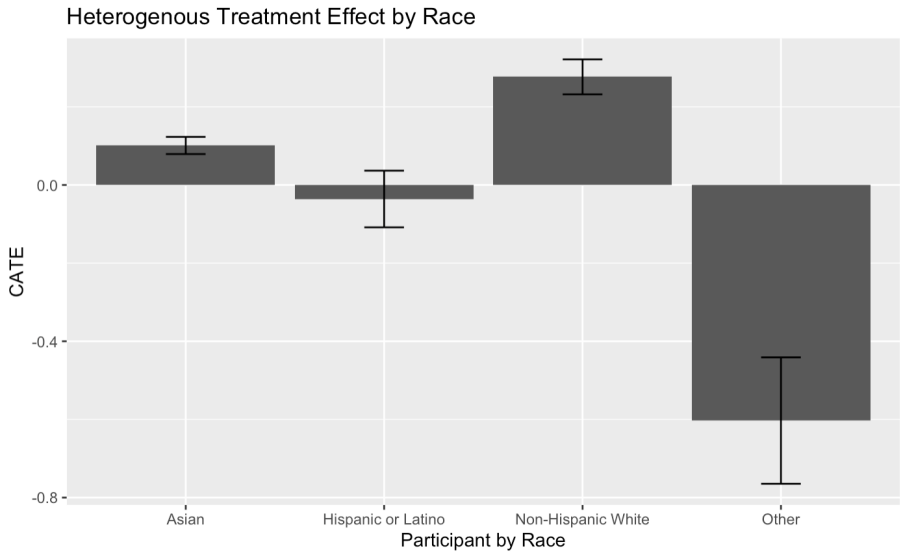

Figure 7: *Bar plot presenting estimated heterogeneous treatment effects and 95% confidence intervals by race.*

However, looking at the differences in CATEs and 95% confidence intervals displayed in Figure 7, we propose that the heterogeneous treat effect by race may be a variable of interest for future studies. We recommend that future studies implement stratified sampling of racial groups in the United States.

Conclusion

In conclusion, our experiment showed no statistically significant result for our key estimate. We are unable to reject the null hypothesis that our treatment of reading personal stories about Asian American discrimination does not increase awareness of Asian American discrimination due to COVID-19 in the United States. We speculate that the small ITT is linked to the increased focus of Asian American discrimination in mainstream news.

Due to this disappointing discovery, we performed additional exploratory research to investigate possible heterogeneous treatment effects from two other covariates: whether survey participants were infected by COVID-19 and their reported race. Our results suggest that infection by COVID-19 had led to a heterogeneous treatment effect despite this result not being statistically significant. We believe this statistical insignificance is due to a small fraction of our survey participants infected with COVID-19. For race, we also observed a lack of statistical significance for treatment by race interaction. However, our calculated CATE also potentially suggests the presence of a heterogeneous treatment effect. Thus, we recommend investigating both of these potential interactions in a future study.

Given that both interaction models showed suggestive results, but were statistically insignificant, we decided not to implement a triple interaction model. Since both of our results suggest that we are suffering due to a lack of statistical power, we concluded that the triple interaction model would suffer more from this due to further division of the participants into smaller subgroups. As such, we hope that in a future study with a larger sample size, we can investigate such a model.

Appendix

Appendix A: *https://time.com/5858649/racism-coronavirus/*

"I didn't think that if he shoved me into the tracks I'd have the physical energy to crawl back up," says Tsui, a registered nurse pursuing a doctorate of nursing practice in psychiatric mental health at Columbia University. Tsui was transferring trains on his way home after picking up N95 masks when he was approached by a man on the platform.

The man asked, "You're Chinese, right?" Tsui responded that he was Chinese American, and the man told Tsui he should go back to his country, citing the 2003 SARS outbreak as another example of "all these sicknesses" spread by "chinks." The man kept coming closer and closer to Tsui, who was forced to step toward the edge of the platform.

"Leave him alone. Can't you see he's a nurse? That he's wearing scrubs?" said a bystander, who Tsui says appeared to be Latino. After the bystander threatened to record the incident and call the police, the aggressor said that he should "go back to [his] country too."

When the train finally arrived, the aggressor sat right across from Tsui and glared at him the entire ride, mouthing, "I'm watching you." Throughout the ride, Tsui debated whether he should get off the train to escape but feared the man would follow him without anyone else to bear witness to what might happen.

Tsui says the current antiracism movements are important, but the U.S. has a long way to go to achieve true equality. "One thing's for sure, it's definitely not an overnight thing—I am skeptical that people can be suddenly woke after reading a few books off the recommended book lists," he says."Let's be honest, before George Floyd, Breonna Taylor and Ahmaud Arbery, there were many more. Black people have been calling out in pain and calling for help for a very long time."

What was Justin Tsui's profession?

- ○ Teacher
- ○ Nurse
- ○ Cashier
- ○ Dancer
- ○ Chef

Grey was out walking her dog on March 17 when she was body-slammed by a stranger. The aggressor also kicked Grey's dog, which howled in pain. In the moments before the attack, Grey was bent over, picking up her dog's waste, and her hood fell over her head. She couldn't see the stranger approaching and was already in a vulnerable position.

Grey was the only one on the block wearing a mask at the time, and her eyes were visible above it—"That's probably what immediately identified me as Asian to them," she says. Later, she shared the incident on Instagram, using her platform to spark conversation and bring awareness to the issue. "In my last post about the racism I've experienced during this virus hysteria, I expressed gratitude that at least I wasn't assaulted. I guess I can't claim that anymore," wrote Grey, who urged her nearly 400,000 followers to "take the time to be extra empathetic and kind to strangers to hopefully make up for their treatment from the rest of the world."

"As horrifying, triggering and deplorable as what happened to me was, it was the one and only time I actually felt like there could be bodily harm inflicted on me," she says. "Some people live in fear of that all the time."

What happened to Eugenie Grey when she was out walking her dog?

- ○ Someone spit on her
- ○ Someone called her a racial slur
- ○ Someone body-slammed her and kicked her dog
- ○ Someone refused to serve her at a restaurant
- ○ Someone followed her for three blocks

Appendix B: *The excerpts and comprehensive questions of both personal stories shown in our treatment*