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W241 Section2 Essay2

Research Question: Can climate change awareness cause change in perception towards environment?

Climate Change : A Reality or A Hoax?

The world is currently divided into two groups: one which acknowledges that climate change is real and other which calls climate change a hoax. With the political leaders elected such as president Trump who belong to the latter group, the naysayers have become more in number and more powerful in terms of policy decisions. There have been a lot of decisions taken by the leaders such as boycotting the climate change accord, reducing the checks and balances on the corporations which are polluting the environment. So a pertinent question amongst the scientists is how do we increase the number of people in the group which agree that climate change is real and a threat to our existence.

According to a global survey, *Global survey: Where in the world is most and least aware of climate change?*[1], world's one third of the adult population has not even heard of the term climate change. The awareness was abysmal is the developing and underdeveloped countries. A more alarming finding by the survey was that amongst the developed countries where the awareness was high the concern was low. According to the survey in the US only 64% of the people who were aware of climate change were concerned about climate change and thought of it as a threat!

The researchers in the climate change field think that the silver bullet through which humanity can overturn the threats of climate change is education and awareness. Each one of us has to take action to curb down our carbon footprint. Before anybody takes a corrective action she should be convinced about the threat climate change poses. Above all if we have to make any progress climate change should not be considered a hoax. There are anti-climate change awareness program also wildly popular which poses additional challenge for humanity. General public has been bombarded with several conflicting views on the topic and one view lowers the efficacy of the other. In such situations public generally turn to their leaders and idol figures for their views. So in the current political landscape it is paramount that effective ways of making people aware should be adopted by the climate change supporters.

How much does awareness and education help? Is it really helpful in changing somebody's perspective on climate change or people who have formed perception cannot be changed? With current leader's speeches and other powerful people who consider climate change not a threat would awareness program fare well? Can the awareness program swing someone from a non-believer into believer group? How effective is the awareness program when compared to anti-climate change propaganda? These are some of the questions which can be answered through field experiment as we want to access the causal effect of the educational program on the outlook of people towards environment.

Research Question

Through this project I want to quantify the effect the awareness program on someone's outlook towards the climate change. I also want to quantify if the awareness program are at least as effective as anti-climate change propaganda.

Climate change is going to affect the whole globe and it is our responsibility to take action now. On a lighter note to quote Sheldon from *The Big Bang Theory* : Swimming would not be an optional but a required skill in the coming future. According to a report[2] the world has only till 2030 to take action against climate change else it would be irreversible and might start the end of humans on the planet. The current approach which is being undertaken is to make people more aware by spreading the word about how climate change is affecting all. But the efficacy of the program in actually changing someone's viewpoint is what I intend to measure through this project. If the outcome has a positive effect then we can encourage the policy makers introduce policies which will reinforce the awareness on a regular basis for general public. Such as making it mandatory for manufacturers to not only print the recycling ways on the products but also what happens if the product is not recycled and hence reinforcing the awareness on an everyday basis.

If the research doesn't provide enough evidence that awareness programs have positive effect then we need to come up with new strategies to combat the problem which can resonate with the public in general.

If the research concludes that ant-climate change propaganda works but not the awareness program then we have a double whammy. This would mean that the general public has been brought up such that the environment concern is not ingrained in us and we are likely to ignore environment if its convenient. If this is true then we would need to change the education system and other systems which can ingrain the culture of environment protection in us.

Research Design

Ideal Experiment Design

An ideal experiment to ascertain the effects of awareness program would be to recruit subjects from all the countries with large sample size (>1000) and then subject a few to treatments and others to control randomly. We would also need to to employ blocking on factors such as the country from which the subject belong to, educational qualifications, socioeconomic background.

The subjects would be posed different likert based rating question about environmental issues. The treatment groups would be divided into two groups: one would be shown informative videos/articles about climate change and other group would be shown anti-climate change videos/articles. Then their response to the survey questions would be noted down. Through this

we can calculate the treatment effects compared to control group who respond to the survey without any treatment videos shown.

The ideal experiment would have to span across many countries and with many subjects. Since we don't have that much resources I would go in detail about the constrained experiment which we can do as part of the course.

Constrained Experiment Design

Recruitment of subjects: To recruit the subjects we will employ the friends,acquaintances,family and colleagues of the group members involved in the experiment. We will have most of the subjects from the countries where the group members are from and also have most probably about the same educational qualifications and socioeconomic background but we can still perform the experiment on them as they would still come from different upbringing. In the end we might also conclude on the population the sample represents rather than whole globe. To encourage people to participate we might have a lottery to give away amazon gift cards to the subjects.

Randomization and Assignment: Once the subjects have been recruited we can block them based on countries if we have a sizeable amount of different countries. We will also block by age groups if that is possible. Then inside each block we will randomly assign subjects to 3 groups namely Control, Positive treatment and Negative treatment. The random assignment would be done such that we have about an equal number of subjects in each of the groups.

Covariates: For each of the subjects we will also note their education qualification, occupation, urban or rural residency, sex, political affiliations. The reason why we would also take a note of these covariates as these can influence the outcomes too and not only the treatments. And if we have an imbalanced number of subjects in treatment and control group along these covariates then that would raise an alarm on if we are comparing apples to apples. Including the covariates would also increase the precision of the estimate of the treatment effect when we employ difference in difference methodology for estimating average treatment effect or use regression.

Treatment: We will have two groups of treatment. One with positive treatment where we will show them the awareness videos/articles regarding climate change. The other group would be shown the videos/articles which supports the notion that climate change is a hoax. The control group would not be shown any videos/articles.

Measuring outcomes: All the subjects would be asked to fill a likert scale survey questions which will be about the how sensitive the subject is about climate change. The treatment groups will be asked to fill the survey after they receive the treatment while control group without any treatment. For each of the questions we would measure the average treatment effect and also an average treatment effect across all the questions. The questions would only have three options Agree, Disagree and Neutral so that we have accurate measurements when compared to giving options to rate something like between 1 to 5 or 1 to 10. The response Agree would be given point of 1, Neutral a 0 and Disagree a -1. Through this we will be able to get the average

treatment effect of both the negative treatment and positive treatment. Then measure the p value using randomization inference assuming sharp null hypothesis. We will also calculate the confidence interval and also determine if the treatment effect is substantive. We will also calculate the power of the experiment using an alpha value at 0.05. The tests will be one tailed tests when determining the statistical significance. We would also use regression analysis with different covariates to see if the treatment has statistical significant effect. Regression would be used for calculating the statistical significance if we have high sample size.

Pilot Study

We will create a pilot study with a small number of subjects (between 10 to 15) initially so that we can refine our recruiting mechanism, survey questions, our methodology of doing the statistical analysis and randomization strategy. Pilot study would also help us in fine tuning the covariates and doing checks and balances on whether the treatment and control have balance on covariates. This will give us enough time to refine the final version of the experiment which will be done with more number of subjects.

References:

1. **https://www.carbonbrief.org/global-survey-where-in-the-world-is-most-and-least-aware-of-climate-change**
2. **https://www.cnn.com/2018/10/07/world/climate-change-new-ipcc-report-wxc/index.html**
3. **https://climate.nasa.gov/**