MACS 30000 Assignment 4

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Problem 1.

(a) I found the Visual Memory Experiment interesting to me.

(b) The reward is 0.10$. In addition, it said that the bonus up to 1.50$.

(c) The qualifications required are the participant's location should be in U.S. and the participant's HIT approval rate(%) is not less than 95.

(d) The allotted time is 60 minutes. Thus, the base hourly rate is 0.10$ per hour. If you get the bonus, then the hourly rate is 1.60$ per hour.

(e) The job expires on December 2nd, 2018.

(f) The most this project would cost the HIT experiment creator if 1 million people participated in the task is when all 1 million people all get the bonus money. Thus, the cost will be 1.60$ times 1 million, which is 1.6 million dollars.

Problem 2.

The research question that the paper proposed is that how people's reaction to the electricity conservation "nudge" of "providing feedback to households on own and peers' home electricity usage

in a home electricity report" be affected by the environmentalist ideology (Costa and Kahn, 2013, p680)?

In order to investigate the research question, the authors collect the primary data set for this study, which is the "residential billing data from January 2007 to October 2009"(Costa and Kahn, 2013, p685) provided by a large California utility district. This data set contains information on energy consumption and types of energy purchased, including "information on kilowatt hours purchased per billing cycle, the length of the billing cycle (measured in days), whether the house uses electric heat, and whether the household is enrolled in the electric utility's program to purchase energy from renewable sources"(Costa and Kahn, 2013, p.685). The authors also retrieved the data of "individual voter registration and marketing data for March 2009" to identify the political affiliation and donation amount to environmental organizations of half households in the sample (Costa and Kahn, 2013, p685). In addition, they utilized a data set to help them make the households ideology from HER (Home Energy Report) clear (Costa and Kahn, 2013, p685).

In this paper's experiment, households from "85 census tracts with a high density of single-family homes" are divided into treatment and control groups. They selected households that "have a current account with the electric utility that had been active for at least one year, could not be living in apartment buildings, and had to be living in a house with square footage between 250 and 99,998 square feet" (Costa and Kahn, 2013, p683) and assign them to treatment and control groups until both had size of roughly 35000 households. The control group consists of "49,000 households who have never received a HER", while the treatment group is around 35,000 households who received HER from the electric utility during March 14th to May 9th, 2008 (Costa and Kahn, 2013, p683). The treatment is receiving monthly or quarterly HER with their and peers electricity consumption information from the electric utility.

In the previous work of Schultz et al.(2007), the authors controlled the participants heterogeneity by whether they were "above or below the average of the energy consumption" (p. 430). However, Costa and Kahn(2013) further included the fixed effects of month/year, average daily tem-

perature within the billing cycle, whether the house is an electric house, block characteristics, house characteristics, the households electricity usage in 2006, and the age of the head of the household as control variables.

Finally they found that compared to conservatives, liberal households are more willing to receive HER reports on peer comparisons information and consequently reduce electricity consumption.

Problem 3.

(a) If the variation among clinics is very large and the variation among the patients in the clinics is small, we should focus on a wide range of clinics. For example, spatially, the districts' wealth status are different significantly, a small number of clinics cannot represent all the clinics, since the patients' decision of taking vaccine will be affected by their income level. Since we want to make our sample to be representative to the population, we should take more clinics to make the selected clinics representative to the 150 clinics and take less patients in each clinics because the patients are not different much. According to the same reason, if the variation among clinics is small, but the variation among patients is large, we should take less clinics and select more patients in each clinics instead.

(b) The smallest effect size depends on the precision level researchers want. If we want higher level of precision, we might want to decrease the standard error of the average treatment effect to a certain level by increasing the sample size, which is the number of patients.

Another factor is the absolute and relative variability of average outcome under treatment and control. When the absolute variability of them are large, or not balanced, we may increase the sample size to make our estimation more precise.

References

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