UBC Social Ecological Economic Development Studies (SEEDS) Sustainability Program

Student Research Report

The Impact of Choice Paralysis on Charitable Giving to Fight Climate Change

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University of British Columbia

PSYC 321

Themes: Climate, Community

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Executive Summary

Previous studies have discovered that in a decision making process with a large number of options can result in choice paralysis. Our current study seeks to investigate the relationship between the number of choices and its effect on people's motivation towards donating to climate change mitigation actions. This experiment consists of three conditions with varying number of options of one, three, and six choices, to find the effect of choices on motivation to donate to a hypothetical $100 towards various climate change actions by measuring the amount of money donated. Results showed that the number of options do influence people's motivation towards donating. A significant difference was observed while comparing the condition with three donation options to the condition with one option as well as the condition with six options. Our results show that including 3 options might be the optimal amount for people to make decisions on donation. However, results need to be replicated with further experimental designs involving in-person questionnaire and interviews.

Keywords: choice paralysis, climate change, motivation, decision making, donation

Introduction

Autonomy - the right to make uncoerced decisions - has been postulated to be one of the three important psychological needs required to increase one's sense of self-motivation, well-being, and mental health (Ryan & Deci, 2000). According to Ryan and Deci's self-determination theory, intrinsic motivation cannot be cultivated unless a perceived sense of autonomy has been established. In fact, more recent research in a cross-national study has shown that individualism - including traits such as freedom, autonomy and choice - is an even better predictor of national well-being than economic variables (Fischer & Boer, 2011). However, a study on jam sales at an upscale grocery store has discovered that an overwhelming amount of options can cause individuals to experience choice paralysis (Iyengar & Lepper, 2000). Displaying a limited amount of jams (6 varieties) in one condition led to a higher level of sales than compared with displaying a large amount (24 varieties) in another condition. This study showed that an overwhelming amount of choices can, in fact, cause participants become indecisive and show inaction in in buying any jam at all.

To apply this finding into sustainable practice, we developed an experiment to measure participants willingness to donate to charitable causes intending to mitigate climate change. Because of the choice paralysis theory, we predict that, given a hypothetical one hundred dollars of winnings, participants in the condition with more sustainability options to donate to will donate less money, or not at all, than in the condition where fewer donation options are available to them.

Research Question and Hypothesis

This study aims to answer the following research question: "Does the number of choices influence people's motivation to donate to climate change actions?" We predict that the amount of option will influence motivation. In this study, we tested a hypothesis on choice paralysis - that an increase in the number of options given will lower people's motivation to donate to climate change actions. We expect to observe an inverse effect between the two variables. More specifically, participants provided with fewer number of options to donate towards climate change actions will donate larger amounts than those provided with greater number of options.

Methods

Participants

A total of 120 (77 women and 42 men) post secondary students participated in this study. They were randomly assigned to condition 1 (n=39), condition 2 (n=40), or condition 3 (n=40). One participant in condition 1 was eliminated for giving an inaccurate answer that exceeded the $100 range. All students provided informed consent approved by the university's institutional review board.

Conditions

Participants were randomly assigned to one of three conditions. Condition 1 provided participants with one option to donate to a climate changes cause: environmental sustainability association. Condition 2 provided participants with three options to donate to various climate changes causes: water resources, land management resources, and energy efficiency resources. Condition 3 provided participants with six options to donate to various climate changes causes: water resources, land management, energy efficiency, ocean conservation, forest resources, and renewable energy resources.

Measures

This study is an experimental design where participants are assigned to one of three conditions. We randomly assigned participants to the three conditions. Participants will complete an online survey

with a money allocating task, where they will donate to different departments in an environmental organization with a limit of $100. Our dependent variable is the participants' motivation to donate to environmental causes measured by the percentage of money, out of $100, donated to different departments within the environmental organization. Our independent variable is the number of options. We manipulated it by changing the number of options of environmental organizations and measured how much they donated under the three conditions. We also measured participants' knowledge of climate change through a survey designed by National Geographic before the money allocating task.

Procedure

We randomly assigned our group members into three conditions by drawing lots, with two members per condition. Each of our 6 group members recruited 20 participants for their respective conditions. Participants will receive a web link to an online survey. First, they will sign a consent form to ensure informed consent in agreeing to participate in our experiment. In the next page, they will be asked to fill in their demographic information including gender, ethnicity and year of education. After that, participants will complete a climate change knowledge quiz designed by National Geographic (2017). In the next page, they will read the scenario the is equivalent across all three conditions. Participants are informed about a hypothetical UBC environmental sustainability association supporting the mitigation of climate change. The organization has a total of three departments and each of them has two teams. In the following page, participants are informed of what these departments are and the teams aim to accomplish. Next, participants take part in the organization's lucky draw event and will hypothetically win $100. In the last step, participants will be asked to allocate their winnings, into one, three, or six of the organization's teams (choices), depending on the condition they are assigned to. They are reminded that it is not mandatory to donate; they can keep any money they choose not to donate. The screenshots of the online survey we have used is in the appendix(Figure 5--12).

Results

Donation amount

The participants were randomly assigned to three condition: one choice, three choices and six choices. One participant who stated a donation amount outside of our indicated range was dropped from our analysis. The overall *M* of the donation amount for all three groups was 65.07 dollar and the overall *SD* was 40.24. For each condition, the *M* was 57.82 dollars (*SD* = 36.14) in condition 1, 79.37 dollars (*SD* = 35.69) in condition 2 and 57.83 dollars (*SD* = 44.39) in condition 3 (See Fig. 1).

A Kruskal-Wallis rank sum test revealed a significant effect for conditions, with $\eta^2 = 0.072$, X^2 (2, N = 119) = 10.358, p <.01, indicating participants' donation amount changed with the manipulation of the number of choices. There was also a significant difference in the comparison of the donation amount by condition. A dunn's test with Bonferroni adjustment indicated that participants in condition two with three choices donated more (M = 79.37) compared with condition one where they were given only one choice (M = 57.82), p = 0.0108 and condition three where they were given six choices (M = 57.83), p = 0.0251.

Knowledge of climate change

On the measure of participants knowledge on climate change, participants got 4.73 out of 8 in average. A linear regression model was used to analyze the correlation between knowledge and the donation amount. There was no significant correlation between these two factors with r(117) = 0.794, p > 0.05 (See Fig. 2).

Normality

A normality check was done for both raw data and residuals. The Q–Q (quantile-quantile) plots indicated that neither the raw data nor residuals were normally distributed (See Fig. 3 and 4). Therefore, instead of parametric test, a nonparametric test was used for data analysis.

Discussion

Based on the choice paralysis paradox, where an increasing amount of choices can cause over-thinking of a situation leading to inaction or failure to reach a solution, we anticipated that condition one will receive the most hypothetical donations and condition three to receive the least. However, our data showed that condition two, which poses three options to donate to a sustainable cause, received the highest percentage of the hypothetical $100 in donation compared to condition one and three, with one and six options respectively. In condition one, participants are more unwilling to choose an option regardless of how attractive it is when there are no competing options included in the choice set. This effect is known as single option aversion which increases participants desire to search for other options when faced with only one. The results in condition three are consistent to our prediction where participants donate the least amount as a result of information overload. When presented with many choices, participants may fear that they will make the wrong decision and become aware that there is a better option. This is due to information overload which occurs when the amount of input, here the number of choices, exceeds our cognitive processing capacity. These results suggest that three choices may be the optimal number for effective decision making.

Although using a web survey method to collect results is time-efficient and provides flexibility in our data analysis, its reliability is a primary limitation. Given how easy it is to quickly click through a survey on a device, participants may not have been motivated to provide accurate and honest answers, and may have even chosen a response before reading the survey. The large number of participants donating all of their disposable income in all three conditions could be explained by the fact that many misread or skipped the instructions stating that they did not have to donate the full amount. Conducting a brief interview or administering the questionnaire in person would improve the reliability of the study. With an in-person data collection method, the interviewer would be able to motivate adequate answers, remind participants of the instructions, and remove data errors from question non-responses. Moreover, we should restructure the survey and make the questions more engaging. This will help to reduce respondent fatigue which occurs when participants become tired, and the quality of responses deteriorate. Another way to counteract fatigue effects would be to include repeated questions to measure the consistency of responses and alternate wording for similar questions.

Recommendations for UBC Client

Participation in UBC term-end surveys are usually incentivized with gift cards of varying amounts. Instead of giving out prepaid gift cards to student winners, UBC could include a question at the end that asks students what portion of their potential winnings they would like to donate towards each sustainable cause. Based on the results from our study, we suggest that including three choice options would be the optimal amount to include. Furthermore, in other activity areas in UBC such as volunteer clubs and initiatives, when asking for amount of time they'd like to volunteer, it could be beneficial to include three choice options rather than just asking whether they would like to volunteer or not. Our finding can be applied in many different ways through sustainability surveys asking for money donations, volunteer hours, or any other climate change mitigation initiatives.

Through our study, we've also determined that the most popular choice of climate change mitigation was through supporting renewable energy causes with an average donation of $17.04 out of a hypothetical $100 dollars while the lowest donation category was for energy efficiency which had an average donation of only $5.59. Using this finding, we have established that post secondary students of British Columbia are highly supportive of seeking new sources of renewable energy. UBC can take this finding into account by investing in renewable energy sources such as solar, wind, or compost

energy in order to become more environmentally conscious as well as appeal to current post-secondary students looking to transfer into UBC or prospective secondary students applying to universities. While UBC has already taken a small step by investing in compacting garbage cans near the bus loop and around campus that run on solar power, UBC could take one further step by replacing current parking meters with ones that run on solar as well, as implemented by Metro Vancouver in other parts of the city such as Coquitlam (Lato, 2018).

References

Fischer, R., & Boer, D. (2011). What is more important for national well-being: money or autonomy? A meta-analysis of well-being, burnout, and anxiety across 63 societies. Journal of personality and social psychology, 101(1), 164.How Well Do You Understand Global Warming. (2017, February 23).

Iyengar, S. S., & Lepper, M. R. (2000). When Choice Is Demotivating: Can One Desire Too Much of a Good Thing? *The Construction of Preference,79*(6), 300-322. doi:10.1017/cbo9780511618031.017

Lato, M. (2018, May 11). Metro Vancouver Features Precise ParkLink's Solar-Powered Meters. Retrieved from https://www.preciseparklink.com/news/metro-vancouver-features-precise-parklink-city-of-coquitlam-solar-powered-meter

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist,55*(1), 68-78. doi:10.1037/0003-066x.55.1.68

Supplemental Material for What Is More Important for National Well-Being: Money or Autonomy? A Meta-Analysis of Well-Being, Burnout, and Anxiety Across 63 Societies. (2011). *Journal of Personality and Social Psychology*. doi:10.1037/a0023663.supp

Appendix

Tables

	Mean	SD	N
Condition 1	57.820	36.14	39
Condition 2	79.37	36.59	40
Condition 3	57.83	44.39	40
Overall	65.07	40.24	119

Table 1. Summary of the described statistic for the donation amount.

Figures

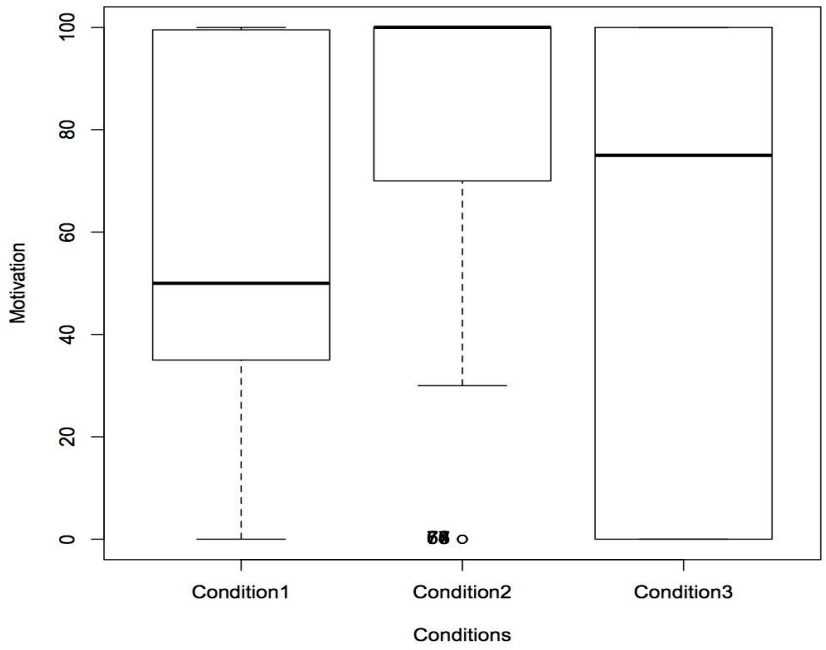


Figure 1. Total donation amount in the money allocating task. The amount is graphed separately for the three conditions.

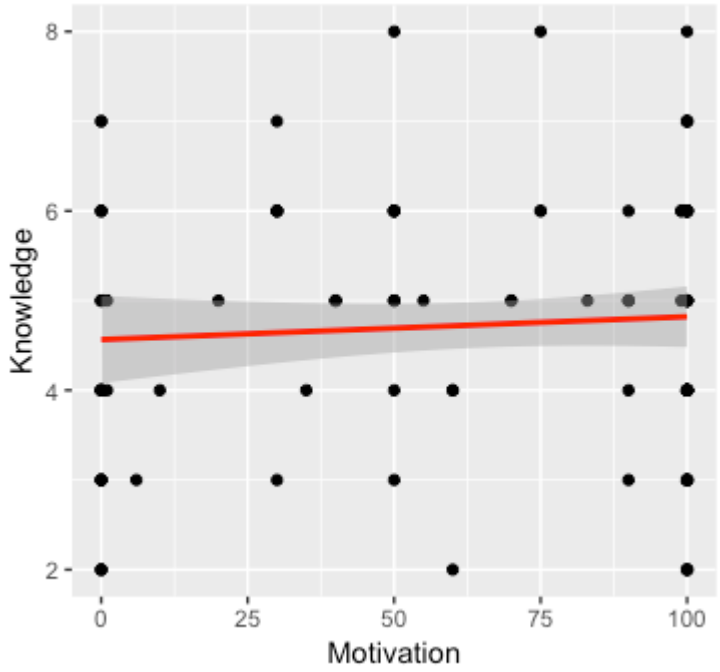


Figure 2. Linear regression with the knowledge in climate change as explanatory variable and the donation amount as the response variable.

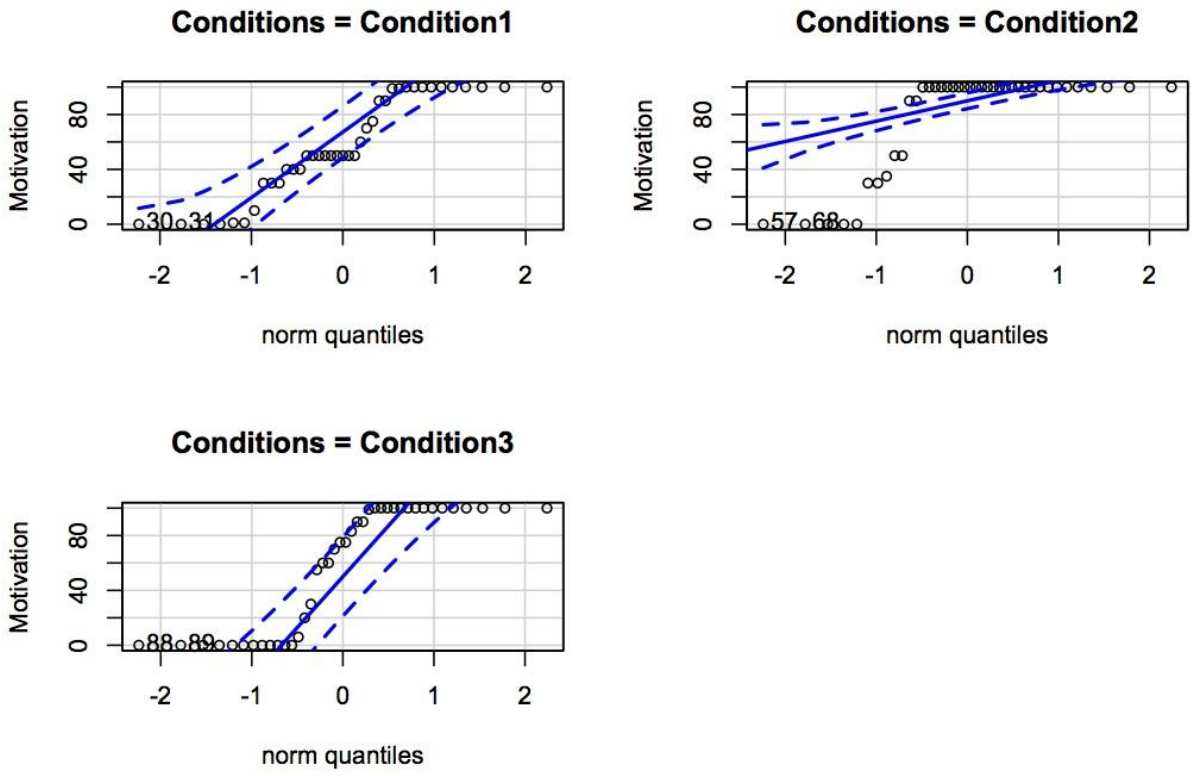


Figure 3. The quantile-quantile plots for the donation amount by conditions.

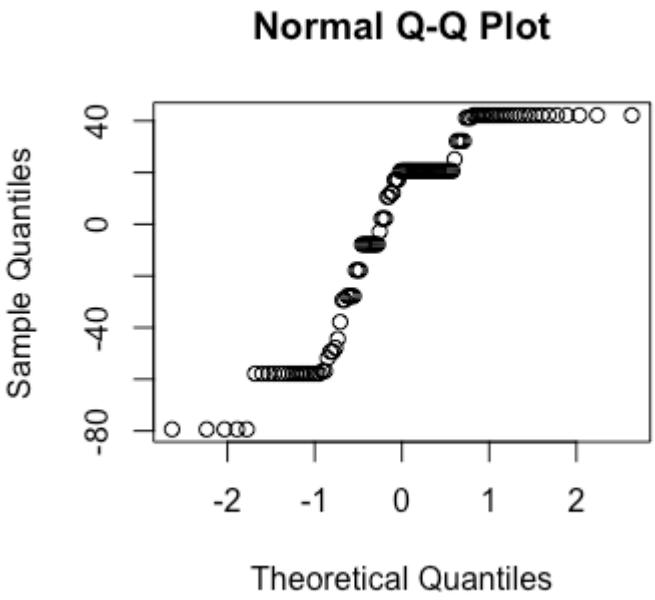
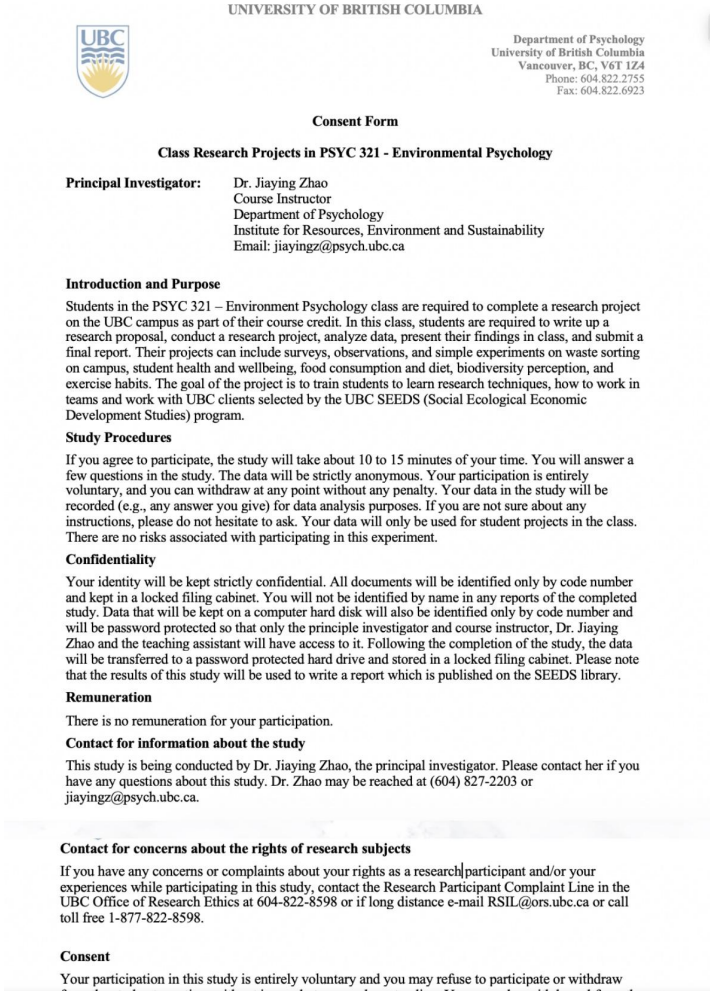


Figure 4. The residuals Q–Q (quantile-quantile) plot.

Survey



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Consent Form

Class Research Projects in PSYC 321 - Environmental Psychology

Principal Investigator: Dr. Jiaying Zhao
Course Instructor
Department of Psychology
Institute for Resources, Environment and Sustainability
Email: jiayingz@psych.ubc.ca

Introduction and Purpose

Students in the PSYC 321 – Environment Psychology class are required to complete a research project on the UBC campus as part of their course credit. In this class, students are required to write up a research proposal, conduct a research project, analyze data, present their findings in class, and submit a final report. Their projects can include surveys, observations, and simple experiments on waste sorting on campus, student health and wellbeing, food consumption and diet, biodiversity perception, and exercise habits. The goal of the project is to train students to learn research techniques, how to work in teams and work with UBC clients selected by the UBC SEEDS (Social Ecological Economic Development Studies) program.

Study Procedures

If you agree to participate, the study will take about 10 to 15 minutes of your time. You will answer a few questions in the study. The data will be strictly anonymous. Your participation is entirely voluntary, and you can withdraw at any point without any penalty. Your data in the study will be recorded (e.g., any answer you give) for data analysis purposes. If you are not sure about any instructions, please do not hesitate to ask. Your data will only be used for student projects in the class. There are no risks associated with participating in this experiment.

Confidentiality

Your identity will be kept strictly confidential. All documents will be identified only by code number and kept in a locked filing cabinet. You will not be identified by name in any reports of the completed study. Data that will be kept on a computer hard disk will also be identified only by code number and will be password protected so that only the principle investigator and course instructor, Dr. Jiaying Zhao and the teaching assistant will have access to it. Following the completion of the study, the data will be transferred to a password protected hard drive and stored in a locked filing cabinet. Please note that the results of this study will be used to write a report which is published on the SEEDS library.

Remuneration

There is no remuneration for your participation.

Contact for information about the study

This study is being conducted by Dr. Jiaying Zhao, the principal investigator. Please contact her if you have any questions about this study. Dr. Zhao may be reached at (604) 827-2203 or jiayingz@psych.ubc.ca.

Contact for concerns about the rights of research subjects

If you have any concerns or complaints about your rights as a research participant and/or your experiences while participating in this study, contact the Research Participant Complaint Line in the UBC Office of Research Ethics at 604-822-8598 or if long distance e-mail RSIL@ors.ubc.ca or call toll free 1-877-822-8598.

Consent

Your participation in this study is entirely voluntary and you may refuse to participate or withdraw

Figure 5

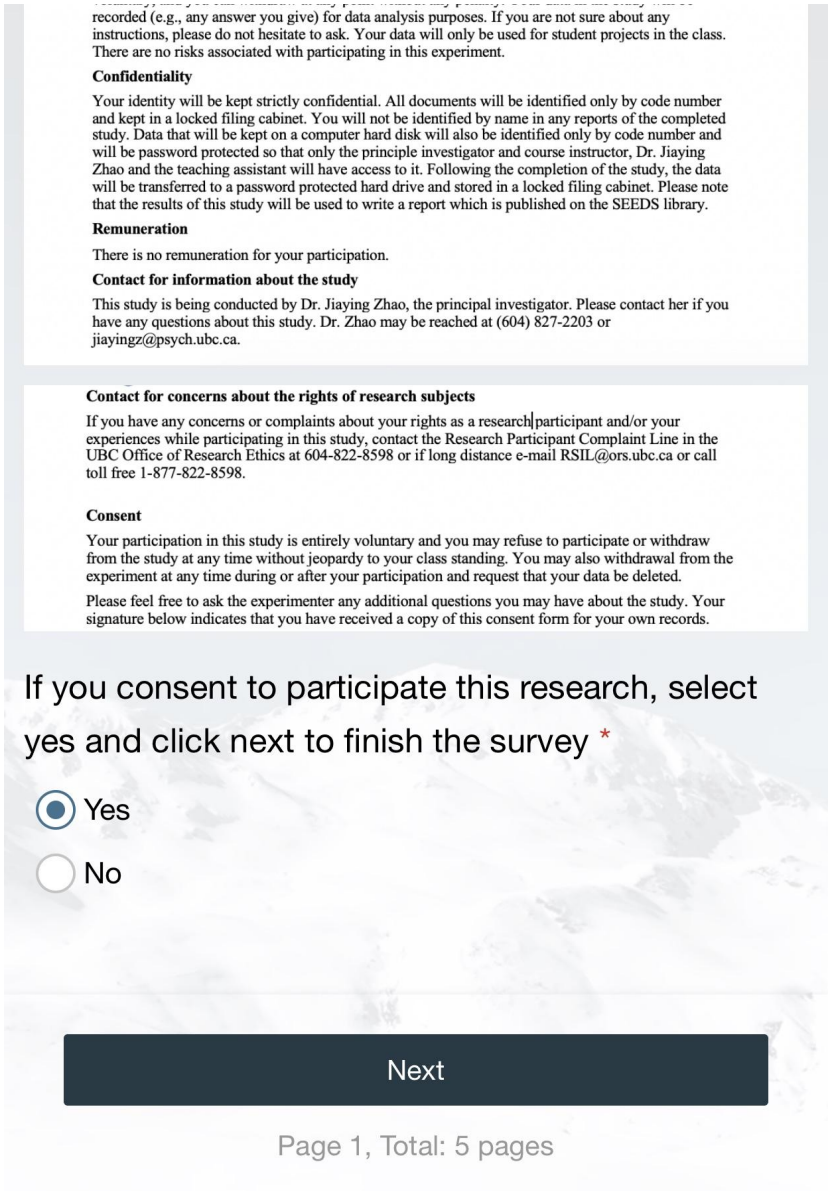
recorded (e.g., any answer you give) for data analysis purposes. If you are not sure about any instructions, please do not hesitate to ask. Your data will only be used for student projects in the class. There are no risks associated with participating in this experiment.
Confidentiality
Your identity will be kept strictly confidential. All documents will be identified only by code number and kept in a locked filing cabinet. You will not be identified by name in any reports of the completed study. Data that will be kept on a computer hard disk will also be identified only by code number and will be password protected so that only the principle investigator and course instructor, Dr. Jiaying Zhao and the teaching assistant will have access to it. Following the completion of the study, the data will be transferred to a password protected hard drive and stored in a locked filing cabinet. Please note that the results of this study will be used to write a report which is published on the SEEDS library.
Remuneration
There is no remuneration for your participation.
Contact for information about the study
This study is being conducted by Dr. Jiaying Zhao, the principal investigator. Please contact her if you have any questions about this study. Dr. Zhao may be reached at (604) 827-2203 or jiayingz@psych.ubc.ca.
Contact for concerns about the rights of research subjects
If you have any concerns or complaints about your rights as a research participant and/or your experiences while participating in this study, contact the Research Participant Complaint Line in the UBC Office of Research Ethics at 604-822-8598 or if long distance e-mail RSIL@ors.ubc.ca or call toll free 1-877-822-8598.
Consent
Your participation in this study is entirely voluntary and you may refuse to participate or withdraw from the study at any time without jeopardy to your class standing. You may also withdrawal from the experiment at any time during or after your participation and request that your data be deleted.
Please feel free to ask the experimenter any additional questions you may have about the study. Your signature below indicates that you have received a copy of this consent form for your own records.
If you consent to participate this research, select yes and click next to finish the survey *
Yes
No
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Figure 6

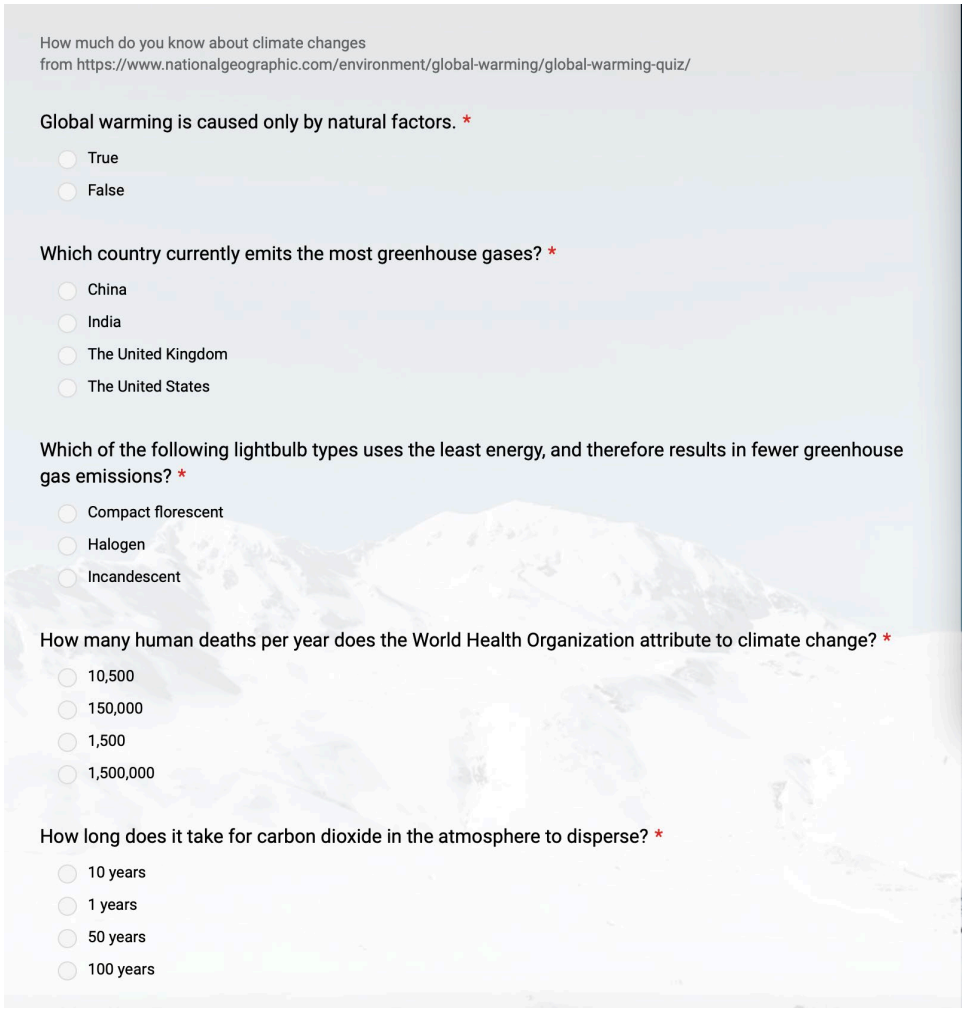

Figure 7

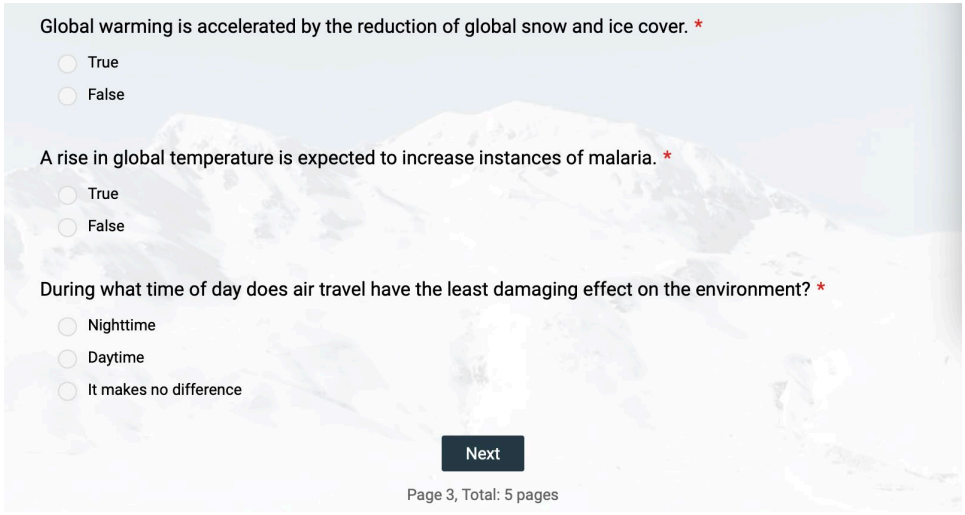

Figure 8

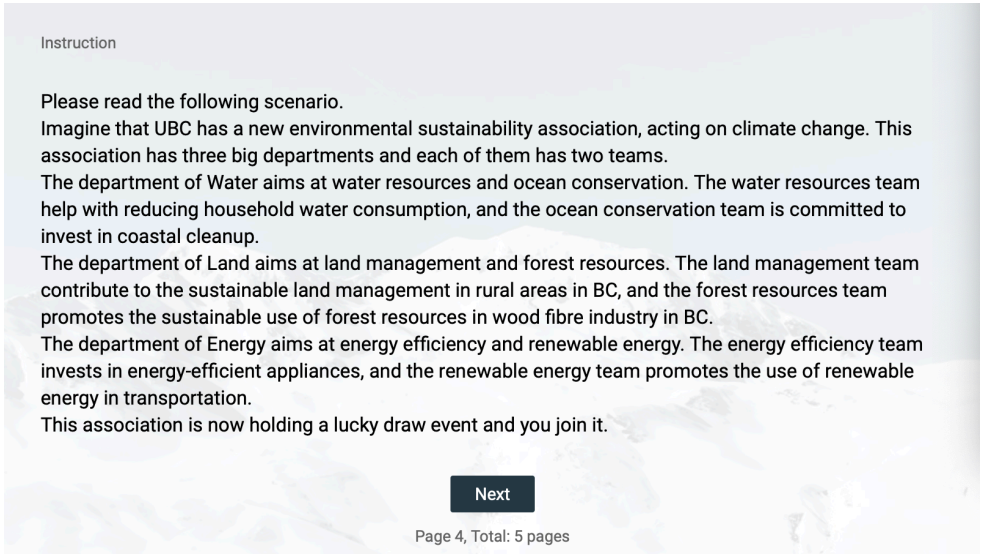

Figure 9

Figure 5-9. Screenshots of survey for condition 1, 2, 3

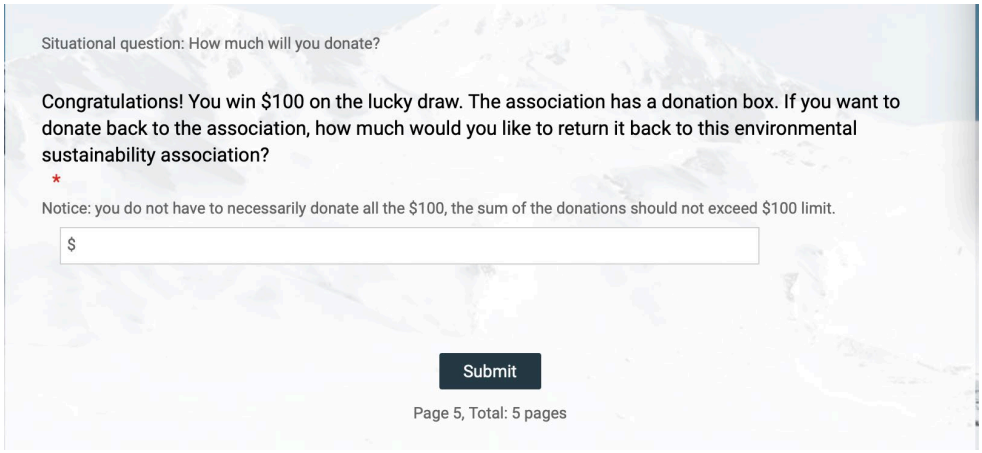

Figure 10 Screenshot of survey for condition 1

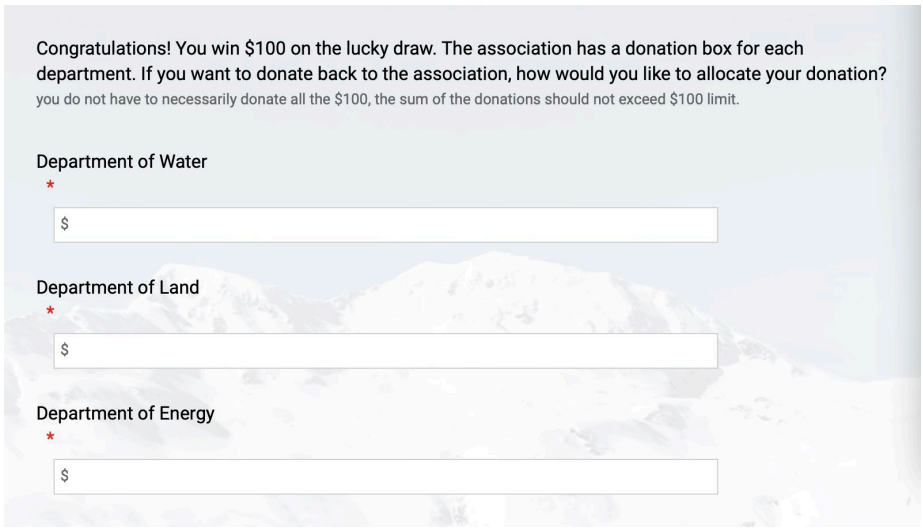

Figure 11 Screenshot of survey for condition 2

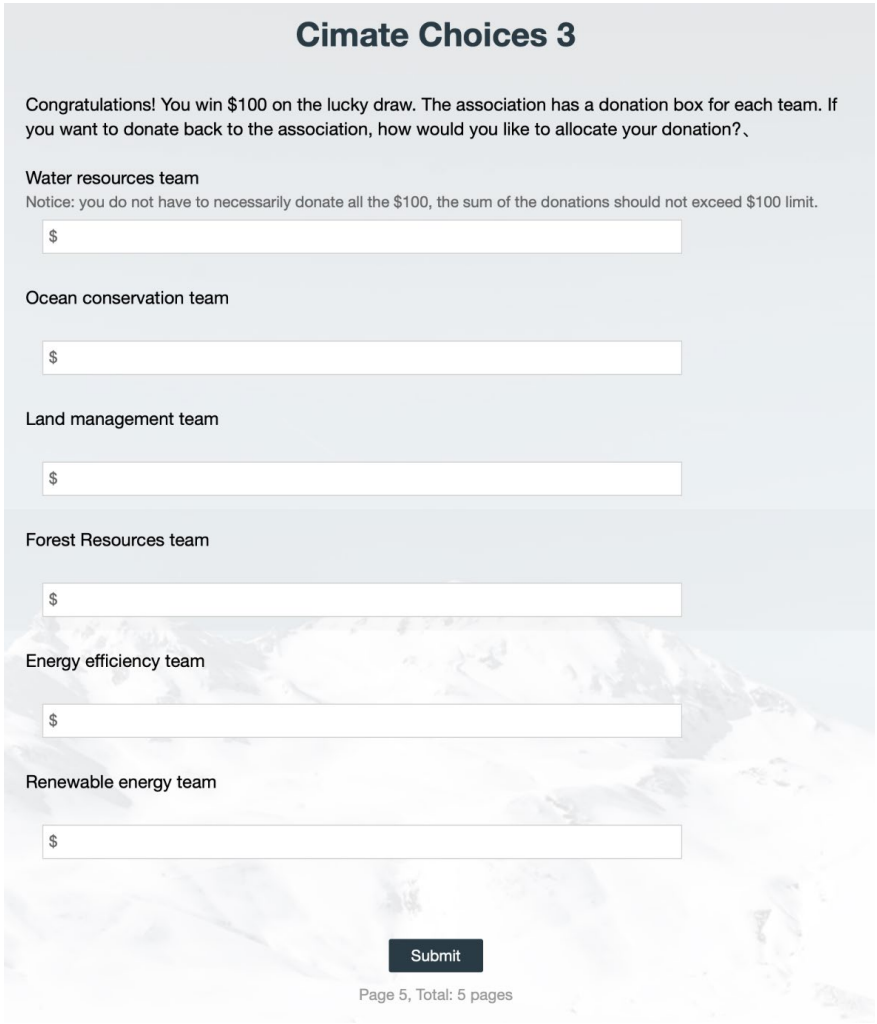

Figure 12 Screenshot of survey for condition 3