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Student Research Report

Exploring Monetary Incentives for Reusable Containers Amongst UBC Students

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Exploring Monetary Incentives for Reusable Containers Amongst UBC Students

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Executive Summary
The research aimed to address whether a change in the monetary rewards in the current Green2Go program would be beneficial. Through the use of an online survey and a between subjects design, the most effective program for increasing the usage of reusable containers of UBC students was investigated. We hypothesised that monetary incentive programs such as a rewards or points-system will incentivise and increase the potential usage relative to the current reusable campus wide container program at UBC. Using three different surveys containing three different monetary incentives, willingness and satisfaction of the different monetary programs was measured. Based on a one-way between subjects ANOVA test, UBC students are most willing to participate and most satisfied with the rewards program compared to other conditions. The current results of this study support the research hypothesis.

Introduction

UBC's current Reusable Container Program, Green2Go has been operating in UBC first year residence dining rooms such as Open Kitchen, Gather and Feast since 2010 (The University of British Columbia, n.d.). The long-standing program currently offers 20 cents off each purchase whilst using the reusable container. However, an immediate discount of 20 cents may not be appealing to students. Additionally, only being able to participate in the program in first year residence dining rooms heavily limits the chances of the program reaching a larger participant base. In partnership with SEEDS, we proposed a program that we intend to be available across all UBC restaurants and cafes. Our purpose boiled down to two goals; How do we increase the usage of the reusable container program and how do we make this into a campus wide program?

Past literature has provided research on the appeal of non-monetary vs. monetary rewards for customers. Despite the two holding varying degrees of incentive, under the assumption that students would prefer to save money, a non-monetary incentive did not seem feasible.

Monetary incentives are financial incentives used by restaurants to motivate customers towards meeting their targets. We identified two overarching concepts with regards to monetary incentive programs; immediate and accumulative. Research in fast-food and casual dining has indicated that a vast majority of customers preferred “immediate, necessary, and monetary gratification” (Jang and Mattila, 2005) in the forms of an immediate discount or cashback. However, introducing a points and/or rewards system, rewarding customers for loyalty, may motivate customers to firstly engage to receive rewards and secondly positively reinforce (thus accumulate) valuable customer behaviours (Kivetz, Urminsky, & Zheng, 2006). The research conducted is critical as it fits into the existing literature and additional research such as the Goal Gradient Hypothesis (Hull 1934). The Goal Gradient hypothesis refers to the idea that people are motivated by how much is left to reach their target, not how far they’ve come (eg. punch cards or your More Rewards card at Save-Ons Foods.)

Taking all background research into consideration, it can be said that a rewards or points system would serve as a great alternative to the current reusable container program in incentivising participants to engage in the program and moreover keep them engaged. The psychological insights that shaped our proposed incentive programs were temporal discounting and theory of extrinsic motivation. Temporal discounting is defined as discounting the subjective value of future goods as a function of the delay to receiving them. In alignment with the theory that behavior is primarily extrinsically motivated, monetary rewards can provide extrinsic motivation in behavioural conditioning. Incorporating these psychological insights within the context of our study, individuals at UBC may be more inclined to “wait” for a greater discount (or monetary reward) in the future as opposed to an immediate 20 cents off, delayed or not delayed.

Research Question and Hypothesis

Our research question was, to what extent do different monetary incentive programs such as a rewards or a points based system, incentivize and increase the potential usage of the reusable containers as opposed to the existing Green2Go Program at UBC? Additionally, our hypothesis stated that monetary incentive programs such as a rewards or points-system will incentivise and

increase the potential usage of the new reusable containers relative to the current reusable (Green2Go) container program at UBC.

Methods

Participants

Since the goal of the project was to incentivize usage of the new campus-wide reusable container program on UBC, the scope of the study was limited to UBC undergraduates The study required a sample size of 111 participants, based on an a priori Power Analysis conducted to find a reasonable effect size, between the three conditions and a power level of 0.8. However, due to covid all data collection was done via online survey. Unfortunately, we were only able to obtain data from 52 students. The participants had a mean age of 22.63. 21 participants lived on Campus and 29 lived off campus. There were 19 males, 27 females, 3 non binary, 2 preferred not to say.

Conditions

The study used three conditions, each a proposed incentive program to gage potential usage of the reusable container program. The first condition was the control condition. The control condition was the 20 cents off each purchase discount, currently used by the Green2Go program. The Second condition was a rewards condition, in which students would receive an increasing rewards schedule. In the proposed condition, students would get $2.00 off every fifth purchase and $5.00 off every tenth purchase. The third condition was a points condition, in which students would have a redeemable points system. Every dollar spent would be counted as points which would later be used as dollars. In this case, every dollar spent gets counted as 5 points. Once a student amasses 50 points, they will be able to exchange it for $1.00 off. When coming up with the rewards and points conditions, the goal was to make the rewards significant enough that they would appeal to students while making them reasonable so that the restaurants accept them. The specific conversion was calculated by equating the incentive programs to each other as much as possible.

Measures

In the study, the proposed incentive program was the independent variable and the potential usage of the container program as the dependent variable. In order to gage potential usage of the new reusable container program, participant satisfaction and willingness were used as measures. More specifically, we measured how satisfied they were in the proposed incentive program and how willing they would be to participate in the reusable container program if the incentives were in place.

Procedure

The study was a between-subjects design with three conditions, analyzing which proposed incentive program will increase usage of the reusable containers. Due to the current

pandemic, all data collection was done through an online survey via Qualtrics. All surveys were accompanied by a consent form. If participants did not consent to the survey, they would not be forced to take it. All surveys were sent out by the researchers online. The participants were selected by convenient sampling. The surveys were distributed to friends, UBC student groups, and classmates through Zoom. Data collection began on March 5th and ended on March 31st alongside regular progress checks and attempts to increase the numbers of participants. Unfortunately, the targeted numbers of the sample size were not obtained.

Results

Given the nature of the study which involved the use of 3 conditions and a between-subjects design, a one-way ANOVA test was used to interpret the data. Desirability for each of the proposed incentives was defined and measured through satisfaction with the proposed incentive and willingness to participate in the Reusable Container program with such an incentive. When measuring for satisfaction within conditions, the results show that participants, on average, were moderately satisfied with the incentives offered in the rewards condition (n= 17, M=6.00, SD= 1.323). While participants were neither satisfied nor dissatisfied with the incentives presented in the points condition (n= 16, M= 4.812, SD = 1.834) and the control group (n= 19, M=4. 211, SD= 1.873). We also found from Table 1 that there was a significant but small difference for satisfaction between conditions, $F(2)= 5.08$, $p = 0.010$, η_p^2=0.172, where the incentives in the rewards condition was the most satisfying to participants.
Similar results were found following the pattern for satisfaction measure, when looking at the willingness to participate in the program measure between conditions. AAs we find that the ratings of willingness of participants for the control group, on average, was neither willing nor unwilling (n= 19, M= 4.211, SD= 2.097). While the points condition showed participants were slightly willing to participate (n= 16, M= 5.188, SD= 1.721) and the rewards condition 8had, on average, a moderate willingness (n= 17, M= 6.118, SD= 0.928) to participate in the program. These results show that while both the points and rewards condition yield more willingness to participate in the program an ANOVA test, Table 2, reveals that this effect is significant but small; $F(2) = 5.83$, p= 0.005, $\eta_p^2 = 0.192$. Therefore, while we can conclude based on the results from the two measures there is a small effect observed between conditions, the rewards conditions are a significantly more desired option amongst UBC students who participated in the study. When compared to the existing incentives provided by the Green2Go container program. Answering our research question that a reward schedule where participants receive larger amounts of money is preferred to nominal amounts over time. This conclusion also supports the hypothesis being explored that there is an observable difference between the incentives presented in the three conditions, allowing successful rejection of the null hypothesis. Additionally, we also found it interesting to note that based on our ANCOVA test in Table 3, that the demographics of the participant-- living on campus or off campus did not significantly impact their preferences; as $p>0.05$ ($F(2)=2.828$, p=0.071, η^2= 0.100) and likely due to chance.

Discussion

With regards to the research question, the research supports that monetary incentive programs will increase the potential usage of the proposed reusable container program. Specifically, the research supports that a rewards style program will provide the most

willingness and satisfaction among UBC students on campus. The results exemplified that participants were significantly more willing and more satisfied to participate in the rewards program in comparison to the control condition and points condition.

Despite the support for the hypothesis shown by the research, there were a number of limitations within the study. Firstly, there was a lack of statistical power due to the small sample size. In order to achieve the optimal statistical power to determine a true effect, a sample size of 111 was required. The current study had a sample size of 52 complete responses. This may have been a result of the methods of distribution for the survey. Despite using Facebook groups, friends, family and client's connections, there was still a lack of participants in the study.

Another limitation of the study relates to the period of time it was conducted in. The attitudes around a container sharing service may have been impacted by the COVID-19 global pandemic. Although it is unlikely that the impacts of COVID-19 caused any of the differences seen between the conditions, there might have been a general impact on the willingness and satisfaction reported as a whole. To reduce the possible implications of COVID-19, we revised the terminology of the container program from "*campus wide container sharing program*" to "*campus wide reusable container program"* when designing the survey.

The final primary limitation of the survey related to the number of items on each likert scale. For the measures, willingness and satisfaction, participants answered their respective responses on a seven item scale. This may have led to a lot of "fence sitting" or responses that tended to stick to the middle of the 7 options. To avoid this in the future, we will use a 6 item scale that prevents participants from sticking to the middle.

With an opportunity to rerun or conduct another study, a number of improvements would be made. Firstly, with regards to the possible impacts of COVID-19, the study would be scheduled after a majority of the population has received the COVID-19 vaccination.
In addition, we would use alternative methods of distribution for the survey including contacting the UBC residence administrators to distribute the survey, posting in other UBC related Facebook groups and perhaps using other methods such as Linkedin to contact professionals that work at UBC that would potentially use and promote the reusable container program. This would further diversify the sample to other age groups within the UBC community such as professors and graduate students. The last change that we would implement for future research would be to make different conditions in which participants express willingness and satisfaction to different values of rewards. The purpose would be to find a value that participants would be satisfied and willing while still benefiting the restaurants on UBC campus as well as incentivising the use of the reusable container program.

Within the domain of environmental sustainability, monetary incentives benefit the reusable container program for individuals who are and are not environmentally conscious. Reducing the campus consumption of single use products such as takeout containers is an important component to environmental sustainability. Even containers made from recycled or compostable materials require significant energy to produce and often still have large carbon footprints through shipping and transportation. UBC is home to younger individuals, serving as a great test centre for sustainable practices that could be viable for the rest of Vancouver and Canadian society in the future. If a reusable container program serves as a feasible solution to takeout containers, especially with a well-structured incentive program, the concept may be able to scale to a neighbourhood or even city wide program.

Recommendations for UBC client:

From our view, incentive is primarily constructed from willingness and satisfaction. The primary implication of our findings supports that students at UBC are more willing and satisfied with a rewards style plan for the reusable container program. The rewards program incorporates a schedule of monetary benefits for every 5th and 10th purchase while utilizing the reusable container program. The current incentive program provides students with a 20 cents discount while using the reusable container. From the research presented, we would recommend that the client implement a rewards based monetary incentive program for the new UBC campus wide reusable container program. The specific values used (list values) yielded high satisfaction and willingness from the participants in comparison to the control condition. We also recommend the client utilize the UBC student card to keep track of individual rewards and usage of the reusable containers. This will provide a convenient way for students to receive their rewards without the extra burden of carrying a separate card carabiner, or identification number to participate in the program. An existing example demonstrating the effectiveness of a rewards program is the punch card system that is used by many cafes and restaurants across Vancouver and Canada.

The results of our study concur with the current body of research on incentives. If the program and incentives yield a high rate of usage of a reusable container program on UBC campus, it may demonstrate that similar programs can be used for larger populations. In conclusion, we recommended that our client use a rewards based monetary incentive program to be implemented into the UBC campus wide reusable container program.

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Appendix A – Survey

Start of Block: Control group

Control
UBC sustainability program are proposing to create a new Reusable Container program that will be implemented campus wide. The new program would include first year residence cafeterias and also restaurants and cafes on campus. This survey will ask you a few questions regarding the new proposed program.
The proposed Reusable Container program will offer you a discount of 20 cents for each purchase upon using the reusable container.

End of Block: Control group

Start of Block: Rewards Condition

Rewards **UBC sustainability program are proposing to create a new Reusable Container program that will be implemented campus wide. The new program would include first year residence cafeterias and also restaurants and cafes on campus. This survey will ask you a few questions regarding the new proposed program.**

The proposed Reusable Container program will offer you a discount of $2 for every 5th purchase and $5 for every 10th purchase upon using the reusable container.

End of Block: Rewards Condition

Start of Block: Points Condition

Points **UBC sustainability program are proposing to create a new Reusable Container program that will be implemented campus wide. The new program would include first year residence cafeterias and also restaurants and cafes on campus. This survey will ask you a few questions regarding the new proposed program.**

The proposed Reusable Container program will offer you discounts using a flexible points system upon using the reusable container. Every dollar you spend while using the container would earn you 5 points. Every 50 points earned is equivalent to a discount of $1 of your purchase. The points would be redeemable at any time.

End of Block: Points Condition

Start of Block: Measure

Q1 **How satisfied would you be with this proposed Reusable Container program?**

- Extremely satisfied (7)
- Moderately satisfied (6)
- Slightly satisfied (5)
- Neither satisfied nor dissatisfied (4)
- Slightly dissatisfied (3)
- Moderately dissatisfied (2)
- Extremely dissatisfied (1)

Q2 **How willing would you be to participate in this Reusable Container program?**

- Extremely Willing (7)
- Moderately Willing (6)
- Slightly Willing (5)
- Neither Willing nor Unwilling (4)
- Slightly Unwilling (3)
- Moderately Unwilling (2)
- Extremely Unwilling (1)

End of Block: Measure

Start of Block: Demographics

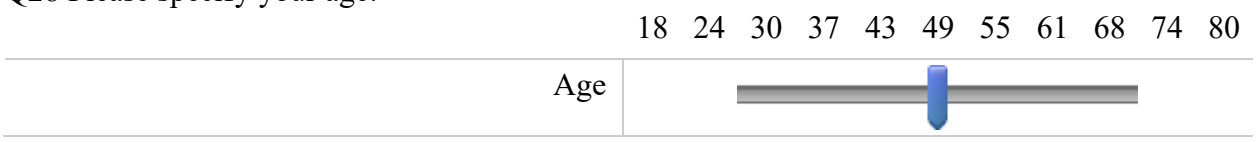
Q19 What other changes would you like to see implemented in the proposed Reusable Container program?

_____

Q27 Do you currently live in UBC on-campus housing?

- Yes (1)
- No (2)

Q28 Please specify your age:



Q29 Which gender do you identify with?

- Male (1)
- Female (2)
- Non-binary / third gender (3)
- Prefer not to say (4)

Q30 Please describe your cultural background

- European (1)
- East Asian (2)
- South Asian (3)
- South East Asian (4)
- African (5)
- Hispanic (6)
- Middle Eastern (7)
- First Nations (8)
- Other (Please specify) (9) _____
- Prefer not to say (10)

Q26 How well does the following statement describe you?
I engage in environmentally conscious behaviour (i.e., recycling, reduced usage of plastics, etc).

- Describes me extremely well (5)
- Describes me very well (4)
- Describes me moderately well (3)
- Describes me slightly well (2)
- Does not describe me (1)

End of Block: Demographics

Appendix B – Contributions to Research

Viral: On the proposal Viral worked with Charlotte on the background literature for psychological insight on the proposal. On the proposal, Viral also worked on the methods section and conducted the power analysis (G*Power) to find the required participant sample. She also created the final survey on Qualtrics—which was proposed to Dr. Zhao, in addition to keeping in touch with the client and organizing meetings with him. Viral worked on organizing the raw data from the survey (for the progress check-in meeting) and used it to get demographic information (for the presentation and the graphs) and used JASP to analyze and interpret the results that were presented in class as well as on the final report.
Charlotte: Charlotte researched background literature in addition to the psychological insights on the proposal that was later presented in class, and the final report. She also outlined the overall thought process when brainstorming our research question and hypothesis.
Kahlil: Aided in creating the questions for the survey on the proposal. Kahlil also reported on the methods and participants in both the presentation and final report.
Aidan:
Aidan primarily aided with the statistical interpretation and collaboration with the clients. For the presentation, Aidan collaborated with Viral for the results, conclusion, limitations and recommendations. Similarly for the research report, Aidan wrote the discussion and recommendations for the client.
Gongmuang: Aided Khalil in preliminary survey questions for proposal. Reported the research question and hypothesis in the presentation. Wrote the executive summary, problems and difficulties that occurred in Appendix D, and helped teammates with overall editing for the final report.

Appendix C – Supplementary Research

ANOVA - Satisfied

Cases	Sum of Squares	df	Mean Square	F	p	η_p^2
Condition	29.385	2	14.693	5.084	0.010	0.172
Residuals	141.595	49	2.890			

Note. Type III Sum of Squares

Descriptives

Descriptives - Satisfied

Condition	Mean	SD	N
Controlgroup	4.211	1.873	19
PointsCondition	4.813	1.834	16
RewardsCondition	6.000	1.323	17

Table 1: One way ANOVA results illustrate the effects of the three different conditions-- rewards, points, and control group-- on the measure of satisfaction, and observable effect size.

ANOVA - Willing ▼

Cases	Sum of Squares	df	Mean Square	F	p	η_p^2
Condition	32.698	2	16.349	5.832	0.005	0.192
Residuals	137.360	49	2.803			

Note. Type III Sum of Squares

Descriptives

Descriptives - Willing

Condition	Mean	SD	N
Controlgroup	4.211	2.097	19
PointsCondition	5.188	1.721	16
RewardsCondition	6.118	0.928	17

Table 2: One way ANOVA showing the effects of the three different conditions on participants willingness to participate in the proposed container program.

ANCOVA

ANCOVA - Satisfied

Cases	Sum of Squares	df	Mean Square	F	p	η^2
Condition	24.542	2	12.271	4.386	0.019	0.155
Campus	0.002	1	0.002	7.043e −4	0.979	1.242e −5
Age	6.428	1	6.428	2.298	0.137	0.041
Condition ∗ Campus	15.822	2	7.911	2.828	0.071	0.100
Residuals	111.899	40	2.797			

Note. Type III Sum of Squares

Table 3: ANCOVA test to find interactions between demographic information on participant preferences

Post Hoc Tests ▼

Standard ▼

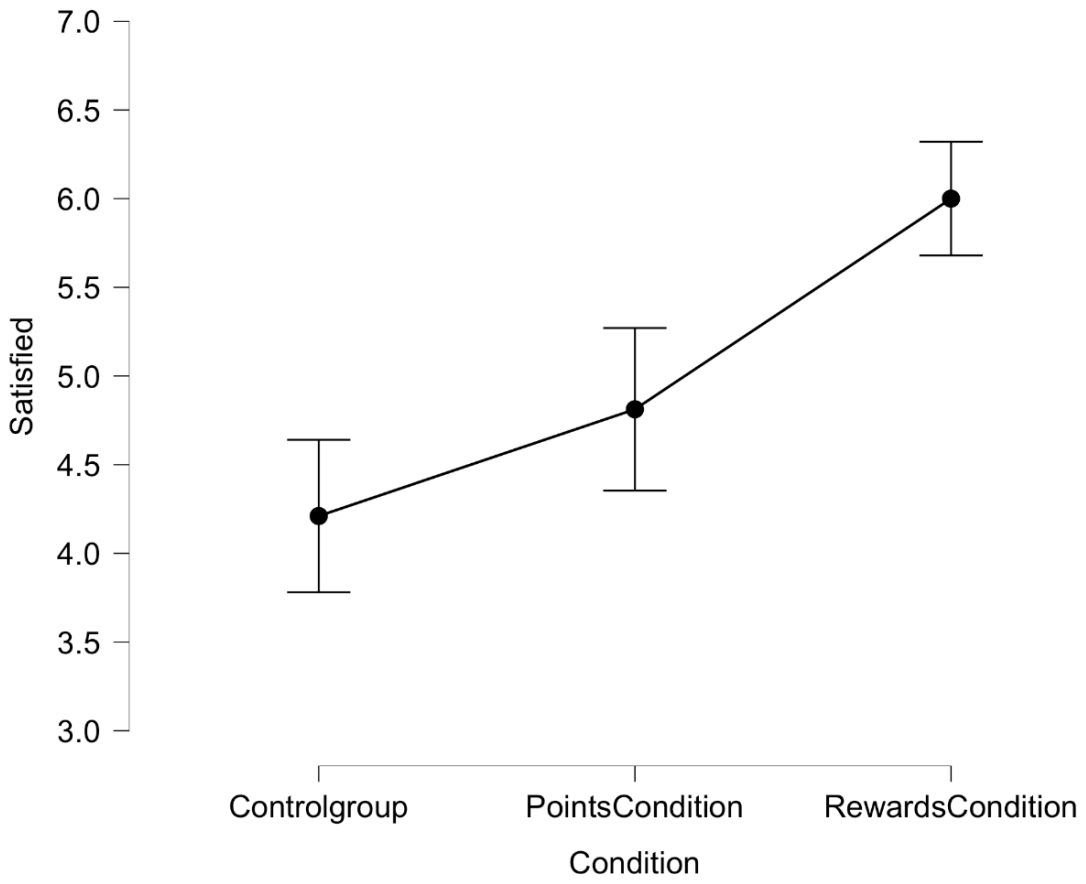
Post Hoc Comparisons - Condition ▼

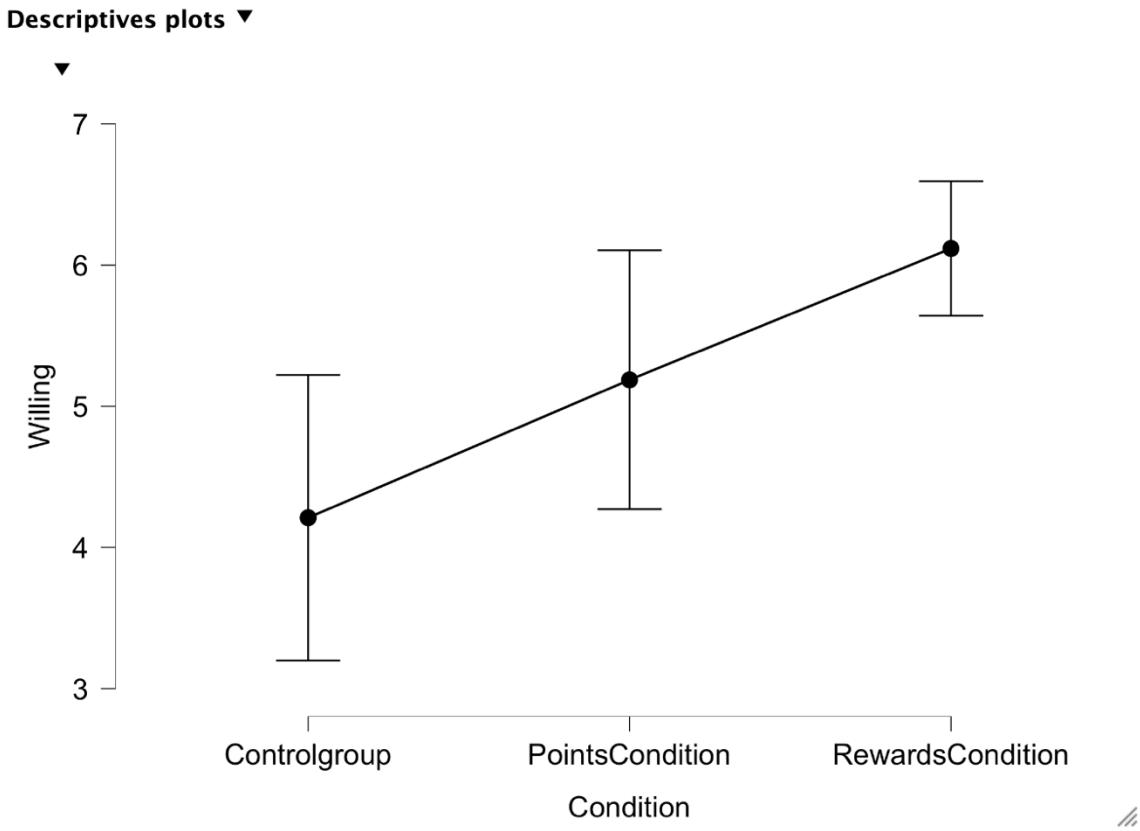
		Mean Difference	SE	t	Cohen's d	p_{tukey}
Controlgroup	PointsCondition	−0.977	0.568	−1.720	−0.505	0.208
	RewardsCondition	−1.907	0.559	−3.412	−1.154	0.004
PointsCondition	RewardsCondition	−0.930	0.583	−1.595	−0.679	0.257

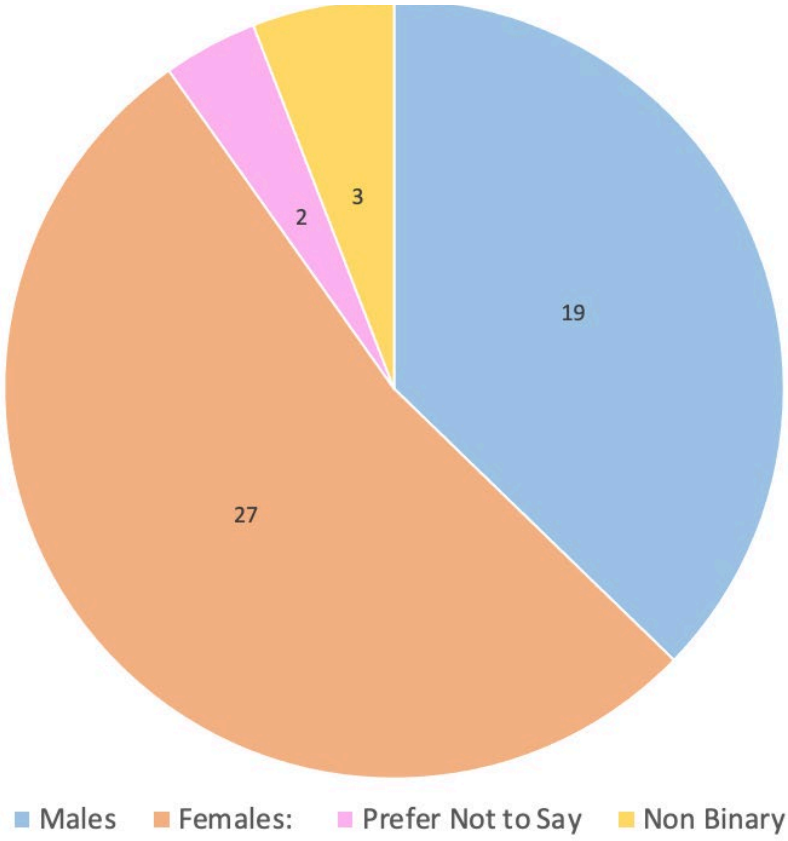
Note. Cohen's d does not correct for multiple comparisons.
Note. P-value adjusted for comparing a family of 3

Descriptives plots ▼

▼




Descriptives plots
7
6
5
4
3
Willing
Controlgroup
PointsCondition
RewardsCondition
Condition


19
27
2
3
Males
Females:
Prefer Not to Say
Non Binary

Appendix D – Coversations, Problems, Delays/Difficultires with the client and other occurences during the project that was not mentioned in the Results/ Discussion Sections

Regarding the points and rewards system, we encountered a problem with determining the values of the points and rewards system. We discussed that we would equate them with each other. To clarify that the values and numbers associated with our rewards and points system would be appropriate, we reached out to our client. Our client confirmed that the values of the rewards and points system were appropriate and that it would be subsidized accordingly if this proposal program were to be accepted. Furthemore, our client mentioned that the values that could be applied to a new program might need adjustment due to different conditions of UBC's and other restaurants' allowance.

Whilst designing the survey questions, after conversations with our professor and the client, we were told we might face problems like response order bias being that the word "receptive" may be too general and may hinder our internal validity. Instead we changed the terminology from "receptive", to their "willingness" and "satisfaction" measuring how willing and satisfied they would be when given each condition.

Moreover, due to time-schedule conflicts, we did not get a chance to reach out to restaurants and cafes across UBC to see if there would be differences in subjective values of monetary rewards for practical reusable containers usage.

Lastly, members in the group live in different time zones which make it more difficult to make meeting appointments within the group and also with the client.