

UBC Social Ecological Economic Development Studies (SEEDS) Sustainability Program

Student Research Report

The Use of Informative Educational Posters in Reusable Cups Usage

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Executive Summary

The current study motivated to study is that will the use of informative, educational posters (environmental awareness) influence the usage of the reusable cup on the UBC campus? To operate the study, we hypothesized the cognitive reminder on the consequences of environmental harmful behavior would increase the reusable cup usage. We used naturalistic observation to measure if the reusable cups using rate increased and an online survey to study the collect more data to study the possible influential factors that may affect the results. In the online survey, chi-square shows that our posters are more informative than UBC posters. However, the chi-square results show that form the naturalistic observation, and this is no significant relationship between the new posters exposure and the reusable cups using rate. Therefore, the results do not support our hypothesis. Due to the COVID-19 pandemic, we have to collect naturalistic observation data after two days of the new posters exposure, and it may cause the failure to prove our hypothesis. The result of the descriptive analysis also suggests that our posters remain low exposure, and the posters' exposure extent is different at locations.

Introduction

The Coffee market has grown considerably in the recent decades. Coffee has become an integral part of some people's daily routine, and a biological need for others, with an estimate of more than half of Americans drinking coffee everyday (Bae et al., 2014). Naturally, this means that the use of disposable cups for consumers on the go have started the same steep climb along with the Coffee industry, with 1.5 billion cups discarded by Canadians per year according to UBC food services.

Disposable cups have a negative impact on the environment for a myriad of reasons: it is difficult to recycle which in turn causes a vast amount of cups to be dumped as waste, the cost of producing an individual cup is low, however, the cost of producing cups in the billions is very high. It should also be noted that disposable cups also contribute to greenhouse gas emissions while in landfills, that is if they do make it to landfills (Cronin et al., n.d.; Ziada, 2009; Hocking, 1994).

UBC signed the 1990 Talloires Declaration which has 10 points revolving around environmental awareness and how awareness should be conducted and raised. UBC has started a campaign called the choose reuse program to reduce the amount of disposable cups used by utilizing reusable cups. The environmental cost of producing reusable cups are many times higher than a disposable cup, but the reusable cup becomes much more environmentally friendly after multiple uses. A glass reusable cup reaches the environmental impact break point with disposable cups in as few as 6 uses (Cronin et al., n.d.; Hocking, 1994). According to a study done in 2008 by Fairbairn et al., Dalhousie university campus has a 82% disposable cup usage rate, signifying the overwhelming amount of cups disposed of daily. UBC is attempting to reduce this by adding an additional cost of 25 cents to every purchase with a disposable cup through the choose to reuse program. UBC advertises this program through the use of posters placed around UBC and cafes on campus. The posters created by UBC are vibrant and subjectively great in design, however, none promotes environmental awareness.

Psychological insight According to Turaga et al. (2010), Norm Activation theory suggests that people can only change their environmentally unfavorable behavior when they are aware of the consequences of that behavior while simultaneously possessing the individualistic responsibility to change that behavior. Norm Activation has found success in creating Pro-environmental behavior in children in a study conducted by Benyamin et al. (2018), as well as a success among adults (Fang et al., 2019). The posters created by UBC do not satisfy the conditions of environmental, behavioral change according to the Norm Activation theory. Thus, if the conditions were satisfied, the percentage of disposable cups would likely see a reduction.

Therefore our **research question** is that will the use of informative, educational posters (promoting environmental awareness) influence the usage of reusable cups on the UBC campus? We **hypothesized** that using posters that create a cognitive reminder regarding the consequences of using disposable cups will increase reusable cup usage.

Methods

Participants

Eighty-nine participants completed the online survey, and 1568 consumption data (reusable cup usage and the drink selection) included in naturalistic observation. For the online survey, only the UBC students and staff responses would be used for the data analysis. There are nine first-year students, 11 second-year students, 14 third-year students, 32 fourth-year students, and 23 Graduate students. For the naturalistic observation, there are 1166 consumption data collected from condition 1, and there are 402 consumption data collected from condition 2.

Conditions

There are two conditions in this study. The first condition is UBC posters only exposure ("Choose to Reuse" program's posters). UBC posters are either in the form of A4 size posters or table tents, and they include a slogan "Real Mug real change, let's choose to reuse" and a reminder on the cost of disposable cups (see Appendix A Figure 1). They were posted on the wall next to the coffee shop and on the table tent on the counter, and the goal of this poster was to encourage individuals to use reusable cups.

The second condition is the addition of an informative educational poster in addition to the UBC posters. These informative educational posters are in the formats of either two A4 posters or in table tents. The posters have the slogan "Cups are reusable. Trees are not. Let's choose to reuse"; whereas, the table tents have the slogan "save a cup, save a tree"(see Appendix A Figure 2). The A4 posters posted on the wall next to the counter of the coffee shop, and the table tents put on tables around the coffee shop. The new posters aim to educate the consequences of disposable cups so that people will learn that their consumption style has an environmental cost so that they will be encouraged to promote eco-friendly activities - which is to use reusable cups.

Measures

The naturalistic observation used to collect the frequency of reusable cup usage. The data would be used to analyze whether the new poster exposure can increase the reusable cup using rate.

The online survey has eight questions (see Appendix B Figure 3). Question 1 is to ensure our posters are seen by participants and their changes in reusable behavior are from the poster. Question 2 is to analyze the locations where posters have the most sufficient exposure, and this is important that it supports whether the informative educational poster has enough exposure to increase the reusable cups usage. Question 3 is to measure if the posters were educational and informational that the participants acknowledge the contents of the posters. It is essential that we can analyze if the posters are informative enough to increase the reusable cups usage. Question 4 aims to measure participant's willingness to use reusable cups in the future. Question 5 aims to analyze whether informative educational posters can teach participants about the consequence of using disposable cups and can force them to take pro-environmental actions.

Procedure

In our study, we selected Orchard Commons "Hero" coffee shop because it has open bars which make naturalistic observation convenient and it has a reusable cups using rate at the similar level with most coffee shop on campus (see Appendix C figure 4). We have two data collection periods, and each data collection lasts for a week. We only collected data for weekdays but not on the weekends because most students consume coffee on weekdays. In the first week of data collection, naturalistic observation happened twice a week between 10 am and 12 pm (the high peak hours). Experimenters would arrive at the coffee shop 30 minutes prior to the observation time to sit at a table facing the counter. During the observation period, data on reusable cup usage would be recorded. At the end of the first data collection, the informative educational posters would only post at the "Hero coffee". The reason for choosing "Hero coffee" to post the informative educational poster is because the manager approved to post the new posters. The second data collection happened two days after the addition of the new posters, and the same data collection method as the first data collection was employed except, we were only able to collect the data

once a week. We were planning to do the second data collection three weeks after the new posters placement to make sure the posters have sufficient exposure to the viewers, and viewers had enough time to absorb the information on posters and to switch to reusable cups. However, due to the COVID-19 condition, we had to collect data two days after the posters were up. After analyzing the naturalistic observation data, we found that the second data collection shows that the reusable cup usage had decreased, and this may be due to the fact that some coffee shops banned the reusable cup usage during the period of COVID-19 pandemic. In order to ensure the power of the new poster, we conducted an online survey and posted on a survey website to get responses. We used Chi-square to study whether there is a relationship or impact. Also, the descriptive data used to analyze the possible influential factors towards the hypothesis.

Results

Regarding the two questions on poster exposure, 95% of participants reported that they have never seen the informative educational posters (see Appendix C Figure 5). Only 5% of participants reported that they have seen the informative educational posters at the "Hero coffee (see Appendix C Figure 5)." This highlights the low exposure of the informative educational posters, and its influences on reusable cup behavior change may be affected. Next, 44% of participants responded that they have never seen the UBC posters (see Appendix D Figure 6). Of those who have seen the UBC posters, most of them saw the posters at Buchanan building (15%), Irving K. Barber learning building (15%), Life building (13%), Nest Building (8%) (see Appendix D Figure 6). This suggests the exposure of UBC is low, and various UBC buildings have different exposure rates. 82% of participants responded they think they will use reusable cups on campus in the future (see Appendix D Figure 7). In terms of reasons for using reusable cups, 73% of participants referred to reusable cups because they are eco-friendly as compared to other reasons: economic reasons (71%), safety (51%) and trendy (39%) (see Appendix E Figure 8). Which means most of the participants understand that using disposable cups are not eco-friendly, and they are willing to use reusable cups in the future. The data shows that the eco-friendly and economic are the major reasons for using reusable cups in the future.

A chi-square test of independence was performed to examine the informativeness of UBC posters and informative, educational posters. The relation between these variables was significant, $\chi^2(1, N = 89) = 15.2, p = .000099$ (see Appendix E Table 1). Which indicates that our posters are more informative than Choose to reuse posters, and it fulfills the requirement of our research question of using informative, educational posters. A chi-square test of independence was performed to examine the relation between our posters exposure and reusable cup usage. The relation between these variables was not significant, $\chi^2(1, N = 402) = 0.0144, p = .904638$ (see Appendix F Table 2). Which means our posters do not increase the reuse cup using rate. Therefore, our results do not support our hypothesis of using posters that create a cognitive reminder, regarding the consequences of using disposable cups will increase reusable cup usage.

Discussion

The chi-square test result shows that our posters are more informative than UBC choose to reuse posters. Follow our research question that using not only educational posters, but also more informative posters can increase reusable cups usage. The previous research suggests that the combination of informative (environmental visual message) posters and extra cost of disposable cups can promote the usage of reusable cups consistently (Poortinga & Whitaker, 2018). Therefore, based on UBC policy regarding extra 25 cents cost, the addition of our informative, educational (environmental consequences of disposable cups) posters should increase the usage of the reusable cup. However, the chi-square test result shows that our posters do not promote a significant effect on the reusable cup usage, which does not support the hypothesis. The reason may due to the second data collection was affected by the COVID-19 pandemic that we have to collect the data after two days of new posters exposure. It means that consumers may not have time to buy reusable cups. Also, the data collection was only able to complete once a week because the coffee shop shut down after the course transact to online format. Besides, we

collected data at Life building Starbucks as well to compare with the data collected at “Hero coffee” to highlight any confounds that may affect the coffee consumption and reusable cup usage. However, Starbucks does not accept reusable cups consumption before the second data collection week, we have to give up the data from the comparison coffee shop. The descriptive results pointed out the possible influential factors that our posters have a low exposure rate (5% of participants saw our posters). This may lead to the reusable cups rate not increasing because the current study motivated to use new posters to encourage viewers to use reusable cups.

Next, most participants (82%) think they will use reusable cups on campus in the future. This means if the study could endure a long time, the reusable cups using rate may increase. Therefore, the future study may consider conducting a long-term exposure of the informative, educational (environmental consequences reminder) posters to make sure the participants have enough time to decide whether to take action. Also, most participants chose eco-friendly and economics as their main reasons for not using reusable cups, which means that the economics is also a major reason for choosing reusable cups. Therefore, future studies may think about applying some economic stimulation, for example, affordable reusable cups or in-store coffee cup to promote the usage of reusable cups. Also, the result of the descriptive shows that 55% of participants never saw the UBC choose to reuse posters, and most of the participants observed the UBC choose to reuse posters at Buchanan building. It means that the poster exposure rate may be affected not only the enduring time but also the location of the posters. Future studies can conduct a study to analyze whether low exposure is due to the location of posters or the building itself so that the posters campaign can achieve sufficient exposure to populations to have effect.

For this study, we used the observational study design, and we assume that people with exposure to the poster will raise their awareness and may choose to switch to pro-environmental behaviors. The primary shortage of the study is the low internal validity; we cannot prevent the third variable and the confounding variables. Considered this problem, we tried to do our observation at the same time, which is to observe all the Café in 2 hours at noon in the same week. However, some other variables may still affect, like the customer in different café may have varied level pre-exposure to the program. The other confounding variable is the customer demographic. Our study is a naturalistic observational study, we were trying to minimize the researchers’ intervention into people’s behavior, so we did not ask people to fill a demographic survey when they were buying drinks in stores. The other main problem is, after the coronavirus outbreak in Canada, we changed our post-poster observation into survey style while asking people’s thoughts of the current UBC poster, our poster, and their cup using habits. For the unexpected change, the reliability of our study is susceptible. According to Cognitive dissonance theory explained by Rashid et al. (2012), people cannot tolerate inconsistencies and will work to eliminate or reduce it whenever it exists. So people’s attitude explicit in the survey could be imbalanced with their behavior in real-life settings, which have more influential factors, those people who said they would use reusable cups in the survey may not use it in real life.

Moreover, our sample size is relatively small and limited. Due to the sudden change of COVID-19 outbreaking and a deficiency of time, we cannot gather enough participants for our survey. Compared to our collected data in pre-poster observation, the survey put on the survey website gathered in a total of 89 participants, which is not persuasive enough to form a conclusion. Also, the data analysis is based on UBC students, which means the results might be biased, and generalizability is relatively low to other institutions or population.

Also, there might be observation errors; it is a cognitive challenge to track each customer enduring two hours. Therefore, there are possibilities of missing recording data regarding the usage of reusable cups in busy hours. We would suggest future study combined observational data with store sales summary of the disposable cups or conduct a long-term study to get a sufficient sample size to minimize the effect of the error.

Recommendation

In the report of UBC Food Services (2019), the surcharge of 25 cents on each disposable cups and posters applied, raised the reusable cup usage from 5.5% to 17.85% around campus, which is a great encouragement for the Choose to Reuse Program. However, there is still a long way to go before the goal of the 50% rate is reached. When UBC Brand and Marketing (2019) are creating the approach of “Let’s choose to reuse,” the program designed to emphasize ownership, the voice of the campus community, clear messaging, and graphic illustrations.

According to Too and Bajracharya (2015), this is a good try that satisfied four of the six factors of sustainable behavior engagement. We designed our study poster with the consideration of Psychological needs. In detail, we added more information about knowledge and values concerning the environment in the poster. Moreover, our results showed that a poster with an emphasis on environmental images would be more noticeable and educational. At the same time, there is still some improvement to do with Personal Motivation (time availability and performance requirement), and Physical facilities. The descriptive result that most participants (82%) think they will use reusable cups on campus in the future, and their main reasons for using reusable cups are mainly because of eco-friendly and economic reasons. Therefore, UBC can try to add more environmental consequences of the disposable in posters campaign. To improve the Physical facilities, we would suggest that UBC provide more in-store cups in cafés. By observation, we found that many cafés in UBC have seats around (like the Buchanan Building’s Stir it up café) but did not provide any for-here cups options for customers sitting there. The use of in-store cups could promote the usage of the reusable cup that café Loafe has nearly 50% reusable cup using rate (see Appendix C Figure #4). Nevertheless, due to the short of time, we cannot make a sub-observation on this topic. The use of for-here reusable cups and impacts needs further research.

The last recommendation is the placement of the poster. In the survey, we asked the participants where they noticed the poster. In the 55% of participants who reported saw the poster, most of them saw the posters in Irving K. Barber, Buchanan, and Life Building. By our observation, all of those buildings have posters on annunciator boards, hanging boards, and small standing signs in the coffee shops, also have relatively high population flow. The previous research suggests that the location for the educational posters is essential to maximize the exposure, the posters should be posted at the high traffic places (Budd et al., 2018). Therefore, our suggestion is to find an optimal space for poster, for example, the poster can be standing table signs if the café has seating available, but for café that has high customer flows, the poster could be placed in the waiting area.

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Appendix A

Figure 1

UBC Choose to Reuse posters



Figure 2

Informative, educational (environmental consequence of using disposable cups) posters



Appendix B**Figure 3*****Survey questions***

Page 1.

Question 1. Have you ever seen these posters before?

A. Yes

B. No

Question 2. If you have seen these posters, where did you see them?

A. UBC Life building

B. Orchard Commons building

C. Buchanan building

D. Irving K. Barber learning center

E. Nest building

F. Never saw these posters

Question 3. Do you think these posters are informative?

A. Yes

B. No

Page 2.

Question 4. Do you think you will use reusable cups to consume coffee on campus in the future?

A. Yes

B. No

Question 5. What's your reasons for using reusable cups to consume coffee in the future?

(please all options that applied)

A. Safety

B. Economic

C. Trendy

D. Ecofriendly

E. All of the above

F. Other

Appendix C

Figure 4
Reusable cup using rate on campus

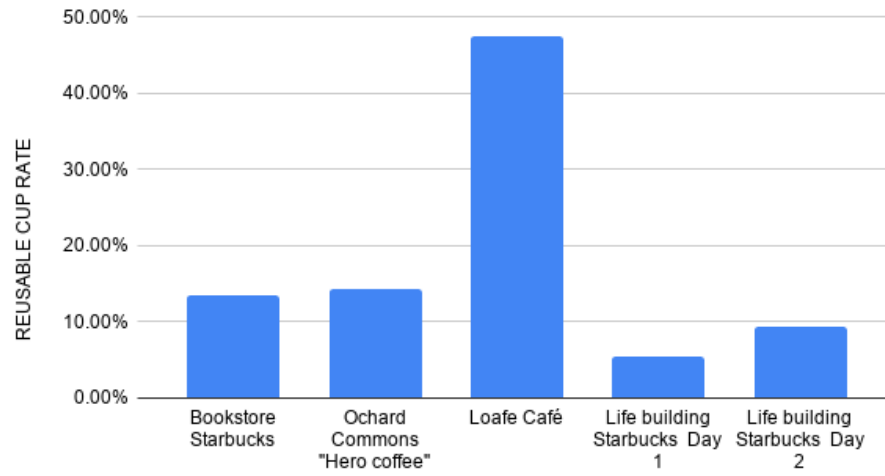
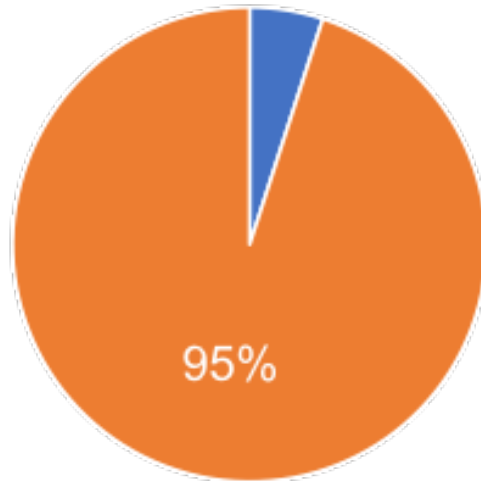


Figure 5
Poster exposure rate of informative educational posters



■ Ocahrd Commons ■ never saw this poster

Appendix D

Figure 6
Poster exposure rate of UBC Choose to Reuse posters

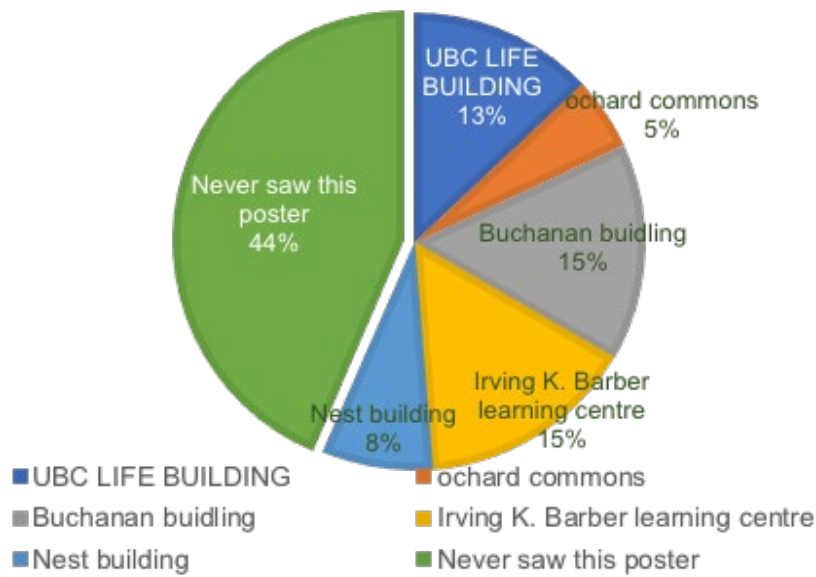
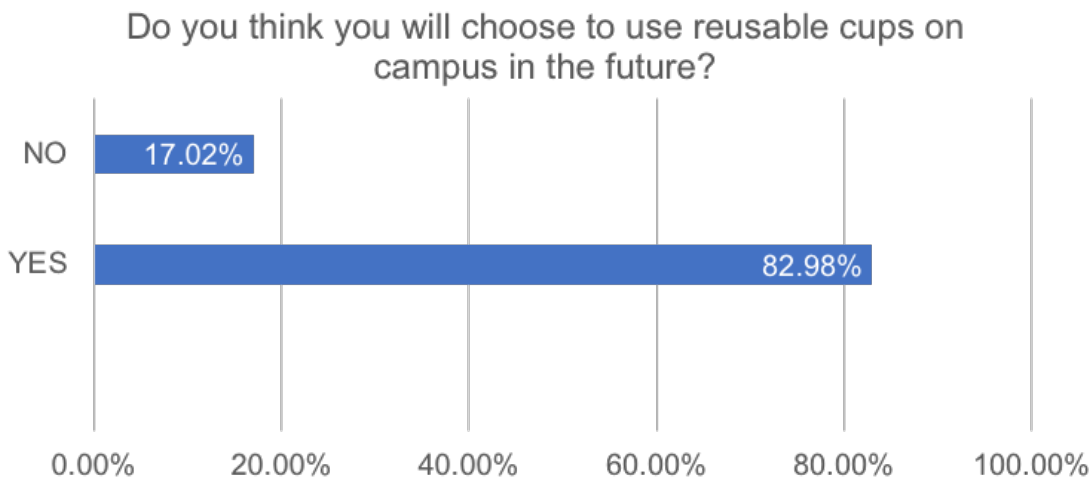


Figure 7
The response to the question “Do you think you will choose to use reusable cups on campus in the future?”



Appendix E

Figure 8

The response for “What’s your main reasons for using reusable cups on campus in the future?”

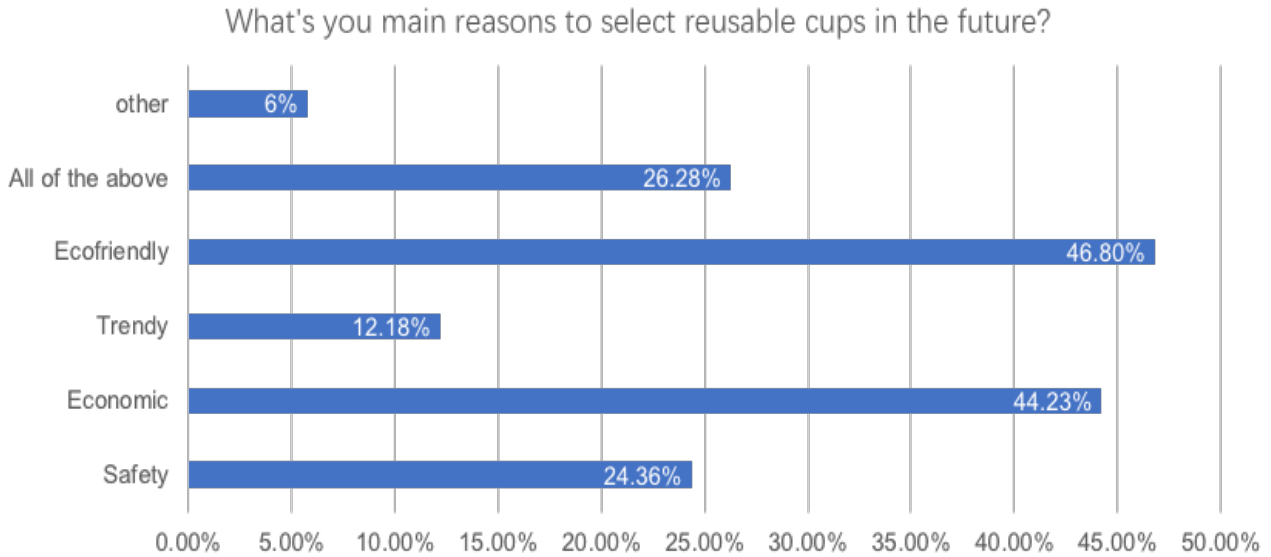


Table 1

The Chi- square result of the informativeness of UBC Choose to reuse posters and Informative, educational posters

Results						
	UBC POSTER	OUR POSTER				Row Totals
YES	24 (32.76) [2.34]	30 (21.24) [3.62]				54
NO	30 (21.24) [3.62]	5 (13.76) [5.58]				35
Column Totals	54	35				89 (Grand Total)

The chi-square statistic is 15.1585. The p-value is .000099. The result is significant at $p < .05$.

Appendix F

Table 2*The Chi-square result of the relationship of the informative educational posters and reusable cups usage*

Results						
	UBC POSTER BEFORE	UBC + OUR POSTER				Row Totals
REUSABLE CUP	46 (45.64) [0.00]	13 (13.36) [0.01]				59
NO REUSABLE CUP	265 (265.36) [0.00]	78 (77.64) [0.00]				343
Column Totals	311	91				402 (Grand Total)

The chi-square statistic is 0.0144. The p -value is .904638. The result is *not* significant at $p < .05$.