

Campus Coffee Consumption: Reducing the Environmental Impact of Dietary Choices
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PSYC 321: Environmental Psychology

Campus Coffee Consumption: Reducing the Environmental Impact of Dietary Choices

Frances' Children

Project title (3%):

Campus Coffee Consumption: Reducing the Environmental Impact of Dietary Choices

Group name and student names (2%):

Frances' Children

Emma Ward-Griffin, Giping Tomczyk, Spencer Williams, Nicole Van Stekelenburg

Executive Summary (10%):

In this study, we aimed to promote pro-environmental dietary choices. Specifically, we were interested in reducing coffee and disposable cup use by displaying an informational sign on the harms of coffee consumption. Survey data assessed participants' intentions to bring reusable mugs in the future, demographics, and other characteristics that may be relevant to environmental behaviours. We intended to use the receipt data to measure Loop café patrons' coffee purchases and reusable mug use. We predicted the sign would lead to greater intentions to use reusable mugs and reduce coffee purchases and disposable cup use. We collected data over 4 weeks; each week alternated between being "control," when the sign was not displayed, or "sign present," when the sign was displayed. We did not receive receipt data, and were therefore unable to test two of our hypotheses. Our survey data do not indicate a significant difference in intentions to bring reusable mugs across conditions. This may suggest that our sign was not effective; however, note that we have a number of limitations that may limit our ability to detect differences. We suggest future research exploring other measures of displaying information, or testing the display of other facts.

Research question and hypothesis (10%)

In this project, we investigated how to reduce the environmental impact of individuals' dietary choices on the University of British Columbia campus. Specifically, we explored whether we could reduce coffee consumption and disposable coffee cup use in the Loop café in the Centre for Innovative Research in Sustainability (CIRS) building by displaying informational signage on the detrimental impacts of coffee consumption and production on the environment.

We hypothesized that the presence of a sign describing the environmental harms of coffee consumption and production would lead to a decline in the number of coffee purchases and in the number of disposable cups bought in the Loop café. That is, we expected that on the weeks in which the information sign was displayed, we would see a decrease in coffee consumption and in disposable coffee cup usage.

We also hypothesized that on weeks when the sign was displayed, survey data would indicate an increase in participants' intentions to use reusable coffee mugs in the future.

Methods (30%)

Our study comprised of two sets of data; (a) objective data in the form of purchase receipts, and (b) subjective data in the form of survey responses collected in the café during the weeks of data collection.

Participants (5%)

Participants for the objective data (receipt data) were patrons of the Loop café between March 6th and March 31st 2017. Everyone who made a purchase at the Loop café during this period would be included in the purchasing data for the purposes of data analysis. These participants did not provide any form of consent, and were unaware of their participation in the study.

Participants for the subjective data (survey data) were patrons of the Loop café who were approached by a member of the research team and were asked to participate in a one-minute survey for a class project. We obtained oral consent from participants before they began the survey. Participants were selected to participate in the study if they had bought at least one item from the Loop café on that visit. Participants were eligible to participate if they were students, faculty, staff, or other (*e.g.*, construction workers).

In total, we received 88 survey responses, 84 of which were complete. 38 participants in the experimental condition did not notice the sign, and were therefore excluded from all analyses in this paper. In total, we had 46 participants whose data will be included in this paper. The most common age range for participants was between 16 and 20 years old (48%) and between 21 and 24 years old (26%). The majority of our sample was East Asian (38%) and Caucasian (38%), and most of our participants were students (76%).

Conditions (10%)

The two conditions of our quasi-experimental study were "sign present" and "control." Our experimental "sign present" condition involved displaying an informational sign describing the environmental effects of coffee consumption and encouraging café patrons to consume less and bring a reusable mug to campus (See Appendix A). The sign includes three facts on the impact of disposable coffee cups on the environment: two pertaining to Canada in general, and one fact specific to the University of British Columbia. The sign's dimensions were 18in by 24in and the sign was printed in colour. It was displayed on the wall behind the cash register, so people who purchased items at the Loop café would see the sign before purchasing coffee.

Previous research on behavioural change and presenting information has suggested a series of best practices to influence peoples' behavior. Van Vugt (2009) suggests that presenting

environmental information is most effective when the information pertains to the local effects of environmental damage. Van Vugt (2009) also posits that local information is more persuasive because the environmental ramifications are clearer to people of the area. Therefore, we included two facts that were specific to Canadian coffee consumption, as well as one fact that related directly to coffee consumption at UBC.

Van Vugt (2009) also notes that simple information is often more effective at provoking behavioural change than is complex information, especially for consumers who are already thinking about behavioural change. Therefore, we only include three, simple and easy to understand facts in the sign.

Previous research has also found that having visual stimuli is beneficial, as it captures peoples' attention. Pieters and Wedel (2004) found that images in advertisements draw a large amount of attention. Thus, in this sign, we included three images: one reusable mug, one disposable mug and one depicting the destruction of the rainforest. We intend for these images to capture the attention of Loop café patrons.

On control weeks, there was no sign present in the Loop café. Both survey and receipt data collection continued during these weeks.

Measures (10%)

Our primary dependent variables were the amount of coffee purchased in the Loop café and also the amount of disposable coffee cups that were bought. Our secondary dependent variable was measured using subjective, self-report survey data. The subjective dependent measure was a measure of the percentage of time over the course of the term that participants intended to bring a reusable mug for hot drink purchases (see Appendix B, question 1). Participants also responded to a series of other measures, including measures of environmental behavior, coffee consumption, perceptions of the sign, and demographic information (see Appendix B).

The purpose of the measures not pertaining specifically to coffee consumption and the sign were to assess possible demographic differences between participants across the weeks of data collection. For example, if, by chance, on control weeks, we had more male participants, we might find effects due to gender and not the sign being present. As this is a quasi-experimental design, there are still possible confounds across the weeks, but by assessing these variables we have some knowledge of the patrons of the Loop café on the different weeks of data collection.

Procedure (10%)

On weeks when the sign was present, the sign was posted at 8:30am on the Monday, one hour after the opening of the café. The sign was then removed at 2:30pm on the Friday, 30 minutes before the café closed for the week. The café was not open on weekends. On control weeks, no sign was posted.

The procedure of data collection was identical across the control and the experimental weeks. The survey data was collected by experimenters using convenience sampling in the Loop café across the four weeks of data collection, ranging in times from 8:30am to 2:30pm. Experimenters approached Loop café patrons who had visibly purchased a food or drink item from the Loop café. Patrons of the café were asked if they were willing to participate in a 1-minute survey for a class project. If participants agreed, they were given either an iPhone, iPad or a laptop with the Qualtrics survey open and asked to complete the survey. After participation, they were thanked for their time and any questions they posed about the project were answered.

The finance department of the UBC food services recorded purchasing information and receipts from each purchase in the Loop café. We obtained consent from the finance department and the IT department to receive the receipts for the period of data collection.

Results (10%)

Due to the lack of random assignment in our study design, we performed a series of Chi Squared tests on our demographic variables in order to ensure that our participants did not vary on other variables across the two conditions. We found no significant differences between the ages, ethnicities, and environmental focus of the participants across the two conditions.

In terms of our hypotheses, we first set out to test whether coffee purchases decreased during the sign weeks relative to the control weeks. As the UBC food services finance department only provided us with the total units of coffee purchased for the first two weeks of data collection, we can only provide descriptive information on coffee sales at the Loop café during this period (See Appendix C). On the control week, 374 units of coffee were sold, whereas on the sign week, 446 units of coffee were sold. Descriptively, it appears that more coffee was sold on the week when the sign was displayed (see Figure 1). We are unable to test this hypothesis with inferential statistics, as we were not provided with the total number of purchases in the Loop café on each week. Thus, we could not test our primary hypothesis that coffee consumption would decrease on sign weeks.

In terms of our secondary hypothesis that reusable mug use would increase on weeks when the sign was displayed. We were also not provided data on reusable mug reimbursement rates on the weeks requested. Thus, we were also unable to test this hypothesis.

We also tested our hypothesis that intentions to use reusable mugs over the remainder of the term would be greater on the experimental weeks. As previously mentioned, the majority of participants in the experimental week (67%) did not notice the sign; these participants were excluded. We conducted an independent samples t-test to assess intentions to bring reusable mugs, and found that on the sign present weeks ($M = 51.89$, $SD = 39.22$), participants did not have significantly higher intentions to bring reusable mugs than did participants on the control weeks ($M = 36.56$, $SD = 36.29$; see Figure 2), $t(44) = 1.37$, $p = .18$, $d = .41$. Despite the moderate effect size, this does not support our hypothesis.

Discussion (10%)

We were unable to test our hypotheses regarding receipt data. The results of our survey data do not support our hypotheses, as intentions to use reusable mugs did not differ across conditions. However, we did find a moderate effect size, suggesting that with a larger sample size and more power, the results may have become statistically significant.

Our results suggest that the informational sign that was displayed in this study had no effect on intentions to bring reusable mugs. There are a variety of possible explanations for these findings. The results suggest that participants did not actually notice the sign, which suggests that a more salient sign (*e.g.*, brighter or larger) may have captured more participants' attention. More central placement of the sign may have also encouraged participants' to read the sign.

Also, as our design was not experimental (*i.e.*, participants were not randomly assigned), we cannot determine that any differences between conditions can be attributable to our sign. There may have been other variables that differed between groups on the experimental and control weeks. For example, certain events or classes taking place in the CIRS building on certain weeks would have altered the demographics of patrons of the Loop café, ultimately acting as third variables. Therefore, it is possible that our sign did have an effect, but external factors made us unable to detect this.

This limitation could be avoided in future studies with random assignment to conditions. For example, over a longer period of time, certain weeks could be randomly assigned to having the sign displayed, instead of simply alternating weeks as was done in this study. Similarly, these practices for future studies would help eliminate possible issues from carry-over effects, in which the display of the sign on one week could then influence purchasing on the next.

Also, we implemented convenience sampling to acquire survey data. The researchers collected data at the Loop café at times that were convenient to their schedules. Thus, certain days and times are underrepresented. These times may have had a different population of people than at other times, potentially skewing our sample.

There is a possibility that the demographics of CIRS patrons are different from those of other cafés on campus. For example, as CIRS is an environmental building that hosts many sustainability-related lectures, participants may be particularly concerned with environmental causes and behaviours. Therefore, CIRS patrons may have responded differently to the sign than other students would, indicating the need for future studies to collect survey data in other locations on campus. Previous work supports this, as research has found that this specific location (CIRS) promotes pro-environmental behavior (Wu, DiGiacomo, & Kingstone, 2013).

Our final possible explanation for our results is that the sign is simply not effective at encouraging behavioural or intention change. For example, the facts listed on the sign may not have altered participants' desire to bring reusable mugs. Previous research has found that displaying statistics including large numbers of people does not necessarily increase people's willingness to act (Slovic, 2007). Thus, we propose that this explanation, that psychic numbing occurred, is a possible reason for our lack of results. Participants may have been overwhelmed by the large numbers and not felt that they could make a meaningful difference.

The biggest strength of our study design is the attempt to incorporate both subjective data (participants' self-reported intentions) and objective data (receipts) that together, inform several possible facets of participants' behaviours and cognitions that may have been influenced by the sign. The receipt data would have allowed us to measure actual, tangible, changes that would have benefited the environment, instead of simply participants' self-reported intentions (which are prone to be influenced by social desirability or inaccuracy). However, unfortunately, the largest weakness of our results is our inability to actually acquire and analyze this data.

Recommendations for your UBC client (10%)

Given the moderate effect size but lack of statistical significance, we suggest collecting more data for this study. This includes both collecting more survey data and attempting to receive the receipts in order to conduct statistical test on the objective data. However, given the lack of statistical significance, we also suggest that the current sign does not seem to be effective in altering people's intentions. Thus, we suggest not continuing to display this particular sign in this context.

We also suggest trying other forms of presenting information to Loop café patrons. As previously mentioned, few participants noticed the sign. Thus, we have a few suggestions for how to make the sign more salient. For example, we suggest other means of communicating the harms of coffee cup use and coffee consumption. Displaying a sign about the harms of consuming coffee is a passive strategy of learning for participants, and research suggests benefits to active learning strategies. Therefore, initiating interactive displays and encouraging discussions may better help the participants encode the information.

Furthermore, other strategies to make the sign more salient could be used, such as creating video displays, or presenting the information in a different location, such as having facts

about the harms of coffee on the actual disposable cups themselves. Also, 3-dimensional displays could be created, such as displaying reusable mugs for sales near the cashier counter.

Another potential way to increase reusable mug use would be to inform participants that incentives exist for bringing reusable mugs. Many cafes such as the Loop café provide a small discount for bringing a reusable mug, but many café patrons do not know this. Thus, advertising this discount could discourage consumption of disposable coffee cups.

Lastly, we recommend using other psychological principles to increase environmental behavior. For example, messaging on social norms has previously been found to increase environmental behavior (Bohner & Schlüter, 2014). Thus, signs presenting not consuming coffee, or consuming little coffee, as the norm may reduce coffee consumption.

In conclusion, it would be beneficial to continue to assess the efficacy of simple and easy methods of behavioural change on campus that can reduce UBC's ecological footprint from dietary choices. As well as reducing UBC's impact on the environment, it would also help UBC to make progress towards its goal of becoming a more sustainable campus.

References

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Figure 1.

The number of units of coffee sold on the first week of data collection (a control week) versus the second week (a “sign present” week). There are no error bars on these graphs as we were not provided the information necessary to create them.

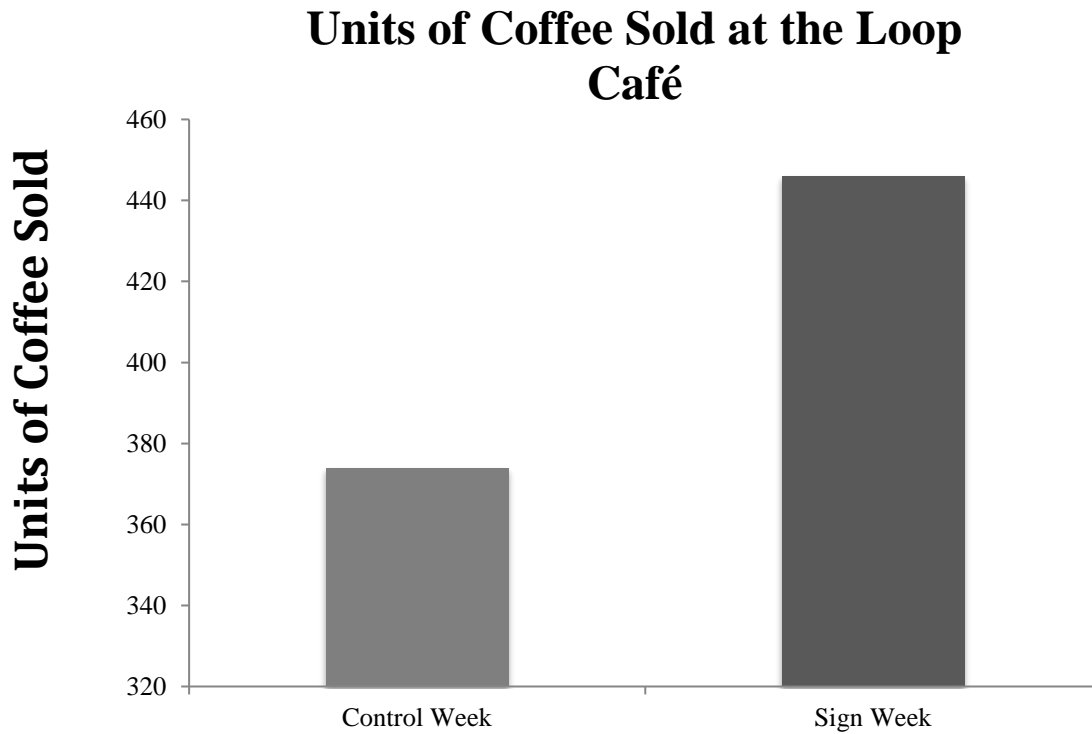
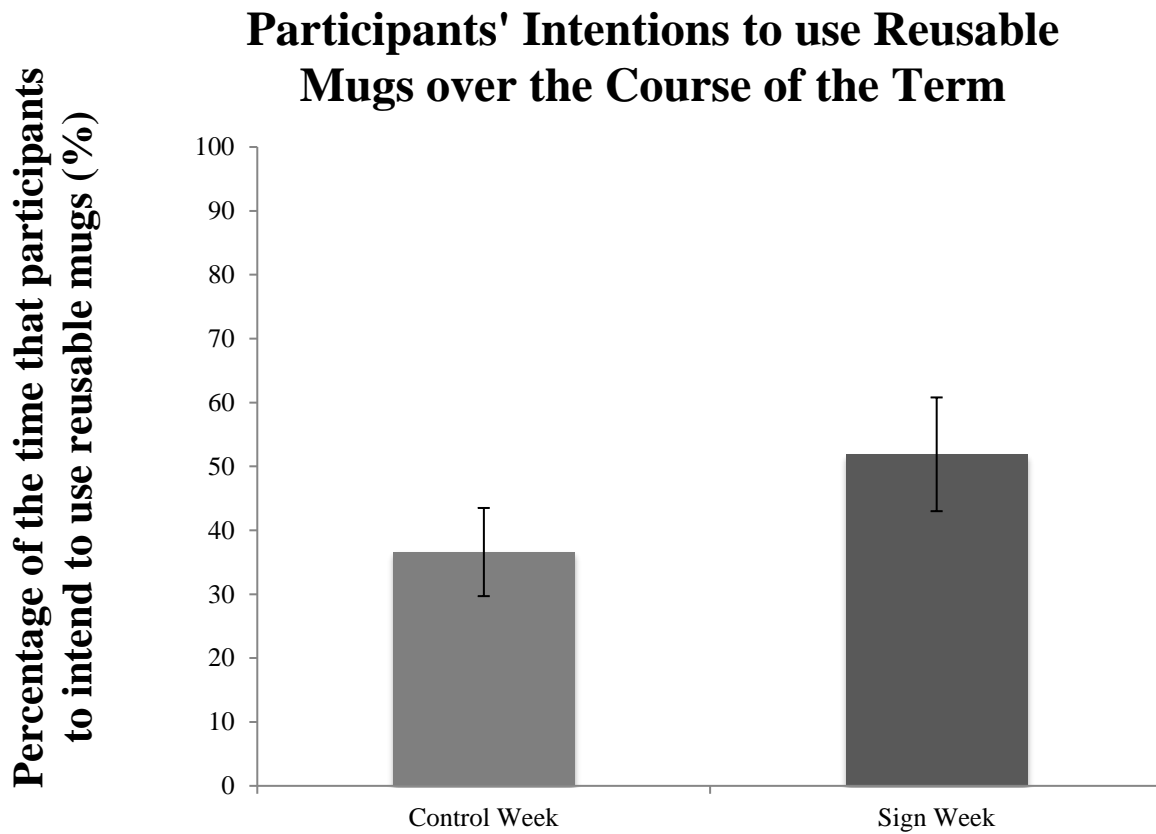


Figure 2.
Participants' intentions to use reusable mugs over the remainder of the term as a percentage of the time across both control and both sign present weeks.



Appendix A
Informational Sign

Each year, **1.6 billion** disposable coffee cups in Canada end up in the landfill



That leads to the destruction of **500,000** trees in Canada each year

Help reduce the **2,000** coffee cups that UBC sends to the landfill every day



Bring a reusable mug or consume less!

Appendix B
Coffee Consumption on Campus Questionnaire

1. Over the course of the term, what percentage of the time do you plan to use a reusable mug for future hot drink purchases?

0 25 50 75 100

2. How many times per week, on average, do you purchase coffee? Please answer as a numeral.

3. What brought you to CIRS today?

- Class or office in/near CIRS
- Meeting in/near CIRS
- Loop Café
- Other (please specify): _____

4. How environmentally focused do you consider yourself to be?

- 1 Not at all
- 2
- 3 Moderately
- 4
- 5 Very

5. Have you ever taken a sustainability course?

- Yes
- No

6. Did you purchase coffee at the Loop Café this visit?

- Yes
- No

7. Did you bring your own reusable mug for your coffee purchase?

- Yes
- No

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Help reduce the **2,000** coffee cups that UBC sends to the landfill every day



Bring a reusable mug or consume less!

8. Did you notice the sign above in the café today?

- Yes
- No

9. Did the sign influence any of your purchases today?

- Yes
- No

10. Which of your choices today were influenced by the sign above?

- Changed food choices
- Reduced food purchases
- Changed drink choices
- Reduced drink purchases

11. Did the sign influence your future intention to purchase certain items at the Loop Café?

- Yes
- No

12. What is your gender?

- Male
- Female
- Neither of the above categories accurately describe me

13. What is your age?

- 16 – 20
- 21 – 24
- 25 – 30
- 31 – 36
- 36 – 40
- 41+

14. What is your ethnicity?

- East Asian
- South Asian
- Caucasian
- Middle Eastern
- Latino / Hispanic
- First Nations, Inuit, Metis, or Aboriginal
- African
- Other: _____

15. What category do you belong to?

- Student
- Professor
- Staff
- Other

Note that question numbers 9 through 11 were only displayed to participants on the weeks when the sign was present.