

Comparison of Textual and Graphic Nudges in Reusable Mug Use

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Executive Summary

Introduction

This study aimed to assess the impact of textual and graphic nudges on the usage intentions of reusable mugs within the UBC community.

Research Question

How do a graphic nudge and a textual nudge influence intended reusable mug use?

Methods

We designed an experiment where 249 participants were shown images of reusable mugs with different types of nudges: a graphic nudge featuring an animated dolphin and an eco-friendly message, a textual nudge displaying the same message but without the animated dolphin, and a control group with a standard black UBC-issued mug. Participants' responses were collected on their likelihood to purchase the mug, willingness to spend money on it, and their frequency of using it at campus cafes.

Results

The results of our study indicated that neither the textual nor the graphic nudges significantly influenced participants' intentions in comparison to the control group. The findings suggest that while nudges are often considered a potent tool for influencing environmental behaviours, their effectiveness can vary significantly based on context and other underlying factors, which need further research within the community.

Recommendations

We recommended that UBC AMS explore a multi-faceted approach to enhance the adoption of reusable mugs within the UBC community. For further research, UBC AMS might consider experimenting with a combination of nudges, incorporating both textual and graphic elements, and perhaps integrating them with other behavioural incentives such as discounts or loyalty programs specifically tailored to reusable mug users. Additionally, more research into design preferences is advised, focusing on creating visually appealing and functional mugs that resonate with environmental themes, such as ocean protection.

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Introduction

When you buy a beverage in a café, do you use disposable cups from a café or use your reusable mug? In the UBC community, there are disposable plastic cups and paper cups provided in cafés. Customers may think using paper cups is eco-friendly, but most paper cups contain inner plastic coating, a pollutant for the environment (Zhang, et al., 2023). Due to the high demand for single-use plastic items during the COVID-19 pandemic, a higher amount of plastic waste will enter the ocean and threaten aquatic ecosystems because of the slow degradation rate and plastic deposits in the ocean (Luo et al., 2022). The growing presence of microplastics also impacts marine life by becoming a part of their food chain (Wright et al., 2013). To reduce the plastic waste from disposable cups, the AMS Sustainable Action Plan (2019), in collaboration with the UBC's SEEDS program, encouraged the usage of reusable mugs in the UBC community in the section of Zero Waste and Foodware Innovation. In 2020, the plan reported that usage of reusable mugs increased from 37 to 1104, which can potentially be attributed to the \$0.25 fee introduced on take-out cups (AMS Sustainable, 2019). Previous research done by the SEEDS program stated that eco-friendly poster design and brand persona of reusable mugs can increase students' motivation for use (Hatmi et al., 2016). Material design also influences students' preference for reusable mugs provided by the UBC Mugshare program (Ruskey et al., 2016). AMS is still looking for more strategies that reflect better practice on the usage of reusable mugs in the UBC community.

According to Thaler and Sunstein (2008), the purpose of nudges is to facilitate people's choices without interfering with their freedom of choice and preferences. Previous studies have discussed comparisons between textual and graphical nudges in promoting environmental health actions. Roozen et al. (2021) found that applying a verbal nudge on a fashion retailer's website had a significant positive influence on customers' selection of sustainable apparel, compared to applying a visual nudge or no nudge at all. However, the effectiveness of nudges varies depending on the context. Graphic nudges have been found to reduce plastic waste through graphic depictions of marine animals entangled in plastic (Luo et al., 2022) and reducing tobacco use through warning messages (Hammond, 2011). Although nudge research has been conducted in many contexts, there is no evidence to support the influence of textual and graphic nudges on the usage of reusable mugs. This calls for the need to compare the impact of these two nudges. Considering the aforementioned, our study aims to examine how the application of nudges on mug design influences UBC community members' intentions for reusable mug usage.

Our study aims to find how graphic and textual nudges designed on reusable mugs can influence people's intention of usage in the UBC community. The idea of nudge design is motivated by research demonstrating that communicating positive consequences through visualization or textual meaning can reinforce people's behaviour (Feng & Zhang, 2019). Therefore, we designed a graphic nudge printed on the mugs as an animated dolphin with dialogue communicating the meaning of using reusable mugs for saving the ocean, and we kept the same dialogue as a textual nudge in our study. In the experiment, we presented mug images with different nudging conditions to participants and measured the intention of use from participants.

Research Question

How do a graphic nudge and a textual nudge influence intended reusable mug use?

Hypotheses

Our study has three hypotheses. **H1:** We predict that participants' likelihood to purchase a reusable mug will be higher with a graphic nudge than with a textual nudge or no nudge (the regular UBC black mug). **H2:** We predict that participants' willingness to spend money on purchasing a reusable mug will be higher with a graphic nudge than a textual nudge or no nudge. **H3:** We predict that participants' frequency of using a reusable mug at campus cafés will be higher with a graphic nudge than a textual nudge or no nudge.

Methods

Participants

Our study initially collected 329 responses, 9 respondents were excluded for not consenting to participate, 51 for incomplete survey responses, and 20 for non-affiliation with UBC, resulting in a final sample size of 249 participants. A priori power analysis was conducted utilizing G*Power software (Faul et al., 2009). The analysis projected that a sample size of $N = 246$ was necessary to attain an 80% power level for detecting a small effect size ($d = 0.2$) across three between-subjects conditions, at a significance criterion of $\alpha = 0.05$ (see Appendix A). Thus, the obtained sample size ($N = 249$) is adequate to test our hypothesis. Participants were aged 17-47 years ($M_{\text{age}}=21.16$ years, $SD_{\text{age}}=2.68$) (see Figure B1). The gender composition was predominantly female (63.9%), followed by 28.9% male, 5.2% non-binary or third gender, 1.6% preferring not to say and one participant self-described as two-spirit (see Figure B2).

Conditions

The independent variable in our study is the type of nudge designed on the reusable mug, which includes graphic, textual, or no nudge. The designs of the mugs were displayed as images on Qualtrics. Participants were randomly assigned to one of the aforementioned three conditions (see Appendix C for conditions). Experimental condition 1 ($N=84$) featured a graphic nudge, presenting an image of a black mug with an animated dolphin alongside the message, “Eco mugs for a cleaner ocean.” Experimental condition 2 ($N=81$) involved a textual nudge, displaying an image of a black mug with the text “Eco mugs for a cleaner ocean.” Participants in the control condition ($N=84$) were shown an image of a standard black mug with the UBC logo.

Measures

The dependent variables were designed to measure the participants’ intention to use reusable mugs through three survey questions. The first dependent variable measures the participants’ likelihood of purchasing the mug (see Appendix C for Question 1) through a 7-point Likert scale (Likert, 1932) ranging from 1 (extremely unlikely) to 7 (extremely likely). This scale allows for an understanding of participants’ purchasing intentions that can be analyzed to assess trends and differences between the three conditions. The second dependent variable measures participants’ willingness to pay for the mug (see Appendix C for Question 2), with responses collected through a numerical text entry ranging from CA\$0 to CA\$50. This direct financial metric was designed to provide data on the economic value participants place on the reusable mugs, and offers insights into the economic impact of graphic and textual nudges on consumer spending decisions. The third dependent variable assesses the frequency that participants would use the mug shown in their assigned condition after purchasing a beverage at campus cafés (see Appendix C for Question 3), measured by a 7-point Likert scale that ranged from 0 (never, 0 times) to 7 (always, every day). This scale was designed to understand the anticipated usage of reusable mugs in daily routines, reflecting the sustainability aspect of consumer behaviour in the UBC campus setting.

Procedure

Data collection for this study was conducted electronically via the Qualtrics survey platform. Participants were recruited through various channels, including university email lists, social media posts, and in-person efforts on the UBC Vancouver campus. The data collection phase took place over three weeks. The survey was structured into four main sections designed to

assess the influence of textual and graphic nudges on participants' intention to use reusable mugs. The first section presented a consent form where if participants did not consent, the survey was terminated immediately. Upon consent, participants proceeded to the second section, where they were asked to imagine shopping at the UBC bookstore and viewed a mug image available for purchase, in one of three distinct conditions. They viewed the mug associated with their randomly assigned condition via an automated process on Qualtrics, ensuring equal chances of placement in each group. The third section measured the dependent variables through three questions (see Appendix C for Q1-Q3). The fourth question in the open-ended format (see Appendix C for Q4), collected qualitative data on participants' opinions about their assigned mugs. The final section gathered demographic information such as age, gender, and affiliation with UBC. Upon completing the survey, responses were automatically saved in the Qualtrics database. Participants were thanked and debriefed about the study's purpose. The study encountered a few challenges, including a lower than expected initial response rate, which was addressed by increasing the frequency of in-person recruitment and extending the survey period by one week.

Results

H1. Likelihood of Purchasing the Mug

We conducted a descriptive procedure to find the measures of central tendency for each dependent variable. Our first dependent variable is the likelihood of purchasing the mug. Our descriptive analyses revealed results for the control group ($M=2.82$, $SD=1.47$), the graphic group ($M=3.3$, $SD=1.84$) and the textual group ($M=3.17$, $SD=1.63$), (See Figure D1). To test the difference between our three conditions, we conducted three one-way ANOVA tests. The ANOVA results for the first dependent variable, the likelihood of purchasing the mug, indicated that the differences in the likelihood of purchasing the mug across the three groups were not statistically significant ($F(2)=1.953$, $p=.144$, $\eta^2=.016$), (See Figure D2). Due to our data not fitting the ANOVA normality assumption, we elected to use a Kruskal-Wallis H test. A Kruskal-Wallis H test showed that there was not a statistically significant difference between the different conditions, $\chi^2(2) = 3.154$, $p = 0.207$, with a mean rank likeliness to buy the reusable mug of 113.96 for the control condition, 129.26 for the graphic condition and 131.93 for the textual condition, (See Figure D3). This suggests that neither textual nor graphic nudges significantly influenced the decision to purchase the mug over the control condition.

H2. Willingness to Spend on the Mug

Our second condition is the willingness of the participants to pay for the mug, measured in Canadian Dollars. Our descriptive analyses revealed results for the control group ($M=13.69$, $SD=7.17$), the graphic group ($M=14.55$, $SD=7.56$) and the textual group ($M=15.22$, $SD=8.24$), (See Figure D1). The ANOVA for willingness to pay did not show a statistically significant difference across conditions ($F(2)=.829$, $p=.438$, $\eta^2=.007$), (See Figure D2). A Kruskal-Wallis H test showed that there was not a statistically significant difference between the different conditions, $\chi^2(2) = 1.354$, $p = 0.506$, with a mean rank willingness to pay for the reusable mug of 118.49 for the control condition, 131.41 for the graphic condition and 125.33 for the textual condition, (See Figure D3). This indicates the type of nudge, textual or graphic, did not significantly impact how much participants were willing to pay for the mug.

H3. Frequency of Using the Mug at a Café on Campus

Our third condition is the participants' frequency of using the mug at a cafe on campus, measured in the number of days of the week. Our descriptive analyses revealed results for the control group ($M=3.14$, $SD=1.53$), the graphic group ($M=3.49$, $SD=1.57$) and the textual group ($M=3.52$, $SD=1.46$), (See Figure D1). Similar to the previous two dependent variables, the ANOVA results for the frequency of using the mug indicated no statistically significant difference across the three conditions ($F(2)=1.568$, $p=.211$, $\eta^2=.013$), (See Figure D2). A Kruskal-Wallis H test showed that there was not a statistically significant difference between the different conditions, $\chi^2(2) = 3.820$, $p = 0.148$, with a mean rank usage of the reusable mug when purchasing a beverage at a cafe on campus of 112.76 for the control condition, 132.07 for the graphic condition and 130.42 for the textual condition, (See Figure D3). This suggests that the nudge type did not significantly influence how often participants would use the mug at a cafe on campus.

After conducting three one-way ANOVAs, our findings indicate that neither textual nor graphic nudges significantly impacted the outcomes compared to the control group. In this study, our alpha level, α , is 0.05. The p-values gathered from all three conditions were greater than 0.05, therefore they would be regarded as not significant. Moreover, Eta squared, η^2 , is a

measure of effect size that is commonly used in ANOVA models. According to Shaker, 2023, $\eta^2 < 0.01$: "negligible", $0.01 \leq \eta^2 < 0.06$: "small", $0.06 \leq \eta^2 < 0.14$: "medium", $\eta^2 \geq 0.14$: "large" effect size. Under the "ANOVA Effect Sizes" table (See Figure D2, Appendix D), the eta squared for all three conditions are considered small effect sizes, (.016 for Condition 1, .007 for Condition 2, .013 for Condition 3). We elected to run a Kruskal-Wallis H test for all three conditions because our ANOVA results did not meet the normality assumption and we used both tests to compare for similar results.

The ANOVA test, ANOVA effect sizes and Kruskal-Wallis test results show that the results of this study did not support our hypotheses. Due to the $p\text{-value} > \alpha$, the difference between the means is not statistically significant. Furthermore, the results show that we have a low eta squared, indicating that we have a small effect size, indicating that our results have limited practical applications. We can conclude that the results of our tests did not support our hypotheses. Across all three dependent variables, the analysis suggests that neither textual nor graphic nudges significantly impacted the outcomes compared to the control group. While there were slight differences in the means across conditions, these differences were not statistically significant, indicating that the nudges did not have a meaningful impact on the likelihood of purchasing the mug, the amount participants were willing to pay, or the frequency of mug use at a cafe on campus. This suggests that other factors not captured by the nudges may play a more significant role in influencing these behaviours in the UBC community.

In addition to the quantitative data, our study included an analysis of open-ended responses. These responses provided qualitative insights into participants' perceptions of the nudges and the reusable mugs. A notable trend in the open-ended responses was a significant portion of participants expressing dissatisfaction with either the design or the usage of the mug (see Appendix E1). Some participants mentioned disliking the aesthetics of the mug, while others preferred mugs with different features such as a straw or a cover. This qualitative data suggests that factors beyond the nudges themselves, such as the design and functionality of the mugs, may also influence individuals' behaviours and preferences (see Appendix. E2).

Discussion

Our study set out to assess how textual and graphic nudges impact the adoption of reusable mugs within the UBC community, focusing particularly on promoting marine protection. We drew on previous research on environmental behaviour change and the effects of nudges to explore how different nudging strategies influence sustainable practices (Feng & Zhang, 2019). Contrary to our expectations, our findings suggest that neither textual nor graphic nudges had a significant impact on participants' likelihood to buy reusable mugs, their willingness to spend on them, or their frequency of use at campus cafes. While there were minor differences in mean values across conditions, these variances did not reach statistical significance, indicating a limited effect of the nudges on changing behaviour related to reusable mug use (see Figure D4).

Our findings have two important consequences. First, they underline the complexities of behaviour change initiatives, particularly in the sustainability sector. Despite earlier data supporting nudges in a variety of circumstances, our findings highlight the necessity of taking unique contexts and message content into account when developing successful nudges. Second, our findings highlight the need for additional investigation and improvement of nudging tactics for environmental sustainability. Understanding the elements that influence people's decision-making processes for sustainable behaviours is crucial for generating more effective strategies.

Our study contributes to the existing literature by offering insights into the comparative effectiveness of textual and graphic nudges in encouraging reusable mug use. While past research has explored nudges' impacts on different behaviours, our study's focus on sustainable practices within a university setting enriches our understanding of how to tailor nudging strategies to specific contexts effectively. Building on earlier research, our findings contribute to a better understanding of nudge efficacy. While Luo et al. (2022) demonstrated the potential of visual nudges in reducing plastic waste, our findings emphasize the nuanced role of message content and context in influencing consumer behaviour toward environmentally friendly products, which is consistent with Roozen et al.'s (2021) emphasis on these factors. By integrating these insights and addressing a specific sustainability issue within a university setting, our study contributes to a deeper comprehension of tailoring nudging strategies for positive behavioural change.

Despite our rigorous study design, we encountered several limitations and challenges. Notably, the study's focus on a specific university community limits generalizability to broader populations. Future studies in this area could explore alternative nudge designs, and message content variations, and target different populations to better understand behaviour change mechanisms in sustainability contexts. Longitudinal studies that follow behaviour change over time may also give useful insights into the long-term viability and effectiveness of nudging treatments.

Finally, our findings highlight the continuous need for research and innovation in behavioural change techniques for environmental sustainability. While our findings did not reveal significant differences between textual and graphic nudges in promoting reusable mug usage, they underscore the importance of continued exploration and refinement of nudging strategies to foster meaningful environmental impact.

Recommendations

Based on the findings of this research, we recommended that UBC AMS explore a multi-faceted approach to enhance the adoption of reusable mugs within the UBC community. Although the nudges tested did not significantly influence mug usage, the study highlights the complexity of behavioural change in environmental sustainability. For further research, UBC AMS might consider experimenting with a combination of nudges, incorporating both textual and graphic elements, and perhaps integrating them with other behavioural incentives such as discounts or loyalty programs specifically tailored to reusable mug users. Additionally, more research into design preferences is advised, focusing on creating visually appealing and functional mugs that resonate with environmental themes, such as ocean protection. Addressing the pricing disparity—where the expected price range was \$13 to \$15 compared to the actual \$34—could involve reducing the price to align with student expectations. Also, considering feedback about the mug's weight and portability, exploring lighter, more travel-friendly designs, possibly incorporating features like collapsible structures or integrated handles that attach easily to bags, would make the mugs more practical for daily campus use. These improvements could significantly boost both purchase and usage rates among students, fostering greater engagement with sustainability initiatives on campus.

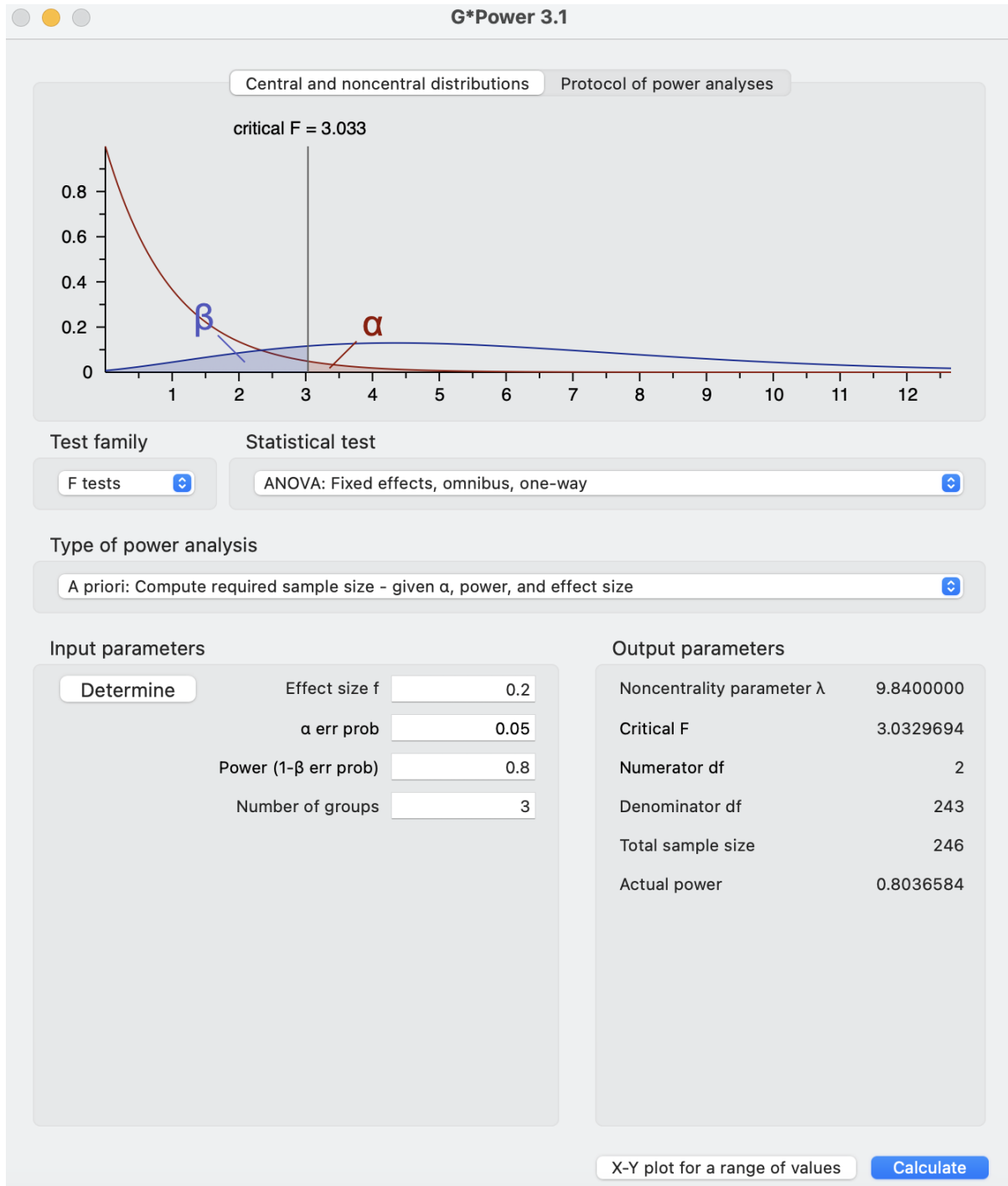
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Appendices

Appendix A: G*Power Calculation for three between-subjects conditions



Appendix B: Demographic Information

Figure B1.

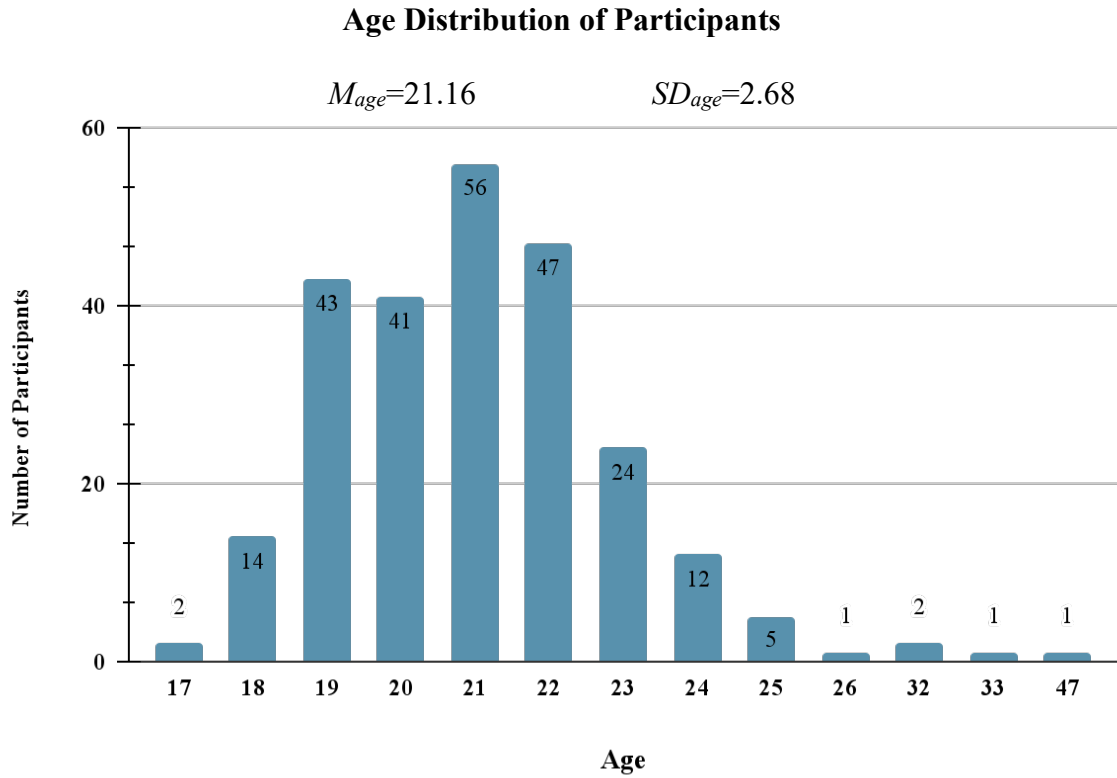
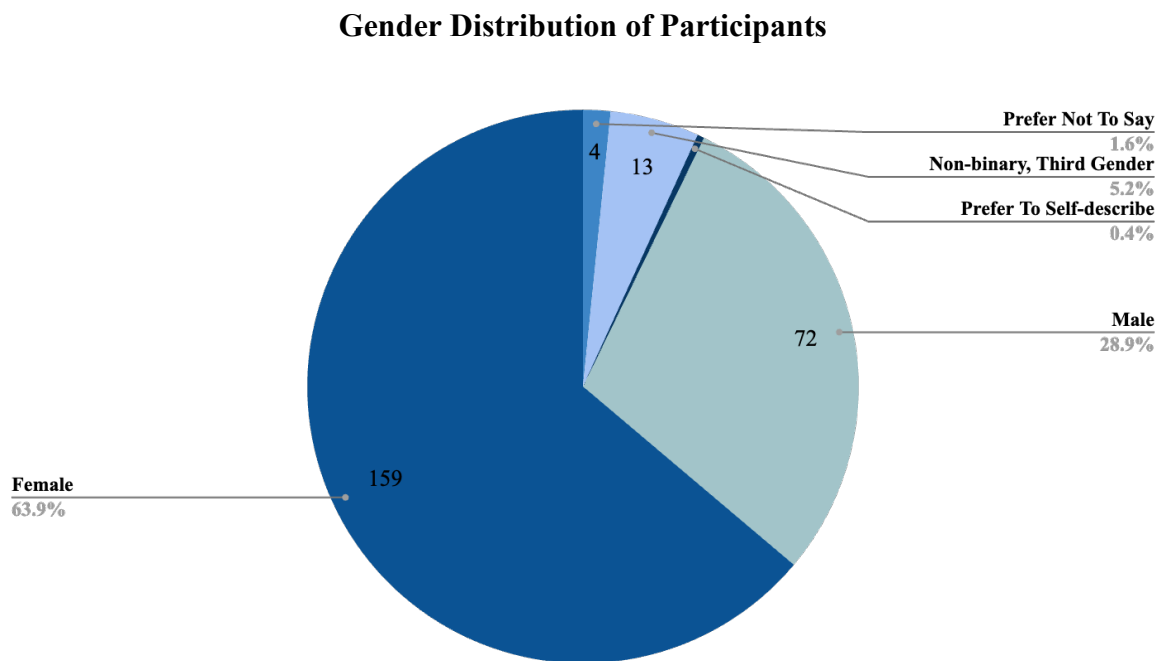


Figure B2.



Appendix C: Survey

Consent Form:

UNIVERSITY OF BRITISH COLUMBIA



Department of Psychology
University of British Columbia
Vancouver, BC, V6T 1Z4
Phone: 604.822.2755
Fax: 604.822.6923

Consent Form

Class Research Projects in PSYC 421 - Environmental Psychology

Principal Investigator: Dr. Jiaying Zhao
Course Instructor
Department of Psychology
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Introduction and Purpose

Students in the PSYC 421 – 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, collect and analyze data, present their findings in class, and submit a final report. Their final reports will be published on the SEEDS online library (<https://sustain.ubc.ca/teaching-applied-learning/seeds-sustainability-program>). Their projects include online surveys and experiments on a variety of sustainability topics, such as waste sorting on campus, student health and wellbeing, food consumption and diet, transportation, 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 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 encrypted and password protected so that only the principal investigator and course instructor, Dr. Jiaying Zhao and the teaching assistants will have access to it. Following the completion of the study, the data will be transferred to an encrypted and 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.

UNIVERSITY OF BRITISH COLUMBIA



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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. You also may postpone your decision to participate for 24 hours. You have the right to choose to not answer some or any of the questions. By clicking the “continue” button, you are indicating your consent to participate; hence, your signature is not required. The researchers encourage you to keep this information sheet for your records. Please feel free to ask the investigators any additional questions that you have about the study.

Ethics ID: H17-02929

- I consent to participate in this study and will continue to the experiment.
- I do not consent to participate in this study.

Conditions:

Imagine you are shopping at the UBC bookstore and notice the mug below is available for purchase.

Experimental Group 1 (Graphic Nudge)



Experimental Group 2 (Textual Nudge)



Control Group



Survey Question:

*Q1. How likely are you to buy this mug?

- Extremely unlikely Moderately unlikely Slightly unlikely Neither likely nor unlikely Slightly likely Moderately likely Extremely likely

*Q2. How much would you be willing to pay (in Canadian dollars) for this mug? (Please enter a number from 0 to 50).

*Q3. How often would you use this mug when you purchase a beverage at a cafe on campus?

- Never (0 times) Very Rarely (Less than once a month) Rarely (1-3 times a month) Sometimes (About once a week) Often (2-3 times a week) Very Often (4-6 times a week) Always (Every day)

Q4. Please tell us any thoughts about this mug

Q5. Are you currently affiliated with the University of British Columbia?

- Yes
 No

Q6. How old are you?

Q7. How do you describe yourself?

- Male
 Female
 Non-binary / third gender
 Prefer to self-describe
 Prefer not to say

Appendix D: Results: Descriptive Statistics

Figure D1. ANOVA test results

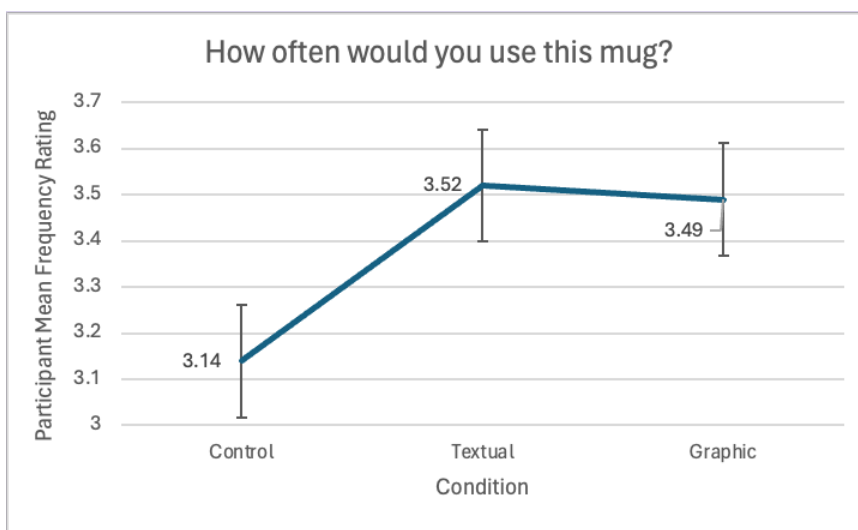
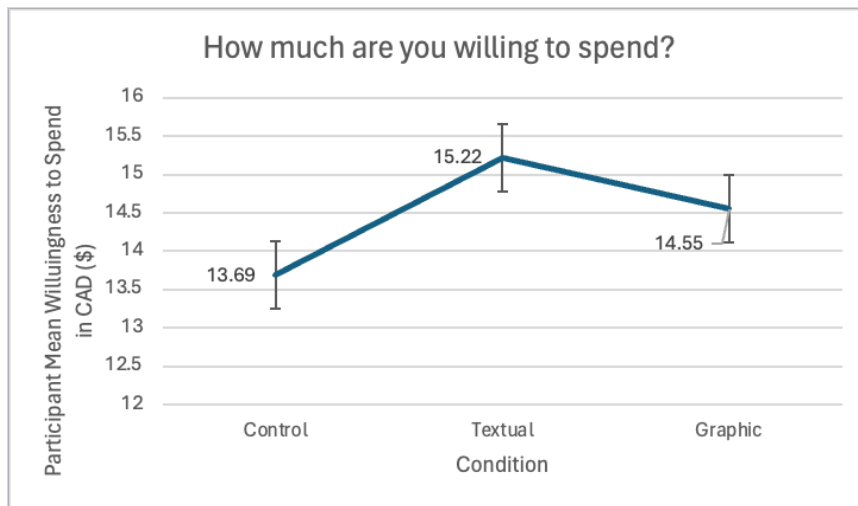
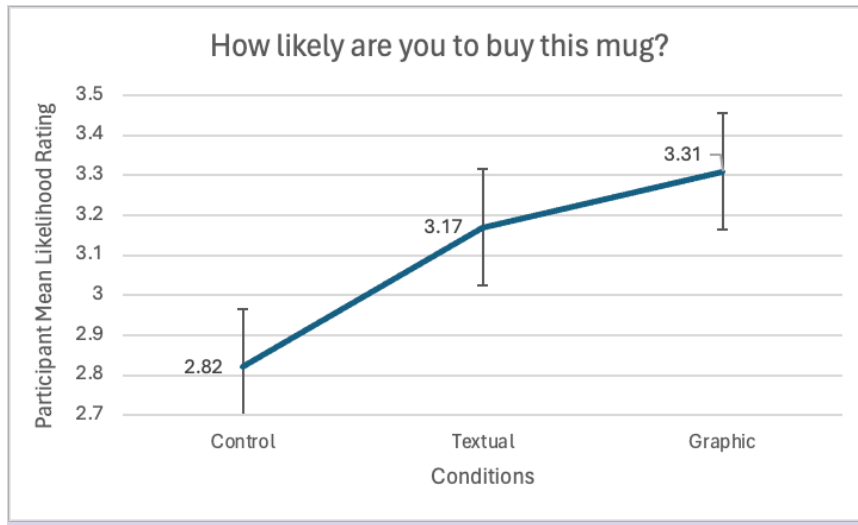


Figure D2. ANOVA test results

		ANOVA				
		Sum of Squares	df	Mean Square	F	Sig.
How likely are you to buy this mug?	Between Groups	10.636	2	5.318	1.953	.144
	Within Groups	669.854	246	2.723		
	Total	680.490	248			
How much would you be willing to pay (in Canadian dollars) for this mug? (Please enter a number from 0 to 50).	Between Groups	97.369	2	48.684	.829	.438
	Within Groups	14453.441	246	58.754		
	Total	14550.810	248			
How often would you use this mug when you purchase a beverage at a cafe on campus?	Between Groups	7.259	2	3.629	1.568	.211
	Within Groups	569.496	246	2.315		
	Total	576.755	248			

ANOVA Effect Sizes^{a,b}

		Point Estimate	95% Confidence Interval	
			Lower	Upper
How likely are you to buy this mug?	Eta-squared	.016	.000	.054
	Epsilon-squared	.008	-.008	.046
	Omega-squared Fixed-effect	.008	-.008	.046
	Omega-squared Random-effect	.004	-.004	.023
How much would you be willing to pay (in Canadian dollars) for this mug? (Please enter a number from 0 to 50).	Eta-squared	.007	.000	.035
	Epsilon-squared	-.001	-.008	.027
	Omega-squared Fixed-effect	-.001	-.008	.027
	Omega-squared Random-effect	-.001	-.004	.014
How often would you use this mug when you purchase a beverage at a cafe on campus?	Eta-squared	.013	.000	.048
	Epsilon-squared	.005	-.008	.040
	Omega-squared Fixed-effect	.005	-.008	.040
	Omega-squared Random-effect	.002	-.004	.020

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

b. Negative but less biased estimates are retained, not rounded to zero.

Figure D3. Kruskal-Wallis mean ranks and test statistics

Ranks			
	Condition	N	Mean Rank
How likely are you to buy this mug?	Control	84	113.96
	Verbal	81	129.26
	Visual	84	131.93
	Total	249	
How much would you be willing to pay (in Canadian dollars) for this mug? (Please enter a number from 0 to 50).	Control	84	118.49
	Verbal	81	131.41
	Visual	84	125.33
	Total	249	
How often would you use this mug when you purchase a beverage at a cafe on campus?	Control	84	112.76
	Verbal	81	132.07
	Visual	84	130.42
	Total	249	

Test Statistics^{a,b}			
	How likely are you to buy this mug?	How much would you be willing to pay (in Canadian dollars) for this mug? (Please enter a number from 0 to 50).	How often would you use this mug when you purchase a beverage at a cafe on campus?
Kruskal-Wallis H	3.154	1.364	3.820
df	2	2	2
Asymp. Sig.	.207	.506	.148

a. Kruskal Wallis Test

b. Grouping Variable: Condition

Figure D4. Descriptive results and tests of Homogeneity of Variances

		Descriptives									
		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	Between-Component Variance	
						Lower Bound	Upper Bound				
How likely are you to buy this mug?	Control	84	2.82	1.466	.160	2.50	3.14	1	7		
	Textual	81	3.17	1.626	.181	2.81	3.53	1	7		
	Graphic	84	3.31	1.837	.200	2.91	3.71	1	7		
	Total	249	3.10	1.656	.105	2.89	3.31	1	7		
	Model	Fixed Effects			1.650	.105	2.89	3.31			
	Random Effects				.146	2.47	3.73			.031	
How much would you be willing to pay (in Canadian dollars) for this mug? (Please enter a number from 0 to 50).	Control	84	13.69	7.174	.783	12.13	15.25	0	33		
	Textual	81	15.22	8.242	.916	13.40	17.04	0	50		
	Graphic	84	14.55	7.563	.825	12.91	16.19	0	39		
	Total	249	14.48	7.660	.485	13.52	15.43	0	50		
	Model	Fixed Effects			7.665	.486	13.52	15.43			
	Random Effects				.486 ^a	12.39 ^a	16.57 ^a			-.121	
How often would you use this mug when you purchase a beverage at a cafe on campus?	Control	84	3.14	1.530	.167	2.81	3.47	1	7		
	Textual	81	3.52	1.459	.162	3.20	3.84	1	7		
	Graphic	84	3.49	1.572	.171	3.15	3.83	1	7		
	Total	249	3.38	1.525	.097	3.19	3.57	1	7		
	Model	Fixed Effects			1.522	.096	3.19	3.57			
	Random Effects				.121	2.86	3.90			.016	

a. Warning: Between-component variance is negative. It was replaced by 0.0 in computing this random effects measure.

Tests of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
How likely are you to buy this mug?	Based on Mean	3.761	2	246	.025
	Based on Median	2.266	2	246	.106
	Based on Median and with adjusted df	2.266	2	241.875	.106
	Based on trimmed mean	3.503	2	246	.032
How much would you be willing to pay (in Canadian dollars) for this mug? (Please enter a number from 0 to 50).	Based on Mean	.234	2	246	.792
	Based on Median	.201	2	246	.818
	Based on Median and with adjusted df	.201	2	238.277	.818
	Based on trimmed mean	.182	2	246	.833
How often would you use this mug when you purchase a beverage at a cafe on campus?	Based on Mean	.258	2	246	.772
	Based on Median	.152	2	246	.859
	Based on Median and with adjusted df	.152	2	243.418	.859
	Based on trimmed mean	.364	2	246	.695

Appendix E: Open-Ended Responses (Q4) Analysis

Figure E1.

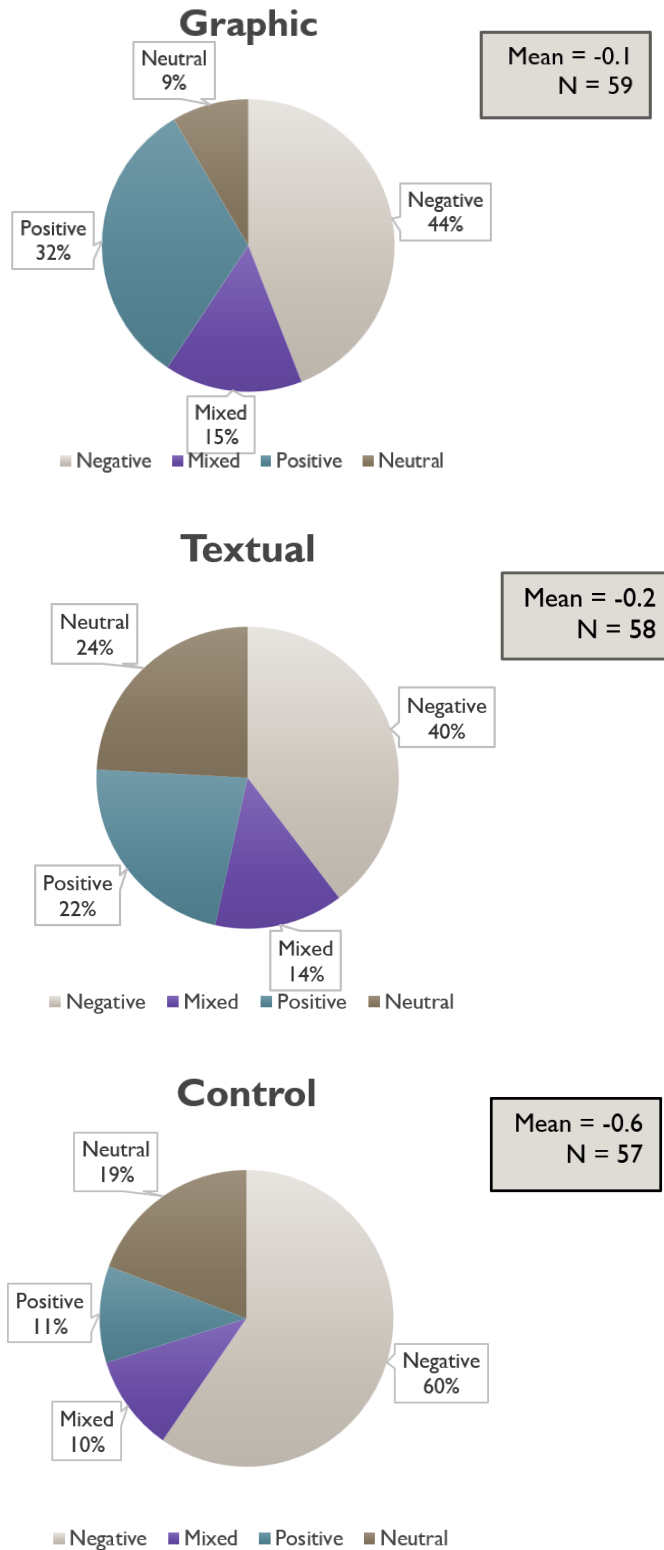


Figure E2.

