

University of British Columbia

Social Ecological Economic Development Studies (SEEDS) Sustainability Program

Student Research Report

# Shame on You: The Positive & Negative Emotions Associated with Colour on Climate-friendly Labels

Prepared by: Ahmed Shaaban, Andre Policzer, Edris Wu, Luiza Amoroso Lima, Anirudh Kannan, Elisha Fu

Prepared for:

Course Code: PSYC 421

University of British Columbia

Date: 1 April 2022

*Disclaimer: "UBC SEEDS Sustainability Program provides students with the opportunity to share the findings of their studies, as well as their opinions, conclusions and recommendations with the UBC community. The reader should bear in mind that this is a student research project and is not an official document of UBC. Furthermore, readers should bear in mind that these reports may not reflect the current status of activities at UBC. We urge you to contact the research persons mentioned in a report or the SEEDS Sustainability Program representative about the current status of the subject matter of a report".*



**Shame on You: The Positive & Negative Emotions Associated with Colour on Climate-friendly Labels**

Group Name: Carbon Copies

Group Members: Ahmed Shaaban, Andre Policzer, Edris Wu, Luiza Amoroso Lima, Anirudh Kannan, Elisha Fu

Course: PSYC 421

University of British Columbia

January - April 2022

## Executive Summary

Since issuing the Climate Emergency Declaration in 2019, UBC has recognized the critical need to deal with the incoming climate crisis. As part of the Climate Action Plan 2030 (CAP 2030) toward net-zero emissions, UBC has shifted to using climate-labels with relevant climate information to promote sustainable consumer behaviour. There have been mixed results so far with students reporting negative emotional outcomes from exposure to these climate-labels. Looking to bridge the gap between colour psychology and consumer outcomes, this study examined the effects of climate-label colouring on emotional affect and behavioural choices. One hundred and ninety-five participants completed a Qualtrics survey where they were randomly assigned to one of three conditions where they were asked to indicate their preference for a variety of food items. Finally, they answered questions on four emotion scales. Our analysis showed no significant results between different climate-labels and emotions, with marginally significant results between different climate-labels and choosing behaviour. Our results did not validate our proposed hypotheses and potential limitations include insufficient sample size and methodological problems with self-report. Our findings suggest future research in the direction of specific colour interactions.

**Key words:** Climate change, UBC, Climate-labels, emotions, behavioural choices

## Introduction

Individual behaviour can be changed towards more positive outcomes through external nudges in particular directions (Thaler & Sunstein, 2008). An area where individual consumers can be influenced is through food labels (Wandel, 1997; Cecchini & Warin, 2016). Additionally, colour choices can influence purchasing behaviour by eliciting certain emotions (Labrecque & Milne, 2011), for instance, pink has been shown to evoke less anxiety than red (Valdez et. al, 1994). Exposure to certain colours can make individuals feel positively, such as hopeful or inspired, or negatively, such as shame or fear (Valdez et. al, 1994). Researchers have examined climate label design from an informational perspective (Lemken et al. 2021), the relationship between food packaging colours and emotion (Lunardo, 2021), as well as the interactions of complex emotions, such as fear and guilt, in behavioural interactions such as inhibition (Mosher, 1965). However, there is a gap in the literature around climate label design from an emotional perspective, and the implications on consumer behaviour.

Implementing climate labels is part of the CAP 2030 (UBC) policy agenda of encouraging climate-friendly culture shifts through leadership and policy. UBC SEED's program has implemented climate-labels in Mercante and Open Kitchen as an initial attempt to steer university students into making more sustainable food choices. They utilised a Traffic Light system, labelling foods as either green (most friendly), yellow (medium friendly) and red (most environmentally damaging). Surveys from these pilot climate-label initiatives revealed that some students reported feeling pressured with this approach and shamed towards choosing climate-friendly options.

Considering this, our study aims to examine how the colour of climate labels influences student emotions, and the role it plays in food choice. The objective of our research is to work towards achieving the most effective climate label approach. While the traffic light label system has been proven effective (Osman, 2019), climate labels are still a new concept at UBC, and there is a lack of research on how the traffic light labels influence consumer emotions.

The driving forces of our research are positive emotions (specifically pride and hope) which are associated with the colour green. We aim to find what effect these two emotions have on climate-labels, but previous research has found that green promotes rational thinking (Valdez, 1994), which may encourage rational awareness of the effects of climate change and increase the purchase of climate-friendly foods. The restraining forces are negative emotions (specifically guilt and shame) associated with red (Lunardo, 2021; Mosher, 1965). The colour red has been shown to encourage impulsive behaviour (Valdez, 1994), which may lead to hedonic, short-sighted consumer choices and an increase in climate-unfriendly behaviour.

## Research Question and Hypothesis

### Research Question

Does the colour of a climate-friendly label (green, red, or “traffic light” system) elicit positive or negative emotions?

### Hypothesis

We hypothesised that the Red-only condition would be associated with the highest levels of negative emotions (shame and guilt), while the Green-only condition would be associated with the highest levels of positive emotions. The Traffic Light condition (green, yellow, and red) served as our control.

Our secondary hypothesis was that more climate-unfriendly food choices (red-labelled foods) would be chosen in the Red-only condition due to spur-of-the-moment hedonistic choices, while more climate-friendly food choices (green-labelled foods) would be made in the Green-only or Traffic Light conditions due to rational feelings regarding climate change affecting behaviour.

## Methods

### Participants

Through a power analysis we determined that a target sample size of 252 would allow our study to be 95% powered to detect effects as small as  $d = 0.25$  in emotional affect. We distributed the survey through convenience sampling (social media platforms, class forums, etc.) as well as direct contact. We initially collected 264 responses, after removing surveys based on our exclusion criteria, we were left with 195 responses. Our sample can be considered representative of the UBC undergraduate population in that our respondents were young adults ( $M = 21.12$  years,  $SD = 3.01$ ) and consisted overwhelmingly of UBC students ( $n = 152$ ). The majority of respondents identified as female ( $n = 110$ ), and our collected ethnicity demographics (32.82% Asian, 31.28% White, 13.33% Mixed, 8.21% Arab, 6.67% Latino, 5.64% other, 1% Black, 0.51% Non-Answer) align well with UBC’s publicly available demographic information<sup>1</sup>. In addition, most of our participants identified as omnivores ( $n = 145$ ), compared to vegetarians ( $n = 20$ ), pescatarian ( $n = 19$ ), or vegan ( $n = 11$ ).

### Conditions

There were three conditions: one control condition and two experimental conditions. Each condition showed six different food items alongside different climate labels depending on the condition. The control is the Traffic Light condition previously used at UBC (Huang, 2021) which included all three climate labels: the green label, yellow label, and red label (see Appendix A, figure 1). The two experimental conditions were the Green-only condition, in which only the

---

<sup>1</sup> For detailed UBC demographic information see: <https://pair.ubc.ca/student-data-analytics/demographics/demographics-overview/>

green label was shown (see Appendix A, figure 2), and the Red-only condition, in which only the red label was shown (see Appendix A, figure 3).

The independent variables in this experiment were the different climate labels associated with the greenhouse gas emissions the food produced. The dependent variables were participant choice of foods and the scores based on the emotion scales.

## **Measures**

Our first dependent variable was emotion - two positive and two negative - measured using scales that were methodologically supported by previous research. These are the: Trait Hope Scale, Authentic Pride Scale, and the State Shame and Guilt Scale. The Trait Hope Scale defines hope as “a positive motivational state that is based on an interactively derived sense of successful (a) agency (goal-directed energy), and (b) pathways (planning to meet goals)” (Snyder et al., 1991). The Authentic Pride Scale assessed “authentic and hubristic pride” (Carver et al., 2010), we chose to test for authentic pride in line with our measurement being for a positive emotion. Finally, the State Shame and Guilt measures shame and guilt (Malinakova et al., 2020).

Our second dependent variable was behaviour, measured and tested by examining the types of food decisions participants made, and if those choices were climate-friendly, non-climate-friendly or had a moderate climate effect (yellow label foods). Our aim was to explore which condition would lead to participants choosing more climate-friendly foods, and how the food choice impacted different emotional outcomes.

## **Procedure**

We distributed a Qualtrics survey through Facebook groups, UBC course groups, as well as direct contact with students in public areas. Data was collected over the course of 3 weeks. When participants opened the survey, they were directed to fill out a required consent form. The survey would then randomly display one of the three conditions (Green-only, Red-only, Traffic Light) and participants would see instructions and definitions of the labels that would be used in the survey (see Appendix A, figure 4). Respondents would then be prompted to choose a food item out of the options that were given and completed 10 trials. Afterwards, participants were asked to complete sets of questions regarding the four measured emotions from the Trait Hope Scale (see Appendix A, figure 5), Authentic Pride Scale (see Appendix A, figure 6), and the State Shame and Guilt Scale (see Appendix A, figures 7 and 8). The survey ended with optional demographic questions including age, race, and dietary preferences.

Some of the challenges we faced included incorrect or incomplete surveys. For example, some participants left the survey before it was completed, and other participants entered inaccurate responses to age (i.e., numbers with decimals or 3-digit numbers). Some ways we could eliminate this issue would be to replace the free answer boxes with a sliding scale for certain questions like age.

## Results

To test the difference in choice behaviour of green, yellow, or red-labelled foods, we conducted one-way ANOVA tests to compare choice behaviour between our three conditions with an alpha level of  $\alpha = 0.05$ . Our findings indicate that choosing green and red-labelled foods showed a marginally significant difference between conditions ( $p=0.054$ ,  $p=0.080$  respectively). After conducting a post hoc Tukey test, we found that the Red-only and Traffic Light conditions were statistically significant for choosing green-labelled foods ( $p_{\text{tukey}}=0.045$ ). Through additional post hoc tests we found that choosing red-labelled foods showed a marginally significant difference between the Red-only and Traffic Light condition ( $p_{\text{tukey}}=0.080$ ). This can be seen in Figures 1 and 2 of Appendix B, with the Red-only and Traffic Light conditions having the largest difference in means. There was no statistical significance between conditions for choosing yellow labelled foods ( $p=0.932$ ), and Figure 3 of Appendix B shows that the mean across conditions were relatively similar (See Figures 1-3 and Tables 1-5, Appendix B).

Our hypothesis regarding choosing behaviour is somewhat supported as more red-labelled foods were chosen in the Red-only condition and less red-labelled foods were chosen in the Traffic Light condition. Green-labelled foods were chosen the most in the Traffic Light condition, followed by the Green-only condition, and chosen the least in the Red-only condition. This is consistent with previous findings that green is associated with rational feelings around climate change because more green choices were made when all food options were labelled, and it was obvious which foods were the most climate-friendly out of all the options.

All four emotions that were tested were statistically insignificant after conducting one-way ANOVA tests between the three conditions with hope ( $p=0.642$ ), pride ( $p=0.571$ ), guilt ( $p=0.921$ ), and shame ( $p=0.277$ ) (See Figure 4-7 and Table 6-9, Appendix B). The mean score for each emotion was relatively similar between conditions, this indicated that participants had overall similar feelings of hope, pride, guilt, and shame regardless of the condition they were in. We can therefore conclude that our results did not support our hypothesis that individuals would feel more positive or negative emotions depending on which label they saw.

## Discussion

Our findings on choice behaviour suggest that the Traffic Light condition was more effective in promoting climate-friendly choices compared to the other two conditions. The Red-only condition seems to be the least effective, and even led to more non-climate-friendly choices. We suspect that these findings are related to interactions between colour and emotions, specifically that viewing certain colours can elicit emotions within specific contexts. Previous research has suggested that the colour red may be linked to impulsivity, and our results may serve as an extension of these findings.

A significant limitation in our research was the potential for multiple confounding emotions. Our speculation regarding the link between the red and impulsivity is simply a

possibility and was not specifically measured in our study. These findings could alternatively be due to a relationship between the emotion of shame and the colour red, as the results for shame were slightly different in our Red-only condition compared to the other two conditions. This requires further research; however, as our data failed to yield statistically significant results. For future research, it may be helpful to include a broader spectrum of emotions than the ones tested, to account for the possibility that the target emotion and the choice outcomes are not related. Including other emotions to compare against the four target emotions from our study can also allow for further interpretation when the relationship between the target emotion and choice outcome is insignificant. Overall, our data did not conclusively point toward an explanation for the increase in non-climate friendly behaviour in the Red-only condition, which is an important consideration for future research to identify the underlying emotions behind these choices.

### **Recommendations**

One of UBC's CAP 2030 goals is to encourage climate-friendly culture shifts through leadership and policy. Incorporating climate-friendly food labels aims to do just that, encouraging students to be more deliberate in their food choices. However, there is a fine line between encouraging people to behave a certain way and shaming them for behaving otherwise. Our clients informed us how students reported feeling some negative emotions regarding the traffic light labels, with around 10% of students who felt shamed into choosing green options. Our research shows a potential relationship between exposure to red labels and feelings of shame which in turn may encourage climate-unfriendly behaviour.

Our recommendation is to steer away from associating negative emotions with climate-friendly food labels, in other words, to focus on rewarding and encouraging climate-friendly behaviour instead of shaming climate-unfriendly behaviour. To accomplish this, we suggest a Green-label only scenario where only environmentally friendly foods are indicated. We have already seen the early stages of this implemented in Open Kitchen in February 2022. This approach had two labels, a climate-friendly food label indicating that a certain food item generates less GHG emissions, nitrogen, and water per 100 grams of food (Making Sustainable Food Choices, 2021) compared to other foods on the menu. The second label is a 'happy planet icon' which is a food item that has at least 50% less environmental footprint per 100 grams, compared with other items (Making Sustainable Food Choices, 2021).

The labels used in this pilot approach are different from those used in our studies. However, based on our research we'd expect this to be a better approach than the Traffic Light system, as it is well set-up to encourage climate-friendly behaviour without making students feel bad or ashamed of their decisions. In forwarding the goals of CAP 2030, students need to agree with the approaches being used and internalize them to shift their behaviours. By shaming those who might choose - or be restricted to - environmentally damaging foods, we may be discouraging positive environmental outcomes where students no longer feel the motivation to change their behaviour.



## References

- Carver, C. S., Sinclair, S., & Johnson, S. L. (2010). Authentic and Hubristic Pride: Differential relations to aspects of goal regulation, affect, and self-control. *Journal of Research in Personality, 44*(6), 698–703. <https://doi.org/10.1016/j.jrp.2010.09.004>.
- Cecchini, M., & Warin, L. (2016). Impact of food labelling systems on food choices and eating behaviours: a systematic review and meta-analysis of randomized studies. *Obesity Reviews, 17*, 201–210. doi: 10.1111/obr.12364
- Climate Action Plan 2030. (n.d.). Retrieved from <https://planning.ubc.ca/cap2030>
- Hanada, M. (2017). Correspondence analysis of color–emotion associations. *Color Research & Application, 43*(2), 224–237. doi:10.1002/col.22171
- Huang, S., (2021). Climate-Friendly Food Systems (CFFS) Labeling Project: An Evaluation Framework for the Operationalization of UBC Vancouver’s Climate-Friendly Food Label. *SEEDS Library*.
- Labrecque, L. I., & Milne, G. R. (2011). Exciting red and competent blue: The importance of color in marketing. *Journal of the Academy of Marketing Science, 40*(5), 711–727. doi:10.1007/s11747-010-0245-y
- Lemken, D., Zühlsdorf, A. & Spiller, A. (2021). Improving Consumers’ Understanding and Use of Carbon Footprint Labels on Food: Proposal for a Climate Score Label. *EuroChoices, 20*, 23–29. <https://doi.org/10.1111/1746-692X.12321>
- Lunardo, R., Saintives, C., & Chaney, D. (2021). Food packaging and the color red: How negative cognitive associations influence feelings of guilt. *Journal of Business Research, 134*, 589–600. doi:10.1016/j.jbusres.2021.05.052
- Malinakova, K., Furstova, J., Kalman, M., & Trnka, R. (2020). A Psychometric Evaluation of the Guilt and Shame Experience Scale (GSES) on a Representative Adolescent Sample: A Low Differentiation between Guilt and Shame.” *International Journal of Environmental Research and Public Health, 17*(23), 8901. <https://doi.org/10.3390/ijerph17238901>
- Mosher, D. L. (1965). Interaction of fear and guilt in inhibiting unacceptable behavior. *Journal of Consulting Psychology, 29*(2), 161–167. doi:10.1037/h0021748
- Osman, M., & Thornton, K. (2019). Traffic light labelling of meals to promote sustainable consumption and healthy eating. *Appetite, 138*, 60–71. doi:10.1016/j.appet.2019.03.015
- Snyder, C. R., Harris, C., Anderson, J. R., Holleran, S. A., Irving, L. M., Sigmon, S. T., Yoshinobu, L., Gibb, J., Langelle, C., & Harney, P. (1991). The will and the ways:

- Development and validation of an individual-differences measure of hope. *Journal of Personality and Social Psychology*, 60(4), 570–585. <https://doi.org/10.1037/0022-3514.60.4.570>
- Thaler, R. H., & Sunstein, C. R. (2008). *Nudge: improving decisions about health, wealth, and happiness*. New Haven : Yale University Press.
- Valdez, P., & Mehrabian, A. (1994). Effects of color on emotions. *Journal of Experimental Psychology: General*, 123(4), 394-409. doi:10.1037/0096-3445.123.4.394
- Wandel, M. (1997), Food labelling from a consumer perspective, *British Food Journal*, 99(6), 212-219. <https://doi.org/10.1108/00070709710181559>

## Appendix A: Qualtrics Survey

The next questions will ask you to pick an item from a menu of six food items. When this menu is presented to you please pick which food item you would pick if you had been presented this same menu in real life. Each food item will have an accompanying climate-friendly food label. This is based on the amount of Green House Gas (GHG) that was used to produce that food item. The labelling system works as follows:



**Green:** These food items have below-average GHG emissions compared to other food items sold within the same meal category (i.e., lunch/dinner, breakfast, or desserts/snacks) and have low enough emissions to achieve UBC's 50% reduction target in food-related GHG emissions.

**Yellow:** These food items have below-average GHG emissions compared to other food items sold within the same meal category (i.e., lunch/dinner, breakfast, or desserts/snacks) but higher emissions than what is necessary to achieve UBC's 50% reduction target in food-related GHG emissions.

**Red:** These food items have above-average GHG emissions compared to other food items sold within the same meal category (i.e., lunch/dinner, breakfast, or desserts/snacks). Food with red labels would drive the average GHG emissions higher, thus impeding the process for UBC in achieving the 50% reduction target in food-related GHG emissions.

**Figure 1.** Traffic Light condition

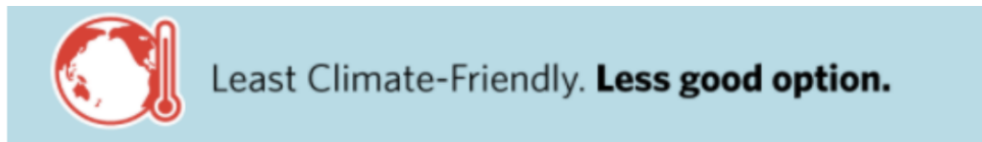
The next questions will ask you to pick an item from a menu of six food items. When this menu is presented to you please pick which food item you would pick if you had been presented this same menu in real life. Some food items will have an accompanying climate-friendly food label, and others will not. This is based on the amount of Green House Gas (GHG) that was used to produce that food item. The labelling system works as follows:



**Green:** These food items have below-average GHG emissions compared to other food items sold within the same meal category (i.e., lunch/dinner, breakfast, or desserts/snacks) and have low enough emissions to achieve UBC's 50% reduction target in food-related GHG emissions.

**Figure 2.** Green-only condition

The next questions will ask you to pick an item from a menu of six food items. When this menu is presented to you please pick which food item you would pick if you had been presented this same menu in real life. Some food items will have an accompanying climate-friendly food label, and others will not. This is based on the amount of Green House Gas (GHG) that was used to produce that food item. The labelling system works as follows:



**Red:** These food items have above-average GHG emissions compared to other food items sold within the same meal category (i.e., lunch/dinner, breakfast, or desserts/snacks). Food with red labels would drive the average GHG emissions higher, thus impeding the process for UBC in achieving the 50% reduction target in food-related GHG emissions.

**Figure 3.** Red-only condition







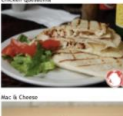























Please indicate which of these food items you would pick (Choose 1).

Please indicate which of these food items you would pick (Choose 1).

Please indicate which of these food items you would pick (Choose 1).


Please indicate which of these food items you would pick (Choose 1).

Please indicate which of these food items you would pick (Choose 1).


<p><input type="radio"/> Reuben Sandwich</p>  <p><input type="radio"/> Vegetarian Spicy Tofu Bowl</p>  <p><input type="radio"/> Vegan Tabouleh Bowl</p>  <p><input type="radio"/> Chicken Pad Pie</p>  <p><input type="radio"/> Lasagna Bolognese</p>  <p><input type="radio"/> Pork Gyza</p> 	<p><input type="radio"/> Chicken Saravella</p>  <p><input type="radio"/> Mac &amp; Cheese</p>  <p><input type="radio"/> Fried Cauliflower Bowl</p>  <p><input type="radio"/> Chicken Burrito Bowl</p>  <p><input type="radio"/> Vegan Pad Thai</p>  <p><input type="radio"/> Vegetarian Chickpea Burger</p> 	<p><input type="radio"/> Pork Katsu</p>  <p><input type="radio"/> Strawberry Chicken Fenchel</p>  <p><input type="radio"/> Vegan Falafel</p>  <p><input type="radio"/> Vegetarian Bitterballer Bowl</p>  <p><input type="radio"/> Vegan Pork Bao</p>  <p><input type="radio"/> Vegetarian French toast</p> 	<p><input type="radio"/> Watermelon feta salad</p>  <p><input type="radio"/> Tandoori chicken</p>  <p><input type="radio"/> Pork and shrimp siu mai</p>  <p><input type="radio"/> Avocado toast</p>  <p><input type="radio"/> omelet</p>  <p><input type="radio"/> Salmon eggs benedict</p> 	<p><input type="radio"/> Grilled Cheese</p>  <p><input type="radio"/> Shakshuka</p>  <p><input type="radio"/> Creps with salsa and guac</p>  <p><input type="radio"/> Pulled pork</p>  <p><input type="radio"/> Dan Dan Noodle</p>  <p><input type="radio"/> Jambalaya</p> 
---	---	--	---	--

Please indicate which of these food items you would pick (Choose 1).


Beef Stroganoff




Tomato Soup




Chicken Piccata




Leek and Artichoke Quiche



Spicy Tofu




Mashed Potatoes




Please indicate which of these food items you would pick (Choose 1).


Avocado toast




Reuben Sandwich




Fried Cauliflower Bowl




Tandoori Chicken



Vegetarian Spicy Tofu Bowl




Jambalaya




Please indicate which of these food items you would pick (Choose 1).


Mac & Cheese




Vegetarian French toast




Chips with Salsa and Guac




Vegan Pad Thai



Vegetarian Bibimbap Bowl




Pork and Shrimp Su Mai




Please indicate which of these food items you would pick (Choose 1).


Shakshuka




pulled Pork




Salmon Eggs Benedict




Vegan Tabouleh Bowl



Beef Stroganoff




Falafel




Please indicate which of these food items you would pick (Choose 1).


Chicken Pot Pie




Dan Dan Noodle




Spicy Tofu




Leek and Artichoke Quiche



Chicken Quesadilla



Bolognese Lasagna



**Figure 4.** The Red-only condition participants would see on the Qualtrics survey. Each 'strip' of 6 foods appears on a separate page for a total of 10 trials.

Listed below are a variety of questions. Please provide a response for every question that best describes YOU:

	Strongly Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Strongly Agree
I can think of many ways to get out of a jam.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I energetically pursue my goals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel tired most of the time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are lots of ways around any problem.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am easily downed in an argument.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can think of many ways to get the things in life that are important to me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I worry about my health.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Even when others get discouraged, I know I can find a way to solve the problem.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My past experiences have prepared me well for my future.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I've been pretty successful in life.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I usually find myself worrying about something.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I meet the goals that I set for myself.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Figure 5.** Question set for hope based on the Trait Hope scale

Below are a number of words and phrases that describe different feelings and emotions. Read each item and then indicate the extent to which you feel this way using the scale shown below:

	Not at All	Somewhat	Moderately	Very Much	Extremely
accomplished	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
like I am achieving	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
confident	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
fulfilled	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
productive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
like I have self-worth	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
successful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Figure 6.** Question set for pride based on the Authentic Pride Scale

Listed below are a variety of questions. Please provide a response for every question that best describes how you are feeling at the present moment:

	Not at All	Slightly	Somewhat	Very Much	Strongly
I feel remorse or regret	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel tension about something I have done	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I cannot stop thinking about something bad I have done	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel like apologizing and confessing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel bad about something I have done	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Figure 7.** Question set for shame based on the State Shame and Guilt Scale

Listed below are a variety of questions. Please provide a response for every question that best describes how you are feeling at the present moment:

	Not at All	Slightly	Somewhat	Very Much	Strongly
I want to sink into the floor and disappear	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel small	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel like I am a bad person	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel humiliated and disgraced	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel worthless and powerless	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Figure 8.** Question set for guilt based on the State Shame and Guilt Scale

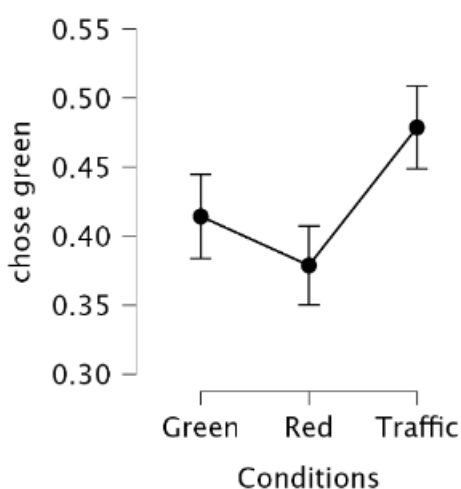
## Appendix B: Figures and Tables

### ANOVA - chose green ▾

Cases	Sum of Squares	df	Mean Square	F	p	$\eta^2_p$
Conditions	0.339	2	0.169	2.964	0.054	0.030
Residuals	10.978	192	0.057			

*Note.* Type III Sum of Squares

**Table 1:** One-way ANOVA with choosing green labelled foods between three conditions



**Figure 1:** Mean choice for green labelled foods between the three conditions (green=0.414, Red=0.379, Traffic=0.479)

### Chose Green - Post Hoc Comparisons of Conditions

		Mean Difference	SE	t	$p_{Tukey}$
Green	Red	0.035	0.042	0.843	0.677
	Traffic	-0.065	0.042	-1.531	0.278
Red	Traffic	-0.100	0.042	-2.402	0.045

*Note.* P-value adjusted for comparing a family of 3

**Table 2:** Post hoc test results for choosing green labelled foods



## ANOVA - chose red

Cases	Sum of Squares	df	Mean Square	F	p	$\eta^2_p$
Conditions	0.349	2	0.175	2.563	0.080	0.026
Residuals	13.087	192	0.068			

Note. Type III Sum of Squares

Table 3: One-way ANOVA with choosing red labelled foods between three conditions

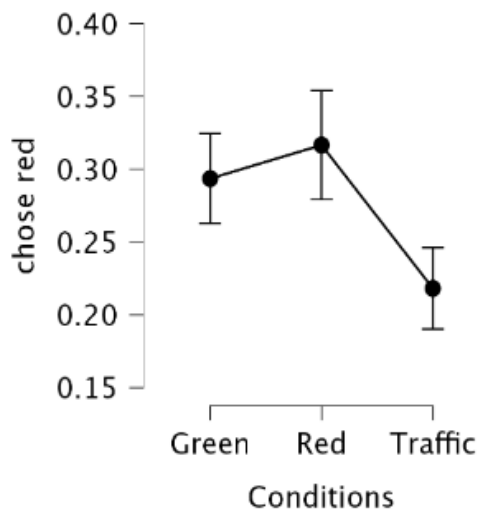


Figure 2: Mean choice for red labelled foods between the three conditions (Green=0.294, Red=0.317, Traffic=0.218)

#### Chose Red - Post Hoc Comparisons of Conditions

		Mean Difference	SE	t	$P_{tukey}$
Green	Red	-0.023	0.046	-0.500	0.871
	Traffic	0.075	0.046	1.641	0.231
Red	Traffic	0.098	0.045	2.167	0.080

Note. P-value adjusted for comparing a family of 3

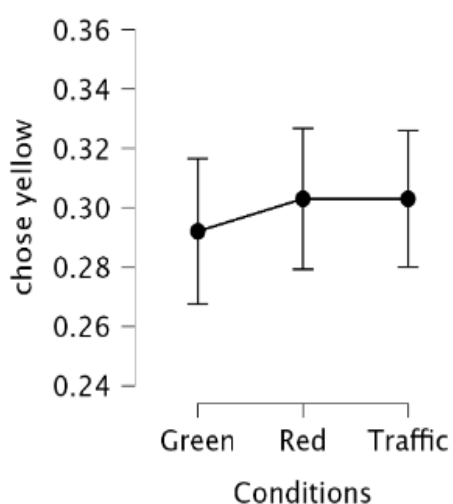
Table 4: Post hoc test results for choosing red labelled foods

**ANOVA - chose yellow**

Cases	Sum of Squares	df	Mean Square	F	p	$\eta^2_p$
Conditions	0.005	2	0.003	0.070	0.932	7.296e-4
Residuals	7.025	192	0.037			

*Note.* Type III Sum of Squares

**Table 5:** One-way ANOVA with choosing yellow labelled foods between three conditions



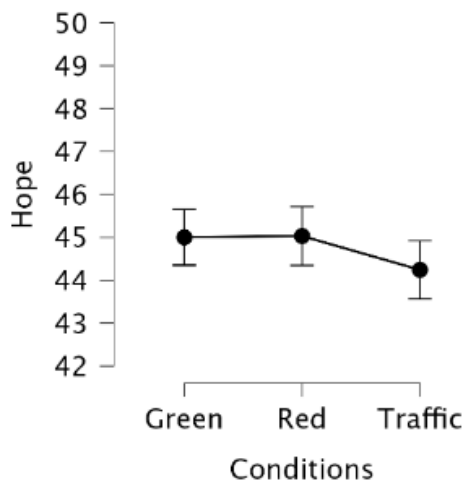
**Figure 3:** Mean choice for yellow labelled foods between the three conditions (Green=0.292, Red=0.303, Traffic=0.303)

**ANOVA - Hope**

Cases	Sum of Squares	df	Mean Square	F	p	$\eta^2_p$
Conditions	26.124	2	13.062	0.444	0.642	0.005
Residuals	5646.061	192	29.407			

*Note.* Type III Sum of Squares

**Table 6:** One-way ANOVA with feelings of hope between three conditions



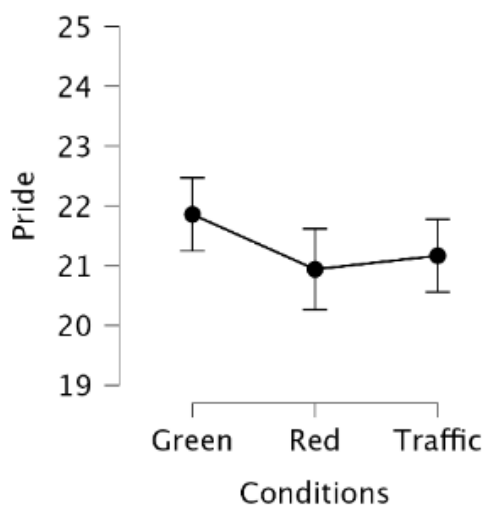
**Figure 4:** Mean hope score between three conditions (Green=45.000, Red=45.030, Traffic=44.242)

#### ANOVA - Pride

Cases	Sum of Squares	df	Mean Square	F	p	$\eta^2_p$
Conditions	29.279	2	14.640	0.561	0.571	0.006
Residuals	5006.639	192	26.076			

*Note.* Type III Sum of Squares

**Table 7:** One-way ANOVA with feelings of pride between three conditions



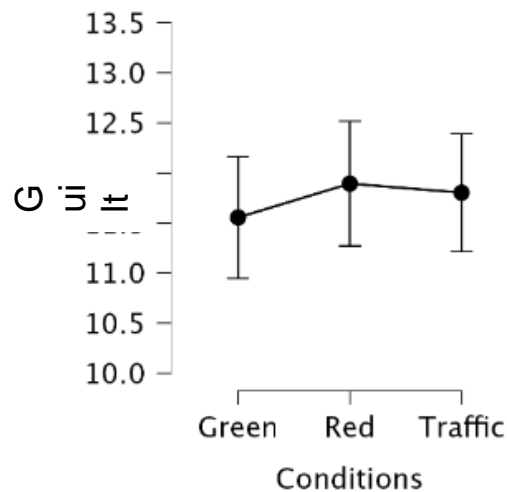
**Figure 5:** Mean pride score between three conditions (Green=21.857, Red=20.939, Traffic=21.167)

**ANOVA - Guilt**

Cases	Sum of Squares	df	Mean Square	F	p	$\eta^2_p$
Conditions	3.932	2	1.966	0.082	0.921	8.555e-4
Residuals	4592.253	192	23.918			

*Note.* Type III Sum of Squares

**Table 8:** One-way ANOVA with feelings of guilt between three conditions



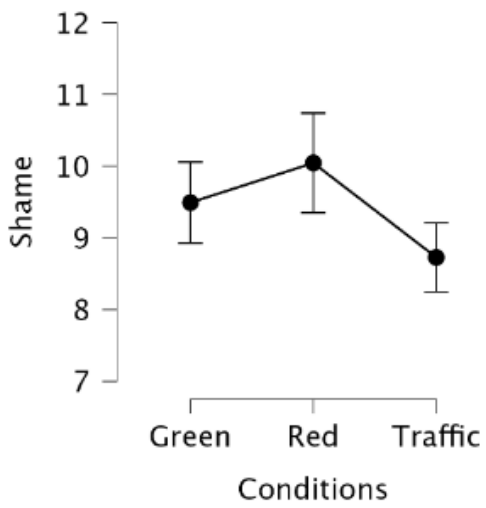
**Figure 6:** Mean guilt score between three conditions (Green=11.556, Red=11.894, Traffic=11.803)

**ANOVA - Shame**

Cases	Sum of Squares	df	Mean Square	F	p	$\eta^2_p$
Conditions	57.817	2	28.909	1.293	0.277	0.013
Residuals	4291.701	192	22.353			

*Note.* Type III Sum of Squares

**Table 9:** One-way ANOVA with feelings of shame between three conditions



**Figure 7:** Mean shame score between three conditions (Green=9.492, Red=10.045, Traffic=8.727)

## **Appendix C: Team Member Contribution**

### **Andre Policzer**

Contributed the ideas for the initial brainstorming and eventual proposal, in the final proposal contributed most of the background literature, worked on defining the research question, and methods sections. Was present for all of the meetings with the professor and TA's, and scheduled additional meetings for TA feedback. Verified the emotional scales and found the Authentic pride scale. Responsible for the emotional scales on Qualtrics as well as final formatting and pre-distribution testing. Worked to distribute our survey, including through direct contact, and messaging other class professors & TA's. Contributed the research question, participant demographics and hypothesis justification/background literature for the presentation, as well as edited slides. In the final report, responsible for the executive summary and participants section, contributed heavily to the introduction section and references and edited the rest of the paper to ensure cohesiveness before submission.

### **Edris Wu**

Contributed to writing the methods section of the first proposal which includes an explanation of conditions, measures, and participant sample. Contributed to creating our survey which includes adding the consent form, finding food images and adding the necessary labels to them, as well as adding the finished images into the appropriate format and section in Qualtrics. Contributed to testing and distributing the survey, data collection, data cleaning, and conducted all the data analysis which includes 7 ANOVA tests and 2 post hoc tests. Wrote and presented slides for the results section of the final presentation. Wrote the procedure and results sections, edited/rephrased different sections, as well as added necessary tables and figures to the appendix section of the final report.

### **Luiza Amoroso Lima**

Contributed to editing the original proposal to take into consideration professor and TA's feedback. For the survey, collected all images, added climate-label and added them into the respective place in the Qualtrics survey. Also developed a way to organise and plan out all of the food combinations, ensuring accuracy and consistency throughout our survey. During participant recruitment, joined facebook groups to increase participant count and once we had our data, was the one who cleaned up all the data and created a coding system to make sense of scales. As for the final paper, wrote the recommendation section, edited the introduction and structured appendix A.

### **Ahmed Shaaban**

Contributed to finding sources for the first proposal for background information. For the survey created and found food images and adding labels to them, and adding those to the correct sections in Qualtrics. Also formatted and added one of the emotion likert-scales to the Qualtrics.

Helped in distributing the survey through messages and in person on campus. Contributed to the presentation by creating slides for conditions, examples of conditions, and measures. As for the final paper wrote within the methods sections, specifically the conditions and measures, and helped in editing and rewriting sections of the paper.

**Elisha Fu**

Contributed to planning the original proposal, finalising specific emotions for the hypothesis and specific demographic questions to ask participants. Edited Qualtrics questions and provided feedback on presentation of survey before distribution. Aided other team members with data analysis of final results. Wrote discussion section and formatted appendix A for final report, edited wording/grammar for consistency and overall formatting.

**Anirudh Kannan**

Contributed to project ideation, specification of the research question from client warrant, and exploring the driving and restraining forces that affected the psychological (affective) and behavioural phenomena we were interested in measuring. Contributed to testing and proofreading the survey, troubleshooting its logic, and distributing it. For the final presentation, I wrote and edited part of the script, created slides, and presented. Contributed to the introduction, literature review, discussion of driving and restraining forces, and overall structure/editing of the final report.