UBC Social Ecological Economic Development Studies (SEEDS) Sustainability Program

Student Research Report

Healthy Beverage Initiative (HBI) Institutional Responsibility:

Reading Nutritional Labels: Higher Health Awareness on Beverage Choice

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PSYC 321

Food, Wellbeing

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Executive Summary (10%)

In this study, we aimed to examine whether UBC students who read the nutritional labels on beverages are more likely to make a healthier beverage choice. Specifically, we were interested in finding out the relationship between reading labels and healthy beverages choice. Survey data accessed participants' action of reading labels and other characteristics that may be relevant to healthy lifestyles. We intended to use recipient data to measure what labels do students normally read and their lifestyles. We predicted that students who read labels on beverages are more likely to choose healthy beverage than students who do not read labels. Among students who read labels, those who read ingredients labels are more likely to choose healthy beverages compare to students who only read nutrition facts labels. We collected data over 2 weeks; each participants filled out the survey based on their preferences and consumption on beverages. Our results did not support our hypothesis, as reading labels do not predict a healthier beverage choice among students on UBC campus. However, we have a number of limitations that may affect our survey results. In future research, experimental study can be conducted to further investigate why the act of reading labels does not predict the preference and consumption of healthy beverages.

Project title (3%):
Reading Nutritional Labels: Higher Health Awareness on Beverage Choice
Group name and student names (2%)
Queen Bees: Cindy Lin, Jessy Lok, Yilu Fei, XiaoQian Ma, Tina Wei

Introduction(10%)

The concern of diet-related issues has dramatically increased since past decade. Nutritional labelling on products emerged as a vital aspect in decisions to purchase food and beverages by customers. As such, nutritional labels on food and beverages come to be credence attributes and become a search characteristic for consumers. Therefore, examining how reading labels may influence consumers' decision on purchasing foods and beverages is crucial to promote a healthy lifestyle among citizens.

Past studies examining on factors that might affect the use of labels are not consistent. For example, there is no consensus among customers on factors, such as income, age, and working stats, in terms of reading labels. On the other hand, there is a positive effect on reading labels by education level and gender (Johnson, 2010). More specifically, people with higher education level are more likely to pay attention to labels when purchasing foods and beverages. Also, people with high health awareness and people who are on special diets are more likely to read labels on their foods and beverages (Johnson,2010). Research by Lagua and Claudio (1996) has shown that household types also affect the use of labels. Households in the rural areas and other non-city locales lack knowledge on how to use the nutritional information (Lagua and Claudio, 1996). Another study by Papowitz (1996) shows that there is a significant change in buying behaviour since customers do not want their products contain unhealthy ingredients. The effect was found to be even greater when information was coupled with informational campaigns aimed to educate consumers. It is obvious that packaging greatly influences consumers' buying decisions through their perception and valuation of products (Papowitz, 1996).

Argument has arisen on whether nutritional information provided to consumers influences consumers' preference and consumption on their products. For example, does labels influence consumers' preference on beverages and further influence their beverage choices? As previous literatures did not address this problem nor give answers to above question, this paper aims to examine whether or not young generations, especially university students, would read labels when purchasing beverages and how labels play a role in consumers preference and consumption on beverages.

Research question and hypothesis (5%)

The purpose of this study is to investigate whether UBC students who read labels on beverages are more likely to make a healthier beverages choice. We hypothesised that students who read both nutrition fact and ingredient labels are the most likely to choose healthy beverages. Second, student who only read ingredient label are more likely to choose healthy beverages than those who only read nutrition fact label. Lastly, students who don't read any labels are the least likely to choose healthy beverages. In addition, we evaluated the healthiness of the beverages based on the beverage classification; water is the healthiest and Coke is the least healthy (see appendix A).

Methods (30%)
Participants (5%)

114 University of British Columbia students participated in this study. The study was conducted between March 6th and March 18th 2018. Only students at UBC Campus were eligible to participate in the study. Participants received the link primary by Email, Wechat, Facebook, and UBC connect. We obtained consent form from participants before they began the survey. In total, we received 121 survey response, with 7 of them were not completed. Therefore, we excluded 7 responses due to lack of completion.The most common age range for participants was between 18 and 27 years old. The majority of our sample was Asian.

Conditions (5%)

We have four conditions in this study and participants were divided into different conditions according to their self-report answers on whether they read nutritional labels or not on the self-report survey. Specifically, the 4 conditions are: 1.) students who only read nutrition fact labels on beverages; 2.) students who only read ingredient labels on beverages; 3.) students who read both nutrition fact and ingredient labels on beverages and 4.) students who do not read any labels.

Measures (10%)

Our independent variable was types of labels UBC students read on beverages: nutrition fact labels, ingredient labels, both nutrition fact labels and ingredient labels, or no labels. We measured the independent variables by the self-report survey (see appendix B) as we asked the participants to identify did they read labels on beverages with the options of nutrition fact labels, ingredient labels, both nutrition fact labels and ingredient labels or no labels. Our primary dependent variables were students' beverages choice preference and beverages consumption in past 7 days. The primary dependent variables were measured by self-report survey. To examine students' beverages preference, we asked the participants to rate their preferences in 6 categories of beverages (100% juice, water, milk, tea/ coffee, coke, coke zero). Participants indicated their preferences of the beverages, using a 5-point Likert scale (from 1, least favourite, to 5, most favourite). To examine students' beverages consumption in past 7 days, participants were asked how many times did they drink those beverages in past 7 days and indicated the frequency of the consumption, using a 5-point Likert scale (from 1, never, to 5, multiple times in one day). Our secondary dependent variable was testing their lifestyle habits that are relevant to health. The secondary dependent variable was also measured by the survey. We have 4 questions that tested participants' level of healthiness. The questions included how often do they exercise every week, how often do they eat junk food and how often do they add sugar in their beverages; participants indicated the frequency, using a 4-point Likert scale (from 1, everyday, to 4, never).

Procedure (10%)

In this study, participants were asked to fill out a self-report survey that consists 23 questions. The self-report survey took each participants around 3 to 5 minutes to complete. The participants first signed the consent form with their names and the completion date. Then they were asked to complete questions about their beverage preferences, recent beverage consumption, lifestyle habits and demographic information. We recruited the participants mainly from members of WeChat and Facebook groups that were formed by UBC students. The participants received the survey link through WeChat, Facebook and Connect. Since the self-report survey was sent through social media, the participants completed the survey in self selected environment and time frame.

Results (10%)

Descriptive Statistics

(All tables are attached in Appendix C)

As shown in Table 1, 19 students in the condition 1(nutritional labels only), 11 students in condition 2 (Ingredients label only), 40 students in condition 3(Read both labels), 44 students in condition 4 (Read neither labels). In the survey, students who are in the condition 1(*M=5.00, SD=1.49; M=4.63 ,SD=1.53*), condition 3 (*M=5.03, SD= 1.31; M=4.20, SD=1.34*) and 4 (*M=4.71, SD=1.39; M=4.39, SD=1.35*) indicated water and juice as their top two favourite beverages (1=least favourite, 6=most favourite). Students who are in condition 2 only chose juice as their primary beverage and water as the second. Coke and coke zero are the two least popular beverages indicated in all 4 conditions.

Table 2 shows that participants among four conditions consumed water most frequently in past 7 days (1=Never, 5=Multiple in one day). The mean for condition 1 is 4.84 (*SD= 0.51*), condition 2 is 4.91(*SD= 0.30*), condition 3 is 4.83 (*SD=0.68*), condition 4 is 4.86 (*SD=0.63*). The least frequent beverage consumption among 4 conditions was coke zero.

Table 3 illustrates the mean and standard deviation between the frequency of exercises and reading labels (1=Every day, 4=Never). Condition 3 has the lowest mean (*M=2.65, SD=0.86*) compared to the other 3 conditions, indicating that students who read both labels are most likely to exercise. In contrast, students in condition 4 had the highest mean (*M=3.05, SD=0.68*), indicating that they were least likely to exercise compared to students who read labels.

Table 4 indicates the average frequency of eating junk food and reading labels as well as the standard deviation (1=Every day, 4=Never). It was indicated that students in condition 4 are most likely to eat junk food (*M=2.64, SD=0.72*) while students in condition 3 are least likely to eat junk food (*M=3.08, SD=0.53*).

Table 5 demonstrates the result of sugar consumption among 4 conditions (1=Always sugar added, 5=Never sugar added). As indicated on the table, no significant difference among 4 conditions was found. However, it was shown that students in condition 3 are least likely to add sugar (*M=3.48, SD=1.18*) while students in condition 4 have slightly higher sugar consumption compared to the other three groups (*M=3.18, SD=1.23*).

ANOVA

In order to verify whether the preference of beverage and the frequency of beverage consumption were significantly correlated with the act of reading labels, we used ANOVA to test two variables: the means of the four conditions on beverages preference and the frequency of beverages consumption in past 7 days. Through the ANOVA test, two significant results were found. As indicated in Table 7, students in condition 1 scored highest, students in condition 2 scored second, while those who read both labels had the lowest consumption of juice. Additionally, as shown in Table 18, students in condition 1 and 3 had the highest consumption of Coke zero in past 7 days while students in condition 2 and 4 showed the least consumption of Coke zero.

Correlation Analysis

In order to testify the correlation between reading labels, the preferences for beverage and the awareness of health behaviour, a correlation matrix has been used to compare question 1(preference of beverage), question 2 (frequency of drinking each beverage), question 19(awareness of health), and question 20 (reading labels). There were only 1 significant

correlation among them. Although there was a significant correlation (p-value=0.002) between the awareness of health and reading of labels, there was no correlation between reading labels and the preference for drinking beverages.

Discussion (10%)

In the current study, we tested how reading labels influences UBC students' beverage preference by asking what parts of labels do students normally read when choosing their beverages. We are specifically interested in examining student's beverage preference in 6 categories (100% juice, water, milk, tea/ coffee, coke, coke zero) in past 7 days as well as daily habits that are relevant to health.

The results of our study do not support our hypothesis, as reading labels do not predict a healthier beverage choice among students on UBC campus. However, we did find a correlation between awareness of health and the act of reading labels.

From the descriptive data, we found that 90.35% of students put water and juice as their top two beverage choices. Students drank water most frequently and coke zero least frequently in past seven days. Among four conditions, we found that students who read both labels are most likely to exercise and least likely to eat junk food, and students who read no labels are least likely to exercise. We also found that students in condition 3 are least likely to add sugar in their beverage, while students in condition 4 have slightly higher sugar consumption than other three conditions.

The results from ANOVA to test relationship between students' beverage preference and daily beverage consumption showed only two significant results. Students in condition 3 have lower consumption of juice, compared to other conditions. Likewise, students in condition 1 and 3 have highest consumption on coke zero in past 7 days while students in condition 2 and 4 have least consumption on coke zero.

The only significant correlation found was between students' awareness of health and the act of reading labels. The correlation indicates that students who read both nutrition facts and ingredients labels think they have higher health awareness, which further influence their beverage preference. However, our data showed no correlation between reading labels and students' beverage preference.

The strength of our study was that we used online survey to gather data. The use of online survey not only allows our participants to access to questions much more easily, but also gives researchers convenience to analyse data. Also, the anonymity of survey allows participants us to obtain more candid and accurate answers. Survey design provides confidentiality and increases chance to get honest responses than other research methodologies.

Our study suggests that reading labels did not encourage students to make a healthier beverage choice. There are a number of possible explanations for these findings. First of all, the sample size is small. Only 114 students participated and completed the survey questions, and 99% of our participants are Asians. Moreover, the results of the study did not consider participants from different cultural backgrounds nor from various religious backgrounds. Therefore, the survey results cannot represent all UBC students' beverage preference and healthy behaviours since the size and diversity of our sample are relatively small. Future studies should recruit more UBC students and explore how cultural and religious backgrounds play a role in beverage choices.

Secondly, the mechanism we used to measure our dependent variables may not reflect what we intended to measure. For example, in question 19, the word phrase "awareness of health"

may be too vague for participants to make accurate decisions. Also, the survey response from participants may be biased due to participants' desire to be socially acceptable. Furthermore, the participants received the survey link through social media so that we did not have control over the environment when participants filled out the survey. For example, participants may fill out the survey at a noisy environment, which may distract their attentions away from the survey.

In addition, the current study is a correlational design. Although our study suggested that students who read both labels think they have high health awareness, their beverage consumption and preferences indicated that there is no relationship between health awareness and healthy beverage choice. Future studies should examine why the act of reading labels does not predict healthy beverage preferences and consumption. Moreover, a third variable may be the cause of two variables. For example, participants who suffer from diabetes may pay extra attention on what is in their beverages. Therefore, we cannot conclude the reasons why the act of reading labels and having high health awareness do not lead to healthier beverage choice.

Furthermore, there are limited beverage choices in the survey might affect how we evaluate participants' responses. For example, if a participant prefers Sprite over Coke (one of the choices on the survey) and rates Coke as least favourite beverage. We might mistakenly consider participants' beverage preference as healthy. However, Sprite, like other sugary soft drinks, is the least healthy according to the beverage classification. Therefore, the result of beverage preferences and consumption could be inaccurate due to limited beverage choices. Future studies should include more beverage choices to avoid potential discrepancy.

Last but not least, lack of correlation between reading labels and students' beverage choice raises the question why the act of reading labels does not predict the preference and consumption of health beverages. A potential explanation could be students do not have a thorough knowledge about items listed on the labels. They may not clearly understand what is in their beverages even when they intend to live in a healthier way. For example, students may think 100% juice is healthy and overlook how much sugar one bottle of juice may contain.

Recommendations for UBC clients (10%)

Current study raises an important question: why do students still make unhealthy beverage choices even when they have the awareness to make healthier beverage choices? Some potential explanations might be students fail to read the nutritional labels accurately or underestimate how much sugar contains in unhealthy beverages, especially those seemingly healthy beverages that market advertised.

Here are some recommendations that clients can do to encourage students to make a healthier beverage choice and to develop habit of reading labels. Clients can promote "Healthy Beverages Awareness Week" on UBC campus and set up booths for mini games that test students' abilities to read nutritional labels accurately and then provide information and tips about how to read the labels correctly and effectively. They can give out free healthy beverages to students who read the labels correctly. Thus, students not only get to learn how to read the labels, but also develop develop habit of reading labels. Moreover, the reason that students tend to underestimate how much sugar contains in beverages might be that sugar is invisible in beverages; therefore, it is important to read nutritional labels. In order to let students visualise how much sugar is added in beverages, clients can select a few popular unhealthy beverages and put the actual amount of sugar that is added next to the beverages. The surprising image of how much sugar beverages actually contain might decrease the likelihood for students to choose unhealthy beverages and increase the likelihood that they read the nutritional labels in the future.

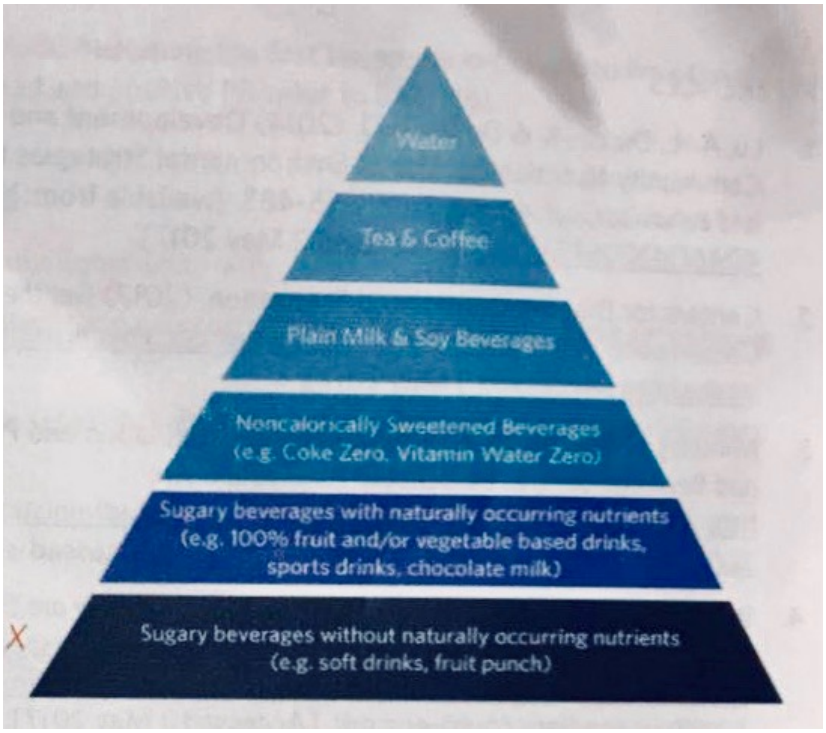
Reference

Johnson, K. M. (2010). Effects of simplified nutrition labels on energy intake in adults

Lagua, R. T., Claudio, V. S., SpringerLINK eBooks - English/International Collection (Archive), & SpringerLink (Online service). (1996). Nutrition and diet therapy reference dictionary (Fourth ed.). Dordrecht: Springer Netherlands. doi:10.1007/978-94-011-6878-6

Papowitz, E. C. (1996). Nutrition labeling : Combatting the dissemination of misleading nutritional information to consumers

Appendix A



Beverage Classification:

According to beverage classification, there are six categories, which constitute a pyramid based on sugar content. Water is at the top of the pyramid as it contains no sugar. Both tap water and sparkling water are in this category. Unsweetened tea and coffee are in the second category as they contain stimulants. Followed by tea and coffee, plain milk and soy beverages are in the middle of the pyramid. Non-sugar beverages, such as zero calories soda, vitamin water zero, and diet ice tea are in forth categories as they contain artificial sweeteners. The fifth category is sugary beverages with some nutrients. 100% fruit juice and chocolate milk are in this category. The last category is sugary beverages without nutrients, including soft drinks, fruit drinks and energy drinks. Water is considered the most healthy beverage while sugary beverages without nutrients are considered the least healthy.

Appendix B
Self-Report Survey

Q1 Please rate your preference of the following beverages. (1 indicates the least favourite; 6 indicates the most favourite)

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)
100% juice (1)	O	O	O	O	O	O
Water (2)	O	O	O	O	O	O
Milk/ Almond milk/ Soy beverages (3)	O	O	O	O	O	O
Tea/ Coffee (unsweetened) (4)	O	O	O	O	O	O
Coke (5)	O	O	O	O	O	O
Coke Zero (6)	O	O	O	O	O	O

Q2 How many times did you drink the following beverages in past 7 days?

	Never (1)	Twice (2)	3-5 times (3)	Once a day (4)	Multiple times in one day (5)
100% juice (1)	O	O	O	O	O
Water (2)	O	O	O	O	O
Milk/Almond Milk/Soy Beverage (3)	O	O	O	O	O
Tea/Coffee (unsweetened) (4)	O	O	O	O	O
Coke (5)	O	O	O	O	O
Coke Zero (6)	O	O	O	O	O

Q4 How often do you exercise every week?

- O Everyday (1)
- O 3-5 times (2)
- O 1-2 times (3)
- O Never (4)

Q5 How often do you eat junk food every week?

- O Everyday (1)
- O 3-5 times (2)
- O 1-2 times (3)
- O Never (4)

Q6 Do you read the calorie labels on the beverages that you drink?

- O Yes (1)
- O No (2)

Q7 Do you read the ingredients on the beverages label you drink?

- O Yes (1)
- O No (2)

Q8 Will you buy beverages based on their packaging?

- O Yes (1)
- O No (2)

Q9 How likely are you willing to try new beverage flavour?

- O Always (1)
- O Usually (2)
- O Sometimes (3)
- O Rarely (4)
- O Never (5)

Q10 Do you prefer sparkling water over water?

- O Yes (1)
- O No (2)

Q11 How often do you add sugar in your beverages (tea, coffee, etc)?

- O Always (1)
- O Usually (2)
- O Sometimes (3)
- O Rarely (4)
- O Never (5)

Q12 Are you vegetarian/vegan?

- O Yes (1)
- O No (2)

Q13 Gender

- O Female (1)
- O Male (2)
- O Other (please specify) (3) _____

Q14 Ethnicity

- O African-American (1)
- O Asian/Pacific Islander (2)
- O Caucasian (non-Hispanic) (3)
- O European (4)
- O Latino or Hispanic (5)
- O Native American or Aleut (6)
- O Other (please specify) (7) _____

Q15 What's your age?

_____

Q16 Which academic year are you in?

- O 1st year (1)
- O 2nd year (2)
- O 3rd year (3)
- O 4th year (4)
- O 5th year and beyond (5)

Q17 What Faculty are you in?

- O Arts (1)
- O Commerce (2)
- O Land and Food System (3)
- O Engineering (4)
- O Forestry (5)
- O Kinesiology (6)
- O Economics (7)
- O Science (9)
- O Other (please specify) (8) _____

Q18 Are your beverage choices available on UBC campus ?

- O Always (1)
- O Usually (2)
- O Sometimes (3)
- O Rarely (4)
- O Never (5)

Q19 Does the awareness of health influence the preferences of your beverage choice?

- O Yes (1)
- O No (2)

Q20 Do you read labels in your beverages?

- O Nutrition Facts only (1)
- O Ingredients only (2)
- O Both (3)
- O Neither (4)

Q23 Do you skip meals?

- O Always (1)
- O Usually (2)
- O Sometimes (3)
- O Rarely (4)
- O Never (5)

Appendix C

Descriptive Statistics

Table 1. The Mean and SD of the preference of different beverages

	100% Juice				Water				Milk			
	N	**I**	**B**	**Ne**	**N**	**I**	**B**	**Ne**	**N**	**I**	**B**	**Ne**
Valid	19	11	40	44	19	11	40	44	19	11	39	44
Mean	4.632	5.545	4.200	4.386	5.000	5.091	5.025	4.705	4.263	4.364	4.128	3.977
Std. Deviation	1.535	0.934	1.344	1.351	1.491	0.831	1.310	1.391	1.284	1.362	1.341	1.320

	Tea/Coffee				Coke				Coke Zero			
	N	**I**	**B**	**Ne**	**N**	**I**	**B**	**Ne**	**N**	**I**	**B**	**Ne**
Valid	19	11	40	44	19	11	40	44	19	11	40	44
Mean	3.947	3.364	4.100	3.955	2.632	2.545	2.600	3.205	2.053	1.727	2.150	1.977
Std. Deviation	1.224	1.629	1.582	1.584	1.535	1.368	1.676	1.472	1.224	1.009	1.406	1.267

*the table demonstrates the mean and the standard deviation of preference of different beverages (1 indicates the least favourite; 6 indicates the most favourite) for students in 4 conditions(N= Nutrition Facts only, I=Ingredients only, B=Both, Ne=Neither of them)

Table 2. The Mean and SD of the drinking frequency of different beverages in past 7 days

	100%juice				Water				Milk			
	N	**I**	**B**	**Ne**	**N**	**I**	**B**	**Ne**	**N**	**I**	**B**	**Ne**
Valid	19	11	40	44	19	11	40	44	19	11	40	44
Mean	2.158	1.909	2.000	1.773	4.842	4.909	4.825	4.864	2.421	2.545	2.900	2.409
Std. Deviation	1.608	0.944	1.198	0.937	0.501	0.302	0.675	0.632	1.216	1.214	1.194	1.127

	Tea/Coffee	Coke Zero	Coke Zero

	N	I	B	Ne	N	I	B	Ne	N	I	B	Ne
Valid	19	11	40	44	19	11	40	44	19	11	40	44
Mean	2.842	2.091	3.050	2.841	1.579	1.182	1.600	1.477	1.158	1.000	1.425	1.045
Std. Deviation	1.259	1.044	1.260	1.256	0.961	0.603	0.928	0.664	0.501	0.000	0.958	0.211

*the table demonstrates the mean and the standard deviation of the drinking frequency of different beverages (1 indicates Never; 5 indicates multiple in one day) for students in 4 conditions(N= Nutrition Facts only, I=Ingredients only, B=Both, Ne=Neither of them)

Table 3. The Mean and SD of Exercises Frequency

	Exercises Frequency			
	N	**I**	**B**	**Ne**
Valid	19	11	40	44
Mean	3.000	2.909	2.650	3.045
Std. Deviation	0.882	0.539	0.864	0.680

*the table demonstrates the mean and the standard deviation of exercise frequency (1 indicates Every day ; 4 indicates Never) for students in 4 conditions(N= Nutrition Facts only, I=Ingredients only, B=Both, Ne=Neither of them)

Table 4. The Mean and SD of Eating Junk Food

	Frequency of Eating Junk Food			
	N	**I**	**B**	**Ne**
Valid	19	11	40	44
Mean	3.000	2.818	3.075	2.636
Std. Deviation	0.667	0.751	0.526	0.718

*the table demonstrates the mean and the standard deviation of the frequency of eating junk food (1 indicates Every day ; 4 indicates Never) for students in 4 conditions(N= Nutrition Facts only, I=Ingredients only, B=Both, Ne=Neither of them)

Table 5. The Mean and SD of Adding Sugar

	Frequency of Adding Sugar			
	N	**I**	**B**	**Ne**
Valid	19	11	40	44
Mean	3.421	3.455	3.475	3.182
Std. Deviation	1.427	0.934	1.176	1.225

*the table demonstrates the mean and the standard deviation of the frequency of adding sugar (1 indicates Always ; 5 indicates Never) for students in 4 conditions(N= Nutrition Facts only, I=Ingredients only, B=Both, Ne=Neither of them)

Table 6. Health Awareness vs. Reading Labels

	Q19

	N	I	B	Ne
Valid	19	11	40	44
Mean	1.000	1.364	1.075	1.386
Std. Deviation	0.000	0.505	0.267	0.493

*the table demonstrates the mean and the standard deviation to whether health awareness influence beverage choice(1 indicates Yes ; 2 indicates No) for students in 4 conditions(N= Nutrition Facts only, I=Ingredients only, B=Both, Ne=Neither of them)

ANOVA

The Preference of Beverage(Q1) and Reading Labels(Q20)

Table 7. – 100% Juice (Q1_1)

Cases	Sum of Squares	df	Mean Square	F	p
Q20	16.441	3.000	5.480	3.014	0.033
Residual	199.980	110.000	1.818		

Note. Type III Sum of Squares

Post Hoc Tests

Post Hoc Comparisons – Read Labels (Q20)

		Mean Difference	SE	t	p_{tukey}
1	2	-0.914	0.511	-1.789	0.277
	3	0.432	0.376	1.149	0.653
	4	0.245	0.370	0.662	0.908
2	3	1.345	0.459	2.931	0.020
	4	1.159	0.455	2.550	0.055
3	4	-0.186	0.295	-0.633	0.919

Descriptives

Descriptives Plot

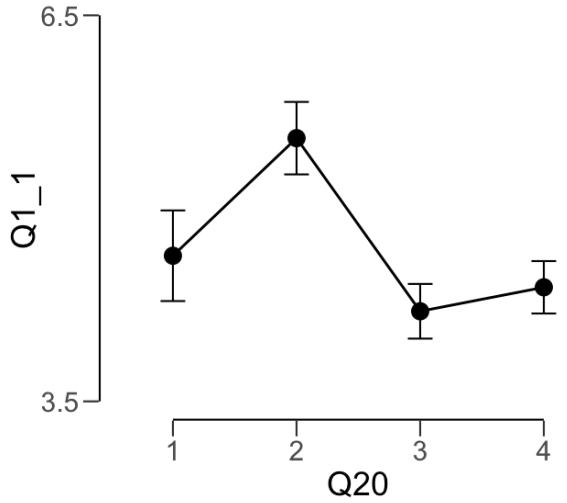


Table 8. – Water (Q1_2)

Cases	Sum of Squares	df	Mean Square	F	p
Q20	2.895	3.000	0.965	0.539	0.657
Residual	197.043	110.000	1.791		

Note. Type III Sum of Squares

Post Hoc Tests

Post Hoc Comparisons – Reading Labels (Q20)

		Mean Difference	SE	t	p tukey
1	2	-0.091	0.507	-0.179	0.998
	3	-0.025	0.373	-0.067	1.000
	4	0.295	0.367	0.804	0.848
2	3	0.066	0.456	0.145	0.999
	4	0.386	0.451	0.856	0.822
3	4	0.320	0.292	1.096	0.686

Descriptives

Descriptives Plot

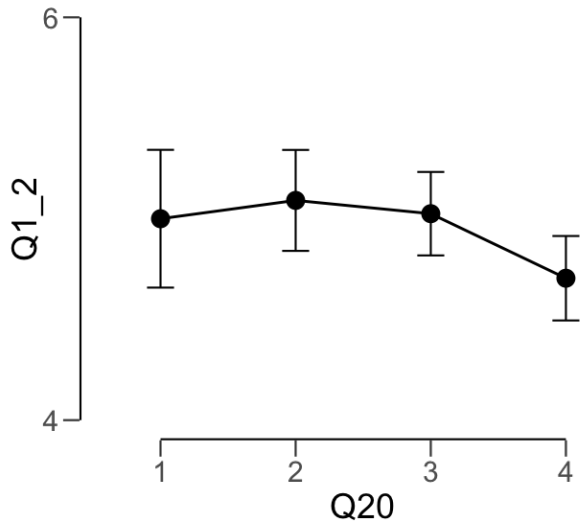


Table 9. - Milk (Q1_3)

Cases	Sum of Squares	df	Mean Square	F	p
Q20	1.939	3.000	0.646	0.368	0.776
Residual	191.566	109.000	1.757		

Note. Type III Sum of Squares

Post Hoc Tests

Post Hoc Comparisons – Reading Labels (Q20)

		Mean Difference	SE	t	p_{tukey}
1	2	-0.100	0.502	-0.200	0.997
	3	0.135	0.371	0.364	0.983
	4	0.286	0.364	0.786	0.857
2	3	0.235	0.453	0.520	0.953
	4	0.386	0.447	0.865	0.818
3	4	0.151	0.292	0.518	0.953

Descriptives

Descriptives Plot

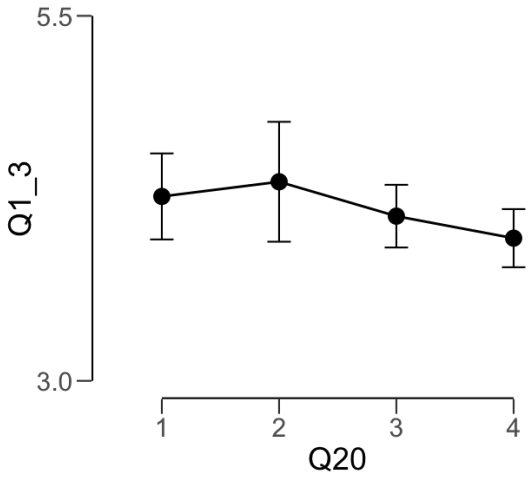


Table 10.– Tea/Coffee Q1_4

Cases	Sum of Squares	df	Mean Square	F	p
Q20	4.682	3.000	1.561	0.663	0.577
Residual	259.002	110.000	2.355		

Note. Type III Sum of Squares

Post Hoc Tests

Post Hoc Comparisons – Reading Labels (Q20)

		Mean Difference	SE	t	p_{tukey}
1	2	0.584	0.581	1.004	0.741
	3	-0.153	0.428	-0.357	0.984
	4	-0.007	0.421	-0.017	1.000
2	3	-0.736	0.522	-1.410	0.487
	4	-0.591	0.517	-1.142	0.657
3	4	0.145	0.335	0.434	0.972

Descriptives

Descriptives Plot

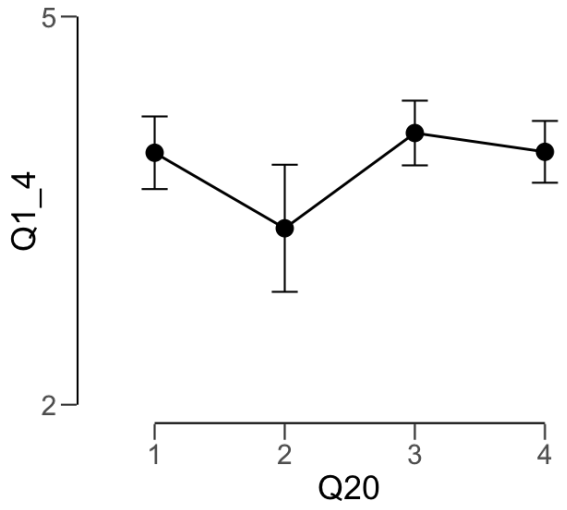


Table 11. – Coke (Q1_5)

Cases	Sum of Squares	df	Mean Square	F	p
Q20	9.926	3.000	3.309	1.379	0.253
Residual	263.907	110.000	2.399		

Note. Type III Sum of Squares

Post Hoc Tests

Post Hoc Comparisons - Reading Labels (Q20)

		Mean Difference	SE	t	p_{tukey}
1	2	0.086	0.587	0.147	0.999
	3	0.032	0.432	0.073	1.000
	4	-0.573	0.425	-1.348	0.526
2	3	-0.055	0.527	-0.103	1.000
	4	-0.659	0.522	-1.262	0.581
3	4	-0.605	0.338	-1.787	0.278

Descriptives

Descriptives Plot

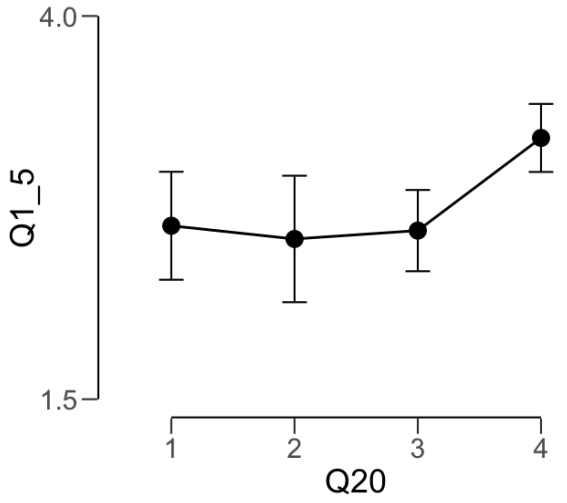


Table 12. – Coke Zero (Q1_6)

Cases	Sum of Squares	df	Mean Square	F	p
Q20	1.715	3.000	0.572	0.343	0.794
Residual	183.206	110.000	1.666		

Note. Type III Sum of Squares

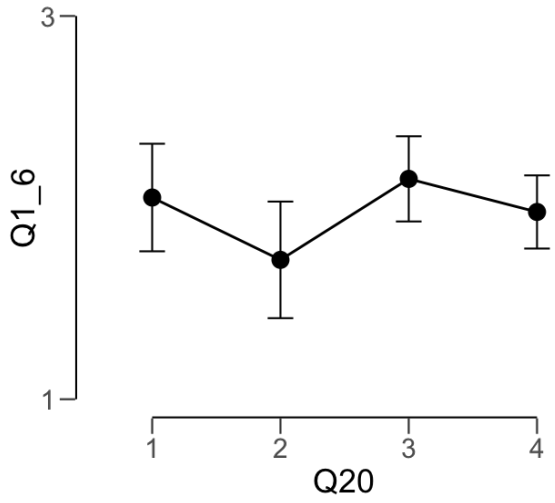
Post Hoc Tests

Post Hoc Comparisons - Read Labels (Q20)

		Mean Difference	SE	t	p_{tukey}
1	2	0.325	0.489	0.665	0.907
	3	-0.097	0.360	-0.271	0.993
	4	0.075	0.354	0.213	0.996
2	3	-0.423	0.439	-0.962	0.765
	4	-0.250	0.435	-0.575	0.938
3	4	0.173	0.282	0.613	0.926

Descriptives

Descriptives Plot



The Frequency of Drinking Beverage(Q2) vs. Reading Labels(Q20)

Table 13. – 100% Juice (Q2_1)

Cases	Sum of Squares	df	Mean Square	F	p
Q20	2.276	3.000	0.759	0.559	0.643
Residual	149.163	110.000	1.356		

Note. Type III Sum of Squares

Post Hoc Tests

Post Hoc Comparisons - Read Labels (Q20)

		Mean Difference	SE	t	p_{tukey}
1	2	0.249	0.441	0.564	0.941
	3	0.158	0.324	0.487	0.961
	4	0.385	0.320	1.205	0.617
2	3	-0.091	0.396	-0.229	0.996
	4	0.136	0.393	0.347	0.985
3	4	0.227	0.254	0.893	0.803

Descriptives

Descriptives Plot

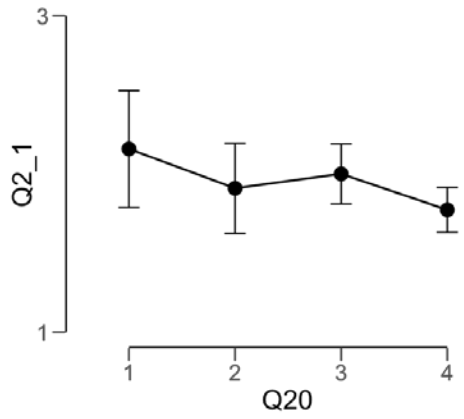


Table 14. – Water (Q2_2)

Cases	Sum of Squares	df	Mean Square	F	p
Q20	0.073	3.000	0.024	0.066	0.978
Residual	40.392	110.000	0.367		

Note. Type III Sum of Squares

Post Hoc Tests

Post Hoc Comparisons - Read Labels (Q20)

		Mean Difference	SE	t	p_{tukey}
1	2	-0.067	0.230	-0.292	0.991
	3	0.017	0.169	0.101	1.000
	4	-0.022	0.166	-0.129	0.999
2	3	0.084	0.206	0.408	0.976
	4	0.045	0.204	0.223	0.996
3	4	-0.039	0.132	-0.292	0.991

Descriptives

Descriptives Plot

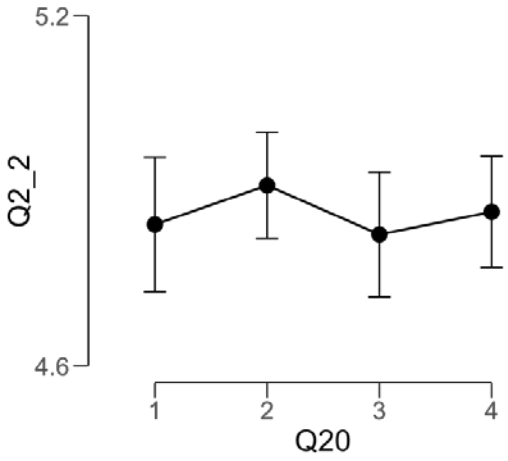


Table 15. – Milk (Q2_3)

Cases	Sum of Squares	df	Mean Square	F	p
Q20	5.843	3.000	1.948	1.413	0.243
Residual	151.595	110.000	1.378		

Note. Type III Sum of Squares

Post Hoc Tests

Post Hoc Comparisons - Read Labels (Q20)

		Mean Difference	SE	t	p_{tukey}
1	2	-0.124	0.445	-0.280	0.992
	3	-0.479	0.327	-1.464	0.454
	4	0.012	0.322	0.037	1.000
2	3	-0.355	0.400	-0.887	0.806
	4	0.136	0.396	0.345	0.985
3	4	0.491	0.256	1.914	0.221

Descriptives

Descriptives Plot

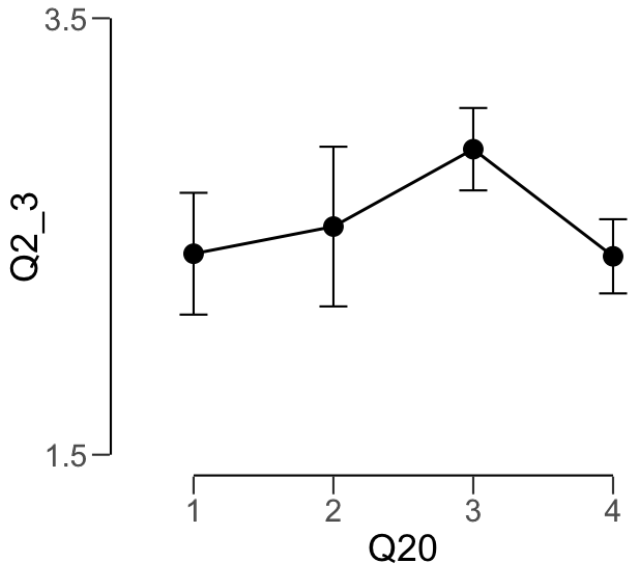


Table 16. – Tea/Coffee (Q2_4)

Cases	Sum of Squares	df	Mean Square	F	p
Q20	7.936	3.000	2.645	1.720	0.167
Residual	169.222	110.000	1.538		

Note. Type III Sum of Squares

Post Hoc Tests

Post Hoc Comparisons - Read Labels (Q20)

		Mean Difference	SE	t	p_{tukey}
1	2	0.751	0.470	1.599	0.375
	3	-0.208	0.346	-0.602	0.929
	4	0.001	0.340	0.004	1.000
2	3	-0.959	0.422	-2.271	0.107
	4	-0.750	0.418	-1.794	0.274
3	4	0.209	0.271	0.772	0.863

Descriptives

Descriptives Plot

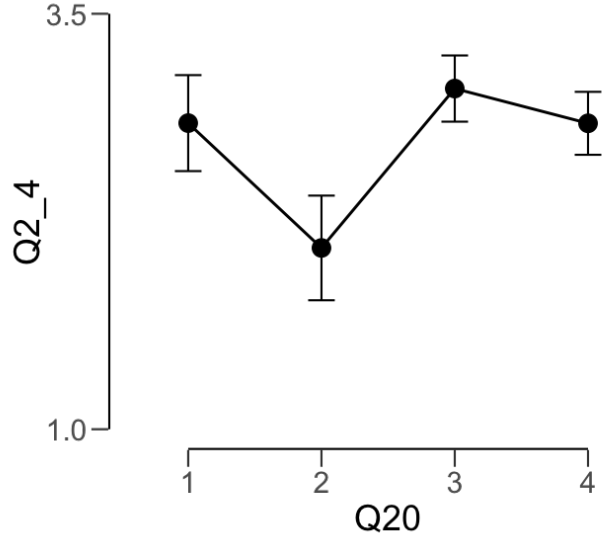


Table 17. – Coke (Q2_5)

Cases	Sum of Squares	df	Mean Square	F	p
Q20	1.646	3.000	0.549	0.829	0.481
Residual	72.845	110.000	0.662		

Note. Type III Sum of Squares

Post Hoc Tests

Post Hoc Comparisons - Read Labels (Q20)

		Mean Difference	SE	t	p_{tukey}
1	2	0.397	0.308	1.288	0.564
	3	-0.021	0.227	-0.093	1.000
	4	0.102	0.223	0.455	0.967
2	3	-0.418	0.277	-1.509	0.427
	4	-0.295	0.274	-1.077	0.697
3	4	0.123	0.178	0.690	0.898

Descriptives

Descriptives Plot

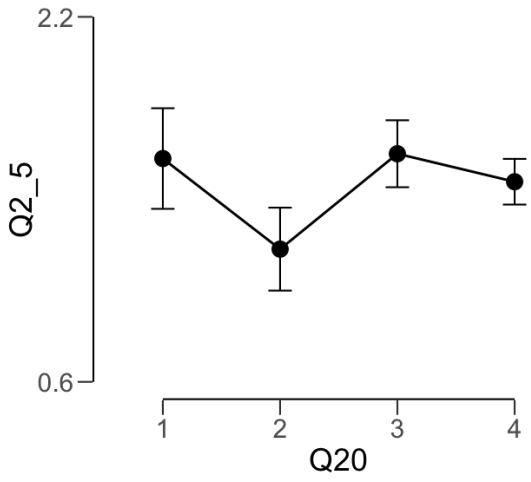


Table 18. – Coke Zero (Q2_6)

Cases	Sum of Squares	df	Mean Square	F	p
Q20	3.544	3.000	1.181	3.079	0.031
Residual	42.210	110.000	0.384		

Note. Type III Sum of Squares

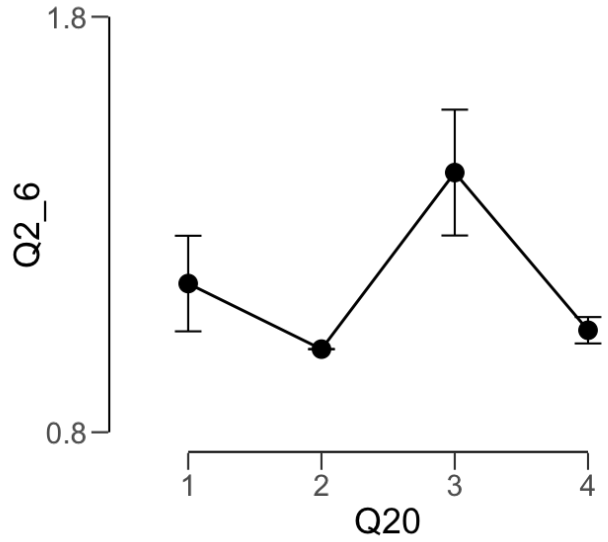
Post Hoc Tests

Post Hoc Comparisons - Read Labels (Q20)

		Mean Difference	SE	t	p_{tukey}
1	2	0.158	0.235	0.673	0.904
	3	-0.267	0.173	-1.548	0.404
	4	0.112	0.170	0.661	0.909
2	3	-0.425	0.211	-2.015	0.183
	4	-0.045	0.209	-0.218	0.996
3	4	0.380	0.135	2.805	0.029

Descriptives

Descriptives Plot



Correlation Matrix

Pearson Correlations
Table.19

		100% Juice	Water	Milk	Coffee/ Tea	Coke	Coke Zero
Q20	Pearson's r	-0.129	-0.090	-0.091	0.036	0.144	0.001
	p-value	0.173	0.343	0.339	0.702	0.128	0.993

* p < .05, ** p < .01, *** p < .001
*This table demonstrates the correlation between the preference of beverages and reading label conditions.

Table. 20

		100%Juice	Water	Milk	Coffee/Tea	Coke	Coke Zero
Q20	Pearson's r	-0.109	0.003	-0.007	0.054	-0.005	-0.039
	p-value	0.248	0.971	0.940	0.569	0.961	0.679

* p < .05, ** p < .01, *** p < .001
*This table demonstrates the correlation between the frequency of drinking beverages and reading label conditions. Q20 represents the 4 conditions of reading labels.

Table. 21

		Exercises	Junk Food	Sugar	Health Awareness
Q20	Pearson's r	0.025	-0.179	-0.076	0.282 **
	p-value	0.788	0.056	0.420	0.002

* p < .05, ** p < .01, *** p < .001

*This table demonstrates the correlation between the frequency of exercises, eating junk food and adding sugar, health awareness and conditions of reading labels
Q20 represents the 4 conditions of reading labels.