UBC Social Ecological Economic Development Studies (SEEDS) Sustainability Program

Student Research Report

Nudging the Tap Open

Sasha Saksena & Ayush Kathuria

University of British Columbia

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Executive Summary

The present study was a two phased investigation, inspecting the gap in literacy that leads to a preference for bottled water over tap water on the UBC Vancouver Campus. The second phase of this study explored the impact of choice architecture; particularly visual nudges, on diverting this preference. Our findings suggest that a visual nudge employing a pre-commitment strategy was the most effective in increasing self-reported use of tap water. This was followed by a visual nudge employing the ease and convenience technique, which pointed out the closest tap water facility. However, the small sample sizes and self-reported nature of the methodology renders these findings highly rudimentary and subject to critique.

(114 words)

Introduction

Given the current climate crisis, discussions around sustainability have become more prevalent. In light of this, the UBC community is employing multiple interventions to monitor it's environmental impact. One such initiative is the *Tap Water Campaign* launched by Campus and Community Planning, which aims to reduce the consumption of bottled beverages and increase the consumption of tap water across the Vancouver campus. In order to do so, they required an understanding of factors that influenced a preference for bottled water and an exploration of interventions that may negate these preferences. Hence, the present research aims to investigate and understand these factors, and explore interventions.

Through viva voce, there is a presumption that members of the UBC Vancouver community who come from other countries may not be aware that tap water is potable here since it may not be in their home countries. This is a stand alone presumption that the study also aimed to test. Past research on the preferred use of bottled water suggests that there are two main factors at play: lack of information and perceived differences in subjective experience (Anadu & Harding, 2000; Doria, 2006; Saylor et al, 2011). Lack of information involves beliefs that there are increased health benefits to drinking bottled water, that the safety and quality of tap water is less that that of bottled water, and that recycling mitigates the environmental cost of bottled water. Differences in subjective experience focus on the perceived taste and aesthetic of bottled water. Consumer research around bottled beverages suggests that generational factors may be responsible for this misinformation (Slootweg & Rowson, 2018). Generation Z tend to be more sceptical of information given by large corporations and governments agencies, which may lead to the distrust in those sources when they claim that tap water is safe for consumption. Since UBC's demographic data shows that the majority of the UBC population falls within this Generation Z bracket, thus this scepticism might be at play on campus (The Planning and Institutional Research Office).

This misinformation and difference in subjective experience may be mitigated through the implementation of choice architecture (Cass, 2014). Choice architecture works towards organising the context in which people make decisions, nudges specifically accomplish this without forbidding any options. Nudges present themselves in many forms that address different aspects of a choice. As such, the current study explore if visual nudging techniques would increase the consumption of tap water amongst the UBC Vancouver population. We hypothesised that UBC students would report an increase in the usage of tap-water fountains after witnessing the visual nudges.

Methods

Our methodology consisted of two online qualtrics surveys. The first was sent to determine demographic information about our participants, and barriers they reported around their own tap water usage. (Appendix A) Based on findings from the first survey, nudges relevant to reported barriers were sent in a second survey. (Appendix B & C) Each nudge was accompanied by a ten point likert scale where 0 represented no persuasion, and 10 represented immediate persuasion to drink tap water. Participants were also asked which factors they though were most responsible for other's lack of tap water consumption and what suggestions they would have for interventions aiming to encourage tap water consumption. In order to avoid order effects, two versions of the second survey were created, both had a randomised order of presentation of the nudges and were sent in alternation to participants.

Results

Through the first survey we were able to reach nineteen UBC students, the results of the survey are shown in Appendix D and E. 53% of our sample were international students, 52% of the entire sample reported coming from places with potable tap water and 94% of the sample said they drank tap water on a regular basis. Internationality did not seem to have an effect on tap water drinking (which mitigated the viva voce factor). When assessing the knowledge around tap water, only 47% of the participants knew that Vancouver tap water was filtered rain and snow melt. 42% thought that the source was glacial ice and 11% thought it was fresh water lakes. These findings suggest a clear lack of information around the water filtration process that. The implications of these findings are as discussed later in this report.

Results from the second survey show that by mean ratings of self reported persuasiveness the nudge using a pre-commitment strategy was rated most persuasive — rated at an average of 7. (Appendix F & G) To asses the validity of this effect we ran a one-way ANOVA test with each participant's ratings for all the nudges presented, we found a p-value of 0.02. (Appendix H)

In response to the additional questions at the end of the second survey asking what factors participants thought contributed most to people not drinking tap water, 56% of the participants mentioned lack of trust in the cleanliness of the water and 22% mentioned misinformation about the condition of the tap water. (Appendix I)

Discussion

These findings suggest that internationality does not influence the preference for tap water consumption. However, there is a clear gap in literacy around the filtration and distribution of tap water in the Vancouver area. This can be observed in both self-reports from the first survey, and in speculations for other's behaviour in the second survey. These results suggest a greater focus on interventions that target the spread of more information regarding the water filtration process used on campus.

Since our participants reported an increase in tap water usage, our hypothesis was confirmed suggesting that the use of nudges may foster more sustainable behaviour. It was also observed that the best strategy for nudging sustainable behaviour is to use a pre-commitment strategy. However, it is important to note that due to the circumstances of a pandemic we were not able to conduct follow up research on the genuine frequency of tap water usage after actual implementation of the nudges and thus, our results remain speculative and our findings have low external validity. In addition, the higher rating for the pre-commitment strategy nudge may not have been due to the contents of the nudge itself but rather due to the more colourful graphics employed in this particular poster. (Appendix B) Participants also reported that they believes more colourful and visually appealing visual interventions may be much more effective.

Another mitigating factor we failed to address is that we do not possess any control over architecture i.e. we cannot pre-determine where a building puts its water fountains. Anecdotally, we have seen students avoiding water fountains which are situated near lavatories, thus even with the presence of a nudge, the location may still hinder the usage of water fountains. Thus, a further study would be needed to nullify this effect by randomising the placement of nudges and observing the strength of nudges in multiple locations.

Regardless of these limitations, this study demonstrates that choice architecture, particularly nudging techniques may be a valid form of intervention when addressing behaviours that come from a gap in literacy as they can serve as a reminder and informative tool simultaneously.

Recommendations for our Client

Through the effects observed in this study, and the feedback we received from our participants, we would suggest that the Tap Water Campaign re-asses the current nudges they have in place to cater to a pre-commitment strategy (encouraging students to commit to drinking more tap water

by investing in a reusable bottle) or amplify the ease and convenience (direct students towards the nearest water fountains).

We also found that UBC students could benefit from more information about the water filtration process used on campus, and that this information is challenging to find and understand even when effort is put in. Thus it may be beneficial for our client to create an easily accessible page online that harbours all the information about tap water filtration and maintenance on campus, and provides further references to scientific data (to mitigate skepticism).

Although our study suggests that these strategies do not need to specifically be targeted towards international students, we suggest that there be a survey with a larger sample that replicates the first survey in this study. This will allow for a better assessment of the impact of internationality on tap water consumption on campus. If a correlation is found in further investigation, it may be beneficial to relay information about the safety of tap water consumption to students during Jump Start, where many international students gather other vital information to help them acclimate to Vancouver.

Finally, as voiced by many participants in the second survey (when asked for suggestions for interventions) there needs to be an emphasis on the clarity within any interventions pushed. The interventions present across campus currently seem to divert a viewer's attention from the tap water to unrelated topics.

References

Cass R. Sunstein, Nudging: A Very Short Guide, 37 J. Consumer Pol'y 583 (2014). http://nrs.harvard.edu/urn-3:HUL.InstRepos:16205305

Congui, L., & Moscati, ICONGIU, L., & MOSCATI, I. (2018). Message and environment: A framework for nudges and choice architecture. Behavioural Public Policy, , 1-17. doi:10.1017/bpp.2018.29

Doria, M. F. (2006). Bottled water versus tap water: Understanding consumers' preferences. Journal of Water and Health, 4(2), 271-276. doi:10.2166/wh.2006.0023

Edith C. Anadu & Anna K Harding; Risk Perception and Bottled Water Use. American Water Works Journal 1 November 2000; 82-92 doi; https://doi.org/10.1002/j.1551-8833.2000.tb09051.x

Engelen, B. (2019). Ethical criteria for health-promoting nudges: A case-by-case analysis. The American Journal of Bioethics, 19(5), 48-59. doi:10.1080/15265161.2019.1588411

Saylor, A., Prokopy, L.S. & Amberg, S. What's Wrong with the Tap? Examining Perceptions of Tap Water and Bottled Water at Purdue University. Environmental Management 48, 588–601 (2011). https://doi.org/10.1007/s00267-011-9692-6

Slootweg, E., & Rowson, B. (2018). My generation: A review of marketing strategies on different age groups. Research in Hospitality Management, 8(2), 85–92, https://doi.org/10.1080/22243534.2018.1553369

The Planning and Institutional Research Office. Demographics overview. Retrieved from http://pair.ubc.ca/student-demographics/demographics/

Appendices

Appendix A; First Survey

https://ubc.ca1.qualtrics.com/jfe/form/SV_71lxEEVKmQSD7HT

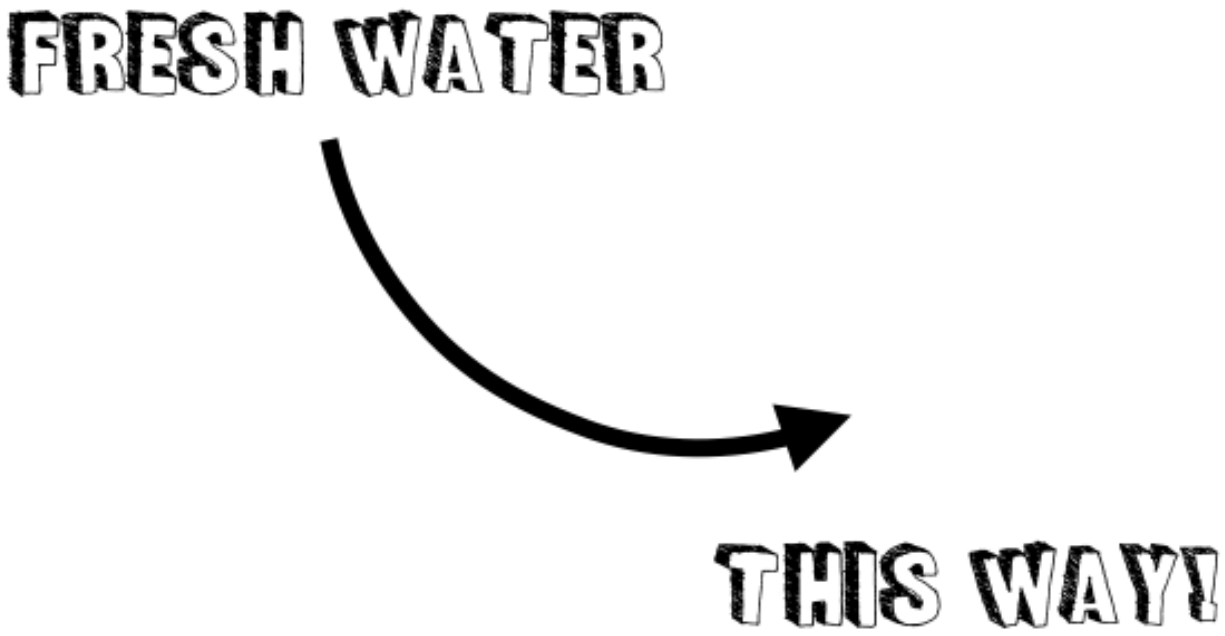
Appendix B; Second Survey

Version 1; https://ubc.ca1.qualtrics.com/jfe/form/SV_3JbDOMotNAkf3MN

Version 2: https://ubc.ca1.qualtrics.com/jfe/form/SV_1YPSo3MMVZDEU4Z

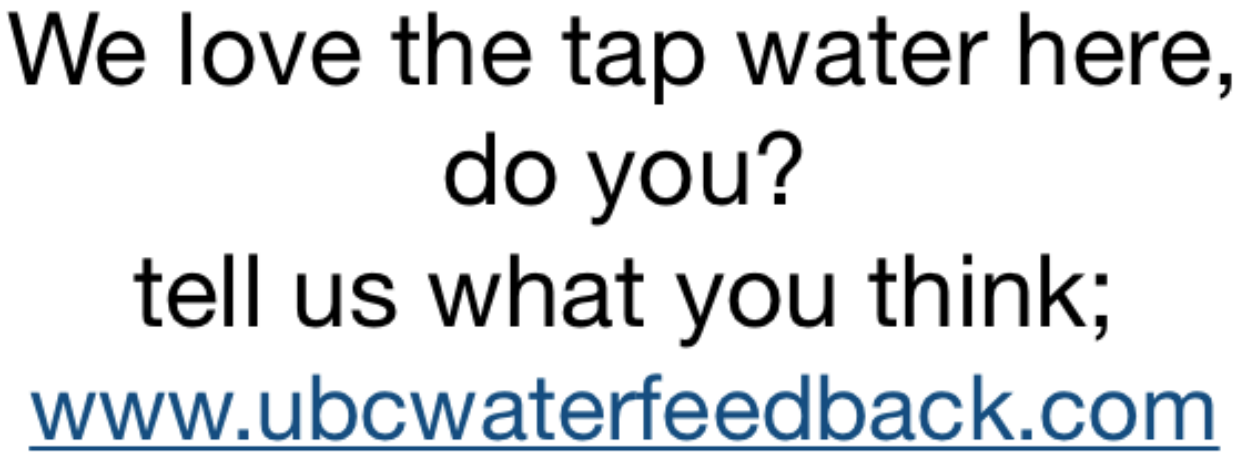
Appendix C; Nudges

Pre-commitment Strategy;



Ease and Convenience;

Use of Social Norm;



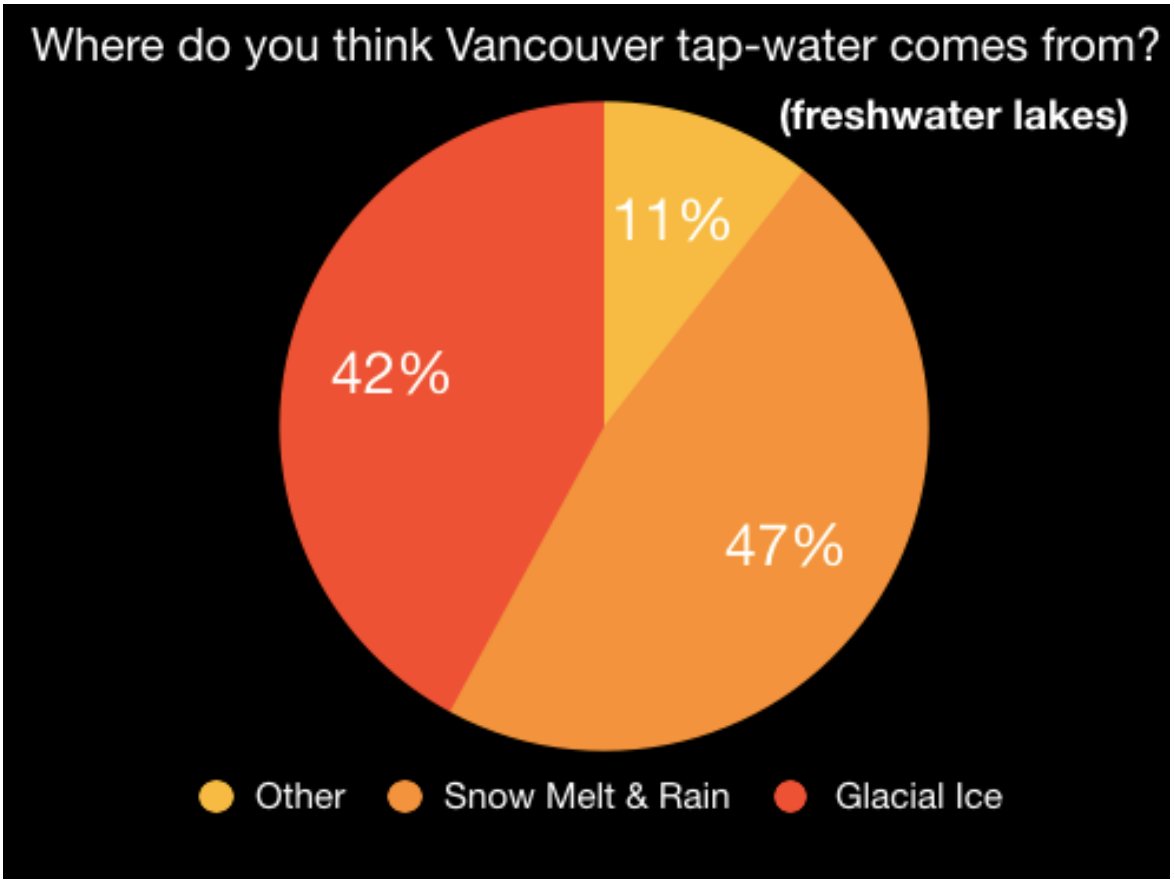
Eliciting Implementation Intention;

Appendix D; First Survey Results

Tap Water Demographics Survey Results

	Are you an international or domestic student?	How long have you lived in Vancouver (in months)	Is tap water drinkable in your home country/region?	Do you drink tap water in Vancouver?	Why?	Where do you think Vancouver Tap Water Comes from?
Participant 1	International	38	No	Yes, always	Because its easily accessible and free	Treated Glacial Ice/ Mountain Snow
Participant 2	International	30	Yes	Yes, always		Treated Glacial Ice/ Mountain Snow
Participant 3	Domestic	286	Yes	Yes, always	Habit	Treated Glacial Ice/ Mountain Snow
Participant 4	Domestic	228	No	No, never	Fear of getting waterborne diseases	Treated Glacial Ice/ Mountain Snow
Participant 5	International	40	No	Yes, always	NA	Treated Glacial Ice/ Mountain Snow
Participant 6	International	48	Yes	Yes, always		Other; Freshwater Lakes
Participant 7	International	30	No	Yes, always		Treated Glacial Ice/ Mountain Snow
Participant 8	Domestic	30	Yes	Yes, always	I love tap water	Treated Glacial Ice/ Mountain Snow
Participant 9	International	42	No	Yes, always		Filtered Snow Melt & Rain Water
Participant 10	Domestic	28	No	Yes, always		Filtered Snow Melt & Rain Water
Participant 11	International	30	No	Yes, always		Filtered Snow Melt & Rain Water
Participant 12	International	30	No	Yes, always		Other
Participant 13	Domestic	50	Yes	Yes, always		Filtered Snow

Participant 17	International	54	Yes	Yes, always		Filtered Snow Melt & Rain Water
Participant 18	Domestic	10	Yes	Yes, always		Filtered Snow Melt & Rain Water
Participant 19	Domestic	36	Yes	Yes, always		Filtered Snow Melt & Rain Water



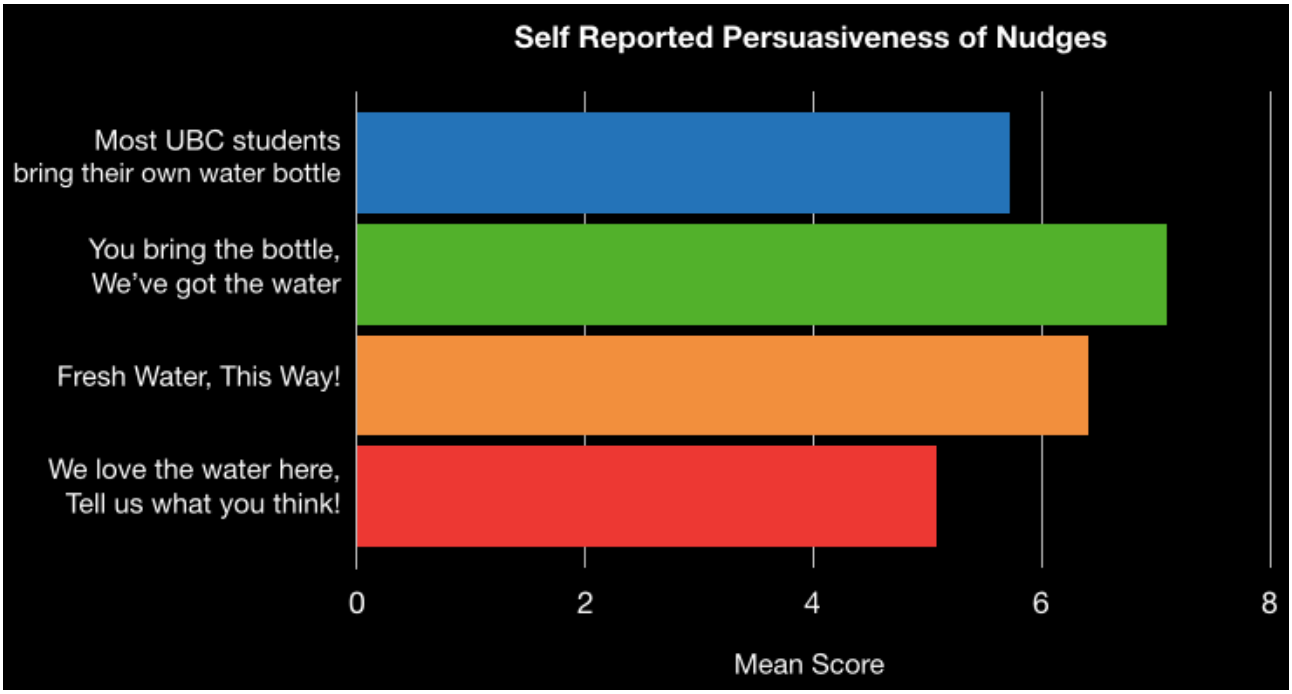
Appendix E; First Survey Graph

Appendix F; Second Survey Results

Self Reported Persuasiveness of Nudges (1-10)

	Fresh water this way	Tell us what you think	You bring the bottle, we've got the water	Most Students bring their own bottle	Do you have any suggestions for posters to encourage people to drink more tap water?	In your opinio what factors contribute mo people not drinking tap water?
Participant 1	8	7	7	3	Maybe something about the GHG emissions associated with plastic water bottles?	Accessibility; bott water is more convenient. You d have to remember bring your own w bottle, and you ca recycle the bottle you're done with i re-usable bottle is more thing to kee of, and it needs to washed.
Participant 2	8	9	10	7	no	health issues and c of tap water
Participant 3	3	1	6	8	Using the fact that people are doing it encourages more to fit into a social norm	laziness, societal nc
Participant 4	7	6	8	8	more info on where fountains are	idk
Participant 5	7	5	7	6	Perhaps, like one of the examples, more signage about where the tap water can be found	laziness?
Participant 6	10	8	10	10	They dont know that tap water in Metro Vancouver is drinkable straight from the tap and super clean	Just like in your example posters: colourful, clear, concise, easy to re messages may encourage people drink tap water. A as maybe a short " fact" about the cle water in Metro Vancouver.
Participant 7	7	9	4	7	cleanliness and quality of water	Awareness that In Fa clean and is suitable f drinking
Participant 8	2	2	8	2	misunderstandings on it being not good for their health	less text more visu

Participant 12	8	8	8	7	the pipe that sends the water to people has some erosion	Show how scare drinkable water for us actually is
Participant 13	7	1	8	2	International experience may prevent them from drinking tap water because in their home country it may not be encouraged	Making individuals feel guilt about there use of plastic is a big idea. Also I know it sounds stupid but a cute caricature and catchy slogan always helps
Participant 14	6	7	7	8	Right now, Fear of coronavirus and germs, lack of proper sanitation and cleaning of water fountains	showing impact on environment and how much cheaper it is for the individual
Participant 15	1	4	4	2	Temperature of the water	glacier pictures
Participant 16	8	7	8	6	cleanliness	source of the water
Participant 17	7	7	6	5	A lot of people think that tap water isnt clean enough to drink on its own	I think it would good to have posters that shows real statistics and benefits of drinking tap water from how clean it is, how environmentally it is, etc
Participant 18	8	2	6	4	Graphics and encouragement to drink water	Do not generalise that all UBC students drink tap water, rather encourage than assume.
Participant 19	8	8	7	6	water being dirty from pipes it flows from	no
Participant 20	4	2	6	4	People believing there are harmful minerals in the water	fact based posters with information
Participant 21	4	1	4	5	not having a water bottle with them	little words and little colours
Participant 22	4	1	5	6	laziness	no



Appendix G; Second Survey Result Graphs

Anova: Single Factor

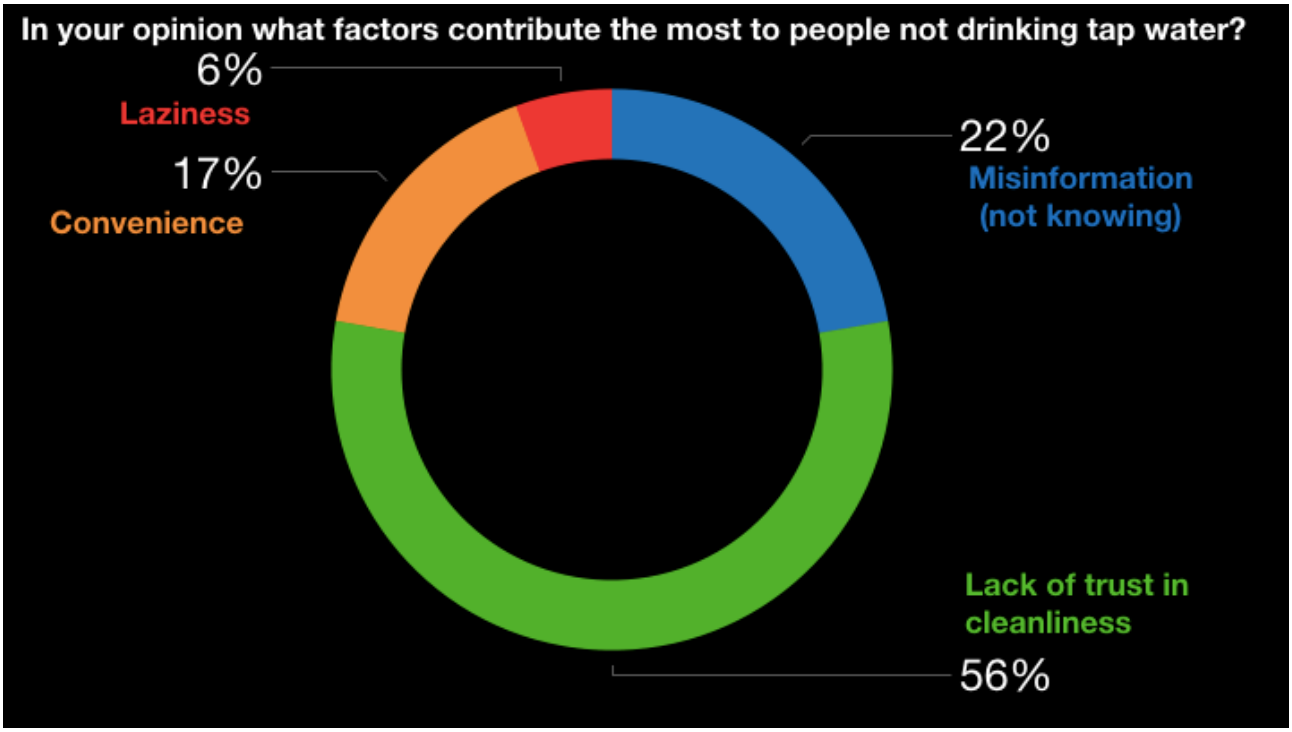
SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Fresh water this way	22	136	6.18181818	6.25108225
Tell us what you think	22	101	4.59090909	9.20562771
You bring the bottle, we've got the water	22	150	6.81818182	2.82251082
Most Students bring their own bottle	22	120	5.45454545	5.4978355

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	60.6704545	3	20.2234848	3.4021848	0.0214031	2.71322713
Within Groups	499.318182	84	5.94426407			
Total	559.988636	87				

Appendix H; Second Survey ANOVA test



Appendix I; Second Survey Contributing Factors Graph