New York University **Sustainability Task Force**

H204U:
A Qualitative Study of the Culture of Water Consumption at New York University

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abstract

While an abundance of information exists about the negative environmental impacts of bottled water, there are few, if any, bottom-up studies of why and how people choose and understand the water they drink, be it bottled, tap or filtered. H204U is an interdisciplinary qualitative study funded by New York University's Sustainability Task Force to investigate the culture— the meanings, metaphors, influences, rhetoric and practices— of bottled and tap water consumption so environmental initiatives can effectively target certain populations and behavioural thresholds. The findings show that there is a gap between popular discourses about bottled water, dominated by environmentalism, marketing, and water quality, and the reasons people choose one type of water over another. Thus, its findings challenge popular assumptions about bottled water consumption, including: availability is more influential than convenience for bottled water drinkers; while a mistrust of public municipal water sources is popular in discourse, water quality is rarely a threshold attribute; environmental values and the consumption of bottled water are not mutually exclusive; and bottled water marketing has a influential, though indirect, effect on how bottled and tap water is experienced. Finally, the project finds that there are two types of initiatives that can impact bottled water consumption: initiatives that change behaviour and can be quantified, and those that attempt to change the terms of the overall discourse of water consumption, perhaps legitimizing common practices but also potentially shifting or expanding the spectrum of how water is understood. The paper ends with concrete operational and communicative recommendations modeled for New York University, where approximately a million bottled waters are consumed every month.

summary of findings

1. The NYU population drinks the approximate equivalent of one million bottles of water a month.
2. The NYU population generally drinks and prefers water over other beverages, and tap water over bottled water.
3. 30% of the sample population drink bottled water once or more a day, 18% drink bottled water a few times a week, and 52% rarely or never drink bottled water.
4. 98% of the sample population drink some form of tap water regularly, even if they also drink bottled water
5. People are usually loyal to the type of water they drank growing up, though there are instances of people stopping BW consumption after high involvement in environmental activities (beyond education).
6. The highest thresholds (attributes that determine whether tap or bottled water will be consumed) are the environment, habit, availability, and aesthetics (the taste, clarity, and smell of water).

7. Availability (the accessibility and ability to obtain water) is a higher threshold (deciding) attribute for choosing bottled or tap water than convenience (the ease of buying, carrying around, and/or disposing of bottled water). Tap water was described as convenient more often than bottled water.

8. Taste is an important aspect of perceived water quality.

9. People who drink bottled water regularly do not necessarily lack environmental values or knowledge, and most or all survey and interview participants were aware that bottled water has a negative impact on the environment.

10. Of the survey population with clearly stated environmental values, 27% drank bottled water more than once a day and 21% drank bottled water a few times a month. The rest rarely or never drank bottled water.

11. Within the above population, environmental values and the consumption of bottled water were not seen as paradoxical because of the following: Bottled water can be seen as a non-issue in comparison with other environmental issues. Water consumption can be just one more environmental action in an overwhelming array of ways to be environmentally friendly. Choosing environmentally friendly brands of bottled water is a way of being environmentally conscious. If the wasteful aspects of bottled water are addressed (through recycling, for example) bottled water consumption becomes “environmentally friendly.”

12. Participants unanimously stated that they were not influenced by bottled water marketing, yet the language and symbolism used in advertisements was ubiquitous in their everyday discourse about both tap and bottled water, regardless of an individual’s beverage preference or habits.

13. 61% of survey respondents filtered their water, but this is an indication of attitudes and discourses about water quality rather than a threshold concern. Only 8% of the sample population based their decisions to drink tap or bottled water on water quality.

14. Posting positive water quality results (where the water exceeds EPA standards) over tap water sources does not have a high or immediate effect on tap water consumption, but sustains a high level of interest among people who already drank tap water. Postings and education may have both long and short term bolstering and cultural effects on discourses and attitudes towards tap water and *reinforces* the decision to drink tap water.

summary of recommendations

NYU is not a homogenous population when it comes to water consumption behaviours and preferences. The recommendations below, as well as any additional initiatives beyond this list, ought to target the discrete populations based on their drinking habits and thresholds.

There are no recommendations for High Bottled Water Drinkers (2% of the population who consume 9% of NYU's bottled water). They are unlikely to change their behaviors on educational, situational, or environmental grounds.

High Bottled Water Drinkers, Mixed Bottled Water Drinkers & Primary Tap Water Drinkers (65% of the population who consume 91% of NYU's bottled water) have high aesthetic and situational thresholds. The majority of the following recommendations target these populations.

1. Replace NYU's 44,071 upright office coolers with in-line water coolers or fountains.
2. Implement a bottled water ban so university money cannot be used to purchase bottled water and bottled water cannot be purchased by university-owned venues - detailed outline of a timeline of a bottled water ban within report.
3. Ensure all offices have access to tap water.
4. Include EPA secondary standards for aesthetic contaminants in regular water quality testing (EPA 2010).
5. Create an infrastructure for complaints or concerns about specific water sources and respond to complaints about taste with the same speed and efficiency as those of colour, odour, or clarity.
6. Place a water quality "seal of approval" on fountains that pass or exceed EPA standards.
7. Conduct research into plastic leachates and advertise the results.
8. Any environmental education or outreach about bottled water should outline ecological issues beyond waste and recycling.
9. Avoid posting notices about filters or filtering.
10. Conduct studies before and after any major initiative to see how it affects tap and bottled water consumption.

statement of problem

In the last three years, there have been a considerable number of student-led initiatives at New York University to reduce bottled water consumption on campus. The leaders of these initiatives (which range from installing bottle fillers at public fountains to a full bottled water bottle ban) are well versed in the environmental detriments of bottled water. They all agree that bottled water is expensive, harmful for the environment, involves social justice conflicts and is unnecessary given abundant access to high-quality tap water in New York City.[1]

However, these initiatives consistently lack well-founded reasons for choosing one type of direct action over another and make assumptions about why or how people make decisions to drink bottled, tap, or filtered water. The little information about water preferences comes from studies of bottled water advertising (Wilk 2003), or studies done by water companies whose quantitative data aims to uncover public opinion of municipal services more than the reasons behind varied water consumption (Hurd 1993). Without the qualitative knowledge of how and why people drink water everyday, initiatives to change behaviour are based on popular assumptions. In most cases, initiatives are created by environmentally-minded tap water drinkers that are unfamiliar with the daily consumption of bottled water. This project aims to reduce this gap in knowledge.

Summary of water initiatives at NYU (as of May 2010):

Student-led bottled water ban: the Undergraduate Student Government has tabled a motion to ban bottled water on campus until Fall 2010. Status: in progress.

Sustainability Task Force: endorsed full ban and recommended a replacement of all upright office water coolers with in-line water filtration units. Status: ongoing.

Student-lead water bottle refill stations (funded by Brita and the Stern Campus Greening Initiative): Two separate projects installed public filtered water bottle refill stations in campus. Status: first project complete, second project in progress.

NYU Environmental Health and Safety: designed a new campus water testing schedule. This includes mapping all water fountains to locate tap water “deserts.” Status: in progress.

NYU Dining Services: removed bottled water from meal plan options and dining halls. Status: complete.

[1] Abundant secondary literature exists on these topics and will not covered here. See Royte 2008, Shiva 2002, Wilk 2003, Clarke 1997, Gleick 2010 and Szasz 2007.

A. Models of Behaviour and the Social Sciences

This project uses the model of lexicographic ordering to analyze conscious decision-making (Debreu 1954, Tversky 1972, Hwang and Yoon 1981). In this model, "a decision maker selects the alternative that ranks highest on the most important attribute" (Murtaugh 1984: 245). If there are several options that have that highest-ranking attribute, the second most important attribute is considered. For example, a person might base her water consumption on availability. If both plain tap water and filtered water are immediately available, she might choose based on the perceived cleanliness of the spouts if cleanliness is her second most important attribute. I call the highest ranking attribute the "threshold;" it is the issue or attribute that determines, *in advance*, which choices will be considered because they are the most important. Thresholds determine how and whether someone will switch from drinking one type of water to another.

However, conscious decision-making does not account for all behaviour. In a study about water conservation behaviour, Gary Gregory and Michael Di Leo categorize different factors affecting behaviour (2003). In addition to reasoned processes, factors that influence behaviour include *stimuli* (such as education, advertising campaigns, or news stories), *unreasoned processes* (such as habits or cultural norms) and *situational factors* (such as income or infrastructure). Furthermore, they categorized reasoned processes into *attitude*, *awareness*, and *involvement*. Attitude is an opinion or belief and is a necessary but insufficient condition of awareness and involvement. Awareness is "a mental state that an individual reaches by consciously accepting and processing informational cues" (2003: 1263). Involvement, their most reliable indicator of behaviour and the factor they believe is most likely to change ingrained habits, and therefore the closest to a "threshold," refers to "the level of perceived importance" of an issue and is "based on one's motivation to act and process information" (2003: 1266). They found that habit, awareness, involvement, and situational factors are reliable predictors of water conservation behaviour. While I am not statistically deducing predictive correlations between drinking water behaviour like Gregory and Di Leo, I can use their terms and categories because they highlight the constellation of factors that influence water consumption patterns and avoid the assumption that all behaviours are based on reasoned decision-making.

B. Cultural and Critical Studies

Cultural and critical studies "zoom out" from individual behaviors to examine larger public sentiments or common sets of perceptions and values, articulated or otherwise, that characterize the experience of a particular group of people in a particular place (in this case, the NYU community). These studies are different from journalistic, educational or other descriptive work that focus on the structure of the bottled water industry, consumer trends or environmental effects of bottled water (such as Royte 2008, Shiva 2002, Stauffer 2004, Petrie 2004). They are also different from the market-driven surveys that quantify attitudes towards municipal tap water where the researcher clearly knows what he or she is looking for in advance (Hurd 1993).

Critical cultural studies are concerned with discourse. Colloquially, discourse narrowly refers to the content and rhetoric of conversations. Yet for theorists such as Paul Edwards and Michel Foucault, discourse is a broader concept and includes:

> "an entire field of *signifying* or *meaningful practices*: those social interactions… through which reality is interpreted and constructed for us…. a way of knowledge, a background of assumptions and agreements about how reality is to be interpreted and expressed, supported by paradigmatic metaphors, techniques, and technologies" (Edwards 1997: 34).

The discourse surrounding potable water includes language and metaphors used to describe water and types of water ("delicious," environmentally damaging, "untouched by man," a "national treasure,"), fictions and fantasies (about purity, spa-water cures, and "people putting their mouths on spouts"), technologies (of plumbing, filtering, aquifer water extraction, and bottling), experiences (of taste, thirst, and water-related illness), and practices (of drinking, buying, or filtering water).

Three cultural studies focus on different aspects of bottled water discourse with the premise that bottled water is a form of *cultural* consumption," that it, a luxury commodity in a society whose basic need for water is already met by clean municipal water supplies (Wilk: 307, emphasis in original).

The first is *Shopping Our Way to Safety: How We Changed from Protecting the Environment to Protecting Ourselves* (2007) by Andrew Szasz. For Szaz, bottled water is an individualized consumer response to a perceived environmental threat. In a contaminated urban environment, people create an "inverted quarantine" by consuming uncontaminated goods such as organic body products or bottled water.

That is, people separate themselves from their contaminated environment through acts of consumption. According to Szaz, various experiences, language, and advertising makes water quality *the* decisive factor in a strategic choice to consume bottled water because of a public distrust of municipal water sources.

The second publication is an essay by Richard Wilk from *The Journal of Consumer Culture,* "Bottled Water: The pure commodity in the age of branding" (2006). Wilk links the origins of bottled water as spa-based, mineral water "cures" to contemporary ideas of nature's mystic and purifying power and theorizes that bottled water drinkers seek to consume the advertised metaphorical aspects of bottled water such as purity, safety, naturalness, health, and distance from humanity, rather than the water itself. For Wilk, bottled water consumption can be both a conscious decision to align oneself with these meanings, or a less conscious action based on the internalization and naturalization of commodity-signs (product images that become concrete indicators of particular experiences or beliefs). He concludes that "the contest between tap and bottled water is a contest for authority and public trust between governments and corporations, in a context of heightened anxieties about risk and health" (2006: 320). While it is difficult if not impossible to correlate the manufacturing of desire with consumption behaviour, Wilk shows that North American culture is fluent in the images and metaphors associated with bottled water.

In "'Waters' or 'Water'?—master narratives in water history and their implications for contemporary water policy" (2000), Christopher Hamlin traces the historical concept water from an empiricist view of many kinds of waters with different characteristics to an essentialist view of water as one kind of commodity with varying degrees of desirable or undesirable contaminants. Different municipal and commercial institutions promote both empiricist and essentialist views, and Hamlin warns that any initiative or policy must take these competing views of water into account, as water is not the same thing to all people.

In all three studies, water quality frames the rhetoric and practices of bottled water consumption. Yet, this study reveals a gap between the language and metaphors of water quality and the practices and decisions that relate to it. In other words, while conversations and practices of filtering saturate the discourse of water consumption, water quality is just one of many competing concepts within the discourse. In fact, the above studies may contribute to the strength of water quality "issues" in discourse as much as they describe it.

methodology

This pilot project outlines the demographics of water consumption at NYU and is a starting point for further research and lines of questioning. It begins with a social science approach where the questions are already determined in advance (what kind(s) of water does the NYU community drink and why?) so recommendations and future initiatives can target certain populations and concerns. The second section describes the trends, practices and attitudes found in section one in more detail and complexity. While the second section is by no means exhaustive, it is based on the premise that understanding human behavior necessitates an understanding of the larger cultural framework within which people interpret their knowledge, experience, and actions.

Data sources include surveys, interviews, observations, and a water quality posting pilot project. During early stages of data collection for the surveys and the posting project, I collaborated with Andrea Mayer, an associate research scientist in the Robert F. Wagner Graduate School of Public Service. Her early input was invaluable to the project.

A. Surveys

Because H204U was funded as an independent Green Grant by New York University's Sustainability Task Force and not conducted through a governing office at NYU, we did not have the ability to contact the entire NYU community. Nonetheless, anonymous web based surveys were sent to over five hundred students, faculty, and staff across the university. We targeted departments or listservs dedicated to food, health, and environmental studies on the premise that these expert populations would have considered their water consumption thoughtfully and in an informed manner before our investigation, and would thus result in richer data. The largest number of responses came from the Wagner School of Individualized study because Andrea Mayer's affiliation with the school allowed her to contact the full student and staff body. 302 surveys were returned, and after eliminating duplicate or incomplete surveys, 273 surveys were used in the analysis. The appendix includes a copy of the survey.

B. Interviews

All interviewees volunteered by indicating their interest on the survey. Interviews were semi structured and ended with an offer to answer any water-related questions the interviewee may have. Follow-up interviews occurred to clarify answers and to see if interviewees had changed their water consumption after having their questions answered during the interviews. After fifteen interviews (which

lasted from an hour to an hour and a half), and seventeen follow-up interviews, data saturation occurred.[2] The basic interview questions are included in the appendix.

C. Observations

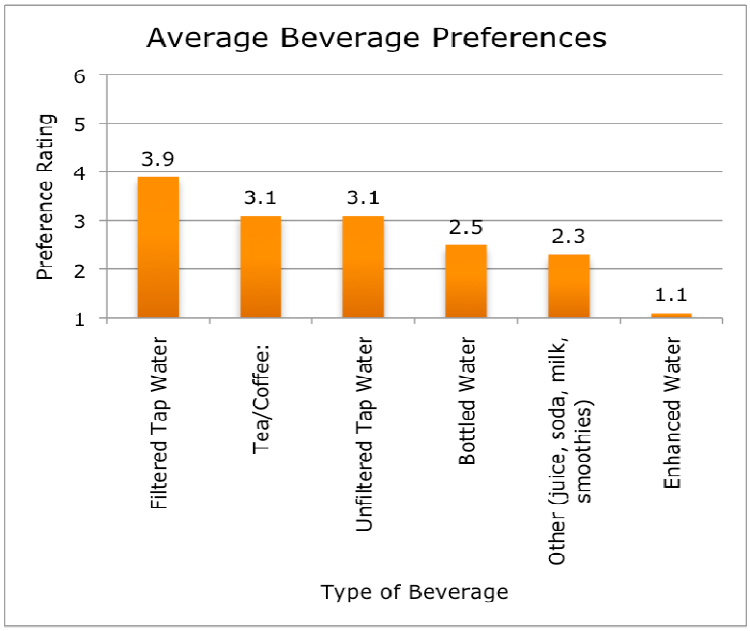
Observations took place on the second and third floors of 194 Mercer Street, an academic building on the main NYU campus. These floors contain classrooms and are unaffiliated with any particular department. Each floor has a small study area adjacent to a water fountain, a soda machine with bottled water, a food machine and bathrooms. Observations occurred from the public area for one to three hours at a time during different times of the day. I recorded how people drank from the fountain, where and how they filled their water bottles, how people approached and bought drinks from the dispenser, and noted all beverages people carried. During observations, the water fountain on the second floor broke and I was able to observe how people who usually drank fountain water responded to this. Another day, the row of bottled waters in the soda dispenser did not dispense and I observed a spontaneous "bottled water ban." During yet another observation, temperatures reached 31 degrees Celsius for the first time that summer and the air conditioning in the building did not work, allowing me to watch how people consumed water in a semi-emergency situation. Towards the end of the observations, I posted water quality reports for the fountain and two types of bottled water above the third floor water fountain and soda/water dispenser. In all, thirteen hours of observation occurred in ten sessions between February 26 and April 29, 2009.

D. Water Quality Pilot Test

Water meters were installed on six fountains, including all three in the Puck building, two in the Kimmel Center for Student Life (one next to the cafeteria, the other next to a beverage dispenser), and one in Palladium near the dinning hall. These meters measure how many gallons of water pass through the fountains. Consumption data was collected weekly from Nov 17, 2008 to December 21, 2009. Water quality data was posted at the three Puck Building locations on February 6, 2009. The test was designed to see if posting water quality results increased fountain water consumption. All fountains tested met and exceeded Environmental Protection Agency (EPA) Safe Drinking Water Act standards.

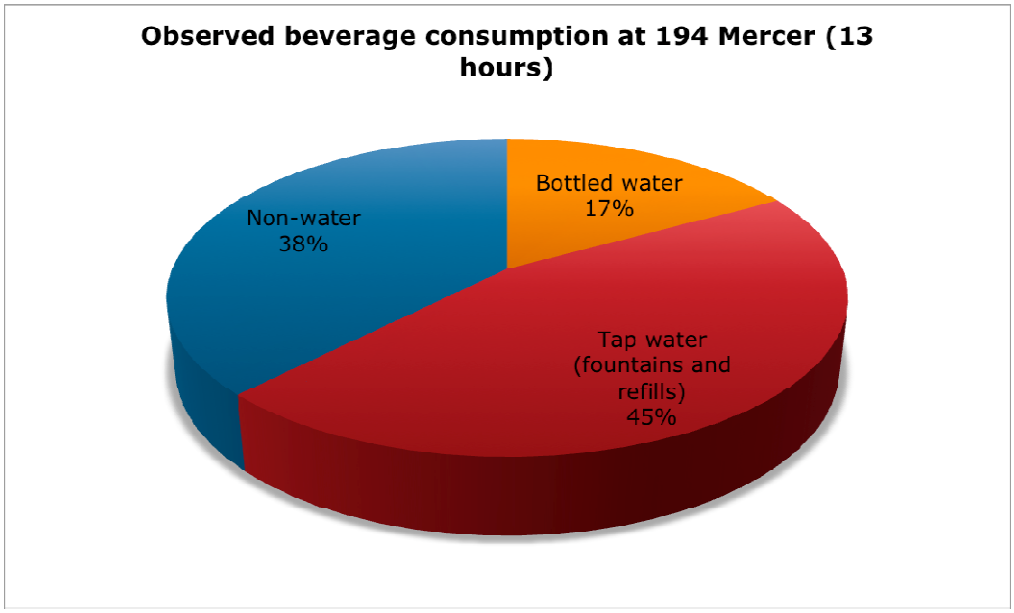
[2] For those unfamiliar with interview methods, data saturation occurs when an interviewer is not receiving any new information from new interviewees. This means that the interviewee is analyzing data throughout the study and does not wait until the "end." Instead the "end" of the study is determined by the data.

water consumption at NYU **(Taxonomies)**



273 survey participants ranked their beverage preferences. On average, filtered water was the most preferred beverage, followed by tea, coffee, and unfiltered tap water. Bottled water ranked as the fourth most preferred beverage.

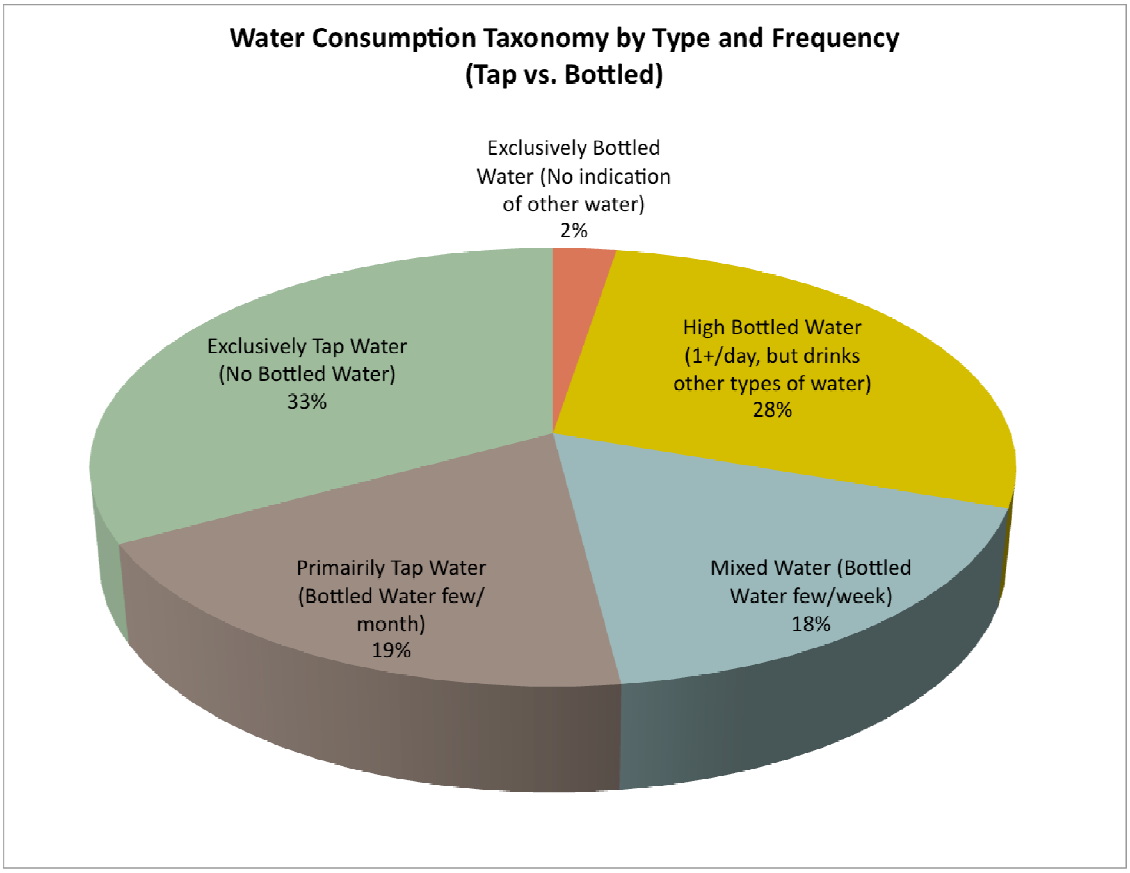
These percentages are based on 248 beverages observed over thirteen nonconsecutive hours at 194 Mercer. A more detailed breakdown of beverages by type is available in the appendix.



Interviews, surveys and observations all show that NYU drinks more water than any other kind of beverage and more tap water than bottled water.

All interviewees drank one or more types of water every day, and one or two other beverages once or twice a day such as tea, coffee, or orange juice. They were also loyal to two or three other beverages, such as a daily coffee or a weekly "treat." This narrow range is intensified by the specificity of the preferred beverages ("Diet Peach Snapple only!"). Eighty-one percent of surveyed students, faculty, and staff from the Wagner School of Individualized study drink from water fountains in the Puck Building. Sixty-one percent of respondents filter their water at home or in their offices.

To characterize the NYU population in terms of bottled water consumption, a water consumption taxonomy was created based on how often survey participants said they drank bottled water:

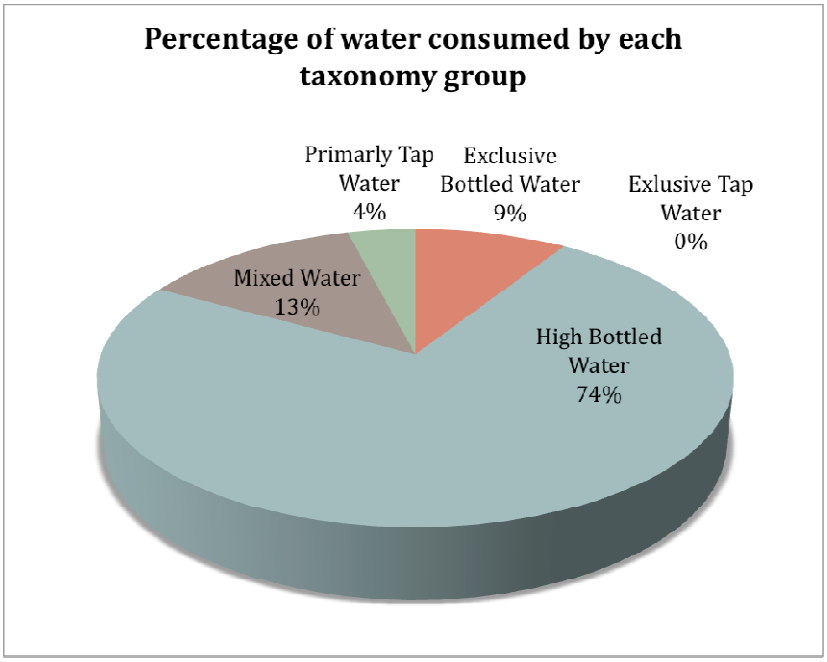


Only two percent of the sample drinks bottled water to the exclusion of all other water. High Bottled Water Drinkers drink bottled water once or more every day but also drink other types of water. Mixed Water Drinkers consume bottled water a few (3) times a week. Primary Tap Water Drinkers drink bottled water rarely but regularly (a few times a month), while Exclusive Tap Water Drinkers rarely or never drink bottled water. The NYU survey sample is consistent with overall national trends where a very small percentage of people exclusively drink bottled water, and the largest percentage of people drink tap water most or all of the time (Hurd 1993).

Ninety-eight percent of the sample drinks some kind of tap water regularly. Thus, habit may indicate a strong preference rather than an exclusive rule. Furthermore, it identifies Mixed Water

Drinkers as "low hanging fruit" in terms of habit; if these individuals drink bottled water a few times a week but not every day, then habit is not necessarily a threshold factor for changing their behaviour. Habit will be discussed in more detail in the next section.

Based on the Water Consumption Taxonomy, *NYU drinks the equivalent of a million bottles of water a month*, both on and off campus.[3] On campus, 18,000 gallons of bottled water a month (the equivalent of 137,000 individual half liter bottles of water) come from upright office coolers that use aquifer water from Maine (Friedman 2009).



The quantification of how much bottled water each group consumes, as opposed to how many people are in each group, should be used when prioritizing target audiences for outreach or other initiatives.

Each group in the Water Consumption Taxonomy can be characterized in more detail to target messages or initiatives for specific groups:

A. Exclusive Bottled Water Drinkers

(2% of the sample population who consume 9% of NYU's bottled water)

These individuals drink bottled water once or more every day, and do not appear to drink other forms of water. They represent student, faculty, and staff positions from a wide age range. Contrary to expectation, this group does not exhibit apathy towards environmental issues: more than half self-identify as environmentalists, all state that they are concerned about the environment and "try to act in an environmentally beneficial way whenever I can." All have worked with environmental issues as part of their job or education before. Thus, environmental messages and campaigns are less likely to change this group's water consumption behaviour.

Water quality is a threshold issue for roughly half of the sample, including some acute mistrust of municipal water sources. One survey participant wrote, "if you tested the NYC water supply - you would

[3] The survey group drinks an estimate of 4,316 bottles of water a month (based on 273 participants, assuming that exclusive bottled water drinkers drink 2 bottles of water a day and high bottled water drinkers drink 1 ½ bottles of water a day, both of which are conservative estimates). This number was extrapolated to include NYU's 51,000 enrolled students and 16,000 employees. One million bottles a month was a reasonable, if conservative, figure after cross referencing it with the amount of plastic recorded in NYU's waste characterization study and the percentage of New York City's overall bottled water sales that NYU would constitute based on population. Another correlating number would be how much bottled water is bought on campus every month. This number was not accessible, since bottled water distributors are highly decentralized at NYU.

be horrified at the bacterial content - plus if it isn't brown it reeks of Chlorine… I will not drink tap water - bacteria content is too high." This belief is not consistent with EPA, NYU health and safety, and my own water quality testing, but the interviewee clearly considers his data central to his consumption choices. Another participant commented that New York City has high water quality, but still did not drink the water. The group is not homogenous on issues of water quality.

This group is unlikely to respond to situational stimuli such as a bottled water ban. Some participants, like the individual "horrified at the bacterial content" of municipal water, are resolute in their decisions. Others buy their water off campus or in bulk. One person worked for Smart Water. All exhibit a commitment to bottled water not dictated by circumstance.

B. High Bottled Water Drinkers

(28% of the sample who consume 74% of NYU's bottled water)

This group drinks bottled water once a day or more, but also drinks tap water. Yet, it is not a homosocial group. Thresholds include water quality concerns, aesthetics, availability, habit, cost, and environmental issues. However, this group consistently rates aesthetic factors such as taste as more important than their peers in other groups. Availability also rates higher than average. That is, they will drink tap water when bottled water is not available. Approximately half of respondents have access to office coolers based on their employment status and department affiliation and many drink bottled water at work or at school and tap water at home.

C. Mixed Water Drinkers

(18% of sample who consume 13% of NYU's bottled water)

Mixed Water Drinkers consume bottled water a few times a week, making them regular bottled water consumers but less loyal to bottled water than other regular consumers. They rate aesthetic issues as less important than average, but rate situational factors such as availability, convince, cost, and what their friends are drinking higher than average. This makes them proverbial low-hanging fruit for operational initiatives to reduce bottled water such as bottled water bans[4] or taxes. While not an indicator of the group as a whole, several interviewees in this category bought bottled water a few times a week and refilled the empty plastic bottle with tap water until the next time he or she bought a new bottle of water. This subgroup of individuals was frequently concerned with plastic leachates from reusing

[4] A "ban" can include a refusal to allow institutional money to be used to purchase bottled water across a campus or institution, or can be more localized, such as removing bottled water from cafeterias or meal plans.

disposable bottles and used taste as an indicator of when to throw away the old bottle.[5]

D. Primary Tap Water Drinkers

(19% of sample who consume 4% of NYU's bottled water)

Primary tap water drinkers are regular but sparse bottled water consumers. They consume either filtered or unfiltered tap water most of the time, but drink bottled water a few times (3) a month. Like Mixed Water Drinkers, their thresholds for consuming bottled water are largely situational, and include travel, receiving free bottled water at catered events, forgetting to bring their refillable water bottles, or buying water when they choose not to carry bulky refillable bottles (such as nights out or while exercising in parks). Half state that they eschew bottled water as much as possible for environmental reasons. This group is not concerned about tap water quality and is less likely to filter their tap water at home. They overwhelmingly rate tap water quality as equal to or greater than bottled water quality.

E. Exclusive Tap Water Drinkers

(33% of sample who consume 0% of NYU's bottled water)

This group is the largest within the consumption taxonomy. While one might assume they are similar to primary tap water drinkers, they are in fact unique and are the most homosocial group in the taxonomy. The group has the highest number of self-described environmentalists and people who have changed their lifestyle to be as environmentally beneficial as possible. When one or two issues are rated as very important and all or most others are rated as unimportant or neutral (non-issues), concerns are said to be "polarized." Individuals from this group have the only polarized concerns about bottled water in the survey (this is not to say that all the concerns within the group are polarized, but that the *only* polarized concerns are found within this group). However, while this polarization describes why an individual does not drink bottled water, it does not explain why he or she drinks *tap water*, since the

2. How important are the following factors when deciding whether or not to drink BOTTLED water? Please rate each one on a scale of 1 – 5 1 very important 2 somewhat 3 neutral 4 somewhat unimportant 5 unimportant

	very important (1)	somewhat important (2)	neutral (3)	somewhat unimportant (4)	unimportant (5)
Availability (easy to buy)	X				
Design/Logo/Colors of the bottle					X
Clarity of water	X				
Convenience (easy to carry around, easy to throw away)	X				
Cost	X				
Effect on the environment	X				
Social justice (privatization, corporate power)	X				
Fitness (weight, complexion, etc.)					X
What it says about my identity					X
No contaminants	X				
No sugar/additives	X				
Prestige/ Reputation					X
Smell	X				
Taste	X				
What my friends or the people I am with are drinking					X

An example of polarized concerns within the survey. When considering whether or not to drink bottled water, the environment and social justice are rated "very important" and everything else is rated "unimportant". The threshold issue is more easily discernable in such a survey.

[5] This is an area for further research; this shallow interpretation of reuse in the case of non-biodegradable disposables indicates that plastic disposables are still considered inherently disposable (or even in a constant act of deterioration fitting of their short useful life).

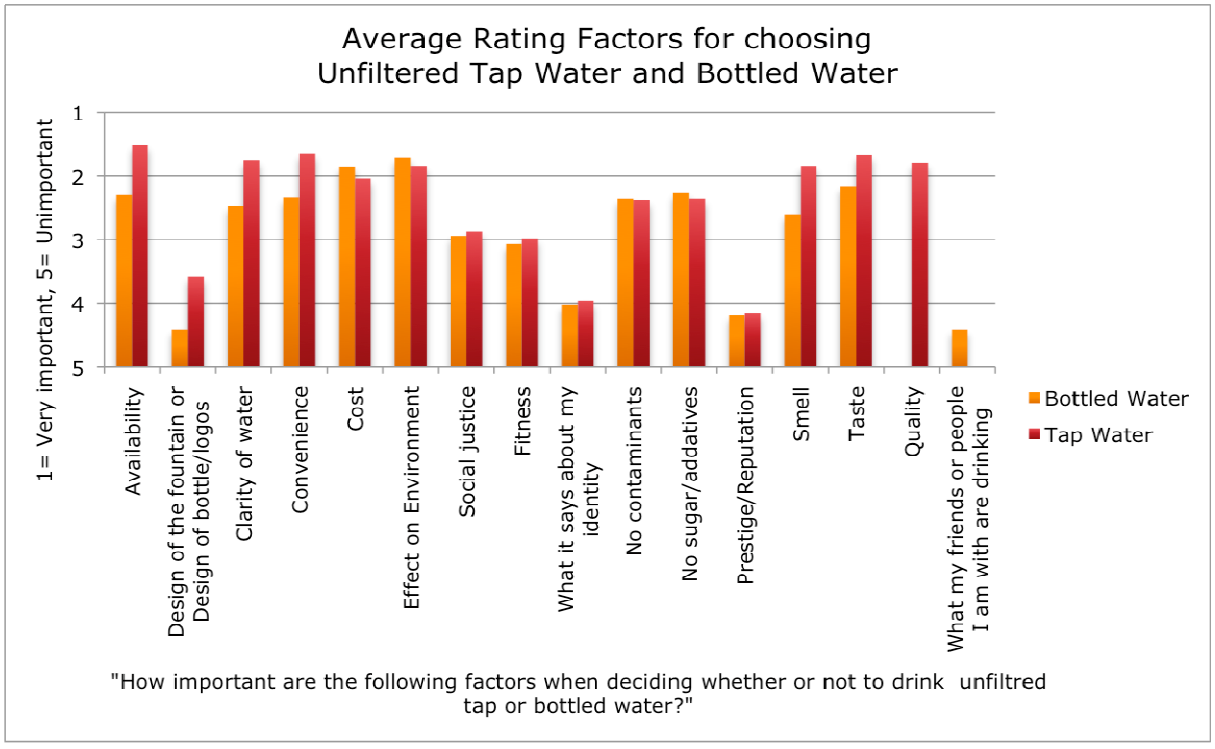
polarization only occurs in terms of bottled water. The individual whose survey excerpt is shown above, like many others in the Exclusive Tap Water group, rated many things as “very important” on the tap water matrix.

Finally, this group is more likely than average to rate the quality of tap water equal to or better than bottled water. They are also much less likely to filter their water at home than any other group. Because many of the group members are value-drive, like the Exclusive Bottled Water Drinkers, they are not likely to be influenced by situational factors like cost, convenience or availability.

water consumption at NYU **(Thresholds)**

A. Overview of Concerns

Survey participants ranked various issues from very important (1) to unimportant (5) for both tap and bottled water. The results provide a snap shot of what concerns the NYU community the most:



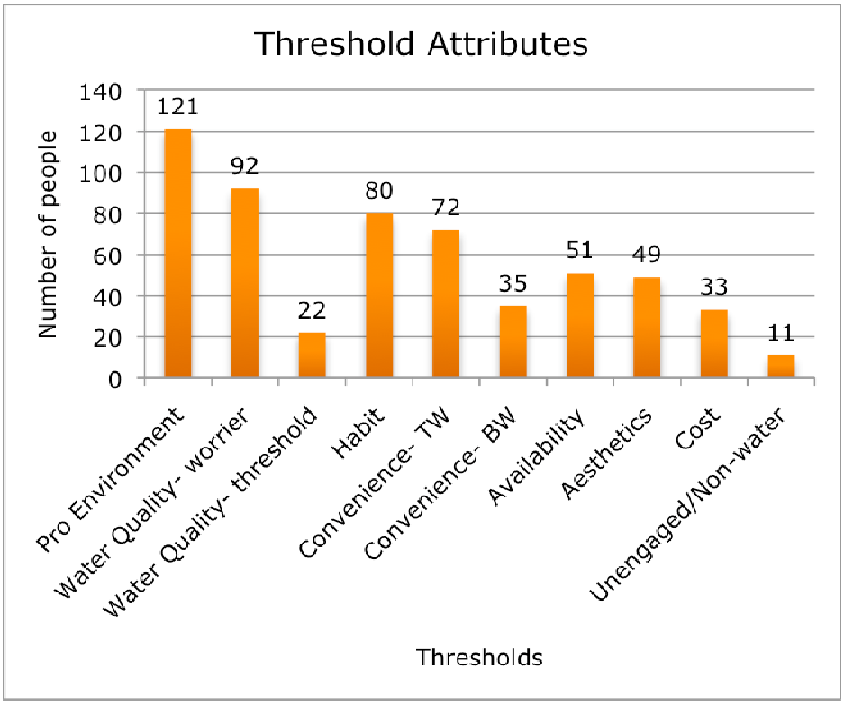
On average, the NYU community is not concerned with bottled water marketing or design, what certain types of consumption say about identity, or the prestige or reputation of either tap or bottled water. Instead, aesthetic and water quality issues such as taste, smell, and clarity, and situational factors such as cost, convenience and availability consistently rate as important issues. Furthermore, the average

importance of ratings is higher for tap water than for bottled water (especially aesthetics, convenience, and availability). This may be because people rate decisions they already make more favourably, which is consistent across the survey. Bottled water drinkers tend to rate more bottled water attributes as very important and tap water drinkers tend to rate more tap water attributes as very important.

Since there are more tap water drinkers in the survey, the average rating of tap water issues is higher. According to Wilk or Szaz, the higher average ratings for tap water could also be attributed to an increased scrutiny of tap water within a context of fear or mistrust of municipal tap water contamination. In this scenario, it is more important that tap water is clear or taste good because its quality is in question. This theory does not account for the higher average ratings for availability and convenience in tap as opposed to bottled water, however. Finally, cost and the environment are consistently rated as more important in the context of bottled water, as these factors are much more apparent in bottled water and are well advertised in the public sphere.

B. Specific Thresholds

The Water Consumption Taxonomy can categorize the NYU population according to their water consumption habits, yet the groups, as already shown, are not homosocial. Thus, threshold attributes were used to describe the NYU population:



Each survey was analyzed for primary and consistent concerns (much like an interview is coded). These concerns are interpreted as the threshold attributes that leads someone to choose one type of water over another. Because thresholds are not mutually exclusive and primary versus secondary thresholds were difficult to isolate, the data is based on the number of survey participants rather than percentages.

A. Pro-environment (121 out of 273 individuals): People drank tap water or a specific type of bottled water for environmental reasons. This group will be discussed in more detail shortly.

B. Water Quality- worrier (92 individuals): This group expressed concerns about tap water quality, but *did not* base decisions to drink a certain type of water on quality.

C. Water Quality- threshold (22 individuals): People drank bottled water *because of* concerns about tap water quality. This group and the "worrier" group are discussed in more in the next section.

D. Habit (80 individuals): Habit was determined as a threshold when an individual had an unwavering preference for a specific type of water but no discernable situational, attitude- or value-based threshold. Years of habit and familiarity solidify preferences: every interviewee drank the same type(s) of water as he or she did growing up, with few exceptions.[6] Many people continued to choose bottled water brands they drank when they were young. Thus, habit and loyalty are significant elements to overcome when trying to change water consumption preferences and patterns. DiLeo and Gregory's work states that habit is one of the best predictors of behaviour (2003). Furthermore, a series of surveys conducted by the American Water Works Associate before and after an outbreak of water-born *Cryptosporidium* found that "there was only limited evidence of significant change in public attitudes and perceptions of water quality and water utilities nationwide as a result of the *Cryptosporidium* outbreak." Within Milwaukee County, where 6 in 10 households were affected by water-born illness, "residents rated the quality of their water the same as the rest of the nation," though some shifts in other opinions did occur (1993: xxiv-xxv). This indicates that attitude may be part of habit and visa versa. In any case, it shows the resilience of belief and habit even when contrary information or experience is present.

E. Convenience- Tap Water (TW- 72 individuals) and Bottled Water (BW- 35 individuals) : Convenience refers to the ease of spontaneously buying, carrying, and/or disposing of bottled water (or the ease of owning, filling, carrying, and refilling reusable bottles for tap water). While the term "convenience" appeared in the survey and interview frequently, *it was rarely a threshold attribute for choosing bottled water*. Thus, the figures mentioned above are people who rated convenience highly or specifically mentioned it in the open section of the survey, not individuals for whom it is a threshold attribute. Furthermore, even though bottled water is sold as a convenience item, twice as many people considered tap water convenient (though again, this was not a threshold issue that caused people to choose one type of water over another).

F. Availability (51 individuals): Availability refers to the accessibility of any type of water. These

[6] The exception was for one young woman who drank bottled water growing up, but who now drinks tap water exclusively after working in the environmental sector. There was also some leeway between unfiltered and filtered tap water; if someone moved into an apartment or house that already had a filter installed, they would drink filtered water if they had not before. Likewise, if people moved to cities where "the water tasted funny" they would filter the water, but would usually abandon the filter after a few years or if they moved again. This is also true of students receiving Brita filters as gifts when they moved away from home. While they might use the container for water, they would rarely change the filter if they were not already accustomed to doing so.

individuals drank whatever was on hand. For example, one interviewee drank bottled water at work because it was free, and drank unfiltered tap water at home.

G. Aesthetics (49 individuals): People choose bottled water or un/filtered tap water based on the clarity, taste, colour and smell of the water. Aesthetics are related to but not synonymous with issues of water quality. This will be discussed in more detail in the next section.

H. Cost (33 individuals): People drank what was free and available to them. This included free bottled water through the workplace or catering, and tap water when free bottled water was not available. Though half of survey participants shared the view, "if I can get [water] for free why should I be paying for it?," and ranked cost as "very important" on their bottled water matrix, regardless of how often they drank bottled water, only eleven percent of respondents indicated that cost was an *exclusive* threshold for choosing one type of water over another. More specifically, it cost is a threshold issue for choosing *between* brands of bottled water rather than between types of water.

I. Unengaged/Non-water drinker (11 individuals): a few individuals did not rate any issue as important. Some of these individuals did not appear to drink water at all.

There were other thresholds mentioned in interviews and in the open portion of surveys but do not appear on the chart because they cannot be quantified within the sample group and there is no way of knowing how common or prevalent they are. These include a fear of plastic leachates (including but not limited to BPA), trust in municipal regulation, and a mistrust of industry, privatization and advertising. Further research is needed to understand the prevalence and nuances of these trends in relation to thresholds and consumption habits.

discourses of water consumption

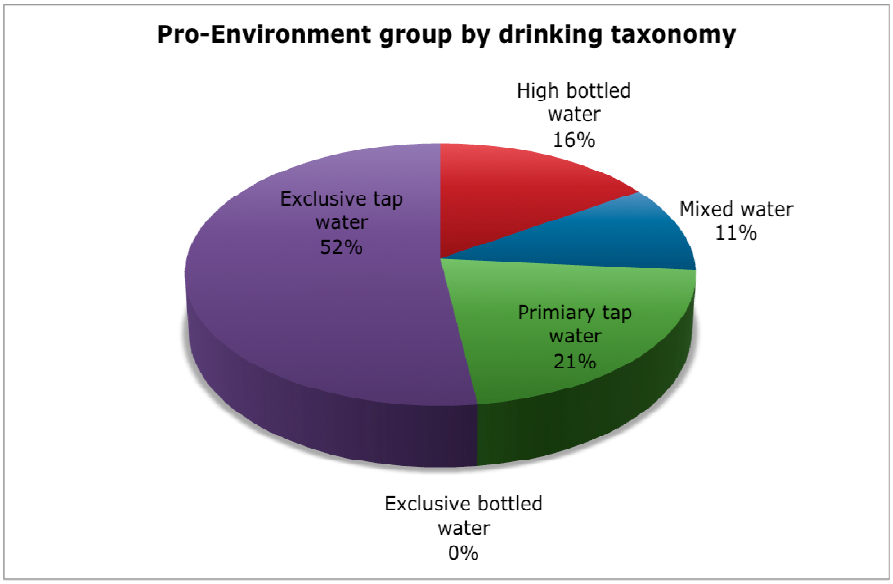
The Water Consumption Taxonomy and the list of thresholds attempt to organize the NYU community into discrete and quantifiable populations to map concrete relationships between decisions, situational factors and behaviours. While taxonomies and behavioral models are necessary to target policies and decisions based on intelligible relationships, this type of analysis does not pursue "thick" description. I do not want the above taxonomies and thresholds to obscure the contradictory, co-constitutive, and multidirectional influences of water consumption discourse.

Cultural discourse analysis has several premises. First, it is "neutral in regards to the truth or falsity of beliefs, attitudes, and information" (Edwards 1997: 31). The survey participant who thinks all municipal tap water and most bottled water is rife with dangerous bacteria or the woman who thinks that the water coming out of her bathroom tap is different from her kitchen sink are considered carefully and given space in the analysis. Beliefs that are factually incorrect play a major role in discourse and a mere "correction" of them will not *change* the overall discourse so much as *add another voice* to it. This is an imperative framework when considering educational outreach. Secondly, people can take part in multiple and even contradictory discourses, such as the career environmentalist who drinks bottled water more than once a day. Thirdly, "discourse" is not synonymous with "discussions" or mere rhetoric or language. While discourse certainly includes these elements, it also includes values, metaphors, practices, technologies and institutions (Edwards 1997). Moreover, each element within a discourse has multidirectional spheres of influence rather than strict one-way causal relationships. Thus, marketing does not simply cause consumption behaviour (the brain-washing model of influence), but consumption behaviour can also influence or appropriate marketing (Goldman 1992, Miller 1995).

The task is not to disambiguate these issues, but to describe them in all their complex, contradictory messiness. Here, I will explore the strongest common interlocking discourses that pertain to water consumption through the data collected from NYU: environmentalism, marketing, and water quality.

A. Environmentalism

Environmental factors ranked amongst the highest in overall importance across both surveys and interviews and were the most frequent threshold attribute for choosing not to drink bottled water. Below is a water consumption taxonomy for survey participants who consistently rated the environment as very important, identified as an environmentalist, and/or stated that they had changed their lifestyle to be as environmentally responsible as possible. While the presence of these factors increased the chances that people preferred tap water over bottled water, it certainly does not guarantee it, as the graph indicates: sixteen percent of survey participants with strong environmental values drank bottled water once or more every day (High Bottled Water Drinkers) and eleven percent drank



bottled water a few times a week (Mixed Bottled Water Drinkers).

So how do people with stated environmental thresholds drink bottled water, which is widely acknowledged to be "bad for the environment"? One survey participant who worked for Smart Water wrote,

> i [sic] want to address that calling bottled water out as an environmental issue is not fair -- yes there is an environmental impact if one substitutes bottled water for tap water. however, if bottled water is a substitute for another beverage, it generally has a lesser effect on the environment. water is used to produce all other packaged beverages, agricultural goods, manufactured goods, etc. this is a simple message that most self-described environmentalists (i am one) don't seem to want to hear. instead they prefer a black-and-white version of the world where they single out a symbolic issue totally out of the context of the rest of their behaviours. this survey is an example of just that fact. you could do more for the environment by addressing the heating/cooling systems in the campus buildings. unfortunately, HVAC is not as sexy as bottled water.

The participant also provided a link to an article about bottled water in *The Economist* that supported this view, indicating that he or she had a high level of knowledge and involvement in the issue. People like this participant and other "self-described environmentalists" who drink bottled water are unlikely to change their water consumption habits because of environmental messages or campaigns. Such individuals are fluent in environmental discourses already, and can describe and prioritize distinct environmental issues in comparison to other participants who cited "the environment" as a monolithic or homogenous cause for carrying water bottles or eschewing bottled water.

There are other relationships that "fluent" environmentalists water have to this discourse, however. One interviewee who coordinated environmental education programs at NYU found the nuances, different issues, and calls for various behaviour change overwhelming. She drank bottled water a few times a week. Like the person who works for Smart Water, she found that prioritization was necessary to deal with the complexity of her commitment to the environment:

> I think I feel overwhelmed with a bunch of different environmental issues. And I am trying to balance which ones I am going to do the most about and which ones I just will have to try to do later…. I'm not sure why I feel less guilty about using a water bottle- a plastic bottle- than I do about a plastic bag. But I think that probably it has a lot to do with the cultural trends, and like other stuff. Everyone's trying to ban plastic bags these days, but plastic water bottles-- at least not that I know of-- they don't seem that popular to be banning plastic bottles [sic] or trying to use less of them generally, or talking about using less of them. I don't know any other—yeah, I'm pretty hypocritical.

Both environmentalists acknowledge that there are other ways to be environmentally friendly than drinking bottled water. However, the first individual illegitimatizes bottled water as a merely "symbolic"

issue that can actually be *good* for the environment "when substituted for another beverage," while the second interviewee considers bottled water a legitimate environmental issue while acknowledging her choice (first as balance, then as hypocrisy) to continue to drink bottled water. Despite different attitudes towards the same behaviour, both acknowledge the role of popular *discourse* ("black and white" framing or the "popularity" of bans) in their decision to drink bottled water.

Another way that environmentalists drink bottled water but maintain a commitment to environmental values is by choosing specific brands of water. One person drank Fiji water because "at least from what I know about the company, they are entirely carbon neutral." Others choose local brands such as Poland Spring, which advertise their location in Maine, to reduce the carbon footprint of transporting the water, or Ethos or other brands that advertise "their social responsibility." Each brand mentioned by interviewees actively advertised its commitment to the environment.

As a specific example, bottled water advertisements conflate waste with the nuanced effects of bottled water. That is, they make waste the one and only environmental impact of bottled water. In critical cultural terms, this abstraction and conflation of meaning is a commodity sign, where values are shifted from social situations onto commodities . Advertisements will represent (literally or not) their product and a second element, object, or context that the advertiser wants its product to form an alliance or equivalency with (Goldman, 1992). In the case of bottled water and environmentalism, bottled water advertisements first align themselves with being environmentally friendly, which most interviewees did not believe, and secondly align their environmental responsibility with less or no waste, which interviews *did* consider plausible. Interviewees and survey participants consistently cited plastic waste as the prime environmental culprit in bottled water both in the context of certain bottled water brands and in terms of bottled water in general. When asked why people carried a water bottle (either a store-bought reusable bottle or a plastic disposable bottle), the most common responses after cost were "the environment" in very general terms, and more specifically to reduce plastic waste. Very few mentioned aquifer depletion, carbon footprints associated with the extraction, creation, and transport of water and water bottles, the use of oil to create the bottles, or the environmental justice issues associated with privatizing environmental resources.

Within popular discourse, and especially within advertisements for "environmentally friendly" bottled water and filtered water, waste often becomes a shorthand for all the ecological impacts of bottled water.

Above: Boxed Water is Better by Deiline (boxedwaterisbeter.com)

Within this framing, Poland Spring's "eco-bottles," Danasai's "plant bottles," and "boxed" water do seem "better for the earth." Likewise, recycling water bottles counts as being "environmentally conscious," and many surveyed bottled water drinkers concurred, stating that they were environmentally responsible by recycling their disposable water bottles.

The reframing of *all* environmental problems with bottled water exclusively in terms of recycling or waste influences understanding and change what things mean. This is best exemplified in two interviews where interviewees said they never drank bottled water for environmental reasons. In both cases, the interviewees refilled their reusable water bottles at office coolers several times a day. They did not consider the office coolers bottled water because the containers are refilled instead of being disposed of or recycled. In these cases, the definition of bottled water is something that is wasteful or disposable, not privatized or commodified with attendant social justice issues.

Environmental values and the consumption of bottled water are not mutually exclusive. Bottled water can be seen as a non-issue in comparison with other environmental issues ("you could do more for the environment by addressing the heating/cooling systems in the campus buildings"). Water consumption can be just one more environmental action in an overwhelming array of ways to be environmentally friendly ("I carry a reusable shopping bag with me. I just haven't gotten to bottled water yet"). Choosing bottled water can be done in an environmentally conscious way ("I buy Fiji because it is carbon neutral"). Finally, waste becomes the environmental issue at stake in bottled water, so if waste is addressed, bottled water consumption becomes environmentally friendly ("[bottled water is] less environmentally detrimental than it used to be because of the recycling").

What about people with environmental values that do *not* drink bottled water? While most interviewees drank the same kinds of water they drank growing up, one undergraduate student changed from a High Bottled Water Drinker to an Exclusive Tap Water Drinker due to environmental education:

> When I worked last summer as an environmental educator at an arts Festival in Pittsburgh, we were basically a trash sorter [*sic*]. But I worked with a bunch of students… one student did [his masters] project on water and how … if you take [water for bottled water] out of the system how it affects the system. … So I learned a lot about that there. And I told my mom to stop transferring water.

This interviewee is an ideal example of how environmental education can impact everyday behaviour. Yet, she is not the norm. The vast majority of Primary and Exclusive Tap Water Drinkers interviewed

already drank tap water before bottled water was criticized for its effect on the environment. The following twenty-three year old interviewee is typical of this group:

> It's funny because I didn't really- until it was out there that bottled water is not as recyclable, blah blah blah [*sic*]… I wasn't actively trying to change my habits. Prior to that I wasn't really drinking much bottled water to begin with, but as a result of it becoming a bit more mainstream, whenever I do buy a bottled water I— got to remember to bring my bottled water tomorrow because... I'm definitely more aware of what I'm buying and how it's going to be disposed of.

For this interview and for several others, information about the environmental cost of bottled water *bolsters and solidifies behaviours and decisions she already makes*. For another interviewee, environmental issues framed what she did and did not like about her water consumption: environmentally friendly water tasted better from her Nalgene than from plastic, environmentally friendly water was cheaper than less environmentally friendly water, and so on. She translated what might have been taste and cost thresholds into environmental reasons. Another interviewee began by discussing how "price point" was the reason she choose to drink bottled water (without any prompting), but after we came to the environmental questions, she reorganized her "thresholds":

> Early interview question: So why do you prefer tap water over bottled water even though you sometimes buy bottled water?
>
> Early Answer: Because I think it's silly to buy bottled water. .... You're at a restaurant, and clearly they filter the water.... And if they don't at this point it's not like when I was younger and there actually were concerns about water. The water in New York and DC is good tap water.
>
> ….
>
> Later interview question: You said bottled water was ridiculous. How is it ridiculous?
>
> Later Answer: In general. Environmentally, but in terms of like, money, its ridiculous. In terms of environmentally, I think that was the original reason I got into it and had nothing to do with money. It was the fact that I could just carry around this Nalgene and it was not going to waste anything! And it was hot pink.

This interviewee had the tendency to say what she thought the interviewer wanted to hear, but I would like to highlight how effortless it was for her to slip into environmental reasoning. She was already fluent in issues of waste and reusable water bottles within the rhetoric of "ridiculousness" many environmental campaigns use to frame an ecologically damaging redundant luxury product. In the survey, it is impossible to tell which participants might have *switched* from bottled to tap water because of environmental thresholds, and which *continue* to use tap water in a more dedicated manner because of environmental information. Yet in the inverviews, these relationships and histories were explicit. In conclusion, environmental messages frequently bolster decisions that people are already making, and to a lesser degree, can change behavior. In both cases, fluency in environmental rhetoric is important.

Environmental imagery, advertising, language, and concerns were ubiquitous in the interviews and environmental importance was pervasive throughout the survey regardless of water preferences. The uncontested acknowledgement that bottled water is environmentally detrimental is what makes bottled water an excellent symbol. Even when individuals express other issues and other threshold attributes such as cost and availability, everyone is aware of the environmental costs of bottled water regardless of how they use or navigate that information. The environment is the dominant discursive framework for bottled water.

B. Bottled Water Marketing and Advertising

In addition to a concern for the effect of bottled water on the environment, the highest agreement among the NYU community was the supreme *unimportance* of the design of water bottles, brands and logos, bottled water marketing, what drinking a certain type of water said about identity, the prestige or reputation of the water, and what their friends drank. Interviewees maintained that while marketing or advertisements might influence *others*, it did not influence *them*:

> I break down the marketing and think, that's a really effective, like, tool or whatever. I could see how they would influence somebody to buy a certain brand. But they don't influence me to buy anything.
>
> I am probably hyper aware of what kind of marketing is being done in association with something, so I am less likely to buy something that I feel is being incorrectly marketed to me. So if someone tells me that this water is going to make me more beautiful and stronger and faster, more brilliant, and contains antioxidants to prevent aging, and costs two dollars, I'm going to say 'yeah, right' and buy a $.50 water.
>
> If I was choosing between water brands, like if there were a bunch at the airport or something, I usually go with the cheapest one. I don't buy Fiji because it is so expensive. It's like paying 90% for the brand and 10% for the water. People have the wool pulled over their eyes.

Despite a steady and often heartfelt denial of advertising influences, traces of language, framing, and information unique to bottled water marketing run through both surveys and interviews.

People never reported advertising as a threshold stimuli—that is, something that made them choose one type of water over another. Yet, advertisements provided information that lead to certain decisions for invested individuals. For example, when one woman was asked why she drank Fiji, she said, "I haven't done the research, I've just read whatever their advertisements are. Fiji I heard was carbon

neutral factories [*sic*]. I think they advertise it and I think I also heard it from sort of consumer thing or another." A significant number of people said they choose Poland Spring because it was from a local source. They liked local sourcing either because it reduced the environmental impact of travel or because "I like that 'local' feeling." Setting aside that a desire for "that 'local' feeling" may be manufactured in the first place (Goldman 1992), Poland Springs is not the closest source of bottled water to NYU. Dasani, owned by Coca Cola, is bottled in Queens, New York, at a considerably closer distance than Maine. Yet, Dasani does not include location as part of its brand, even though local Dasani bottles carry print identifying the bottling location (in small print).[7]

As already mentioned, marketing has a significant effect on environmental rhetoric and discourse. In addition to advertising its location, Poland Spring markets its plastic disposable "eco-bottle" as 100% recyclable. It also has a smaller label (that uses less resources, one assumes), is light weighted to use less plastic, and "is flexible so it's easier to crush for recycling." The decontextualization of bottled water from its industrial and commercial process and then its conflation and recontextualization within other issues, whether they are pro- or anti-environmental, has been the hallmark of bottled water's commodification (the creation of its commodity-sign). This is how a symbol *works* to change meaning, and therefore change how experience is framed and actions are interpreted.

Bottled water marketing and framing information within its advertisements is only one example of how it contributes to the discourse of water consumption, however. In one case, an interviewee defined water quality as something that "tastes closer to what bottled water tastes like." Here, bottled water sets a standard for water quality in general. The popular assumption that bottled water is higher quality that tap water (which was also reflected in the survey)[8] is the result of marketing. Tap water is not only regulated more heavily than bottled water,[9] but there has been a simultaneous increase in municipal tap water quality and bottled water consumption (EPA 2010, Hurd 1993). The issue of water quality will be discussed in more detail in the next section.

Traces of advertising were also evident in the language people used to describe their preferred

[7] Dasani's byline is "Better by Design: Purified Water. Enhanced with Minerals for a Pure, Fresh Taste" and sells highly purified municipal water. Yet, because Dasani promotes its purity and freshness, they tend not to advertise their location in urban centers, which are usually not associated with purity or freshness.

[8] Forty-three percent of survey respondents said that tap and bottled water were equal quality, twenty-one percent said tap water is better quality, and twenty-five percent said bottled water was better quality. Eleven percent were unsure.

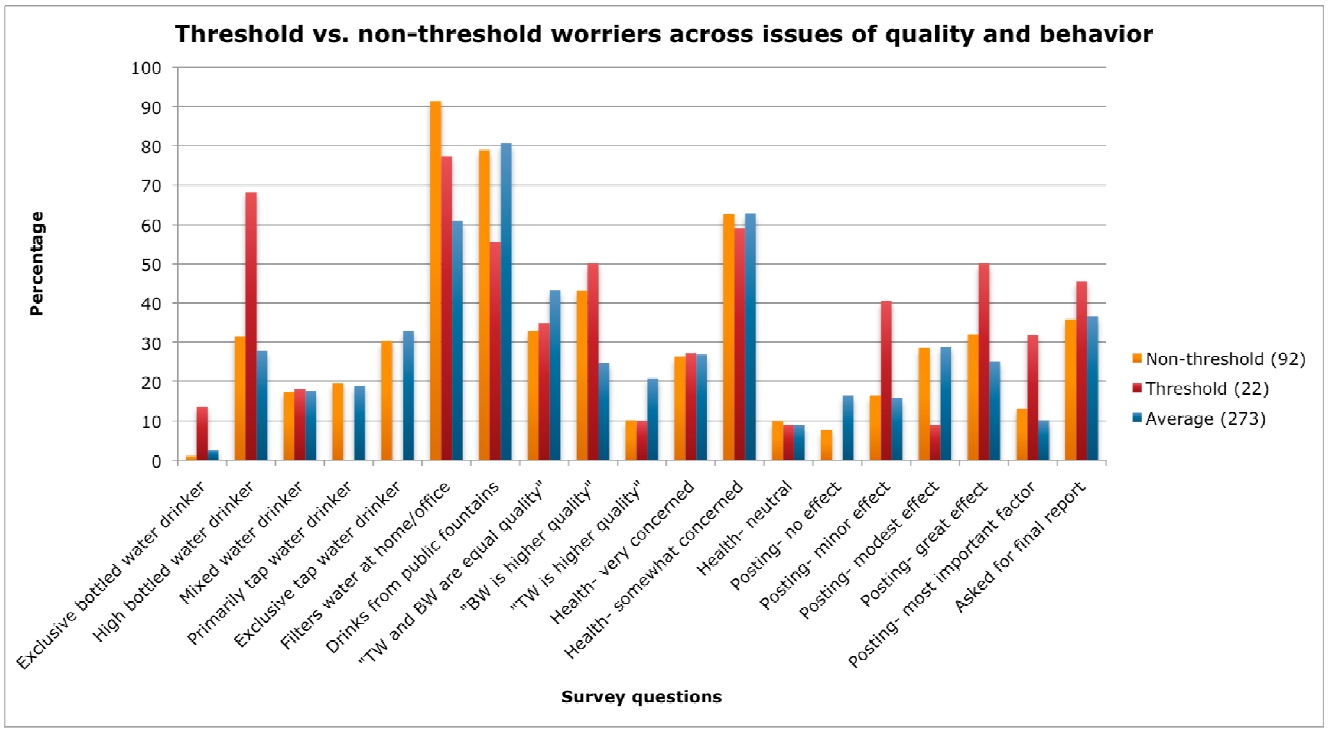
[9] Bottled water is largely self regulated by bottled water companies under the Food and Drug Administration, while tap water is regulated by the Environmental Protection Agency (Royte 2008).

type of water, regardless of whether it was bottled or tap water: “simple,” “thirst-quenching,” “natural-tasting,” “satisfying,” and “crisp.” This is slightly different from being “fluent” in advertising language and symbolism (one of the findings of Wilk’s research); when people use bottled water as a standard of taste for quality and when they use marketing language to describe water, advertising becomes the framework within which to *interpret experience*. Regardless of whether advertisements directly instigate behaviour change, it remains an important element of the culture of water consumption at NYU.

C. Water Quality

Water quality continues to be a dominant discourse despite a steady increase in municipal water quality across the United States. Concerns about municipal tap water quality, and to a much lesser extent, bottled water quality, were frequent in interviews. There were discernable trends in surveys to prefer filtered to unfiltered tap water, yet there was also significant a trust in municipal water quality, and a particular enthusiasm for the quality of New York City tap water. In fact, a concern about water quality and a trust in municipal regulation *coexisted* in sixteen percent of the survey sample. How can we explain these competing trends?

Firstly, there is a marked difference between people who filtered water because “I think the water might not be pure and I’d rather be safe than sorry” (“non-threshold worriers”) and those for whom tap or bottled water quality is a threshold attribute (“threshold worriers”). The graph below depicts how non-threshold worriers and threshold worriers answered questions relating to water quality compared to the average response.



a) There is a much higher number of non-threshold worriers (34% of the sample population) than threshold worriers (8% of the sample population). This implies that attitudes (beliefs and opinions) about water quality are significantly higher than actual behaviours or practices that act on that concern.
b) In terms of the Water Consumption Taxonomy, while threshold and non-threshold worriers were just as likely as the average participant to be Mixed Water Drinkers, no threshold worriers primarily or exclusively drink tap water, and they are twice to ten times more likely than non-threshold worriers or the average sample to drink bottled water more than once a day.
c) Both threshold and non-threshold worriers were more likely to filter their water than the average individual, but ninety percent of non-threshold worriers filtered while around seventy-five percent of threshold worriers filtered. The lower number of threshold worriers that filter may be due to their consumption preference of bottled water over any kind of tap water, filtered or otherwise.
d) Around eighty percent of non-threshold worriers drink from public water fountains (the same as the average). Only fifty-five percent of threshold worriers did so (note that most public fountains at NYU are filtered, though they are not labeled as such).
e) Both threshold and non-threshold worriers are more likely to say that bottled water is higher quality than tap water. Again, following Gregory and DiLeo, this indicates that both types of worriers share similar attitudes, but that threshold worriers are more involved in issues of water quality. A higher percentage of threshold worriers than non-threshold worriers asked for a copy of this report, a measure of investment and involvement, which supports this interpretation.
f) Neither group is more or less concerned about health in general than the average.
g) Non-threshold worriers were similar to the average population in terms of how they thought the posting of water quality results over public fountains would affect their decision to drink fountain water. Threshold worriers were polarized and were much more likely to say that posting would have a significant affect on their decision to drink fountain water, yet were also more likely to say it would have a minor affect. They were much less likely to say it would have a modest effect. A tentative interpretation, which would also explain the lower tendency to filter tap water, is that some worriers do not trust municipal water supplies at all, while others are willing to trust outside testing and material or scientific “proof” of water quality. There is a shared mistrust of public water and a heightened concern about cleanliness and germs within a small section of threshold worriers (about fourteen percent of all threshold worries and five percent of the survey population as a whole).

The comparison of non-threshold and threshold worriers starkly illustrates the difference between attitudes (an opinion or belief) prevalent in discourses about water and involvement (a high level of importance evoked by information or scenarios upon which decisions are made).

To further complicate the problem of water quality and discourse, there is no standard definition of "water quality." In the United States, the Environmental Protection Agency has a list of maximum allowable concentrations of certain compounds that municipal water must meet or exceed (EPA 2010). However, these standards change over time, are often criticized for being too lax and do not account for everything that is in water, such as pharmaceuticals (Royte 2008). Furthermore, when interviewees were asked to define water quality their answers did not always follow a logic of "allowable levels," meaning that posting EPA-approved water quality results may not be an indicator of water quality for everyone. Most people equated water quality with specific aesthetic features of water, including clarity, smell, and qualities the interviewee preferred (no Chlorine smell, or a cold temperature, for example). Others focused on infrastructure they trusted, such as monitoring and filtering water or reputable sources of water. Other interviewees followed the EPA logic of water quality and desired "safe" levels of contaminants rather than a complete absence of all dissolved substances (contaminates mentioned included "a lack of evil bugs," bacteria, minerals, toxins, heavy metals, and medications). One person did demand purity, however—in her words, the "ratio of H2O to anything else"— as the hallmark of high water quality. The ideal of "purity" in water is recent, even though bottled water has been around for centuries (Hamlin 2000). Historically, bottled water is desirable *because* of its mineral content (or non-purity so to speak). The desire for pure water may stem from bottled water marketing in the past twenty years, which has popularized notions of "ultra pure water," water "untouched by man," and free of all "contaminants" (Wilke 2006, Hamlin 2000, lebleu.com, Fijiwater.com).

References to taste appeared in most interviewee definitions of water quality. A good taste or the complete absence of taste could be a description (high water quality *is* good tasting water) or symptom (you can tell water is good quality when it tastes good) of good water quality. Most of the time, aesthetic and sensory stimuli was used to detect undesirable contaminants. People will not drink discoloured, unclear (turbid), or "funny-tasting" water even if that water had passed standardized water quality tests. In recognition of this common-sense reluctance, the EPA has set secondary standards that address aesthetic contaminants that are not risks to human health (EPA 2010).

However, taste is not an objective description of water that unilaterally originates in the water and is then detected by the consumer. Attitudes and involvement on the consumer's part can influence taste. For example, one interviewee stated that she could taste the BPA leaching into her old water bottle, even though BPA is odourless, tasteless, and occurs at minute concentrations. This is not to say that the water from her old bottle and her new BPA-free bottle did not taste differently, but that an awareness of BPA informed her of what she could and could not taste in her water. Another survey participant wrote that Fiji water "is the only bottled water that I find has a noticeable difference in taste. To me it has a hint of coconut. If I have to buy bottled water, I prefer Fiji." Fiji water contains silica, calcium, and magnesium, but no coconut (fijiwater.com). One can assume the participant tasted Fiji's tropical marketing. Thus, even in something as simple as taste, discourse constitutes a feedback loop of experience, information, beliefs and behaviour and not merely a unidirectional relationship of stimuli and response.[10]

The prevalence of "the water quality issue" in discourse has variety of repercussions. A final case is how one interviewee, the used water quality as shorthand for explaining her own consumption habits. She was a Mixed Water Drinker involved in environmental activism and struggled with her guilt over drinking bottled water regularly. Initially, she explained her bottled water consumption as an issue of taste and quality. Yet, as the interview progressed, she became aware of how her use of environmental and water quality discourses were competing rather than seamlessly explaining her behaviours:

> I think when it comes down to it if I'm thirsty I'll drink anything. … I talk about water quality, because it's more concrete to me than, you know, all these issues of guilt and what not. But I think at the end of the day it doesn't really matter to me that much unless it's just awful, awful water. I would say, in my mind, the moral and ethical problems behind bottled water bother me the most and I think about them the most, but they're probably the ones-- well, I wouldn't say I act more on taste than I do environmental reasons, but I would say that I'm slacking on environmental reasons, at least lately.

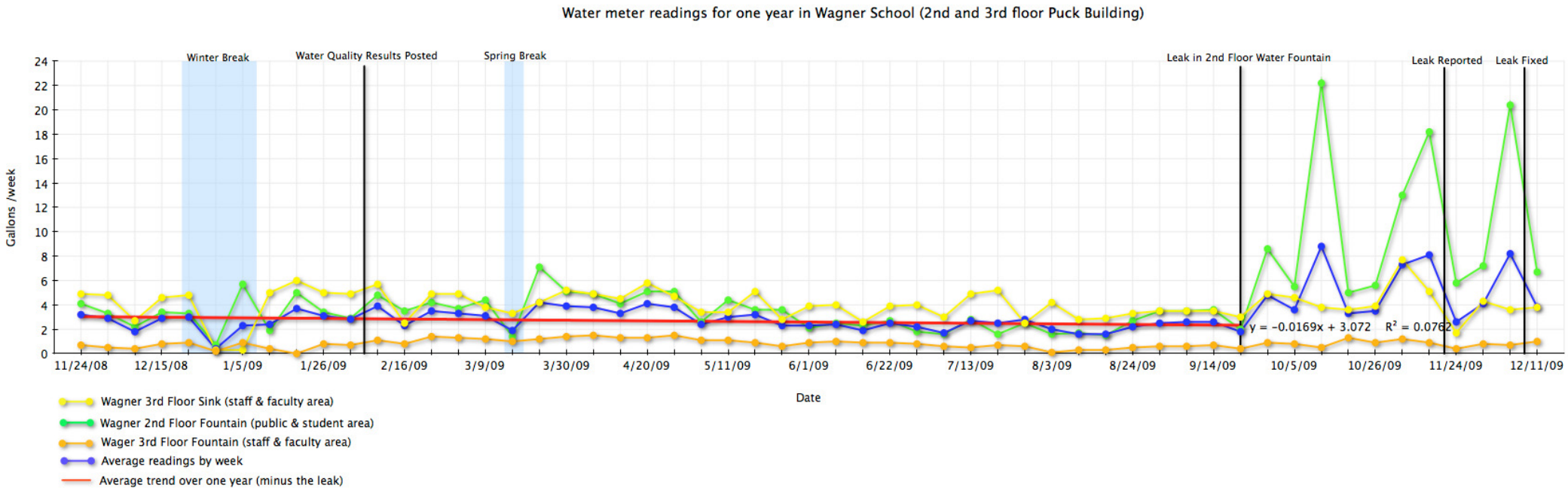
Without the rhetoric of water quality, she was at a loss to explain why she drank water she knew was not good for the environment despite her commitment to environmental values. Eventually she settled on "being lazy" as the reason, but her threshold may have been situational or habitual rather than based on conscious arguments and decisions. Yet when she felt the need to justify her behaviour logically, she used water quality. This example, like the woman who reinterpreted her price threshold as environmentalism, shows how fluent people are in the rhetoric of water quality and how easily they can adopt it as an explanation or justification. A further area of research would be how fluency in common rhetorics can shore up, explain, or break down certain behaviours and how certain behaviours can influence people's

[10] Likewise, smell was constantly rated as a "very important" factor in deciding what kind of water to drink on the surveys and was also present in interviewee descriptions of water quality. Yet not a single interviewee could recall having personally experienced bad smelling water. The smell of water is part of the social imagination about water that people are acquainted with through discourse.

After excluding water meter readings affected by winter and spring vacation (areas highlighted in blue), numbers rise very slightly for the remainder of the semester after the water quality results are posted. However, water consumption decreases in the summer and returns to the exact same average when the Fall semester starts again. On average, each fountain was used around eighty times a week for an average of three gallons of water a week.

Note: the Puck Building is mostly an office space with very few classrooms, though there is a public study area. The erratic results towards the end of the graph are the result of a water leak.

use and understanding of



discourse.

We designed a quantitative pilot study to disambiguate how discussions, perceptions, definitions, justifications and practices surrounding water quality affect consumption behaviour and bring it back into the realm of quantifiable cause-and-effect relationships. Water quality results were also posted above fountains in 194 Mercer during observations to see if their presence increased fountain use. In the Puck Building, three water meters measured the amount of water consumed before and after water quality results for those fountains were posted at each location. All water quality results exceeded EPA standards (see appendix). As far as measuring quantifiable increases in the consumption of water before and after posting, the results are inconclusive. The sample size and differences in water consumption were too small (see appendix and graph below). Fountain consumption increased a small amount after posting water quality results, but returned to normal over the course of the year. However, warmer weather, changes in staff and students, or even faulty water meters could have produced these results. These minute numbers and slight changes are consistent with the relatively small percentage of threshold worriers whose behaviours posting would influence the most.

However, a discernable behavioural trend emerged from *observing* students consume water after water quality results were posted above the fountains in 194 Mercer Street. In an environment where competition for student's attention is fierce, a third of students who came to drink at the fountain stopped and read the posting. More importantly, they read the number-heavy, technical water quality posting in its ungainly *entirety* (see appendix for a copy of the post). One student who was walking down the hall passed the fountain, backed up, read the entire posting, and continued to class without drinking any water. Moreover, the postings, printed on ordinary white 8 ½" x 11" bond paper, stayed above the fountains for more than a year, significantly outlasting all other fliers in the area. These factors indicate a high level of interest in water quality, even if its effects on immediate behaviour change are quantifiably inconclusive.

This interest in information about water quality was also present in interviews, though interviewees, are already a self-selected group of higher than average interest or involvement. At the end of each interview, interviewees were asked if they had any questions about water quality or water more generally that the interviewer, an expert on water, could answer. Questions ranged from "is it true what I said about New York City having good tap water?" to "somebody told me that every time you wash your dishes you should rinse with the cold after the warm [to avoid lead contamination]. Is that true?". This final part of the interview was as a kind of educational outreach, both in terms of answering questions, but also by proactively validating or challenging information or practices interviewees had cited during their interview (for example, the popular practice of letting the water run for five minutes before drinking

was validated by the interviewer for buildings with old infrastructure). In follow up interviews, interviewees occasionally reported a change in behaviour (usually drinking more tap and less bottled water) due to the information exchanged, but more often reported that they were more confident in their decisions to drink tap water and were comfortable educating and encouraging their friends to do the same. Thus, the bolstering of behaviours people already engage in through information can encourage a move through attitude to awareness to involvement.

This finding is supported by the number of survey participants who stated that "posting of water quality testing near water sources (taps, water fountains, soda machines) [would significantly] affect [their] choice of what type of water to drink," but who *already* drank tap water most of the time. Twenty-five percent of survey participants said the postings would have a "great effect" and ten percent said, "it would be the most important factor affecting my choice of water." Of these respondents, just under half were already Primary or Exclusive Tap Water Drinkers. Thus, informational and educational outreach initiatives may have the most success in strengthening or rewarding desirable behaviours rather than changing behaviours.

To push back on this picture of high interest and the bolstering of desirable habits, however, a few situations should be considered. First, not a single person noticed the water quality postings when placed on or near beverage dispensers. This may be due to the high visual stimuli of the machines, making plain sheets of paper less eye-catching, but people ignored these postings even when the machine was broken and they may have been more interested in a notice. Secondly, and most expressively, while every other person who read the fountain postings drank water before or after reading the posting (or both), one woman who was about to drink from the fountain read the posting and left without drinking, even though the posting showed the water was high quality. This may have been a case of mistaken reading, but her behaviour is backed up by the following open-answer response from a Mixed Bottled Water doctoral student who was not generally concerned about water quality:

> I don't really understand question #2, "How would posting of water quality testing near water sources (taps, water fountains, soda machines) affect your choice of what type of water to drink?" What does "posting of water quality testing" mean? Do you mean posting the RESULTS of testing the quality OF THAT PARTICULAR WATER SOURCE? So you're saying that you would open up a bottle of Aquafina, test it, and then put up a poster near the soda machine telling us if there is any mercury (or whatever) in Aquafina? What a weird thing to do. Please do not do this. It would just be awkward.

I am at a loss for interpreting why public water quality tests would be awkward, especially because this attitude is unique and did not come up in other survey participants or interviewees. However, the presence of this dissent should highlight that natural areas of disagreement exist within any population and dominant discourses. While in a quantitative study this individual would be statistically insignificant,

in a qualitative study it points to an area of future study and highlights the inerrant openness of cultural studies, even as such studies can help recommendation social and infrastructural changes.

The discrepancy between the lack of quantifiable behaviour change due to postings and the simultaneous significant interest in the postings by tap water drinkers leaves environmental advocates with a problem. one focus on initiatives that change behaviour and can be measured through hard data methods, or does attempt to change the terms of the overall discourse of water consumption, perhaps shoring up behaviou also potentially shifting or expanding the spectrum of how water is understood? I recommend both approaches, and believe that they can bolster each other, such as in the case where a bottled water ban is preceded by information and educational outreach. Yet keep in mind that methods of description and me of success are substantially different in both approaches and even if they are used in the same environme initiative and work towards the same goal, they cannot be treated as synonymous.

conclusion

There is a gap between popular discourses about bottled water— dominated by environmentalism, marketing, and water quality— and the reasons people choose one type of water over another. Thus, this study proposes that there are two types of environmental work to be done concerning bottled water at NYU. First, we can attempt to change specific behaviours by targeting specific populations and their thresholds. Secondly, we can aim to influence the overall discourses of water consumption, including rhetoric, information, infrastructure, practices, and beliefs more broadly. The former set of initiatives would certainly contribute to the later, and ought to be framed with the larger discourses of environmentalism, bottled water marketing, and water quality in mind.

recommendations

The following recommendations have been prepared for New York University's Sustainability Task Force and the Office of Sustainability, the granting bodies of this project. They are organized according to the demographics created by the Water Consumption Taxonomy and threshold attributes and any outreach should keep in mind that it is targeting a specific population and not the NYU community as a generic whole.

Exclusive Bottled Water Drinkers

2% of the population who consume 9% of NYU's bottled water

- No recommendations. This relatively small population is very dedicated to bottled water and is not likely to be swayed by situational changes such as bottled water bans, nor to environmental or water quality information.

High Bottled Water Drinkers, Mixed Bottled Water Drinkers & Primary Tap Water Drinkers

65% of the population who consume 91% of NYU's bottled water

These groups have a high incidence of people with aesthetic thresholds and high situational thresholds. Thus, we recommend

- Use EPA's secondary standards that test for aesthetic contaminants in addition to NYU's established practice of local testing.
- Create an infrastructure for complaints or concerns about specific water sources and handle complaints about taste with the same speed and efficiency as those of colour, smell, or clarity.
- Replace all upright office coolers with water fountains or in-line filtration systems. In offices with sinks but no water fountain, add a fountain spout and/or a hot tea spout.
- Continue free aluminum water bottled giveaways.
- Create a bottled water ban, whereby no university funds within departments are to buy bottled water (for coolers, staff, or catering) and no on-campus beverage dispensers or cafeterias are permitted to sell bottled water.
    - Before the ban: Conduct a campus-wide study of "tap water deserts," or offices and locations where tap water is absent or difficult to obtain. Bathrooms do not count as

sources of public potable water.[11]

- Ensure there is tap water access in all public areas and offices currently relying on bottled water.
- Use the strategies and tactics of other schools and municipal institutions that have implemented bottled water bans (See appendix).
- Publicize the high quality of NYC tap water and the relative regulation of tap versus bottled water. This can appear through public notices on soda dispensers and in cafeterias, but should also occur with more depth with more information through the Environmental Advocate Program and in campus newspapers.
- Coordinate with PlaNYC 2030, NYC non-profits and campus groups across NYU and other universities to build a city-wide action plan to ban bottled water (see the University of Washington as an example).
- After the ban: Gauge NYU community reaction to bottled water ban with a campus-wide survey.

- Replace bottled water in cafeterias with tap water and encourage specific departments to ban bottled water (targeted bottled water ban). This recommendation is in lieu of a full bottled water ban.
- Eliminate free bottled water from all catering events.

Water Quality Threshold Worries & Non-Threshold Worriers

42% of the population who consume 55% of NYU's bottled water
This population is concerned or interested in water quality.

- Indicate that public fountains are tested directly on the fountain (see below for details).
- Publicly communicate the relative water quality and regulation of tap and bottled water in newspapers, near water sources, listservs and through the Environmental Advocate Program. Couple this information with the press release of NYU's new water testing program.

Other Communication and Outreach Recommendations

- Indicate water quality results directly and visibly on fountains that have met and exceeded EPA standards. Frame the results as a "seal of approval" for that specific fountain. Since the City tests municipal water regularly, NYU is really testing its pipes and infrastructure and their effects on

[11] In interviews, only materially minded scientists and engineers considered drinking out of public bathroom sinks, and not one single person used a bathroom to refill water during observations, even when fountains were broken.

water. The seal avoids the need to post specific (and changing) water quality results, though a url or other source could be provided on the seal if individuals want to view specific water quality results. These results are already publicly available at NYU, though difficult to locate.

- Locate the above initiative and any future water initiatives with fountains that already have water meters (the Puck Building, the second and third floor of the Kimmel Center, and the third floor of Palladium) so that another pilot study can gage behavioural changes. As part of this pilot, conduct a follow-up survey and interviews with people in those buildings to see if the "seals" contributed to dominant discourses and attitudes about water at NYU.
- While indicating the presence of filters in public fountains may encourage individuals who prefer filtered water to drink fountain water, it also implies that municipal water ought to be filtered for water quality reasons, which is not the case at NYU or within the majority of New York City. I advise against direct advertisements of water filtration. The water quality "seal" described above is meant to address the same threshold worrier issues that publicizing filtration would.
- Target any educational or water consumption initiatives at specific groups within the Water Consumption Taxonomy or through various thresholds. Furthermore, target sources of information interviewees listed as influential, especially those that are not already associated with population concerned about environmental issues (see appendix).
- Any environmental education should diversify the ecological impacts of bottled water beyond waste and recycling.
- Conduct research into plastic leachates into water and publicize the results through the Environmental Advocates Program, student clubs, and near bottled water dispensers. This will encourage reuse culture or decrease disposable plastic use, both of which can reduce bottled water consumption.

impacts of recommendations

The NYU community drinks the approximate equivalent of a million bottles of water a month. The charts below outline how different recommendations might affect that number as well as how much individual and institutional money would be saved over the course of one year:

Intervention	**Thresholds Affected**	**Number of Bottled Waters Per Month** (conservative estimate)	**Money Saved Per Year** (assuming $0.50/bottled water)
Business as Usual	none	1,059,200	$0
Make tap water accessible to all offices and near all classrooms	Office cooler use eliminated, increased availability of tap water (bolstering mixed and primary tap water drinkers)	868,500	$1,144,000
Bottled Water Ban (including Deer Park office coolers)	Availability threshold (affecting High and Mixed Bottled Water and Primary Tap Water Drinkers), office cooler use eliminated	714,500	$2,368,000
Post water quality "seals," test for aesthetic contaminants, and add infrastructure for taste complaints*	Worrier thresholds eliminated, non-worrier thresholds bolstered	595,300	$2,783,000
Bottled water ban, post water quality "seals," make tap water accessible to all offices and classrooms	Affect all thresholds able to be influenced.	291,800	$4,604,000

* These numbers are based on how targeted areas of the Bottled Water Taxonomy and populations with certain thresholds would be effected. They assume that the initiatives result in all tap water at NYU consistently tasting the same as filtered water in people's homes. It also assumes that Exclusive Bottled Water Drinkers are unaffected by all interventions, and High Bottled Water Drinkers, Mixed Water Drinkers and Primary Tap Water Drinkers either reduce their consumption of bottled water on campus but not at home (as in the case of a ban), or stop completely due to attitude changes.

Situational interventions have a much higher guarantee of behaviour change and can occur in a much shorter period. Educational or informational recommendations aimed at changing attitudes, increasing involvement, and swaying the overall discourse at NYU might have farther reaching effects (including behvaiour change beyond campus) but are not guaranteed, are difficult to quantify, and would take longer.

Thus, a final recommendation is to begin to shift discourse using water quality posting and education and then introduce a bottled water ban across campus. After a ban, continue to work to change discourses about bottled and tap water within the NYU community to extend the "ban" into other aspects of people's lives.

appendix

Survey

Survey data sets are available upon request (max.liboiron@nyu.edu).

Statement to the Subject for Survey:

Dear NYU Student, Faculty, and Staff;

The Wagner Water Project (WaWa) and H204U (now Water Ways), two Green Grant projects supported by NYU's Sustainability Task Force, are conducting a survey to investigate the water consumption habits and preferences of the NYU community. The information gathered will be used to improve the quality, accessibility, and portability of drinking water at NYU as well as inform future water education and outreach.

The survey includes 20- 35 questions about your water consumption habits and preferences and will take approximately 15- 28 minutes. We thank you for your time and appreciate your participation.

1. Are you (check all that apply)
_____Undergrad Student
_____Masters Student
_____PhD Student
_____Faculty
_____Staff
_____International Student_____ Other_____

2. Are you:
_____Full time
_____Part time
_____Other _____

3. Which school are you associated with (check all that apply):
_____College of Arts and Science / Graduate School of Arts and Science
_____Steinhardt
_____Gallatin
_____Wagner
_____Silver School of Social Work
_____Tisch
_____School of Continuing and Professional Studies
_____College of Nursing
_____College of Dentistry
_____Study Abroad
_____Other_____

(end of page one)
(Skip logic: if they choose Wagner, they get the following questions, if not, skip to page three)

(start of page two: Wagner questions)
W1. On an average week, how many hours do you spend on the 2nd and 3rd floors of the Puck building
_____0 hours
_____1-10 hours
_____11-20 hours

_____21-30 hours
_____31-40 hours
_____over 40 hours

W2. Do you ever drink tap/fountain water at the Puck building?
_____Yes
_____No

(skip logic: if no, answer questions W2b and W2c, if yes, answer questions W2e,f,g).

W2b. If no, do you have a reason (please explain)?

W2c. If no, do you drink tap/fountain water at other locations (not at the Puck building)?
_____ Yes
_____ No

W2d. If yes, why do you drink tap/fountain water at other locations but not at the Puck building?

W2e. If yes, how often do you drink tap/fountain water at the Puck building?
_____More than once a day
_____Around once a day
_____A few times a week
_____A few times a month
_____Rarely

W2f. Is there a particular location that you prefer to go for water?
_____2nd floor water fountain
_____3rd floor water fountain (near the jersey conference room)
_____3rd floor sink/fountain (near the restrooms)
_____2nd Floor pantry sink
_____ Wagner Works Cafe
_____ Bathroom
_____other
_____no preference

W2g. If you prefer a specific location, why (check all that apply)?
_____ closest to my office/ study location
_____ tastes better than other locations in the Wagner space
_____ area is cleaner than other locations in the Wagner space
_____ easier to fill my bottle/cup than other locations in the Wagner space
_____ Other (please explain) _____

W3. Do you use a water filtering system (e.g. Brita) at the Puck building?
_____ Yes
_____ No

(skip logic: if no, skip to W4)

W3b. If yes, why?
Check all that apply:
_____ I think the water at Puck might not be pure
_____ Force of habit
_____ I want to take fluoride out of the water
_____ I think it makes the water test better
_____ It is a convenient container for water in my office
_____ Other

W4. Are you responsible for planning events/meetings at the Puck building?
Yes

No
(skip logic, if no, skip to page 3)

W4b. If yes, which, if any, of the following do you serve at meetings/events at the Puck building?
_____ Tap/fountain water
_____ Bottled water
_____ Both tap and bottled water
_____ Neither tap nor bottled water
_____ I don't serve any beverages
_____Other (please explain)

W4c. Why?

(end of page 2: Wagner-specific questions)

(start of page three: bottled water)

4. How often do you drink bottled water (including from office water coolers) [include image if possible]?
_____ More than once a day
_____ Around once a day
_____ A few times a week
_____ A few times a month
_____ Rarely
_____ Never

5. How important are the following factors when deciding whether or not to drink **BOTTLED** water? Please rate each one on a scale of 1 – 5
1 very important
2 somewhat
3 neutral
4 somewhat unimportant
5 unimportant

_____ Availability
_____ Design/Logo/Colors of the bottle
_____ Clarity of water
_____Convenience (easy to carry around, easy to throw away)
_____ Cost
_____Easy to carry around
_____ Effect on the environment
_____ Fitness (weight, complexion, etc.)
_____What it says about my identity
_____ No contaminants
_____ No sugar/additives
_____Prestige/ Reputation
_____ Smell
_____ Taste
_____ Other (please specify) _____

(end of page 3: bottled water)

(start of page 4: tap water)

6. How often do you drink unfiltered tap or fountain water?
_____ More than once a day
_____ Around once a day
_____ A few times a week
_____ A few times a month

_____ Rarely
_____ Never

7. How often do you drink filtered tap water (Brita filter, faucet filter, reverse osmosis, etc)?
_____ More than once a day
_____ Around once a day
_____ A few times a week
_____ A few times a month
_____ Rarely
_____ Never

8. Do you have a water filter at home or in your office?
_____ Yes
_____ No

(skip logic: if no, skip to 9)

8b. If so, why? (click all that apply):
_____ I think the water might not be pure and I'd rather be safe that sorry
_____ I know the water is not pure
_____ Force of habit
_____ I want to take fluoride out of the water
_____ I think it makes the water test better
_____ It is a convenient container for water
_____ other

8c. Do you change the filter regularly and in accordance with the timeline and instructions specific to the filter?
_____ Always
_____ Usually
_____ Sometimes
_____ Rarely
_____ Never

8d. Which contaminants does your filter block?
_____ lead
_____ pesticides
_____ nitrates/nitrites
_____ fluoride
_____ chlorine
_____ bacteria
_____ iron
_____ copper
_____ hardness ($CaCO_3$)
_____ not sure
_____ other

9. Do you use a portable, refillable water bottle?
_____ Always
_____ Usually
_____ Sometimes
_____ Rarely
_____ Never

10. Why or why not?

11. How important are the following factors when deciding whether or not to drink unfiltered **TAP** water? Please rate each one on a scale of 1 – 5
1 very important
2 somewhat

3 neutral
4 somewhat unimportant
5 unimportant

_____ Availability
_____ design of fountain/ tap/ water bottle
_____ Clarity of water
_____Convenience
_____ Cost
_____Easy to carry around
_____ Effect on the environment
_____ Fitness reasons (weight, complexion, etc.)
_____What it says about my identity
_____ No chemical or organic contaminants
_____ No sugar/additives
_____Prestige/ Reputation
_____ Quality
_____ Smell
_____ Taste
_____ Other (please specify) _____

(end of page 4 tap water)

(Start of page 5 water quality and behavior)

12. Which, if any, of the following statements do you agree with (please check one):
_____ I believe tap water and bottled water are generally of equal overall quality
_____ I believe tap water is of better overall quality that bottled water
_____ I believe bottled water is of better overall quality that tap water
_____ I don't know
_____ I have no opinion
Other _____

13. How would posting of water quality testing near water sources (taps, water fountains, soda machines) affect your choice of what type of water to drink?
_____ no effect; I probably wouldn't even notice/read the posting
_____ no effect; other factors drive my choice of water
_____ a minor effect
_____ a modest effect
_____ a great effect
_____ it would be the most important factor affecting my choice of water

14. In your daily life, how concerned are you about the environment?
_____ very concerned- I read about environmental issues and have changed my lifestyle to be as environmentally beneficial as possible
_____ somewhat concerned – I try to act in an environmentally beneficial way whenever I can
_____ neutral – I do not go out of my way to act in an environmentally beneficial way, and I don't have opinions about environmental issues
_____ somewhat unimportant – I am not sure that the environment needs to be attended to as much as it is
_____ unimportant – I do not think the environment is important

15. Do you consider yourself an environmentalist?
_____ Yes
_____ No
_____ Unsure

16. Do you deal with environmental issues in your professional or academic work?
_____ always- it is the focus of my work
_____ frequently- it is important to my work

_____ occasionally
_____ once or twice
_____ never

17. In your daily life, how interested are you in food issues, including food culture, fine foods, and food connoisseurship?
_____ very interested – I read about food regularly, and my dining and cooking lifestyle is attuned to food connoisseurship
_____ somewhat interested – I read about food or watch the Food Network occasionally, and I like dinning out or cooking fine foods once in a while
_____ neutral – I do not go out of my way to experience or know about food
_____ not very interested – food is not very interesting to me
_____ not interested at all – food is of no interest to me besides as sustenance

18. Do you deal with food issues in your professional or academic work (including food culture or food systems)?
_____ always- it is the focus of my work
_____ frequently- it is important to my work
_____ occasionally
_____ once or twice
_____ never

19. In your daily life, how concerned are you about physical health?
_____ very concerned – I read about health issues and my lifestyle is as health-conscious as possible
_____ somewhat concerned – I try to be as healthy as possible
_____ neutral – I do not go out of my way to know about or become more healthy (except perhaps when I am not feeling well)
_____ somewhat unimportant – I only care about health issues when I am ill
_____ unimportant – health issues are of no interest to me (even when I am not feeling well)

20. Do you deal with physical health issues in your professional or academic work (including fitness and preventative health issues)?
_____ always- it is the focus of my work
_____ frequently- it is important to my work
_____ occasionally
_____ once or twice
_____ never

(end of page 5 water quality and behavior)

(start of page 6: end of survey)

The survey you have just completed is a component of two NYU "Green Grant" projects that involve testing water quality at several NYU locations as well as the water quality of bottled water. Would you like to be notified of the results of this study?
If so, please provide your email address. It will not be linked to the rest of the survey.

This project will also include one-on-one interviews regarding drinking water habits and behaviors. Interviews will take approximately 10-30 minutes. If you are interested in participating in an interview, please provide your email address. It will not be linked to the rest of the survey

(end of page 6: end of survey)

<u>Interview Questions (open-ended):</u>

I am interested in your water consumption habits in regards to bottled water, tap water, and filtered water and about your perceptions of water quality.

1. I would like you to begin by telling me generally about what you drink in an average day?

a)Does that pattern change on the weekend?
b)Has that pattern changed over the last few years?
c) Do you drink more bottled water, tap water, or filtered water?
d) Which do you prefer and why?

2. Water-specific questions:
a) Do you drink more bottled water, tap water, or filtered water?
b) Which do you prefer and why?
c) Is there certain [tap water, bottled water brand, filter type] you prefer? Why?
d) Describe its packaging, images, or logo?
e) Under what conditions will you drink other types of water?

aa) for water filter users: What kind of filter do you use, and why?
bb)What does your filter take out of or put into the water?
cc)Do you change or clean the filter as often as the directions indicate?

3. Water Quality:
a) Tell me what you know about water quality or any experiences you've had with it.
b) Do you know what the quality of your preferred water source is? How?
c) What would you consider/ how would you describe good water quality?
b) How would you feel about having a different water quality for water you drink versus water you bathe in or water your lawn with?
c) How do you think water quality is regulated or maintained for tap water and bottled water?
d) What would you do if you found out your tap water was contaminated?
e) How do you think you would find that out?
f) What would you do if you found out bottled water was contaminated?
g) How do you think you would find that out?

Identity Questions:
4. Current Demographic Information:
a) age
b) educational status (undergrad, grad, faculty, etc)
c) NYU school of affiliation and department

5. a)How important are environmental issues to you?
b)Would you consider yourself an environmentalist?
c) How do you think your environmental values impact your water consumption habits?

6. a) How important are health issues to you?
b) What kind of health issues are most important to you?
c) Would you consider yourself knowledgeable in health issues?
d) How do you think your interest in health issues impact your water consumption habits?

7. a) How interested are you in food and gourmet tastes?
b) Would you consider yourself a food connoisseur?
c) How do you think your knowledge of food impacts your water consumption habits?

8. What sort of cultural things do you think affect your water consumption habits if any?
Ex. social standing, urban/rural setting, peer group, consumer culture, gender, what your parents drink, etc?

Water Meter Readings

Date **Location**

	2nd floor fountain	Net	3rd floor sink (combo)	Net	3rd floor fountain	Net	average	Notes:
11/17/08	12		29		6.7			
11/24/08	16.1	4.1	33.9	4.9	7.4	0.7	3.2	
12/1/08	19.4	3.3	38.7	4.8	7.9	0.5	2.9	
12/8/08	21.6	2.2	41.4	2.7	8.3	0.4	1.8	
12/15/08	25	3.4	46	4.6	9.1	0.8	2.9	
12/22/08	28.3	3.3	50.8	4.8	10	0.9	3	
12/22/08	CLOSED FOR WINTER BREAK - NO READINGS TAKEN							
1/5/09	29	0.7	51.1	0.3	10.2	0.2		(not included in average)
1/12/09	34.7	5.7	59.8	0.3	11.1	0.9	2.3	
1/19/09	32.8	1.9	56.1	5	11.5	0.4	2.4	
1/26/09	37.8	5	62.1	6	11.5	0	3.7	
2/2/09	41.2	3.4	67.1	5	12.3	0.8	3.1	
2/9/09	**44.1**	**2.9**	**72**	**4.9**	**13**	**0.7**	**2.83**	**Water test results posted: 2/6/09**
2/16/09	48.9	4.8	77.7	5.7	14.1	1.1	3.9	
2/23/09	52.4	3.5	80.2	2.5	14.9	0.8	2.3	
3/2/09	56.6	4.2	85.1	4.9	16.3	1.4	3.5	
3/9/09	60.3	3.7	90	4.9	17.6	1.3	3.3	
3/16/09	64.7	4.4	93.8	3.8	18.8	1.2	3.1	
3/23/09	66.1	1.4	97.1	3.3	19.8	1		spring break- not included
3/30/09	73.2	7.1	101.3	4.2	21	1.2	4.2	
4/6/09	78.3	5.1	106.5	5.2	22.4	1.4	3.9	
4/13/09	83.2	4.9	111.4	4.9	23.9	1.5	3.8	

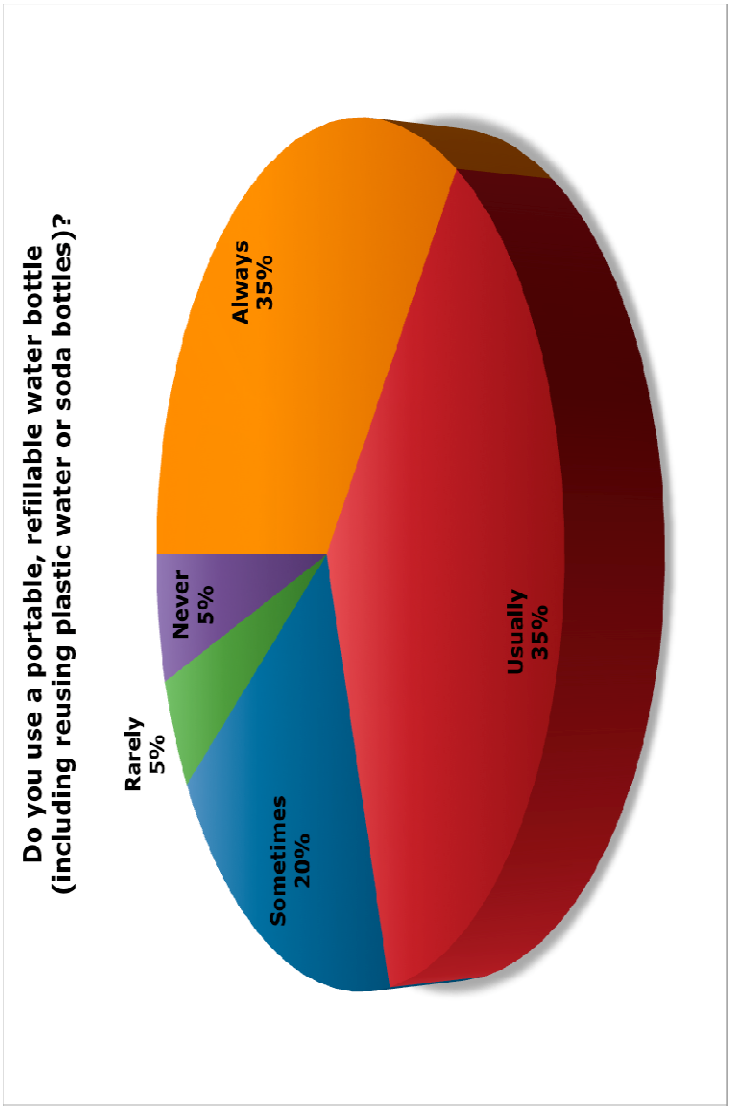
4/20/09	87.3	4.1	115.9	4.5	25.2	1.3	3.3	
4/27/09	92.4	5.1	121.7	5.8	26.5	1.3	4.1	
5/4/09	97.5	5.1	126.4	4.7	28	1.5	3.8	
5/11/09	100.1	2.6	129.8	3.4	29.1	1.1	2.4	
5/18/09	104.5	4.4	133.2	3.4	30.2	1.1	3	school out
5/26/09	108.1	3.6	138.3	5.1	31.1	0.9	3.2	
6/1/09	111.7	3.6	141.1	2.8	31.7	0.6	2.3	
6/8/09	113.8	2.1	145	3.9	32.6	0.9	2.3	
6/15/09	116.3	2.5	149	4	33.6	1	2.4	
6/22/09	118.6	2.3	151.6	2.6	34.5	0.9	1.9	
6/29/09	121.3	2.7	155.5	3.9	35.4	0.9	2.5	
7/6/09	123.1	1.8	159.5	4	36.2	0.8	2.2	
7/13/09	124.7	1.6	162.5	3	36.8	0.6	1.7	
7/20/09	127.5	2.8	167.4	4.9	37.3	0.5	2.7	
7/29/2009 *	129.1	1.6	172.6	5.2	38	0.7	2.5	
8/3/09	131.6	2.5	175.1	2.5	38.6	0.6	2.8	
8/10/09	133.2	1.6	179.3	4.2	38.7	0.1	2	
8/17/09	134.9	1.7	182.1	2.8	39	0.3	1.6	
8/24/09	136.4	1.5	185	2.9	39.3	0.3	1.6	
8/31/09	139.1	2.7	188.3	3.3	39.8	0.5	2.2	
9/7/09	142.6	3.5	191.8	3.5	40.4	0.6	2.5	school starts
9/14/09	146.1	3.5	195.3	3.5	41	0.6	2.6	
9/21/09	149.7	3.6	198.8	3.5	41.7	0.7	2.6	
9/28/09	151.7	2	201.8	3	42.1	0.4	1.8	
10/5/09	160.3	8.6	206.7	4.9	43	0.9	4.8	
10/12/09	165.8	5.5	211.3	4.6	43.8	0.8	3.6	

10/19/09	188	22.2	215.1	3.8	44.3	0.5	8.8	LEAK beings
10/26/09	193	5	218.7	3.6	45.6	1.3	3.3	
11/2/09	198.6	5.6	222.6	3.9	46.5	0.9	3.5	
11/16/09	211.6	13	230.3	7.7	47.7	1.2	7.3	
11/24/09	229.8	18.2	235.4	5.1	48.6	0.9	8.1	reported leaky faucet on 2nd floor water fountain
11/30/09	235.6	5.8	237.1	1.7	49	0.4	2.6	
12/7/09	242.8	7.2	241.4	4.3	49.8	0.8	4.1	
12/11/09	263.2	20.4	245	3.6	50.5	0.7	8.2	leaky faucet fixed on 12/9/09
12/21/09	269.9	6.7	248.8	3.8	51.5	1	3.83	

Refillable Water Bottled Data

Reasons to Carry or Not Carry a Reusable Water Bottle:

cost	58
“environment”	54
Less waste	50
Convenience of WB	36
To always have water on hand	22
Health/BPA/leachates	12
Inconvenience (heavy/bulky)	11
High quality of tap water	7
No cleaning/washing (neg)	7
Anti plastic	6
Prefers tap/filtered water from home	5
Love WB	5
For gym only	3
Not thirsty	3
Don’t have one	2
Habit (neg)	2
Water avail everywhere	2
Cost/loss of WB	2
SWAG	2
Forget WB too much	2
Bulk BW	1
Siggs are popular	1
For fridge- cold	1
Bad taste of tap	1



Wagner Water Project

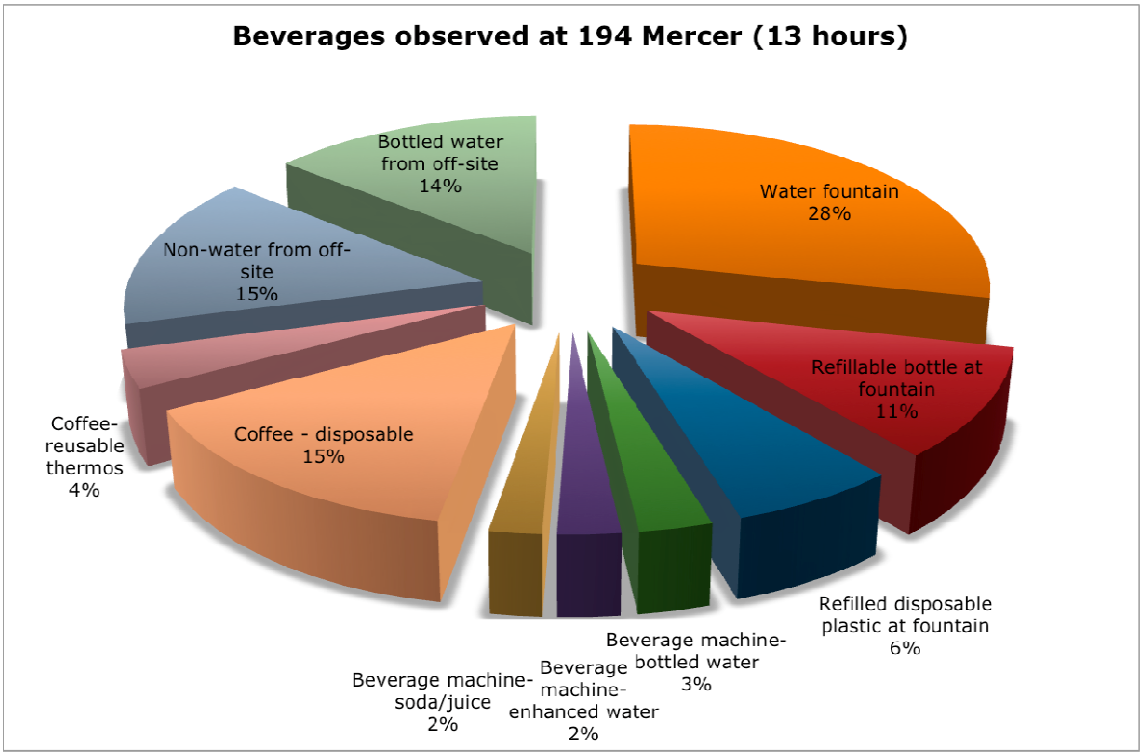
The Wagner Water Project is funded by the NYU Sustainability Task Force. A portion of the funds is being used to test water quality and post results for tap/fountain water and bottled water at NYU. Below are the results of tests conducted on December 16, 2009

	Crystal Geyser Bottled Water	2nd Floor Water Fountain	3rd Floor Water Fountain (Jersey conference room)	3rd Floor Water Fountain/Sink (near bathrooms)	Allowable levels*
Bacteria	Negative	Negative	Negative	Negative	None
Lead	Negative	Negative	Negative	Negative	Below 15 ppb
Pesticides	Negative	Negative	Negative	Negative	Below 3 ppb
Total Nitrate/Nitrite	0 ppm	0 ppm	0 ppm	0 ppm	Below 10 ppm
Nitrite	0 ppm	0 ppm	0 ppm	0 ppm	Below 1 ppm
Total Chlorine	0 ppm	0 ppm	0 ppm	0 ppm	Below 4 ppm
pH	6.5	7.5	6.5	7.5	6.5 to 8.5
Total Hardness	0 ppm	50 ppm	50 ppm	50 ppm	50 ppm or less

* Environmental Protection Agency maximum contaminant levels or guideline standards
ppm = parts per million
ppb = parts per billion

Example of Water Quality Posting above fountains:

Observed beverages by type over thirteen nonconsecutive hours. The numbers for bottled waters from on and off campus was used to calculate the effects of a bottled water ban.



Sources of information about water (from interviewees):

- taste or looks of water
- class or colleges at the university
- jobs, particularly environmental jobs or journalism job
- NPR/radio/news articles (NY Times, Edible NY)
- movies and documentaries (*Flow* & *A Civil Action*)
- google if searching (rare)
- stranger in the street (about BPA)
- the interview itself
- doctors
- friends and family and roommates
- observations (of water monitoring stations on the street)
- own water tests (rare)
- didactic art
- commercials and advertising
- bottles themselves (BPA free)
- practices from childhood (local or not)
- seeing water bottles "around"

List of Municipal and University Bottled Water Bans

Canada:

- *St. John's, Newfoundland:* City Council banned the use of city money for providing bottled water on city property, including city-hosted events. 2008.
- *Charlottetown*, *Prince Edward Island:* City Council made the decision to stop purchasing bottled water. 2007.
- *Toronto, Ontario*: City Council passed a comprehensive bottled water motion that banned the sale or distribution of bottled water and provided alternatives for the provision of accessible tap water. 2008.
- *London, Ontario*: City Council passed a resolution that banned the provision and sale of bottled water on city owned and operated property. The resolution also included provisions for a public awareness campaign and an assessment of tap water availability in these locations. 2008.
- *Banff, Alberta:* Banff council voted to ban the sale of plastic bottles of water in all municipally owned buildings, including the Rec Centre. 2010.
- *Altona, Manitoba:* Municipality banned water coolers and bottled water in its offices. 2007.
- *Region of Metro Vancouver, British Columbia:* Council voted to launch a public campaign to support tap water and to encourage local municipalities to phase out the availability of bottled water in civic centres and install more water fountains. 2008 (note, this decision was reversed for the 2010 Winter Olympics).
- *University of Winnipeg:* ended the purchase and sale of bottled water on campus. 2009.
- *University of Ottawa:* bottled water will not be available for purchase on campus. Beginning September 1, 2010.

The United States:

- Office of the Mayor of *San Francisco, California* passed an Executive Directive phasing out the use of City funds to purchase single serving bottles of water and switching to bottles-less water dispensers for city departments and agencies occupying city or rental properties. 2007.
- *Emeryville, California:* endorsed Corporate Accountability International's "Think Outside the Bottle" campaign. Discontinued purchase of large bottled water for economic reasons. 2007.
- *Davis, California:* City Council decision banned the purchase or sale of single-use water bottles for city operations and events to reduce greenhouse gas emissions. 2007.
- *Ann Arbor, Michigan:* Buying or serving commercially bottled water at City Council functions banned. 2007
- Mayor Greg Nickels *of Seattle, Washington* signed an executive order in ending the purchase of bottled water for city buildings and events. Environmental impacts and Seattle's high-quality municipal water supply were cited as reasons for the order. 2008.
- *U.S. Conference of Mayors* passed a resolution encouraging mayors to phase out city spending on bottled water and to promote the importance of municipal water.
- *Washington University, St. Louis*: banned the sale of bottled water in vending machines, cafeterias, in offices, and events. 2009
- *University of Portland*: banned the sale of single-use plastic water bottles. March 2010.
- *Leeds University, UK:* Voted to ban bottled water from all their bars, cafes and shops. 2008-2009.

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