Factors influencing water intake at school among youth in King County, Washington: a qualitative study based on the social ecological model

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Abstract

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Introduction: Sufficient water intake is essential for health, cognitive function, and school performance among youth. Approximately three in four children do not drink enough water during the school day leading to inadequate hydration status. Although research on youth water intake in school indicates that beverage choice may be influenced by school infrastructure, water quality, and policy, there is a lack of comprehensive multilevel research about the influences on youth water consumption at school.

Methods: This secondary qualitative study was based on the social ecological framework. Focus groups were conducted with youth aged 14-19 years at 10 high schools in King County, WA. Schools were selected based on percent free and reduced priced meal eligibility. Focus group

transcripts were coded using Atlas.ti and analyzed using phenomenological qualitative methodologies to determine common themes.

Results: Perceived barriers to drinking water include overall quality of water from fountains, access to water fountains, and cost of water bottles. Facilitators of drinking water included water bottle filling stations on campus, water coolers in classrooms or cafeterias, and bringing water from home. Availability of other beverages around school, in coffee shops, convenience stores, and supermarkets also influenced beverage consumption, especially when schools had an open campus lunch policy.

Conclusion: This study highlights perceptions about the adequacy of school drinking water, and suggests that availability of and access to high quality and affordable drinking water may be inadequate. Because school and community infrastructure and policies influence beverage choice among adolescents, collaborative, multilevel policies and interventions are needed to promote water intake, access, quality, and affordability in schools.

Key words (up to 10): Qualitative Research; Focus Groups; Models, Theoretical; Adolescent; Beverages; Water; Drinking Behavior; Drinking Water; Schools

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Introduction:

Sugar sweetened beverage (SSB) consumption is associated with obesity, diabetes, and increased healthcare costs[1-5]. Increased water intake has been shown to reduce energy intake and has potential to prevent obesity[6,7]. Additionally, water intake is essential for adequate hydration, optimal health, cognitive function, and school performance in youth[8-10]. Behaviors around beverage choice are influenced by infrastructure of schools and communities[11,12], perceived control of decision-making and capacity[13,14], and ability to make a healthy choice[13,14]. When physical access to quality, free drinking water is provided in a location that is perceived as clean and attractive, overall water consumption tends to increase[11,15-18].

Individual behaviors, such as beverage consumption, depend on a variety of factors, from perceived social norms to individual level beliefs. Theoretical models, such as the Theory of Planned Behavior (TPB)[19], the Social Ecological Model (SEM)[20], and the Social Cognitive Theory (SCT)[21] help to identify factors that influence individual behaviors. Studies looking at adolescent beverage consumption have used several frameworks to guide their studies, from TPB and SEM to SCT and the Attitudes, Social Influence and Self-Efficacy model (ASE)[13,14,22]. Other studies have created their own conceptual models to guide future research and intervention strategies based on a combination of frameworks, or previous findings[13,14,22,23].

Many studies that address policy-level interventions suggest that behavior around healthy beverage consumption is influenced on many levels of the SEM[13-15,18,22-24]. Individual, psychosocial, and physical/environmental factors such as preferences, family and work dynamics, parenting practices, and accessibility and availability of foods or beverages all play a role in adolescent behavior[17] but do not tell the whole story. Food and beverage intake is also

influenced by micro- and macro-level built and natural environment, socio-cultural environment, and political and economic environmental factors[18]. While availability of foods or beverages at home influences a child's behavior, the broader food landscape also plays a role; customs/traditions and cultural identity as a whole influence behavior, as do an individual's socioeconomic status and government programming and policies[18]. While these studies make the case for further multi-level studies and intervention when considered together, few studies use SEM as a framework for comprehensively addressing potential policy or program interventions for adolescent beverage consumption.

Applying theoretical models to describe the determinants of beverage consumption behaviors of adolescents can help to elucidate factors that truly influence beverage consumption. Understanding such factors will help inform direction and approaches for future research, and program and policy decisions.

There is a growing body of knowledge about water intake in schools[11,15,18,25-29]. Approximately three in four children do not consume enough water during the school day[25,30], leading to inadequate hydration status[31]. Students may not drink enough water at school due to lack of physical access to, and quality of water and water fountains in schools[11,15-18]. Students may not perceive water as clean, safe to drink or good tasting[18,28]. The water offered at school may be poor quality, in a physically inaccessible location, or fountains may not be maintained[12,29].

Most studies use quantitative methods to determine influences on water access in school. Others use qualitative methods to describe student perceptions around water consumption in schools. Of the studies that use qualitative methods, most detail barriers to water intake and outline potential solutions. It appears that the social ecological model has not been applied

extensively to guide research about youth water consumption[13,14,20]. While several studies do outline multilevel problems[18], and others help detail solutions[32-34], the issues and solutions have never been presented in a clear multilevel way.

The aim of this study is to apply theoretical constructs in order to understand how beverage choices of individual students are affected by different levels of influence, including individual beliefs, the school environment and institutional practices, and the environment or system as a whole.

Methods:

Research Context:

This study is secondary to the *Impact of Access to Free and Appealing Water in High Schools on Sugary Beverage Consumption* study, a mixed-methods, cross sectional, school-level study of 19 diverse public high schools in King County, WA. This secondary study was based on transcripts from focus groups conducted in 10 King County high schools. Focus groups were designed to gather information about the sources and types of beverages available to high school students while they are on school campuses, and students' perceptions about water access.

Study Design and Sample:

Ten high schools were identified for the initial phase of the parent study. Recruitment of schools into the study was stratified by the school's percent of students eligible for free and reduced price meals (%FRPE), a proxy for income, to assure a representative sample. Of these ten high schools, three are considered high FRPE, with over 66 per cent of the students qualified for free or reduced price meals. Four schools were considered medium FRPE, with 34-66% of the students qualifying for free and reduced lunch. Three schools were considered low FRPE, with 0-33% of

the students qualifying for free and reduced lunch. A total of eleven focus group sessions were conducted, one at each high FRPE school, one at three medium FRPE schools, two at another medium FRPE school, and one at each low FRPE school.

Schools distributed recruitment fliers directly to students, who then contacted the research team if interested in participating. All students in the study schools were eligible to participate - there were no specific inclusion or exclusion criteria.

The study protocols were approved by the University of Washington Human Subjects Division. Focus group attendees eighteen years or older signed a consent form and attendees under eighteen signed an assent form, and their legal guardians signed a consent form. Students who attended the focus group session were provided a gift card at the end of the session.

Focus group questions were designed to learn about the sources of beverages consumed in school and key locations in the school where beverages are consumed. Questions also addressed behaviors that impact beverage consumption in schools.

Focus groups were conducted by one of two trained moderators, and session content was documented by note-takers. Sessions were audio recorded and transcribed. Transcripts were combined with session notes to assure a complete record of session contents.

Data Analysis:

Data were analyzed through coding and extraction, and categorized using Atlas.ti[35], following phenomenological qualitative research and data analysis methodologies[36]. Initial codes and definitions were developed based on the tenets of the social ecological framework[21]. Codes were assigned to quotes in two passes. First, codes were assigned using key word auto-coding in Atlas.ti. Second, codes were assigned manually to ensure coding was appropriate and that no information had been missed.

Data analysis focused on identifying and explaining major influences on beverage consumption behavior among high school students in King County. Major themes were organized based on the levels of the social ecological model: individual, interpersonal, organizational, community, and systemic influences. Data were further analyzed for potential differences in opinions and influences by school percent FRPE.

Results:

Eighty-three female and 41 male high school students aged 14 to 19 years participated in focus groups.

Focus group participants described a range of facilitators and barriers to water consumption in high schools in King County, Washington. All barriers can be categorized into different levels of the Social Ecological Model (SEM). Major themes identified by focus group participants in each level of SEM were summarized to denote common influences on beverage consumption behavior, as well as similarities and differences in perspectives by the school's % FRPE.

Individual Level Influences on Water Consumption:

Self-efficacy, in terms of having a sense that one could chose a healthy beverage, appeared to influence behavior to a limited extent. Students cited an increased sense of self-efficacy around water consumption when they carried water bottles with them. Behavioral capacity also played a role. For example, if the school had an open campus policy, students felt like they could leave campus and choose healthier, better tasting food during the school day. In schools that had open campus lunch policies but outside restaurants were not within walking distance, students felt like they could make healthier choices if they had a car. Students without a

car, and those at schools with closed campus lunch policies, felt that they had limited options, and reported that they chose only what was available at school, and at grocery stores and convenience stores near school.

Gender also appears to play a role in beverage choice (Table 1). Of the two focus groups that mentioned differences in consumption by gender, it was noted that male students drank more energy drinks, and female students drank more coffee drinks and used reusable water bottles more often.

Interpersonal Level Influences on Water Consumption:

Students in all focus groups cited interpersonal interactions as having major influences on beverage consumption. Social norms in schools influence beverage choices (Table 1). Students appeared to follow similar beverage consumption patterns within each school. Across several study schools, focus groups participants reported that students chose water or another hot beverage in the morning, and sports drinks, soda, or water in the afternoon.

Organizational Level Influences

After school and extracurricular settings, culture, and norms make a difference in beverage choices (Table 1). Most sports teams are provided with water, or have facilities for players to fill up reusable water bottles. Some sports team coaches and managers also provide juice or sports drinks. The majority of after school clubs provide juice for their participants. When parents and students provide beverages for the club or team, beverages provided to participants usually do not include water. Teams and clubs provide fewer beverages at higher FRPE schools.

School and classroom policies influence beverage choices, whether they are a teacher's classroom policy or a school-wide policy. Some schools have a policy regarding beverages allowed in classrooms and on the school campus. For each school, enforcement of school policy varies from teacher to teacher, and classroom to classroom. For the schools that do not have a school policy regarding beverage consumption, students note that some teachers are "picky," and that different beverages are allowed in different classrooms. Despite the fact that focus group participants mentioned that some students leave campus regardless of the lunch policy, open or closed campus lunch policy strongly influenced beverage choice. Schools with open campuses had more sugary drinks brought on campus from surrounding stores and restaurants compared to schools that have a closed campus policy, according to focus group participants.

Arrival time policies seemed to influence beverage consumption as well. When more students arrive late they often bring less healthy beverages to school with them.

Environmental Level Influences:

School infrastructure, including placement and maintenance of water fountains, water bottle filling stations, organization of the lunch room, placement of water and other beverages in the lunch line, vending machine options, and the operation of school stores directly influence water consumption. Water fountains in the lunch room can be placed in locations that are not conducive to use, like near a restroom or behind tables. Students noted that tables blocked physical access to water fountains, leading to less water consumption. Restrooms caused the air around the fountain to smell, and students reported that no one wanted to drink water where the "air is polluted". Other fountains did not taste good, provided warm water, or contained sediment. Beverages, including milk, water, juice, diet and sugary drinks were chosen based on

price and how easy the beverage was to purchase or access in the cafeteria and school store. If a beverage was further away, students reported they were less likely to purchase that beverage.

Students preferred water from certain fountains, but the locations of those fountains were not always convenient. For example, students mentioned it was not always feasible to walk to the areas with the best tasting water, like the gym, other sports facility, or another floor, between classes or at lunch.

In addition to placement of water fountains, taste and temperature preferences influenced water consumption (Tables 1 and 2). Water perceived as clean, cold and tasteless was preferred by students in all focus groups. Many students preferred water bottles or large commercial water containers with spigots that allow students to fill cups or water bottles with cool, good tasting water (water coolers) over water from the fountains. In the schools that had water bottle filling stations, the students preferred to use those over the water fountains citing the colder water temperature, cleaner water taste, and cleaner appearance of the station.

Perception of a school's infrastructure played a role in beverage consumption behaviors. Schools that students perceived as "ghetto" or falling apart were perceived to have worse tasting water. Students at those schools reported that they chose other beverages over water (Table 1). This was particularly true at higher % FRPE schools (Table 1). Students at schools with newer infrastructure perceived their water as cleaner, colder and better tasting than schools with older infrastructure.

Community Level Influences:

The community around the school seemed to influence choices more when the school had an open campus lunch policy. However, at all schools, proximity to convenience stores, grocery

stores, restaurants, and coffee shops appeared to play a role in beverage choice. Students report that they will often purchase beverages that their school sells at a nearby convenience store because it is less expensive there.

In some schools, the bus rules play a role in morning and afternoon beverage choice. Most bus drivers will not allow a beverage without a lid or cap. Many drivers will only allow students to drink water while on the bus.

Systems Level:

Systems level influences were not directly addressed by students but were alluded to in several focus groups. For example many participants wished that water bottles, or filling stations or coolers with cups were available with school lunch instead of, or in addition to milk. They also wished that schools would stop "shortening" portion sizes for drinks like milk and juice, and offer larger portions of water. These issues are related to federal school lunch regulations.

Beverage price was also discussed in several focus groups, especially the price of coffee drinks and the prices for bottles of water. Bottles of water cost $1.50 or more, which deterred students from purchasing water at school. Other students noted that convenience stores near schools sold water and other beverages at cheaper prices than school vending machines, cafeterias, and school stores. Participants from one focus group discussed that they would be willing to pay a ten dollar annual fee to help finance purchasing and maintaining water filling stations.

Discussion:

Results of this study indicate that student behaviors around beverage intake are

influenced on many levels by several factors. Consistent with previous studies[5,12,16-18,32], water taste, temperature, school infrastructure, school environment and the community influence beverage choices at school among adolescents. Our results are similar to those from previous studies, noting that students chose water that tastes good and is in an accessible location[16-18,37]. When water fountains are unsanitary, not maintained, near restrooms, or produce foul-tasting or smelling water, students are less likely to drink water from that fountain.

Because water fountains are often plumbed with existing restroom infrastructure, changing placement of drinking fountains may be difficult. While, Seattle and King County Plumbing Code, in line with the national standard Uniform Plumbing Code (UPC), does not allow water fountains to be placed within restrooms[38], placing a water fountain outside but near restrooms is not discussed in the UPC. Because students reported that odors wafting from restrooms to the water fountain made the fountain's water taste foul, reexamination of placement of water fountains by restrooms, and updates to plumbing code may be needed.

Consistent with several recommendations to improve water intake among students at school[32-34,39,40], our findings indicate that students prefer water filling stations and water coolers with cups over water fountains. Results from this study indicate that students would purchase water bottles to avoid unpalatable water from fountains.

Federal school nutrition regulations require access to free and potable water in schools[32] but many students noted they do not have access to free, high quality drinking water during lunch. One study school offered water bottles with breakfast and lunch, and two others have water bottle filling stations on campus. In schools with neither, students will go without water, or choose to pay $1 to $1.50 for bottled water rather than drink out of the school's drinking fountains. While both filling stations and water coolers cost money for schools to obtain,

students preferred water from filling stations, and financing options are available[41]- students might even be willing to pay an up-front fee for clean water at schools. This is in line with recommended strategies for obtaining water filling stations and refurbishing existing water fountain infrastructure[32-34,40].

Program and policy implications

Results from this study have implications for further research and policy change. Because increased water intake is associated with decreased energy intake[4,7,42], creating more appealing sources of free water on school grounds could help reduce the risk of obesity later in life.

Some political action has been taken, and in 2015, the Washington state legislature passed a capital budget that provides one million dollars in grants to schools to fund water filling stations in schools[41]. Other ways of obtaining and maintaining water filling stations include directing resources toward infrastructure, charging each student a nominal annual fee, or reaching out to private, public, or nonprofit institutions for funding that would pay for infrastructure, filtration systems and/or maintenance[32-34].

In addition to increasing access to cold and good tasting water on school grounds, schools and school communities can adopt policies that increase water consumption and decrease sugar sweetened beverage consumption during the school day. School policies that promote water intake include closed campus lunch and encouraging offering water in after school activities. On a community level, water intake could be increased by changing zoning laws around schools to reduce exposure to sugar sweetened beverages[43,44]. By demonstrating how water intake is influenced on several levels, from individual to system, this study emphasizes the

need for multilevel interventions to best promote water intake in schools, and this study provides information that could be used to design interventions that could help to improve water intake in high schools.

Study Limitations

This study has limitations. Although the qualitative methods used provided rich data, allowing researchers to examine water intake in great detail, generating several hypothesis, the results may not be generalizable to other populations. Although study schools were chosen to represent a variety of FRPE, students volunteered to participate in the study and may not have been representative of the gender, race, income, or social makeup of their school.

Conclusions

This study highlights perceptions about the students' experience of school drinking water, and suggests that availability of and access to high quality and affordable drinking water may be inadequate. Because school and community infrastructure and policies influence beverage choice among adolescents, collaborative, multilevel policies and interventions are needed to promote water intake, access, quality, and affordability in schools.

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Table 1. Factors that influence beverage consumption at school among youth in King County High Schools, by Social Ecological Model level of influence.

SEM	Theme	Quotations
Individual	Attitude: Beverage perception	"A lot of kids drink super-value-sized slurpees, and I'm, like, you're crazy. And they have another Coke in their backpack."
		"Like soda disgusts me. It's syrup basically. It's nasty. I don't remember the last time I drank it."
		"[The water from the fountains is] nasty. I call it toilet water. It's nasty. It smells bad."
		"It's not trustworthy-looking."
	Attitude: School Perception	"If you look at our school you already think it's ghetto so the water is ghetto."
	Self-Efficacy	"I have a water bottle with me every day—I never used to do that. Just the past couple years I became more aware of it, with doing sports and everything. Now I, like, need to have it—it's become a habit. Something I feel like I need to have with me though."
		"I think having a job and a car gives you more access to the sugar world."
		"We don't want junk food all the time and be unhealthy. We just want it (water) to taste good. I've been here three years and I hate it. It was even worse at [another school]. Nothing is really helping. You are dehydrated. They don't turn on the air. It gets hot in here. Teachers say drink the water. It is horrible. About to pass out going to the east wing."
	Gender	"I think there's a gender difference. I think I notice girls bringing more water bottles, teas, and Starbucks. Guys are either not really drinking or drinking energy drinks—the ones advertised a lot."
		"Guys tend to have plastic water bottles a lot and girls tend to have reusable ones."
		"Some students bring protein shakes that they make. Yeah a lot. Especially the boys that work out."
		"I went through like four or five reusable water bottles in three months because I kept losing them." (said by a male participant)
Interpersonal	After School Activities, Clubs, Sports	"I see a lot of athletes—the good athletes, too—drinking a lot things that aren't water, that aren't healthy."
		"When Robotics is going on, parents will bring in snacks. Then it's usually boxed juice, Capri Suns, or water bottles"
		"They give us each a reusable water bottles and they just fill it up for us—in track, soccer, softball, basically all the sports besides the water sports—swimming and water polo—because they go to a different building."

		"Snack with a Capri sun or other similar drink provided to anyone who stays after school in the cafeteria."
		"For yearbook and newspaper nights, everyone brings a ton of food and it's not necessarily the healthiest. Usually just one person that would bring soda and juice. Those nights happen like once a month. I just bring water to those."
		"Swim team does a lot of food—not a lot of drinks. But orange juice is the swim team tradition. The guys before their meets drink like a gallon of orange juice by 2nd period, but they buy it themselves. They do more food."
	Social Norms	"I'm not originally from the Seattle area. Where I'm from, we just didn't drink water. I never saw as many water bottle and camelbacks. I feel like beverages weren't as big of a deal. People here drink a lot of water. People make a conscious effort to drink water here."
		"A lot of people here don't start their day off with soda, it's usually coffee, or water, or tea of some sort."
		"People spill food in [the water fountain in the cafeteria] so they don't like to drink from it."
		"I see people bring milkshakes into sixth period (DQ and Costco) after lunch"
		"Sometimes people stand out there watching you leave [the school campus] but we still do."
		"Nobody pays attention to school rule not to have drinks in the classroom."
		"I drink more coffee. I think that now that we're more privileged to have these things, like being able to drive to Starbucks, we drink more coffee. We could never do that in middle school."
		"I see soda a lot actually."
		"A lot of Starbucks drinks." [lots of laughter and agreement]
Organiza-tional	School and Classroom Policies	"If it's not on campus, it might deter a bunch of people."
		"[Our school] is a closed campus, so a lot of people are getting drinks from the school store and from what the school provides."
		"I don't think the new policies are going to help, we have a Safeway and QFC right here so if people really want them they can buy them."
		"No, I don't think they would ever be allowed to sell Monsters or Red Bulls because they're energy drinks."
		"If you want water in the lunch line, you have to buy it."
		"Yeah, teachers even tell us not to drink water out of the sinks in their classrooms."
		"It depends on the teacher, but most teachers are pretty lenient."

		"Some teachers have their own rules about drinks in classes but no policy for the school as a whole."
	Infra-structure	"There is a water fountain in the cafeteria. It is by the bathroom, so no one uses it. But the air over there is polluted."
		"Yeah, [there is a water fountain in the lunch room] but people spill food in it so they don't like to drink from it."
		"[If you wanted water in the lunch room,]You would go to [the cafeteria store] and pay a dollar for it."
		"[There is a] water fountain in almost every building. Some don't work at all or water just dribbles. Some are not sanitary. Some of them are gross. Everyone goes to the new filler/fountain just installed in the gym."
		"And there's a coffee bar in the lunchroom where you can buy coffee."
		"There's a hot water tap in the cafeteria near the microwave. Some people fill up with tea after their water bottle is empty."
		"The water fountains in the lunchroom are blocked by tables and chairs and they're in the corners. I tried one once and it was kinda warm."
		"The water fountain can be nice, but there can be gum or stuff in there so you are not putting your face in there. Gum in fountains. Some jerk will stick gum in spout and it will be there for a week. They do that all time."
		"I had a friend who got water in his water bottle [from the one upstairs]. I saw in class that things were floating in the water. That is nasty."
		"Everything in vending machine is diet zero."
		"Most of the options in the school store are extremely unhealthy and have little to no nutritional value."
		"They taste more pipey. And the water fountains are gross-looking. It's not as good as the cafeteria water bottle filler."
		"Library has a no food and drink sign. [I] asked a librarian about water and she said as long as you don't open it or drink it and it has a closed cap."
		"One time I went out to drink at the water fountain and when I pushed the button it was like brown, the water was brown and it grossed me out"
Community	Neighbor-hood around school	"Starbucks is like a mile away – really not far from here, really easy access" "Yeah, there's one in Safeway and one right nearby."
	Transit	"A lot of people that are drinking things in the morning drive themselves. For example, a lot of bus drivers don't allow food or drink on the bus."
		"You can go off campus, but only have 40 minutes and there nothing close by. You either need to have a car or wait for

		the bus… You need to go down a steep hill to get [to restaurants], and then go up the hill. It is a workout. Or you can catch [a bus] and go all the way down to the [store]. But you would probably be late if you take the bus. You really need to drive. Lots of people drive to go out, but most students stay on campus."
		"A lot of people have cars so they can drive to further places"
Systems	Policy	"I don't think the new policies are going to help, we have a Safeway and QFC right here so if people really want them they can buy them."
		"Instead of just shortening the portion sizes they should add water or something else to drink besides juice and milk. The juice is that big, just a sip. Milk is same the size of a shot."
	Price	"I think people are just cheap. The water bottles in the vending machines are $1.50, so no one's gonna pay $1.50 for water."
		"I don't drink soda because my family can't afford to buy a lot of it."
		"Yes! I would [pay a 10 dollar fee for a water filling station]." "I spend $25 a week on Starbucks. It is really bad." "So yeah 10 dollar would be great."

Table 2. Barriers and facilitators of water consumption at school among youth in King County High Schools by Social Ecological Model level of influence.

SEM	**Barriers to water consumption**	**Facilitators of water consumption**
Individual	• Students prefer particular brands of water • Students demonstrate negative attitudes to drinking water from fountains at school: "Gross, warm, carrot tasting" • Students perceive school's economic status as "ghetto" which impacts perception of water quality	• Students bring water from home • Students demonstrate positive attitudes to drinking water from fountains at school: "water in the gym is cold and tastes the best"
Interpersonal	• Peers drink coffee, energy drinks, other sugary drinks • Sugary drinks available at home	• Peers drink water • Family drinks water or other unsweetened beverages at home
Organizational	• School infrastructure does not support water consumption: water tastes bad, too warm, rust in water • School and classroom policies that promote water consumption over sugary beverage do not exist or are not enforced • School store sells sugary drinks, coffee drinks • School does not provide water cooler, water bottle filling station, or water cups • Water only available from water fountains • Sports teams and after school activities provide juice or sports drinks	• Schools provide water bottle filling stations, in addition to water fountains • Teachers have large commercial water dispensers with spigots in classrooms that they allow students to use to fill water bottles • School and classroom policies that promote water consumption and are enforced • Cold water easily available and accessible at school • Get cup or water cooler with school lunch • Sports teams and after school activities provide water
Community	• Coffee shops, grocery stores, convenience stores near the school	• Difficult to get off campus during school day to purchase sugar-sweetened beverages
Systems	• Open campus policy • School lunch provides milk and water cups are not distributed • Only free water available is from water fountains for most schools	• Closed campus policy • National policy that schools provide access to free, potable water

Appendix A: Focus Group Questions

Tell us your first name only and one thing that you enjoy doing in your free time.

1. Now, think about a typical school day IN THE MORNING, What kinds of water and other beverages do you bring to school from home? (probe for brand s)

2. IN THE MORNING, What kinds of water and other beverages do you see other students bring to school from home?(probe for brands)

3. What kinds of water and other beverages do you buy on your way to school and where do you buy them? (probe for brands)

4. What kinds of water and other beverages do other students buy on their way to school and where do they buy them? (probe for brands)

5. When do you usually have something to drink during your morning at school?

6. When do other students have something to drink during morning at school?

7. What kinds of water and other beverages do you usually drink during your morning at school? (probe for brands)

8. What kinds of water and other beverages do other students drink during the morning at school?(probe for brands)

9. Where in the school do you and other students usually drink morning drinks (probe: classroom, hallway, front of school, gymnasium, cafeteria, other places,water fountain use)

10. Does your school have a policy about bringing beverages in the classrooms or carrying them with you at school? Please tell me about it.

11. Now, think about a typical school day AT LUNCHTIME, What is your off-campus policy? How many of you stay on the school grounds for lunch? How many go off school grounds at lunchtime?

12. AT LUNCHTIME, What do you usually have to drink? (specifically probe for water if it doesn't come up)

13. AT LUNCHTIME, What do other students have to drink? (specifically probe for water if it doesn't come up)

14. Where do you get the beverages you drink at lunchtime? (Probe: from home, vending, from school store, from local grocery store, local restaurant, water fountains, etc)

15. Where do other students get the beverages they drink at lunchtime? (Probe: from home, from school store, from local grocery store, local restaurant, water fountains, etc)

16. Where do you and other students drink the beverages you drink at lunchtime? (probe: hallway, front of school, gymnasium, cafeteria, different floors of the school, etc)

17. IN THE AFTERNOON AND AT SCHOOL AFTER CLASSES ARE OVER, What do you usually have to drink? (specifically probe for water if it doesn't come up)

18. IN THE AFTERNOON AND AT SCHOOL AFTER CLASSES ARE OVER, what do other students usually have to drink? (specifically probe for water if it doesn't come up)

19. Where do you get the beverages you drink at school in the afternoon after classes are over? (Probe: from home, from school store, from local grocery store, local restaurant, water fountains, vending, etc)

20. Where do other students get the beverages they drink at school in the afternoon after classes are over? (Probe: from home, from school store, from local grocery store, local restaurant, water fountains, vending, etc)

21. Where do you and other students drink the beverages you drink at school in the afternoon after classes are over? (probe: hallway, front of school, gymnasium, cafeteria, etc)

22. Are beverages provided for after school sports and activities? Please describe them.

23. Do you have any other comments you would like to make about beverages at school?

Appendix B: Codebook

Code	Description	Theme	Key words
SEF	Used when students talk about their confidence in their ability to make healthy beverage choices. "I can make healthy beverage choices."	Self efficacy, individual	"I can", "we can", "we do"
QUOTE	Used to capture direct student quotes of interest	Quote, varies	
POL	Used when students discuss a class or school rule or policy	Institutional Policies	Policy, Rule
NORM	Used when students make reference to "we", "lots of people", "most", or "everyone" doing or drinking something	Interpersonal	we, lots, most, , everyone
HOME	Used when students reference a beverage they bring from home	Interpersonal	family, parents, home
ACTIVITY	Used when students reference a behavior of a particular group or activity within the school	social network influence, interpersonal, community	sports, gym, after school, club
ATT	Used when students reference their attitudes about beverages	individual attitudes, individual	think, healthy, gross
PEER	Used when students reference PEER's attitudes about beverages	Interpersonal	friend, they
INFRA	Used when students reference preference of one place over another ON school grounds	infrastructure , institution	fountain, history, gym, cafeteria
PLACE	Used when students reference a physical place where students drink water and other beverages OFF school grounds	community /physical environment	76, safeway, starbucks
SYST	Used when students refer to local, state, or national policies that influence behaviors around beverage consumption	Systems	portion