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School Meals Experiment: Can a Taste Test Increase Vegetable Acceptance?

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Abstract: As of fall 2012, school food services have needed to provide vegetables in greater quantities and diversity to fulfill new USDA requirements for the National School Lunch Program (NSLP) and School Breakfast Program (SBP). This paper summarizes the results of a set of experiments conducted in four DC public schools that provided taste tests of new vegetables to NSLP participants. Using a basic difference-in-difference design, the results found that a simple taste test led to higher consumption among students of collard greens, and a more elaborate taste test that allowed students to vote on their favorite style of preparation led to higher consumption of sweet potatoes, a starchy vegetable that was surprisingly unpopular at the beginning of the year. The small numbers of schools included in the study limits the tests somewhat, but the positive and significant results suggest that exposing children to new vegetables, and especially giving them some ownership in how the vegetables are prepared, can lead to more children eating new vegetables.

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Introduction

Concerns about school meal quality have led many states and localities like the District of Columbia to implement new school food nutrition standards. In 2010, D.C. passed a law that required the use of locally produced fruits and vegetables and other changes, many of which were already underway under new leadership in the Office of Food and Nutrition Services (OFNS) of DC Public Schools (DCPS). Since the fall of 2010, the menus offered in DCPS have reflected new standards, including increases in the amount and diversity of vegetables offered.

DC school officials have many questions about how to improve student acceptance and consumption of the healthy foods that are now part of the meal. And the rest of the country now faces the same questions. In January of 2012, USDA issued new nutrition requirements, calling for more fruits and vegetables among other changes. The school food service community is concerned that the new standards will decrease school lunch participation and put additional strain on already-precarious operating budgets. Even if children take the meal, many fear they will not eat the healthier items resulting in more plate waste and higher costs.

This paper presents the results of a set of experiments conducted in DC elementary schools that investigated whether exposing children to new foods via taste tests can lead to greater acceptance of those foods. Two kinds of experiments were conducted, one in the fall of 2012 and the other in the winter of 2013, allowing us to also compare the effectiveness of different taste test approaches. In both kinds of taste tests, we tested the effect of providing a taste of two kinds of vegetables on their subsequent consumption by students. The vegetables tested were collard greens and sweet potatoes, and they were offered as part of the NSLP school lunch on different

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days. The fall and winter experiments were conducted in four elementary schools over all of the lunch periods, with two schools serving as control schools.

The results were surprising in many ways, but they generally showed that students will eat more of a given vegetable after trying it. The most surprising result was that the children in these schools love taste tests, even if they claim to not like the vegetable being offered. We had thought that the taste test itself would be a challenge and that many children would not want to participate. But that was not at all the case. Collard greens were fairly popular to begin with, but in the fall experiment, their consumption increased significantly more in the test schools than in the control schools. Consumption of sweet potatoes, which were unpopular at the beginning, did not increase in the fall experiment, but it did significantly increase in the winter experiment.

Background

Many states have implemented new school-based nutrition standards, and the District of Columbia is at the forefront of this movement. The D.C. Healthy Schools Act of May 2010 introduced many new requirements and supported new initiatives already underway by the DCPS's Office of Food and Nutrition Services. The Act provides additional funding for many of the new requirements, such as using locally produced fruits and vegetables, and it requires that all foods sold at school meet USDA HealthierUS Gold Level standards. Since the fall of 2010, the menus offered in DCPS have reflected these new standards, including increases in the amount and diversity of vegetables offered.

According to DC school food service officials, participation in school meals at DCPS dropped immediately following the reforms, but recovered in the spring of 2011. DCPS school food

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officials still have many questions about how to improve student acceptance and actual consumption of the healthy foods that are now part of the meal. While they are able to track whether or not students are choosing certain items, they are unable to assess which foods children actually consume.

The results of changes in DC school food operations can provide important lessons for the rest of the country as school districts prepare to meet new meal requirements set by USDA. In January of 2012, USDA issued new nutrition requirements, calling for more fruits, vegetables, and whole wheat grains among other changes (Federal Register, 2012). The new requirements are supported by new legislation in The Healthy, Hunger-Free Kids Act (S. 3307) of 2010. While these changes will improve the quality of meals served, the school food service community is concerned that school lunch participation will decrease and that already-precarious operating budgets will suffer. And, even if children take the meal, they fear children may not eat the healthier items resulting in more plate waste.

The DCPS Office of Food and Nutrition Services is leading the way by having completely revamped their school meal program. Findings from this research can help strengthen the program and show other districts whether taste tests are useful tools for getting children to try new foods and eat well.

Previous Literature

Recent studies have shown mixed results for the school meal programs' effects on children's health and obesity outcomes (Gundersen *et al.* 2012, Campbell *et al.* 2011, Millimet *et al*. 2009, Schanzenbach 2009, Gleason and Henley Dodd 2009, USDA 2007, Hofferth and Curtin 2005).

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Although results have been mixed, nutritionists and community advocates have long been concerned about the presence of less nutritious foods in and around the school meals programs (IOM 2007). Now that new laws and regulations that have been passed limiting the offerings of less healthy foods and increasing the offerings of vegetables, Federal and local policy makers are seeking additional ways in which to encourage consumption of vegetables and other healthy foods.

There is a growing body of research examining the effects of small interventions in school meal environments on children's consumption (Just and Price, 2011; Wansink, Just, and Payne, 2009). Many of these studies have found that small, unobtrusive changes can have surprisingly large impacts on children's behavior. The idea is that subtle changes to available choices, rather than directives to eat different foods, can encourage consumption changes that will be more enduring. This approach is based on an emerging body of research called behavioral economics which blends theories from the fields of psychology and economics to investigate the ways biases in perception and thought processes affect behavior (Just and Wansink 2009; Wansink 2006; Thaler and Sunstein 2008).

Recent work by Just and Price (2011) examined the effect of giving children small rewards for consuming fruits and vegetables as part of their school lunch. They conducted a field experiment in 15 elementary schools in Utah. They recorded the numbers of fruits and vegetables taken by each student and then also recorded the share that was consumed when the student took their tray to the trash can. The schools were divided randomly into 6 groups that received the rewards in different forms over different time periods. The reward for consuming a fruit or vegetable was a nickel, a quarter, or a raffle ticket for a prize, and the rewards were offered either right away or

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after two weeks. One of the groups received no reward, representing a control group. They found that providing a small reward increased the fraction of children eating a serving of fruits or vegetables by 27 percent. They also found that the larger and more immediate the reward, the bigger the response. Moreover, they found that the increased consumption of fruits and vegetables led to a large reduction in plate waste (40 percent reduction) and only required a small increase in their production.

In another recent set of experiments, Madden and colleagues at Utah State University have been measuring the effects of several behavioral strategies on student consumption of fruits and vegetables (Madden et al. 2011). They first conducted a short-term pilot experiment and are now conducting a longer one to test the longer-term incentivizing effects of different strategies. In the pilot, they tested the effects of repeated tastings of new foods, tangible incentives (a small toy), and role models. To test how role models might affect consumption, they used a set of videos developed in the U.K. by behavioral psychologists called "The Food Dudes." The videos show students of differing ages and gender describing their love of different vegetables, and they have been successful in influencing student consumption. The Food Dudes videos were used to explain that students will be rewarded for eating their fruits and vegetables. At the conclusion of the pilot experiment, the researchers found a 40 percent increase in the cups of fruit consumed and a 55 percent increase in the cups of vegetables consumed. Skin carotenoid scores, which are correlated with consumption of certain fruits and vegetables, also increased more than twofold.

A project in Minnesota public schools examined the effect of several behavioral economics strategies. The three strategies they examined were: 1) serving vegetables to students before they go through the cafeteria line; 2) serving larger portions of vegetables in the school meal; and

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3) sticking pictures of vegetables on the Styrofoam trays as a suggestion for what goes in each part of the subdivided tray before the students serve themselves. Test results of the effects on consumption of the third strategy, placing photographs of vegetables in trays, have been published (Reicks, 2012), but in a presentation at USDA ERS, the researchers shared all of the results (Vickers et al. 2011). All three strategies were successful at increasing consumption amounts.

In a study of salad bar configurations, Rozin et al. (2011) found that small changes in the accessibility of different foods on the salad bar affected consumption. Moving items to the back of the salad bar or using utensils that made foods slightly harder to serve led to small but significant decreases in the amounts consumed by adults.

In another study, Schwartz (2007) found that the share of children taking and eating fruit increased when cafeteria workers asked if the child wanted a fruit serving with their lunch. The study was conducted in only two schools, but the percentage of students that took a fruit serving was much larger in the school using the verbal prompt (90%) than in the control school that did not (60%). In both schools, about 80% of the students ate the fruit they had taken. Perry et al. (2004) found the same effect.

Research Design

This research uses a difference-in-difference approach to test the effect on consumption of offering taste tests to NSLP-participating students in four schools. Consumption is compared before and after the experiment in the treatment schools and before and after in similar control schools where the experiment was not conducted. The control-school observations capture any

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changes that happen over time that also occur in the treatment school. This approach assumes that, in the absence of an intervention, the treatment and control schools would exhibit parallel trends in consumption. We use Tobit models to estimate the treatment effects.

The four schools in this study are located in the Anacostia area of Washington, D.C. (figure 1) and their demographic characteristics are very similar (table 1). We are not aware of any events or changes in lunch policies that would have affected one school more than others. However, the data collection team did observe some important differences in the way teachers and school staff supervised the lunch periods that may have affected vegetable consumption. Those issues are discussed below.

To measure consumption, the team used a data collection tool called "V-Project", an iPhone application developed by Joseph Price of Brigham Young University for similar studies of school meal consumption. It allows data collectors to pre-program the app with the food items being served and then record the portion consumed as children dispose of their lunch trays or appetizer cups.

The experiments and data collection were conducted by a team from the School of Education, Teaching and Health at The American University. ERS researchers advised on the experiment's design and implementation.

May 2012 Pilot Experiment

In May 2012, the American University team conducted a pilot experiment in two Washington, D.C. schools, Watkins Elementary and Brent Elementary, both in the Capitol Hill area of DC. In

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the pilot, the team conducted the experiment in both schools (and there was no control school). The experiment was one of providing students with a taste of the vegetable that was being served that day, while the students waited in line for lunch. This was when we first learned of the tremendous popularity of giving out what we called "appetizers". Almost all of the students at both schools, on different days, eagerly ate the vegetable when it was offered as an "appetizer", but they were much less likely to eat it when it was part of the larger meal. Two vegetables were tested, green beans and broccoli, on separate days.

The team learned many lessons from the pilot, but the most important concerned the importance of having a reliable partner in the cafeteria. In DCPS cafeterias, there are three different vendors that serve meals to different subsets of schools. One large multinational vendor provides meals to the majority of schools, and two smaller vendors (one local and one national) provide meals to a smaller subset of schools each. In the pilot, the team worked closely with the large vendor, and despite having a very good working relationship with the manager in charge of menus, there were a couple of occasions in which the right vegetables did not arrive at the school on time for the experiment to be conducted properly. For the fall experiment, the team decided to switch to a set of schools that had a more reliable operation and one with whom the AU team leader had a good working relationship. The other advantage of the small vendor that was then selected was that they prepare meals from scratch, and the team felt that the meals they provided tasted better than the food the other vendor served.

Fall Experiment

Like the pilot, the fall experiment tested the effect on subsequent consumption of providing children with a taste of the vegetable on the menu that day while they wait in line for lunch.

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Providing a taste while students waited in line was intended to take advantage of children's immediate hunger when they enter the cafeteria. We were agnostic about how the appetizer would affect consumption of the vegetable that day (since students may not want more), but we expected average consumption of the vegetable to increase from the baseline consumption collected before the experiment to the next time the vegetable was served as part of the meal, when consumption data was collected a third time. This experiment was directly inspired by a similar experiment using carrots conducted by a team of University of Minnesota researchers and described above (Vickers et al. 2011).

In sum, the fall 2012 experiment tested the taste test effects on three measures of consumption: 1) consumption of the offered taste test, or "appetizer", for short; 2) consumption of the vegetable as part of the meal on the day the appetizer was offered; and 3) consumption of the same vegetable as part of the meal on a subsequent day, roughly a week later.

The experiments were conducted in four DCPS elementary schools over roughly four weeks, with two control schools in which the appetizers are not offered. The schools chosen are all very similar demographically (almost all students at each school are African American and eligible for free lunches), and they serve contiguous neighborhoods in Northeast DC, east of the Anacostia River. The schools served the same meals from the same vendor on each day. Two vegetables were tested on separate days for each one.

In phase one, the team collected a baseline measure of vegetable consumption in the first visit. A week later, the team offered the vegetable appetizer, measured its consumption and also measured the consumption of the vegetable portion of the meal. Then about fourteen days later, they measured consumption of the same vegetable as part of the meal, when no appetizer portion

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was offered. This process was done twice with two different vegetables, collard greens and sweet potatoes, so that the experiment would not rely too much on one vegetable's popularity or lack thereof. The two appetizers were done in the same week, two days apart.

Winter Experiment

The second set of experiments examined the effects on consumption of taste tests that the school food vendor was already doing to try to get students to eat new vegetables. When we met to discuss the fall experiment results with the vendor staff in January 2013, they told us that they had been doing a kind of taste test themselves once a month. They prepared a new vegetable in three different ways, and after lunch one day, they set up a table at which students could taste each of the three preparations and vote on which one they liked best. We decided that this would be an ideal test since it gave students some ownership of what would be served to them, and also because such a test would clearly help the school food vendor assess the effectiveness of a tool they were already using. The school food vendor eagerly supported the effort and they coordinated with our team to conduct two taste tests, one for sweet potatoes and one for collards, and to serve those vegetables several other times so that the team could collect baseline and follow-up data.

The team collected baseline data at two of the four schools, one treatment and one control school. These data were collected at only two schools because of difficulty in finding data collectors to fit the schedule. We hoped the baseline results would be consistent with the baseline results collected in the fall, and we thought, at worse, we could use the final results from the fall as the new baseline.

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Unlike in the fall experiment, there was no opportunity to measure consumption of the taste test offering itself, or of the consumption that day since the vegetable in question was not part of the meal. The plan was to collect consumption data for two follow-up days in which the vegetable would be prepared in the way that received the most student votes during the taste test. And to increase the "ownership" value of the test, the team displayed signs at the entrance to the cafeteria line in the treatment schools touting that the sweet potato or collards are prepared in the way for which most students voted (figure 2). The plan was to conduct two follow-ups.

The first taste test included three preparations of sweet potatoes: sweet potato fries, sweet potato puree, and roasted sweet potatoes. The sweet potatoes had been roasted in the fall experiment, and they were also roasted when new baseline consumption data were collected in early February (before the new taste test). The taste test was conducted simultaneously at two schools: Aiton Elementary and Nalle Elementary. We had not anticipated what happened next: at one school, sweet potato fries got the most votes, and at the other school, sweet potato puree got the most votes. Thus, instead of two follow-ups using the same preparation, the two days of post-test data collection were essentially one follow-up for each different preparation. On one follow-up day, sweet potato fries were served and our team measured their consumption, and on the second follow-up day, sweet potato puree was served, and our team measured their consumption.

With collards, the experiment was conducted at only one school due to staffing limitations. And unlike in the case of sweet potatoes, two follow-up days of consumption measurement were conducted.

Results

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This section discusses the results from each experiment in turn. For each, results are first presented for the shares of vegetables consumed and the share of students who consumed at least some of the vegetable. Then, we discuss the significance of the differences as measured in Tobit difference-in-difference models.

Results -- Fall Experiment

In the fall experiment, as noted above, the appetizers were very popular. Students were happy and eager to eat the vegetable being served, though they were a lot less likely to eat the food when it was part of the meal. Table 2 shows the mean differences in amounts of sweet potatoes and collards consumed when it was part of the taste test and when it was part of the lunch (over all times). In the treatment schools, the mean share of the appetizer servings that was consumed was 96 percent for collards but only 46 percent for collards in general when they were part of the lunch. Sweet potatoes were a lot less popular than collard greens, and the mean share of the appetizer servings that was consumed was 69 percent. Almost all students tried the collard greens appetizers (99 percent), and just over half of them (52 percent) ate at least some of the collard greens that were served as part of the lunch (averaged over the whole study). A much higher share of students tried at least some of the sweet potato appetizer (84 percent), while only 13 percent ever ate some of the sweet potatoes that were served as part of the lunch (averaged over the whole study).

For collard greens, there was some increase in consumption over the course of the experiment. At treatment schools, the shares of collard greens consumption increased from the baseline visit to the follow-up visit from 40 to 43 percent consumed, a small (insignificant?) change (table 3). Consumption of collard greens went down in control schools from the baseline to the follow-up

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day, from 46 to 39 percent consumed. Similarly, the share of students at treatment schools who consumed any collard greens increased from 44 to 49 percent from baseline to follow-up, while the share of students at control schools who ate any collard greens decline from 61 to 53 percent.

For sweet potatoes, shares of sweet potatoes consumed increased in control schools (from 6 to 11 percent) and decreased in treatment schools (from 10 to 5 percent) from the baseline day to the follow-up day, the exact opposite of what was expected (table 3). The preparation of the sweet potatoes could have been part of the issue since the school preparation did not feature added sugar, as may have been the case with home-prepared sweet potatoes. Thanksgiving occurred between the experiment day and the third day of data collection, so this could have depressed sweet potato consumption differently for different children (who may not have been equally distributed across the treatment and control schools). There was an increase in the share of sweet potatoes consumed from the baseline to the day of the appetizer test (from 10 to 13 percent) in the treatment school, but an even larger increase happened across these dates in the control schools (6 to 12 percent). The shares of students trying at least some sweet potatoes reflect the same trends.

Difference-in-difference estimates reveal a significant increase in consumption of at least some collard greens as part of the meal both on the day of the experiment and 14 days later in the treated schools (table 4). The team had not anticipated that the experiment would have an impact 14 days later, and the original intention was to conduct the follow-up data collection a week later. But because the Thanksgiving break occurred between the experiment day and the follow-up day of data collection, the test became instead one of whether the experiment would have an effect 14 days later. It is especially strong evidence that an effect of the taste test was found after

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two weeks. However, the decrease of sweet potato consumption in the treatment school was statistically significant as well, the opposite of what was found for collard greens. Does this mean that students can come to dislike a food if exposed to it too much? Or was it the preparation that caused the decrease? In the winter experiment, the opportunity to test for the effects of preparation on consumption was especially welcome given these results.

Results -- Winter Experiment

The winter experiment tested the effects of providing students with a taste test in which the vegetables were prepared in three different ways. After tasting, the students were asked to vote for their favorite. The favorite preparation type is then offered on the menu on a subsequent day. This is a test that the school food vendor was already doing, and they were happy to tailor it to sweet potatoes and collards in order to see if it was having a measurable impact on consumption.

First, as mentioned above, baseline data were collected at only two schools, one control and one treatment (Aiton was the treatment, CW Harris was the control). The team had been concerned about the fact that only two of the four schools would be providing the baseline data. But rather surprisingly, the new baseline data conducted match up almost perfectly with the last data collected in the fall for sweet potatoes, and the match was almost the same for collard greens in control schools. But the new baseline was lower for collards in treatment schools compared to consumption levels last seen in the fall experiment (tables 3 and 5).

In this test, consumption increased from before the test to after the test in both treatment and control schools and for both sweet potatoes and collards (table 5).

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Sweet potato consumption did increase significantly more in the treatment schools than in control schools, and slightly more so for schools serving sweet potato fries (table 6). However, for collard greens, consumption did not increase in the treatment schools more so than in the control schools as shown by the lack of statistical significance in the Tobit difference-in-difference model.

Caveats

A big caveat is that we have a very small sample size. The team plans to expand the sample of schools included and continue to test the effects of taste tests as well as the effects of signage.

We cannot rule out the potential for Hawthorne effects, which in this case means that students may well have chosen to eat more of a given vegetable because they knew that the data collector were measuring their consumption.

As an example of some of the larger complexities of trying to run a controlled experiment in a school setting, is that in at least one school while data collection was going on, school staff encouraged the students on a microphone to eat their collard greens, and they also seemed to give the students more time that usual to eat all of their lunch. As a result of both, a large number of students ate all of their greens that day. This happened to be a control school on the first follow-up day in the winter experiment. This is just one example of anomalies of which the team was aware, and these kinds of things can disproportionately affect the results given the small sample of schools.

Conclusions

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Many nutritionists say that students need to be exposed up to ten or so times to a new food before they will be willing to eat it. If that is the case, then the taste tests conducted this year with sweet potatoes and collards have been unusually successful. In the fall experiment, the simple taste test used led to a significant increase in collard greens consumption, and in the winter experiment, the more elaborate taste test led to a significant increase in sweet potato consumption. Over the course of the year, many more students—roughly double—ate at least some of the sweet potatoes on the last day of the winter experiment than they had in the first day of the fall experiment.

The next step is to expand the test to a larger sample of schools. That should help us further understand the potential for using taste tests in schools to encourage students to consume more of the new vegetables that schools will be required to serve across the country.

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Figure 1: Mapped Locations of the Four Elementary Schools in Study

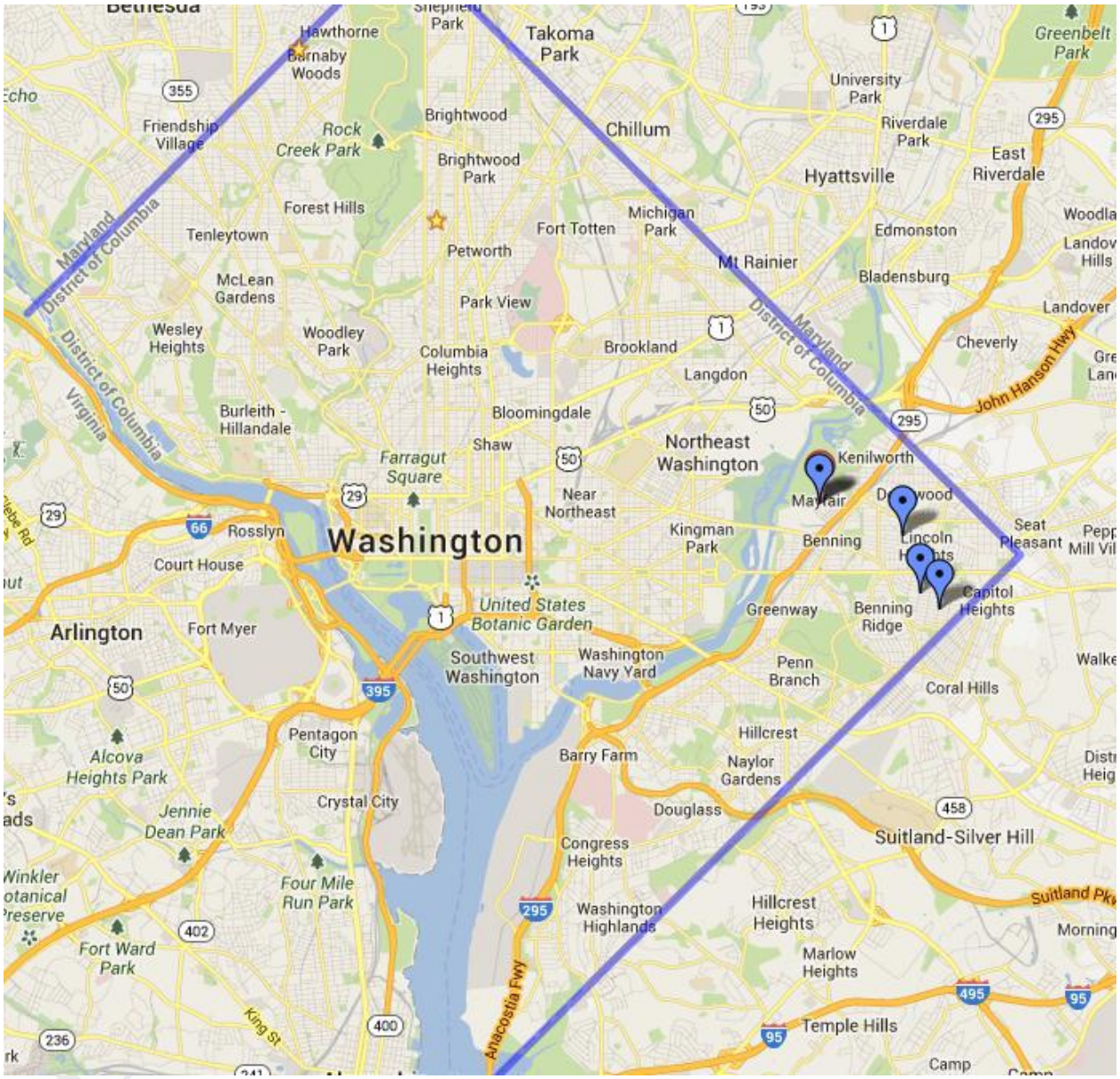

Figure 2: Sign Used on Follow-up Day for Sweet Potato Fries to Encourage Consumption

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Table 1. Demographic Characteristics of the Four Elementary Schools in the Fall and Winter Experiments

Schools	Aiton	CW Harris	Nalle	Thomas
Black	100%	99%	94%	97%
Hispanic	0%	1%	6%	1%
White	0%	0%	0%	1%
Multiple races	0%	0%	0%	1%
Free/RP	99%	99%	99%	99%
Special needs	11%	21%	7%	20%
Enrollment	252	265	335	312

Table 2. Fall Experiment: Shares of Servings Consumed and Shares of Students who Consumed Any of Appetizers and Vegetables in Lunch

		Shares of Serving Consumed			
		Collards		Sweet Potatoes	
		Appetizer	Part of Meal	Appetizer	Part of Meal
Control					
	Share	NA	0.42	NA	0.11
	N		801		728
Treatment					
	Share	0.96	0.46	0.69	0.09
	N	285	1212	251	1176
		Shares of Students Who Consumed Any			
		Collards		Sweet Potatoes	
		Appetizer	Part of Meal	Appetizer	Part of Meal
Control					
	Share	NA	0.55	NA	0.16
	N		801		728
Treatment					
	Share	0.99	0.52	0.84	0.13
	N	285	1212	251	1176

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Table 3. Fall Experiment: Shares of Servings Consumed and Shares of Students Who Consumed Any of the Vegetable Serving

		Shares of Vegetables Consumed					
		Collards			Sweet Potatoes		
		Baseline	Same Day as Test	Follow-up	Baseline	Same Day as Test	Follow-up
Control							
	Share	0.46	0.40	0.39	0.06	0.12	0.11
	N	247	277	277	119	286	323
Treatment							
	Share	0.40	0.54	0.43	0.10	0.13	0.05
	N	369	413	430	338	372	466
		Shares of Students who Consumed Any Vegetable					
		Collards			Sweet Potatoes		
		Baseline	Same Day as Test	Follow-up	Baseline	Same Day as Test	Follow-up
Control							
	Share	0.61	0.52	0.53	0.08	0.17	0.17
	N	247	277	277	119	286	323
Treatment							
	Share	0.44	0.62	0.49	0.14	0.19	0.07
	N	369	413	430	338	372	466

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Table 4: Tobit Estimated Marginal Effects of Fall Experiment on Consumption of Sweet Potatoes and Collard Greens

	Consumption off the Tray			
	(1)	(2)	(3)	(4)
	Both Vegetables	Both Vegetables	Sweet Potatoes	Collard Greens
Girl	-0.0261*	-0.0267**	0.00829	-0.0585***
	(-2.57)	(-2.61)	(0.53)	(-3.76)
Day of Experiment, t1	-0.00921	-0.00510	0.0903*	-0.0507
	(-0.44)	(-0.24)	(2.21)	(-1.68)
Treatment Effect, t1	0.0987***	0.0931***	-0.0249	0.166***
	(3.75)	(3.51)	(-0.53)	(4.23)
Week After Experiment, t2	-0.0129	-0.00690	0.0899*	-0.0559
	(-0.63)	(-0.33)	(2.23)	(-1.85)
Treatment Effect, t2	-0.00705	-0.0132	-0.187***	0.0860*
	(-0.27)	(-0.49)	(-3.83)	(2.19)
Collard Greens	0.289***	0.293***		
	(24.83)	(24.96)		
Aiton	-0.0640**			
	(-2.90)			
Nalle	0.0381			
	(1.74)			
Harris	0.0447**			
	(2.77)			
Treatment Schools		-0.0297	0.0713	-0.0783**
		(-1.48)	(1.76)	(-2.74)
N	3917	3917	1904	2013

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Table 5.Winter Experiment: Shares of Servings Consumed and Shares of Students who Consumed Any of the Vegetable Serving

		Shares of Vegetable Servings Consumed						
		Collards			Sweet Potatoes			
		Baseline	1st Followup	2nd Followup	Baseline	1st Followup (Puree)	1st Followup (Fries)	1st Followup Combined
Control								
	Share	0.42	0.42	0.58	0.10	0.12	0.14	0.13
	N	136	158	141	135	319	333	652
Treatment								
	Share	0.23	0.25	0.38	0.05	0.16	0.23	0.19
	N	118	119	126	168	310	315	625
		Shares of Students who Consumed Any Vegetable						
		Collards			Sweet Potatoes			
		Baseline	1st Followup	2nd Followup	Baseline	1st Followup (Puree)	1st Followup (Fries)	1st Followup Combined
Control								
	Share	0.53	0.60	0.67	0.16	0.19	0.22	0.21
	N	136	158	141	135	319	333	652
Treatment								
	Share	0.36	0.34	0.51	0.08	0.27	0.33	0.30
	N	118	119	126	168	310	315	625

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Table 6: Tobit Estimated Marginal Effects of Winter Experiment on Consumption of Sweet Potatoes and Collard Greens

	Shares of Vegetable Consumption		
	Both Vegetables	Sweet Potatoes	Collard Greens
First follow up day	-0.00232	0.0309	0.0178
	(-0.11)	(0.98)	-0.49
Treatment effect, 1st follow up	0.129***	0.127**	-0.0171
	-4.28	(2.78)	(-0.30)
Second follow up day	0.102***	0.0539	0.104**
	-3.68	(1.73)	2.82
Treatment effect, 2nd follow up (CG)	0.00521	0.147**	0.0126
(first follow up for SP fries)	-0.13	(3.26)	0.23
Treatment schools	-0.102***	-0.0797*	-0.140***
	(-3.91)	(-2.01)	(-3.42)
Sweet potato fries	0.0496**		
	-3.04		
Collard greens	0.196***		
	-11.9		
N	2378	1580	798

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