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Middle School Student Perceptions of School Lunch Following Revised Federal School Meal Guidelines

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ABSTRACT

Purpose
This study assessed student perceptions of school meals under the new federal meal patterns for the National School Lunch Program (NSLP). Student feedback is instrumental in developing strategies to increase and maintain NSLP participation, satisfaction, and ultimately provide students with a healthy meal.

Methods
Anonymous questionnaires were completed by 1,867 6th to 8th grade students in the Houston, Texas area during Spring 2013. Analysis of variance was used to assess whether student perceptions about school meals, fruit/vegetables/whole grain consumption, and staff attentiveness varied by grade level, gender, school free/reduced price (FRP) meal eligibility, or frequency of eating school lunch. The top five reasons why participants choose to eat school lunch were also assessed.

Results
Sixth graders ($p < .001$) reported greater satisfaction with the NSLP meal than other grades, while students from schools with higher FRP eligibility reported less satisfaction ($p < .001$) than other schools. Sixth graders ($p < .001$), as well as boys ($p = .015$), were more likely to report selecting and consuming fruits, vegetables, and whole grains. Students from schools with higher FRP eligibility ($p < .001$) and students who reported eating school lunch more frequently ($p < .001$) were more satisfied with staff attentiveness. The most popular reason for eating school lunch was "I am hungry". The least popular reasons for participating in the NSLP were "I get a balanced meal", and "It prepares me for after school activities".

Applications to Child Nutrition Professionals
This study documents that satisfying all students receiving NSLP meals is multifaceted. Findings suggest the need for schools to engage students in ongoing evaluations of school meals, and to respond to identified concerns.

Keywords: schools, nutrition, USDA, health, lunch

INTRODUCTION

The National School Lunch Program (NSLP) has a major influence on the diet quality of American school children. Most American children attend school 180 days per year for six or more hours a day from ages 5-18 years. No other institution has as much continuous and intensive contact with children during their first two decades of life (Peterson & Fox, 2007). Thus, school meals have the ability to impact the nutritional quality of children's diets.

The most recent federal requirements mandated by the 2010 Healthy, Hunger Free Kids Act, align school meals with the 2010 U.S. Dietary Guidelines (Byker, Pinard, Yaroch, & Serrano, 2013). The new meal patterns increased the availability of fruits, vegetables (including different subgroups), and whole grains in meals served to students, and included minimum and maximum calorie ranges. Additionally, schools are only able to serve skim/low-fat milk and there are guidelines for saturated fat, trans fat, whole grain rich foods, and sodium content of meals (U. S. Department of Agriculture [USDA], 2012). School food authorities must offer five meal components daily: fruits, vegetables, grains, meat/meat alternatives, and milk.

One challenge school nutrition programs face is the gradual decline of school lunch participation in high schools (Gilmore, Hutchinson, & Brown, 2000). Previous research revealed that this decline in school lunch participation begins during middle school years (McConnell, Matta, & Shaw, 1997). School nutrition professionals need to continuously investigate the perceptions, wants, and needs of middle school students so they can please these customers, maintain student participation into high school, and ultimately provide a nutritious meal (Roseman & Niblock, 2006). It is also important for schools to assess student perceptions of meals to ensure that the students consume and not waste foods.

In previous research, girls reported higher satisfaction with school meals compared to boys (Meyer, 2000a). Girls also reported a greater preference for fruits and vegetables than boys (Cullen, 2005). Students who consumed school lunch more frequently reported greater satisfaction with the school lunch program itself (Meyer, 1998; Meyer, 2005). In addition, satisfaction ratings for school meals differed by grade level with students in sixth grade reporting greater satisfaction than students in grades seven and eight (Meyer, 2000b).

Middle school students reported that the top five reasons they chose to eat school lunch were hunger, getting to sit with friends, not bringing anything else to eat, gaining energy for the rest of the day, and having no other choice (Castillo & Lofton, 2012). The same study found that student satisfaction with their school lunch experience could be attributed to two main factors: food preference and staff attentiveness. Food preference includes appearance, quality, aroma, variety, and freshness of the food served. Questions on staff attentiveness represented the interaction of cafeteria staff with the students, including friendliness, attitude at work, and listening to the students (Castillo & Lofton, 2012).

The purpose of the study was to investigate perceptions of 6th to 8th grade students regarding different aspects of school lunch after the new USDA meal patterns were implemented in the fall of 2012. Finally, the top reasons that students choose to eat school meals were assessed.

METHODOLOGY

The Institutional Review Boards at Baylor College of Medicine and Texas Woman's University approved this study. No consent forms were needed because the questionnaires were anonymous.

Sample

The study group consisted of sixth, seventh, and eighth grade students attending one of four middle schools in the Houston, Texas area. The school district had 37,000 students [21% Hispanic, 10% African-American, 10% Asian, 59% White, 26% eligible for free/reduced price meals (FRP)], and 10 middle schools (grades 6-8). The Child Nutrition Director selected the schools based on eligibility for FRP meals in the district: two low-income (~39% FRP) and two middle-income (~23% FRP) intermediate schools. Demographic data collected included grade level and gender. Additionally, the adolescents were asked to report how many times per week that they ate school lunch.

Instrument

The questionnaire used to collect the data was specifically designed for middle school students and adapted from a previously validated customer service questionnaire (Castillo & Lofton, 2012). Statements on the questionnaire referred to satisfaction with the school meal (taste, appearance, freshness, choices, cooking method, portion size, and time to eat), consumption of fruits/vegetables/whole grains, and general atmosphere of the cafeteria. The statements were grouped into three separate scales; response options were 4= agree a lot, 3= agree a little, 2= disagree a little, and 1=disagree a lot. The meal perceptions scale included seven items that asked opinions on taste, appearance, freshness, choices, cooking method, portion size, and time to eat. Internal consistency was 0.84. There were four statements for the fruits/vegetables/whole grains consumption scale. Sample items included "I select 2 servings of vegetables for my lunch." Internal consistency was 0.77. The two-item staff attentiveness scale had an internal consistency score of 0.81. The statements queried student opinions about whether staff members listen and smile/talk to students. Students were then asked to check the top five reasons they consumed the school lunch meal. The students could choose from a list of fourteen statements/reasons.

Data Collection

The study's research team visited each of the four schools on one day during the spring of 2013. Questionnaires and pencils were made available on tables during lunch, and students were asked to leave completed questionnaires on the tables.

Data Analyses

For each of the three scales, responses of each student were summed. The average of all the students' summed responses in that category was then calculated and presented in the results, along with the range for each scale. Higher scores indicate more agreement or satisfaction with the each statement; lower scores denote disagreement with the particular aspect of the school meal or cafeteria.

Analysis of variance (ANOVA) was used to test the relationship between the student responses to the statements in the three scales by gender, grade level, FRP school status, and frequency of eating school lunch. Least significant difference post hoc analyses were conducted to determine significant differences if needed. The significance level was set at $P < 0.05$. The responses for reasons students consumed the school lunch meal were summed and percentages calculated. The data were analyzed using the Statistical Package for the Social Sciences software for windows (IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY: IBM Corp.).

RESULTS AND DISCUSSION

Approximately 51% of the total number of students in the schools completed the questionnaires (n=1,867). Similar percentage of 6th, 7th, and 8th grade students, slightly more females (52%) than males (43.3%), and more students who ate school lunch 4-5 days per week participated (Table 1).

Table 1. ***Demographic Characteristics of 6th to 8th Grade Participants***[1]

	n	%
Gender		
Male	808	43.3
Female	970	52.0
Missing	89	4.8
Grade		
6th	664	35.6
7th	562	30.1
8th	567	30.4
Missing	74	4.0
Weekly Participation in NSLP		
4-5 days per week	1,233	66.0
3 or less days per week	546	29.2
Missing	88	4.7
School FRP Meal Eligibility		
Low	962	51.5
High	905	48.5

[1] **N** = 1,867

Meal Perceptions Scale

Significant grade level differences were found for the meal perceptions scale (Table 2). Sixth graders reported more agreement with statements indicating satisfaction with meals than the other two grades ($p < .001$). Seventh graders reported higher satisfaction with meals than eighth graders ($p < .001$). This result agrees with research prior to meal revisions that indicated sixth graders were more satisfied with school lunch (Meyer, 2000a). Perhaps younger students have not yet become tired of school foods and cafeteria atmosphere.

Significant differences were found for meal perceptions by FRP eligibility status. Students attending the schools with higher rates of FRP eligible students reported less satisfaction with meals ($p <. 001$). In contrast to our finding, a separate study in a low-income district conducted after implementation of the new revisions revealed overall consumption of the school meal increased significantly, suggesting satisfaction with the meal (Cohen, Richardson, Parker, Catalano, & Rimm, 2014). However, the rate of FRP eligibility reported in the previous study was considerably higher at 85%, thus may be more reflective of the lower income student population than the present study. Foodservice employees in schools with high percentage of FRP eligible students should ensure that quality, presentation, and visual appeal set by the district procedures are comparable to other schools in the district.

Table 2. ***Middle School Students' Perceptions of Satisfaction with School Lunch Meals, Fruit/Vegetable/Whole Grain Consumption, and Staff Attentiveness***

Satisfaction with School Lunch Meals

Variable		Sample size	Scale score[§]	*SD*	Range of scores	*p*-value
Gender	Boy	749	22.62	6.57	9-36	
	Girl	888	22.19	6.01	9-36	0.177
	Total	1,637	22.39	6.28	9-36	
Grade level	6th	614	24.44	6.27	9-36	
	7th	512	21.84	6.06	9-36	<0.001*
	8th	522	20.48	5.78	9-36	
	Total	1,648	22.38	6.28	9-36	
FRP eligibility	Low	910	23.31	5.87	9-36	
	High	798	21.12	6.60	9-36	<0.001*
	Total	1,708	22.29	6.31	9-36	
Weekly participation in NSLP						
4-5 times per week		1,147	22.55	6.26	9-36	
3 or less times per week		490	21.98	6.26	9-36	0.095
Total		1,637	22.38	6.26	9-36	

Fruits, Vegetables, Whole Grain Consumption

Variable		Sample size	Scale score[§]	*SD*	Range of scores	*p*-value
Gender	Boy	772	8.28	3.12	4-16	
	Girl	939	7.92	3.09	4-16	0.015*
	Total	1,711	8.08	3.11	4-16	
Grade level	6th	638	8.67	3.04	4-16	
	7th	541	7.98	3.12	4-16	<0.001*
	8th	546	7.45	3.07	4-16	
	Total	1,725	8.07	3.11	4-16	
FRP eligibility	Low	936	8.11	3.13	4-16	
	High	854	8.00	3.10	4-16	0.456
	Total	1,790	8.06	3.12	4-16	
Weekly participation in NSLP						
4-5 times per week		1,191	8.05	3.12	4-16	
3 or less times per week		523	8.11	3.06	4-16	0.713
Total		1,714	8.07	3.10	4-16	

Staff Attentiveness

Variable		Sample size	Scale score[§]	*SD*	Range of scores	*p*-value
Gender	Boy	796	4.90	2.13	2-8	
	Girl	957	4.84	2.12	2-8	0.549
	Total	1,753	4.87	2.12	2-8	

Grade level	6th	650	4.93	2.06	2-8	
	7th	555	4.75	2.13	2-8	0.335
	8th	563	4.84	2.17	2-8	
	Total	1,768	4.85	2.12	2-8	
FRP eligibility	Low	951	4.50	1.99	2-8	
	High	889	5.18	2.19	2-8	<0.001*
	Total	1,840	4.83	2.12	2-8	
Weekly participation in NSLP						
4-5 times per week		1,218	4.98	2.12	2-8	
3 or less times per week		537	4.57	2.08	2-8	<0.001*
	Total	1,755	4.86	2.12	2-8	

*Indicates significant finding. $p < 0.05$

§Agree a lot -4, agree a little-3, disagree a little-2, disagree a lot-1

Note: Number of total participants vary throughout the table due to some missing responses on the student questionnaires.

There were no significant differences by gender ($p = .177$) or for those students with high frequency of eating school lunch each week ($p = .095$) in the meal perceptions scale.

Fruit, Vegetable, and Whole Grain Consumption Scale

Significant gender differences were found for the fruit, vegetable, and whole grain consumption scale (Table 2). Boys had significantly higher scores regarding selecting and consuming fruits, vegetables, and whole grains than girls, indicating more agreement with the provided statements ($p = .015$). In contrast to this finding, a study conducted prior to the revised meal patterns revealed that girls reported a greater preference for fruits and vegetables than boys (Meyer, 2000a). Nonetheless, adolescent boys ages 9-13 years of age generally require approximately 200 to 400 additional calories per day than adolescent girls of the same age and activity level (USDA & U.S. Department of Health & Human Services, 2010). The added calorie requirement of boys may increase hunger and thus lead to greater consumption of the school lunch meal. Research supports this greater caloric consumption. One study found that on average, boys consume an additional 155 calories from the lunch meal than girls (Martin et al., 2007).

Sixth grade students were also more likely to agree with statements regarding selecting and consuming fruits, vegetables, and whole grains than seventh grade ($p < .001$) or eighth grade students ($p < .001$). Seventh grade students reported more agreement with the statements than eighth graders ($p = .004$). This is similar to other research findings as well (Meyer, 2000a; Cullen, Thompson, Watson, & Nicklas, 2005).

There was no significant difference for the fruit, vegetable and whole-grain consumption scale by FRP eligibility of the schools ($p = .456$) or for those students who consumed school lunch more frequently throughout the week (4-5 times) ($p = .713$).

Staff attentiveness scale

Students in schools with higher percentages of FRP eligibility were more satisfied with staff attentiveness ($p < .001$) (Table 2). It is important to note that in 2012-2013 an average of 70 % of NSLP meals were served to students in the free or reduced price meal category (USDA,

2014). These FRP-eligible students may eat school lunch more frequently throughout the week and may develop positive relationships with the staff because of this frequent contact.
The students who consumed school lunch more frequently throughout the week (4-5 times) agreed significantly more with statements regarding satisfaction with staff attentiveness than students who ate school meals three times or less per week (p <.001). This may be related to increased contact/familiarity with the food service staff leading to more positive interactions.

There were no significant gender (p = .549) or grade level differences for the staff attentiveness scale (p = .335).

Table 3. ***Reasons Students Reported Choosing to Eat School Lunch***

Rank	Reason	% Total[1]	n
1	I am hungry	18	1,559
2	I didn't bring anything to eat	14	1,173
3	It's convenient	10	851
3	I have no choice	10	840
4	I can afford it	8	696
4	I like the food	8	693
5	It fits my schedule	6	503
6	My friends eat school lunches	5	442
7	My parents/I pay in advance	5	435
8	I like the variety of menu items	4	368
9	I know what is being served	4	342
10	I get to try different foods	4	316
11	It prepares me for after school activities	3	235
12	I get a balanced meal	3	231

[1]Percent of students selecting statement as one of the five top reasons
n = number of students that selected this choice as one of their five top reasons

Reasons for Eating School Lunch

The most common reasons that students chose for eating school lunch were "I am hungry" (18% of total), followed by "I didn't bring anything to eat" (14%), "It's convenient" (10%), and "I have no choice" (10%) (Table 3). The next popular statements were, "I can afford it" and "I like the food" (both 8%), while "It fits my schedule" was the top fifth choice (6%). School nutrition professionals should respond to comments to maintain student participation and potentially even increase school lunch participation by reaching out to students. Notably, nearly 32 % of the students chose one of their top responses as having no choice/no other food, or affordability ("I didn't bring anything to eat", "I have no choice", and "I can afford it"). These comments reflect the home situation of a large majority of FRP eligible students participating in the NSLP. Nonetheless, regular priced students may have no choice as well due to a parent decision to solely utilize NSLP meals.

CONCLUSIONS AND APPLICATION

Although previous research examined the perceptions and satisfaction of students participating in the NSLP, there is limited research regarding students' perceptions following implementation of the revised school meal patterns in 2012-2013. This study found differences in perceptions of school lunch regarding meal perceptions, fruit/vegetable/whole grain selection, and staff attentiveness by gender, grade level, FRP eligibility of the school, and frequency of eating school lunch. These findings suggest that NSLP meals should be planned reflecting student diversity and preferences.

Results from the present study indicate that students report hunger, no other options, and convenience as the most common reasons for eating school lunch. As school menus include more fruit, vegetables, and whole grains, a common concern regarding the new meal patterns is that children may simply opt out of purchasing lunch from the cafeteria. Alternatives to this would be bringing food from home or other sources outside of the NSLP. Meals brought from home provide fewer fruits and vegetables, and rarely meet all of the NSLP standards (Hur, Burgess-Champoux, & Reicks, 2011; Hubbard, Must, Eliasziw, Folta, & Goldberg, 2014; Caruso et al., 2015). Accordingly, including student taste testing of foods and menu planning may influence food preferences and improve participation of students who are accustomed to the fast paced American lifestyle.

Similarly, school nutrition programs may benefit from incorporating meal programs and menus that emphasize customization of the meal and allowing students to make independent decisions about their lunch, while continuing to meet USDA guidelines. This may help maintain student participation and satisfaction for older students who may tire of the school lunch program throughout their middle school years. Nevertheless, other post-meal revision research suggests that older students may have a more difficult time acclimating to changes in school meals than younger students (Golembiewski et al., 2015). This is consistent with the present study, which revealed that eighth graders were the least satisfied compared to other grades in regards to satisfaction with various aspects of the meal, and selecting/consuming fruits, vegetables, and whole grains after the meal revisions. Consequently, districts may need to specifically modify marketing strategies to target these different grade levels.

Boys were more likely than girls and sixth graders more likely than any other grade to agree with statements about selecting and consuming fruits, vegetables, and whole grains. Schools should ensure that fruits and vegetables look visually appealing and offer variety. Middle schools may also want to incorporate a salad bar, as this has been shown to increase vegetable consumption in past research (Gosliner, 2014). To spark interest in new food items, schools could also consider involving students in marketing methods such as handing out free samples of new fruits/vegetables. For instance, having older students volunteer to hand out free samples during sixth and seventh grade lunch hour may in fact interest these older students to learn about and select these food items themselves. Providing fun nutrition tips next to fruits, vegetables, and/or whole grain items may also increase nutrition awareness and knowledge.

Some limitations must be acknowledged. The questionnaire was not pretested with students prior to use. Generalizability of the findings is limited because the study was conducted in four

schools in one school district in southeast Texas. Future studies should include school districts with more diverse student populations.

In order to maximize the health benefits of the new meal patterns, researchers and school professionals should conduct ongoing student satisfaction research. Depending on staff time/availability, forming student advisory groups and conducting focus groups with students may help nutrition professionals enhance meal programs, identify strategies to increase participation, and improve consumption of school lunch. Ultimately, increasing consumption of school lunch may enrich the overall health status of students.

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