

Is Healthy Happy?

The Affective Impact of the Renton Menu Labeling Project in an Adolescent Population

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**Abstract**

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The Affective Impact of the Renton Menu Labeling Project in an Adolescent Population

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**Purpose:** To determine if enjoyment of cafeteria meals varies by sex, grade-level, school-level socioeconomic status (SES) and reported use of nutrition information in restaurants.

**Methods:** This is a cross-sectional study using data from cafeteria surveys and focus groups conducted in six secondary schools as part of the Renton Menu Labeling Project. The survey and focus groups assessed exposure to the healthy choice symbol, its impact on enjoyment of cafeteria meals, and use of restaurant nutrition information. Rates of noticing the symbol and enjoyment were compared with two sample *t* tests. Logistic regression analysis was used to predict the effect of the symbol on enjoyment. Focus group sessions were audio-taped, transcribed and coded.

**Results:** Of the 81.3% of survey respondents who noticed the symbol, 15.2% of students reported that the symbol decreased their enjoyment of cafeteria meals. The symbol decreased enjoyment more among boys, middle school students and students who use restaurant nutrition information. Male sex (OR = 1.6; 95% CI = 1.2-2.3;  $p = 0.004$ ), middle school age (OR = 1.6; 95% CI = 1.1-2.3;  $p = 0.015$ ) and use of restaurant nutrition information (OR = 1.4; 95% CI = 1.1-2.0;  $p = 0.038$ ) were significant predictors of decreased enjoyment. Focus group participants were confused by the term enjoyment. Students observed the symbol did not generally impact enjoyment, but stated its potential to have a positive or negative effect depending on the student.

**Conclusions:** This method of menu labeling is unlikely to negatively impact students' enjoyment of school meals, but it has the potential to affect some groups of adolescents. Future research should compare the affective impact of different types of menu labeling, specifically calorie labeling, among adolescents using an assessment tool more specific than questions about 'enjoyment'.

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## **Introduction**

### **Literature Review – Disordered Eating Among Adolescents**

The increase of obesity among children and adolescents in the U.S. is a considerable public health concern given the well-established link between obesity and metabolic and cardiovascular diseases. Along with the increase in obesity, studies have noted an increase in disordered eating among youth. Disordered eating includes a wide range of abnormal eating behaviors such as those seen in eating disorders, chronic restrained eating, compulsive eating and habitual dieting [1]. This body of research is relevant to the purpose of this project, to investigate the affective impact of menu labeling in middle and high school cafeterias [2].

From 1999 to 2011, the prevalence of obesity<sup>1</sup> among high school students nationwide rose from 10.6% to 13%, and the prevalence of overweight rose from 14.2% to 15.2% [3]. Simultaneously, there has been an analogous increase in the prevalence of dysfunctional eating practices among youth, including eating disorders (e.g., anorexia nervosa, bulimia nervosa, binge eating disorder, eating disorder not otherwise specified) and unhealthy weight loss behaviors (e.g., diet pills, laxatives, diuretics, self-induced vomiting, skipping meals), that has gone largely unnoticed [4]. Dieting to lose weight has reached epidemic proportions among adolescents. Overall trends measured by the Center for Disease Control and Prevention's National Youth Risk Behavior Survey indicate that 46% of high school students nationwide are currently trying to lose weight, up from 41.8% in 1991 [3]. Some of these students reported using extreme weight control practices to lose or keep from gaining weight. During the 30 days before the survey, 12.2% of students had not eaten for 24 or more hours, 5.1% of students had taken diet pills, powders or liquids and 4.3% of students had vomited or taken laxatives [3].

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<sup>1</sup> Obese was defined as a body mass index (kg/m<sup>2</sup>) (BMI) of  $\geq 95^{\text{th}}$  percentile for age and sex. Overweight was defined as a BMI of  $\geq 85^{\text{th}}$  percentile and  $< 95^{\text{th}}$  percentile for age and sex.

A population-based longitudinal study, Project EAT (Eating Among Teens), found that half of all girls surveyed reported dieting in the past year as compared to about a fourth of boys [5]. More alarming, this study found that adolescents who engage in dieting and disordered eating behaviors are at increased risk for these same behaviors 10 years later. Of particular concern, a large increase in extreme weight control behaviors among youth transitioning from adolescence to young adulthood was noted, suggesting that adolescence is a critical time to prevent unhealthy weight control behaviors that persist into adulthood. Despite the high prevalence of weight control behaviors during adolescence, current evidence suggests that dieting for weight gain prevention is ineffective and associated with harmful consequences.

Dieting and other disordered eating behaviors have been established as important risk factors for a number of problematic outcomes, including eating disorders [6, 7], poor diet quality [8, 9], and weight gain and obesity [10-12]. For example, further data from Project EAT reveal that adolescent girls using unhealthy weight control behaviors are less likely to meet the dietary recommendations for fruits, vegetables, grains and micronutrients (including calcium, iron, vitamin C and B-6, folate and zinc) than girls using no weight control behaviors or only healthful behaviors [9]. Despite trying to lose weight, results from this same longitudinal study also suggest that adolescents engaging in dieting and unhealthy weight control behaviors are at two to three times greater risk for being overweight five years later, compared to adolescents who do not use these behaviors [10]. A number of other studies [11, 13, 14], but not all [15], corroborate these findings that dieting predicts weight gain among adolescents. Additionally, dieters tend to have a negative relationship with food as evidenced by the research finding that dieters associate significantly more fear and guilt with food than non-dieters [16]. Disordered eating among

adolescents is a less well-known public health concern but warrants increasing consideration in light of widespread efforts to combat obesity.

Disordered eating and obesity are not mutually exclusive. Specifically, obesity, eating disorders, and unhealthy weight loss practices can occur simultaneously such that individuals may “cross-over” from one eating problem to another. In light of these coexisting public health problems, experts have called for an integrated approach to the prevention of eating and weight disorders and the spectrum of resultant health problems [4]. For example, the body image messages for individuals with these two conditions are often contradictory with potentially harmful implications [4]. An unintended consequence of strategies and messages to prevent obesity may be a preoccupation with body weight and/or shape and, consequently, disordered eating habits. Healthy nutrition and physical activity are the foci of treating and preventing eating and weight disorders, but mental health is another important focus to include in an integrated approach.

A recent review of the association between mental health and childhood obesity identified emotional problems, body dissatisfaction, self-esteem, depression and anxiety, among others, as key psychosocial factors related to childhood obesity [17]. Specifically, obese youth are at increased risk of developing body dissatisfaction, dietary restraint and depressive symptoms compared to their overweight and normal weight peers [18]. In turn, disordered eating is fueled by psychological disturbances. Body shape and weight dissatisfaction may increase the likelihood of unhealthy eating and physical activity behaviors [19]. Muris and colleagues found that biological and sociocultural influences, as well as psychological risk factors (e.g., self-esteem, body dissatisfaction, body importance and body comparison) each made unique and significant contributions on body change strategies and dysfunctional eating among youth [20].

The authors found that self-esteem was correlated with the employment of weight loss strategies (girls), and that higher levels of body change strategies were associated with lesser body satisfaction (girls) and greater body importance and body comparison (boys and girls).

As these studies demonstrate, preventing disordered eating is equally important as obesity prevention. Therefore, interventions that address prevalent overeating and unhealthy food choices should be evaluated for both their effectiveness *and* for their impact on participating subjects' psychological response and emotional well-being.

### **Literature Review – Menu Labeling**

Menu labeling is an example of an intervention aimed at improving healthy food choices and, ultimately, combating the obesity epidemic. Menu labeling interventions may include calorie information, nutrient information, or a symbol representing specified nutrition criteria. Up to this point menu labeling has primarily been piloted in fast food restaurants that list calorie information on menus and menu boards. However, there is the potential to reach millions of children and adolescents with menu labeling in the school setting. The Institute of Medicine (IOM) Committee on Prevention of Obesity in Children and Youth suggests that menu labeling can play a role in improving diet quality and writes that “nutrition labeling should be clear and useful so that parents and youth can make informed product comparisons and decisions to achieve and maintain energy balance at a healthy weight [21].” Additionally, menu labeling is featured as one of the “recommendations for empowering parents and caregivers” in the May 2010 report of the White House Task Force on Child Obesity, chaired by Michelle Obama [22].

Despite the good intentions of menu labeling, adolescent health experts have raised concerns that menu labeling, specifically calorie labeling, is “over-simplifying nutrition” and may increase the incidence of eating disorders by increasing societal preoccupation with dietary

restraint and worsening body image [2, 23]. Media reports have also featured consumer concerns about the unintended consequences of menu labeling. In 2008, Harvard University removed calorie information from dining halls in response to student and parent complaints that the displayed calorie counts led to or worsened eating disorders [24]. College students at other universities have shared the same ideas and called for removing labels [23]. In response, the experts recommend researchers evaluating obesity prevention efforts, like menu labeling, should examine potential iatrogenic effects of these initiatives [2].

Although the concerns have been voiced, the effects of menu labeling on eating disorders or other psychological and emotional responses have not yet been measured. The emerging body of literature on menu labeling primarily addresses whether labels change purchasing behavior. A natural experiment study conducted by Elbel and colleagues found that a small sample size of adolescents and children ( $n = 427$ ) did not significantly change the amount of calories they purchased after labeling was instituted [25]. However, few studies among adolescents or adults have investigated the affective impact of menu labeling and the potential downstream effects on psychological risk factors for unhealthy weight control behaviors or disordered eating. Qualitative studies have examined consumer receptiveness to and attitudes about menu labeling [26], as well as their views about different approaches to providing nutrition information [27]. A survey of urban public health clinic patients aged 15-75 years revealed that 93% of survey respondents thought that calorie information was ‘important’ and 86% thought that restaurants should be required to post this information on menu boards [26]. Further findings from the survey analyses indicate that respondents aged 15-24 years would not be more likely to eat fewer calories if calorie postings were available in restaurants. Evaluating menu labeling in a school

setting has the potential to specifically assess adolescents' purchasing behaviors and emotional reaction in response to menu labeling.

### **Renton Menu Labeling Project Description**

In 2010 the Renton School District (RSD) received a Communities Putting Prevention to Work program grant through Public Health – Seattle & King County<sup>2</sup>. Using these funds, RSD planned to promote the IOM nutrition standards with a school-based media campaign and menu labeling using digital menu boards and point of sale signage. RSD implemented the “Healthy is Happy” campaign in six secondary schools in the District: Renton, Hazen and Lindbergh high schools and Dimmitt, McKnight and Nelsen middle schools. The over-arching goal of the project was to encourage healthy eating behavior among students by educating them about healthier food choices. The project used a student-led media campaign, menu labels identifying the healthier choices on digital menu boards in the cafeteria, and point of purchase signage in the cafeteria lunch line, a la carte lines and vending machines.

In January 2011, RSD convened a Student Nutrition Council made up of high school student volunteers to develop marketing and educational materials for the healthy eating campaign. Nutrition department staff within the school district worked with the Council to create a single logo - an apple - to indicate a healthier food choice that met pre-defined nutrition criteria. The healthy choice symbol and tagline used in the campaign is shown in **Figure 1**. In September 2011, digital menu boards were installed in all six secondary schools in RSD and were operational by October 1, 2011. The screens displayed all daily school meal menu options and included the healthy choice symbol next to those items that met the nutrition criteria. The screens also featured healthy eating media campaign messages. Point of purchase signage

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<sup>2</sup> The grant was funded by the Centers for Disease Control and Prevention.

placement began November 1, 2011. For this signage the healthy choice symbol was placed next to the salad bar and other items that met nutrition criteria.



**Figure 1**

The research team at the University of Washington, Center for Public Health Nutrition (UW-CPHN) conducted an impact evaluation of the initiative from January 2011 through December 2011. The goals of this evaluation were to understand the impact of the Healthy is Happy campaign on student food choices and school lunch participation, and to learn about the perceptions and experiences of students and food service staff.

### **Research Aims and Hypothesis**

This Master's degree thesis research project was conducted in collaboration with the UW-CPHN's impact evaluation of the Healthy is Happy campaign in RSD. The primary aim of this study is to determine if enjoyment of cafeteria meals varies by sex, grade-level, school-level socioeconomic status (SES) and reported use of nutrition information in restaurants. The secondary aim is to describe the thoughts, emotions and perceptions of students about school menu labeling in order to inform future menu labeling interventions. We hypothesized that of students exposed to the symbol, girls, students in higher grade-levels and students with higher school-level SES will have lower ratings of enjoyment.

## **Methods**

### **Study Design and Study Subjects**

This study is a cross-sectional, school-based study of high school and middle school students' emotional response to a school-based menu labeling initiative and healthy eating campaign. The overall study population included adolescents from six public secondary schools from Renton School District near Seattle, Washington. During December 2011, student volunteers participated in cafeteria surveys and focus groups as part of an evaluation of the Healthy is Happy campaign.

### **Menu Labeling**

RSD staff collaborated with the research team at the UW-CPHN to develop nutrition criteria that align with the standards developed by the IOM and are appropriate for use in school meals. Criteria for a la carte food items match the IOM standards for competitive foods<sup>3</sup>. Criteria for foods served as part of school meals represent a combination of a food-based approach, and inclusion of specific nutrient criteria for saturated fat and maximum total calories for entrees. Both sets of nutrition criteria can be found in **Appendix A**. A school district consultant provided nutrition information for all items served as part of the school meal program using NutriKids® nutrition analysis software. For a la carte items and for missing school meal items, a combination of product menu labels and comparable items located in the Food Processor SQL, version 10.9.0 (ESHA Research) nutrition analysis software database were used to determine nutrient content and eligibility for labeling as a “healthier” food. Foods that met nutrition criteria were labeled with the Healthy is Happy symbol.

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<sup>3</sup> Foods other than meals served through United States Department of Agriculture's school meal program.

## Measures

The impact of the healthy choice symbol on students' enjoyment of cafeteria meals was measured using a cafeteria survey question and focus group question about enjoyment. The term enjoyment has been used by researchers at the Yale Rudd Center for Food Policy and Obesity in surveys assessing college students for eating disorders and their response to nutrition labels in the school dining halls (M. Schwartz, PhD, unpublished data, June 2011). Research tools and protocol were approved by the University of Washington Institutional Review Board.

### *Cafeteria Surveys*

Students in every school had one opportunity to take a brief checklist survey in the cafeteria during lunch on a designated study day. Any student in the cafeteria on that day was encouraged to participate. A total of 1,678 students completed the survey.

To administer the survey, data collectors approached students in the cafeteria and invited them to participate in the survey. The survey took approximately 3 minutes to complete. Students answered questions on their sex and whether they had noticed the healthy choice symbol in the cafeteria. Students who indicated that they had seen the symbol were further asked if the presence of the symbol negatively impacted their enjoyment of cafeteria meals: "Does having this symbol in the cafeteria take away from your enjoyment of cafeteria meals?" (yes/no).

The survey also queried students about their use of nutrition information in fast food restaurants: "Do you use nutrition information in restaurants to help you decide what to buy?" (yes/no). The survey questions were pre-tested among adolescents for comprehension and interpretation. A full version of the cafeteria survey is included in **Appendix B**.

### *Focus Groups*

Classroom teachers distributed flyers to recruit students to participate in focus groups. Students in each of the six schools who volunteered were given letters and consent forms for parents or guardians to review and sign. Each subject received a \$20 gift card at the end of the focus groups. Teachers were asked not to target high school student members of the Student Nutrition Council, but the focus group sample did include student members of the Student Nutrition Council. Focus group participation required both written parental consent and student assent. All students who arrived at the focus groups with written parental consent were allowed to participate. Written student assent was obtained at the beginning of each focus group. A total of 50 students participated in the six focus group sessions.

Focus group moderators asked students about eating in the cafeteria, exposure to and observations about the nutrition symbol, the impact of the symbol on enjoyment of cafeteria meals and the influence of nutrition information in fast food restaurants. The information most relevant to this project came from the question regarding enjoyment: “Do you think that having the symbol in the cafeteria impacts students’ enjoyment of cafeteria meals?” Refer to **Appendix C** for a full version of the focus group questions. For the enjoyment question, moderators explained that enjoyment did not refer to the taste of the food and encouraged students to consider their experience in the cafeteria and their feelings while eating in the cafeteria in their responses. Students were encouraged to explain how they thought the symbol affected enjoyment either positively or negatively, if they thought it did have an impact. All sessions except one were audiotaped and transcribed verbatim to have a written record of responses. Detailed notes were recorded during the one session that was not audiotaped.

### *Demographic Data*

Demographic data including sex and grade-level were measured using the cafeteria survey responses. The proportion of free or reduced-price meal enrollment in each school was used as a proxy for school-level SES. These school-level demographic data were obtained from the Washington State Office of Superintendent of Public Instruction [28]. Refer to **Appendix D** for free or reduced-price meal enrollment rates in each school.

### **Analysis**

Cafeteria survey responses were coded and individual responses were entered into an excel spreadsheet by UW-CPHN research staff. The Research Coordinator reviewed each survey twice to verify data entry. For statistical analyses of the surveys, the following variables were selected from the master database and entered into a new database: age, sex, proportion of free or reduced-price meal enrollment and responses to survey questions about noticing the symbol, enjoyment and using nutrition information in fast food restaurants. Age (middle school or high school), sex (male or female), noticing the symbol (yes or no) and using nutrition information (yes or no) were treated as dichotomous variables. The proportion of free or reduced-price meal enrollment was entered as a continuous variable using the actual values for each school. All analyses were conducted using STATA (version 12.1; StataCorp, College Station, TX).

A total of 1,678 students completed the cafeteria survey; twelve surveys were excluded from analysis due to typographical errors in the master database. The number and proportion of yes responses to the survey questions were tabulated. Students who reported that they had noticed the healthy choice symbol were compared with those who had not noticed the symbol using a two sample *t* test to examine differences between the groups. The students who had not noticed the symbol (no exposure) were excluded from further analyses. Two sample *t* tests were also used to examine differences in enjoyment between age groups, sexes, and students who

reported using and not using nutrition information in restaurants. A logistic regression analysis was conducted to test whether demographic characteristics (age, sex and school-level socioeconomic status) and restaurant nutrition information usage predicted the effect of the healthy choice symbol on enjoyment among students who reported noticing the symbol in the cafeteria. Odds ratios (ORs) were used to describe effect sizes in this analysis. Logistic regression diagnostics validated the sensitivity and specificity of the model using a receiver operating characteristic (ROC) curve. For all of the analyses,  $p$  values less than 0.05 were considered statistically significant.

Focus group transcripts were analyzed using coding methods including descriptive coding, in vivo coding, process coding, emotion coding and versus coding; these coding methods have been described elsewhere [29]. Moderator notes including impressions and reactions were also included in the analysis. The data related to enjoyment content were organized by codes, and themes and interrelationships were synthesized. The primary researcher first analyzed the transcripts individually and then discussed them with the research team at UW-CPHN. The researchers came to consensus on the codes and emergent themes.

## **Results**

### **Cafeteria Surveys**

**Table 1** provides information about students' responses to the selected cafeteria survey questions. A majority of cafeteria survey respondents were middle school students ( $n = 971$ , 58%). There was a comparable number of responses from boys ( $n = 787$ , 51%) and girls. Approximately 81% of participants reported that they had noticed the symbol in the cafeteria (**Table 1**). Students who had noticed the symbol were compared with those who had not noticed the symbol and found to more likely be female than male ( $t = -2.8$ ;  $df = 1,509$ ;  $p = 0.01$ ) and in

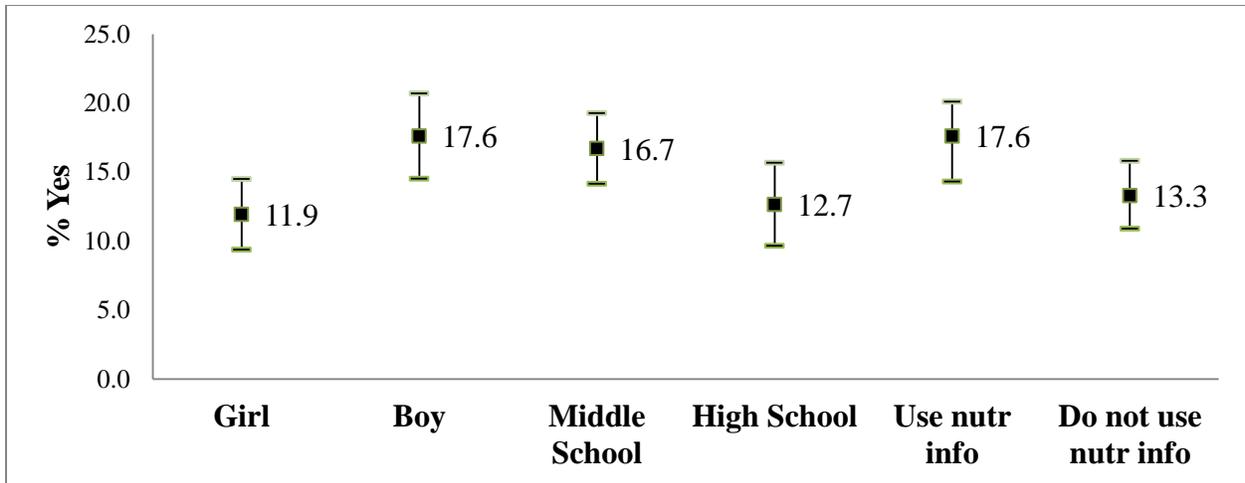
middle school rather than in high school ( $t = -7.1$ ;  $df = 1,625$ ;  $p = <0.0001$ ). Of note, rates of noticing the symbol varied from 67-88% among the six schools.

**Table 1: Proportion of yes responses to selected questions from the cafeteria survey**

Survey Measure ( <i>n</i> = number of eligible* responses)	Yes Responses %
Q1. Have you noticed this symbol in the cafeteria? ( <i>n</i> = 1,627)	81.3
Q2. Does having this symbol in the cafeteria take away from your enjoyment of cafeteria meals? ( <i>n</i> = 1,288)	15.2
Q3. Do you use nutrition information in restaurants to help you decide what to buy? ( <i>n</i> = 1,609)	39.7

\*Eligible means students who responded to that specific question. In the case of Q2, only students who had answered yes to Q1 and answered Q2 were included.

Of the subjects exposed to the healthy choice symbol ( $n = 1,323$ ), a relatively small proportion reported that it decreased their enjoyment of cafeteria meals (**Table 1**). The means and confidence intervals for proportions of positive responses to this question for sex, age and nutrition information use subgroups are represented in **Figure 2**. Two-sample  $t$  tests revealed that boys in this sample had a significantly higher rate of decreased enjoyment than girls ( $t = -2.8$ ;  $df = 1,203$ ;  $p = 0.01$ ). Similarly, middle school students also had a higher rate of decreased enjoyment than high school students, although the result was not significant ( $t = 2.0$ ;  $df = 1,286$ ;  $p = 0.05$ ). Students who use nutrition information in fast food restaurants were more likely to have decreased enjoyment compared with students who do not use nutrition information in fast food restaurants ( $t = -2.1$ ;  $df = 1,266$ ;  $p = 0.04$ ).



**Figure 2** Proportion of students exposed to the healthy choice symbol who reported that it decreased their enjoyment of cafeteria meals by sex\*, age and use of restaurant nutrition information\*. The means and 95% confidence intervals for each subgroup are shown here.

\*Significant result

The associations between enjoyment and age, sex, school-level SES and nutrition information usage were examined further with a logistic regression model. In the models, enjoyment was the dependent variable. Age, sex, school-level SES, and using nutrition information in restaurants were included as covariates. The results of this analysis are shown in **Table 2**. The logistic regression analysis revealed that male sex, being in middle school and using nutrition information were statistically significant predictors that the Healthy is Happy symbol would decrease enjoyment of school meals (**Table 2**). Out of the four covariates, only school-level SES had no effect on enjoyment (**Table 2**).

**Table 2: Odds Ratios (ORs), 95% Confidence Intervals (CIs) and Significance Levels (*P*) for independent predictors of decreased enjoyment among 1,186 survey participants\***

<b>Predictors</b>	<b>OR</b>	<b>95% CI</b>	<b><i>P</i></b>
Male sex	1.6	1.2 – 2.3	0.004
High school age	0.6	0.4 – 0.9	0.015
School-level proportion of FRPE†	1.0	0.98 – 1.0	0.226
Use nutrition information in restaurants	1.4	1.1 – 2.0	0.038

\*Only includes participants who were exposed to the symbol and had no missing values

†FRPE = free and reduced price eligible

Diagnostics of the logistic regression model show that it is a poor predictor of whether the covariates decrease enjoyment. The area under the ROC curve for the model is 0.6 (out of 1.0), indicating that the model has low accuracy for predicting enjoyment in the general population. This fact shows that, while the covariates were significant in affecting enjoyment of the subjects in this study, these results cannot be generalized to the general school-aged population.

### **Focus Groups**

A total of fifty students from the six schools participated in focus group sessions. There was approximately an equal proportion of high school students ( $n = 26, 52\%$ ) and middle school students who participated in the focus groups. In the notes and transcripts, sex was not attributed to the respondents. Responses revealed that students had varied interpretations of what the term enjoyment referred to including taste, physical feelings, or an emotional response. Of note, the middle school students had more difficulty responding to the enjoyment question than the high school students and said substantially less in response to this question than the high school students. Middle school students also tended to give *non sequitur* responses to the question

including comments about how they might not want to eat if they had physical ailments such as a “burnt mouth” or “stomach ache.”

Most focus group participants reported seeing the symbol in the cafeteria and did not think that the symbol affected students’ enjoyment of cafeteria meals. The most common explanation students provided for the absence of an effect was that many students did not actually use the symbol because it was difficult to see in the cafeteria. One middle school student stated, “I just don’t think we, like, notice that it’s there all the time so it doesn’t really affect us.” Students commented on how the cafeteria environment distracted students from the symbol, thus minimizing its effect. “I know that if I showed my friends the symbol they wouldn’t see it because of how much people there is [sic] in the cafeteria at once. There’s so many people walking around, I don’t think it would make a difference in enjoyment.” While standing in the cafeteria line students are often preoccupied with socializing. One student observed, “Usually in line they’re just talking, they’re not really looking that much at the menu so they barely see that sign so it wouldn’t really impact them.”

Another explanation voiced by high school students for why the symbol has no effect on enjoyment was that the many students still did not understand its meaning. One high school student stated, “I assume that many people much like me would start eating, look up at the screen, see an apple, stop, and continue back eating because no one knows what that means.” Students also suggested that other factors might influence enjoyment more than the symbol. These factors included how the food tastes, how the person physically feels eating the food, or what mood they are in when they enter the cafeteria. High school students observed that the information was not displayed on the screen long enough to be read which made it difficult to read the logo or health messages when they were standing in line.

Although the majority agreed the symbol had no effect, some participants postulated that it might affect enjoyment for some people. Both older and younger students thought that the symbol could increase students' enjoyment of cafeteria meals by helping them make healthy choices and making them feel good when they choose a healthy food item. A middle school student stated, "I think it helps [with enjoyment] because it helps people know what's healthy and what's not healthy." Similarly, a high school student said, "If they choose something healthy and they think they are eating healthier it probably makes them feel better when they eat."

The high school students introduced the idea that the symbol could decrease enjoyment of cafeteria meals by making students feel guilty if they do not select an item labeled with the symbol. However, students thought it was unlikely students would be overly afflicted with guilt for three reasons: 1) the fact that many students were confused about the symbol meaning, "I think the apple in the cafeteria doesn't make you feel guilty if you don't know what it means;" 2) the normalization of unhealthy eating among their peers, "Most people eat pizza or a burrito and there's always fries with most of the meals. It might make the person feel guilty but then they'll see everyone else eating it so it's like normal, oh it's OK. It's like I'll eat the pizza, whatever you're eating;" and 3) the pervasive impression that kids do not feel as guilty about unhealthy eating as adults, "Kids they don't notice the health effects or negative health effects of what they are eating. So they might feel guilty a little bit, but they usually feel the most guilty when they grow up and such." The overwhelming perception among all participants was that normal kids don't need to "watch what they eat" because they don't feel threatened by the risk of chronic disease, "If they are not fat and they have nothing to worry about they really don't care [about eating healthy] and they'll just keep eating that." Only one student specifically mentioned eating

disorders by name, but her comment revealed that she did not have a good understanding of the topic.

*Summary of results:* Inconsistent with the priori hypothesis, the symbol decreased enjoyment of cafeteria meals more among boys and middle school students. It also decreased enjoyment among students who use nutrition information in fast food restaurants. Although we found a significant effect in the study population, the logistic regression model is a poor predictor of enjoyment in the general school-age population. Students in the focus groups did not generally perceive the symbol as impacting enjoyment, but stated the possibility that it could increase or decrease enjoyment depending on the person. The symbol may influence enjoyment by making some students feel guilty about not choosing an item designated with the healthy choice symbol, but students reported the symbol is more likely to make them feel good about making healthy choices.

## **Discussion**

The healthy choice symbol in the school cafeteria did not reduce enjoyment of cafeteria meals for most adolescents in this study. Further findings from the focus groups suggested that this could be because students did not widely see the symbol or understand its meaning. Alternatively, students' enjoyment may have been more positively affected, and therefore not reduced, if they perceived the symbol as helpful and positive reinforcement for making healthy choices. A study conducted by Soldavini and colleagues evaluating the impact of nutrition claims on fourth- and fifth graders showed that the children perceived products with a nutrition claim as healthier and identified the "healthier" items as tasting better [30]. This phenomenon could also have occurred with the older students in this study and led to higher ratings of enjoyment.

Middle school students and girls were more likely to see the symbol than high school students and boys. The difference in the rates of noticing the symbol between age groups is likely attributed to the differences among the media campaigns in each of the schools. These results suggest that the middle school media campaigns were more effective than the high school media campaigns for the Healthy is Happy initiative. This is further supported by the repetitive high school student responses in the focus groups about not understanding the symbol's meaning. Girls being more likely to see the symbol may be an indication that they are more attentive to nutrition information or more motivated to make healthy choices than boys. This is supported by research that has revealed that individuals who frequently read nutrition labels tend to value healthy eating and eat healthier diets more than individuals who infrequently read nutrition labels [31]. Therefore, their ratings of enjoyment may be more affected by eating healthy foods rather than by the presence of the symbol.

Among subjects exposed to the symbol, however, there were significant differences in the impact on enjoyment between sexes, age groups and students who use and do not use nutrition information in restaurants. This implies that students of different ages, sexes and familiarity with menu labeling perceived the healthy choice symbol in different ways. The findings that boys and younger students rated lower enjoyment than girls and older students were inconsistent with the priori hypothesis for the study. One explanation for why boys reported that the symbol decreased their enjoyment more than girls is that girls, since they may place more value on healthy eating, perceived the symbol as more helpful in making healthy choices than boys. Therefore, girls may have been less likely to report reduced enjoyment as a result of the symbol. Another possibility is that girls rated higher enjoyment during meals because they tend to feel guiltier about eating between meals rather than during meals. A study of college-aged women

showed that although women regularly experience guilty feelings related to food, most of the guilty moments occurred between meals while eating snacks [32]. One reason for why middle school students reported that the symbol reduced their enjoyment more than high school students is the difference in comprehension and acceptance of the symbol between age groups. High school students were more concerned about not understanding the symbol's meaning which could have led them to disregard it, thus decreasing its effect on their enjoyment. Similar to the explanation for the differences between sexes, students who use nutrition information in restaurants are more likely to have decreased enjoyment compared to students who do not use nutrition information may have higher levels of awareness and concerns about the healthfulness of food choices.

The logistic regression model predicted that the healthy choice symbol would lessen enjoyment of cafeteria meals for boys, middle school students and students who use nutrition information at restaurants. The model predictions are consistent with the findings of the effects in the study population. However, the diagnostics of the model indicate that it has limited accuracy in predicting which groups are more susceptible to the negative impact of the symbol in the general population. Although the  $p$  values are significant for age, sex and nutrition information usage, the wide confidence intervals for these covariates indicate there is a possibility of seeing the increased risk by chance. A reasonable interpretation of these results is that using this method of menu labeling is unlikely to negatively impact students' enjoyment of school meals, but it has the potential to affect some groups of adolescents.

Another important finding of this study was that using the term enjoyment was not an effective way to measure emotional response in middle school students due to comprehension barriers. Although the high school students could coherently discuss and debate the symbol's

effect on enjoyment, the middle school students in all three schools struggled to understand the concept of enjoyment. Of note, only one student specifically mentioned eating disorders, an indication that these students may not consider the symbol to have an impact on potential disordered eating.

In this study, nearly half of the adolescent sample population reported using nutrition information in fast food restaurants. This is higher than previously published rates of adolescent use of nutrition information when ordering at fast food restaurants (9%), but less than the proportion of adolescents who reported noticing calorie labels in fast food restaurants (57%) [25]. In combination, these results show the emotional impact of menu labeling initiatives is extremely relevant for teenagers and should be further evaluated.

The greatest strength of this study was that it examined a previously unexplored effect: the emotional response of adolescents to nutrition labeling in a school cafeteria. Another strength was that the validity of the study was substantiated by triangulating quantitative and qualitative methods. However, the study had several limitations as well. One limitation of using qualitative data is that interpretation is subjective. Another limitation of this study was that students were exposed to the symbol for only three months prior to the evaluation due to technical delays in installing the menu boards. Longer exposure to the symbol and media campaign may have resulted in a more pronounced response in this population. Developing new healthy choice menu items to feature with the symbol may also have resulted in a greater response than using the symbol with the existing RSD menu items. For the study design, using convenience sampling could have introduced bias into the study results. The study population included student members of the Student Nutrition Council who helped to develop and implement the Healthy is Happy campaign. As a result, the proportion of students who reported

reduced enjoyment may be underestimated. Some limitations of the analysis were that they included the schools as the unit of analysis for the covariates age and SES. Further, the logistic regression model for these data was not a good fit due to a small number of covariates, many similarities between covariates and too few observations. Therefore, the results have limited generalizability to adolescents outside RSD.

In conclusion, using a healthy choice symbol for menu labeling is unlikely to negatively affect students' enjoyment of cafeteria meals but students contend that there is the potential for it to impact enjoyment for some people. The findings emphasize the value of evaluating the affective impact of menu labeling initiatives to identify the susceptible populations. Although the enjoyment question was an important one to ask adolescents, the term enjoyment is an invalid measure to assess the emotional impact of menu labels on adolescents, particularly middle school students. Future research should compare the emotional response among adolescents to different types of menu labeling, specifically calorie labeling which will soon be ubiquitous in fast food restaurants. Additionally, future research should specifically examine the associations between menu labeling and each of the following: psychological risk factors, weight control behaviors and disordered eating practices.

## **Implications and Contributions**

Experts contend that school environments play an important role in eating and weight disorder prevention efforts because children and adolescents consume a substantial proportion of their total daily calories at school [33]. School menu labeling, along with classroom nutrition education, provides a unique opportunity to improve healthy food choices among children and adolescents.

This project reveals that using a symbol representing nutrition criteria for menu labeling is unlikely to negatively impact students' enjoyment of cafeteria meals. However, there were differences in enjoyment between sexes, ages and use of nutrition information in restaurants so some groups of adolescents may be more susceptible to the symbol's negative or positive impact. Although enjoyment is not an effective measurement tool to assess emotional impact among adolescents, because students are widely seeing and using nutrition information it is extremely relevant to measure their emotional response using other tools. The results of this study may also have broader policy implications in light of the recent legislation regarding inclusion of nutrition information on restaurant menus because legislation related to nutrition information in school cafeterias may soon follow.

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## **Appendices**

### **Appendix A: Criteria for Renton Symbol for School Lunch and a La Carte Lines**

#### **School Lunch Items**

*Main Entree:* 600 calories or less and less than 10% of calories from saturated fat

*Fruit:* all fresh fruits; all frozen or canned items in juice or packed in water-no sugar added

*Vegetables:* all non-fried items

*Breads/Grains:* all that are whole-grain, based on IOM guidelines

*Beverages:* Milk 1% or fat free (including flavored); 100% fruit juice in maximum portions recommended by IOM (4oz MS, 8oz HS). We propose that any water stations also have the symbol on them (consider putting the symbol on all water fountains/stations throughout the school?).

#### **A La Carte**

These items meet the IOM standards for competitive foods

*Fat:* Snacks, foods, and beverages meet the following criteria for dietary fat per portion as packaged:

- No more than 35 percent of total calories from fat;
- Less than 10 percent of total calories from saturated fats; and
- Zero trans fat.

*Sugar:* Snacks, foods, and beverages provide no more than 35 percent of calories from total sugars per portion as packaged.

Exceptions include:

- 100-percent fruits and fruit juices in all forms without added sugars (4oz MS, 8oz HS maximum portion size for fruit juice);
- 100-percent vegetables and vegetable juices without added sugars; and
- Unflavored nonfat and low-fat milk and yogurt; flavored nonfat and low-fat milk with no more than 22 grams of total sugars per 8-ounce serving; and flavored nonfat and low-fat yogurt with no more than 30 grams of total sugars per 8-ounce serving.

*Calories:* Snack items are 200 calories or less per portion as packaged and á la carte entrée items do not exceed calorie limits on comparable NSLP items.

*Sodium:* Snack items meet a sodium content limit of 200 mg or less per portion as packaged or 480 mg or less per entrée portion as served for á la carte.

*Beverages must also be free of caffeine and nonnutritive sweeteners*

## Appendix B: Student Cafeteria Survey

### Renton Cafeteria Survey

We are inviting you to participate in research by completing a brief survey about nutrition symbols and cafeteria food choices. The survey will take you about 3 minutes. You don't have to answer all of the questions, and your participation is voluntary.

Check one→:  **Male**       **Female**

1.) Do you get food from the cafeteria?

**Yes**       **No** (Check this box if you ONLY get food from home, off-campus, school vending machine, or school store-if your school has one)

2.) Have you noticed this symbol in the cafeteria? (If no, skip to #6)   **Yes**       **No**

3.) If yes, where have you seen it? (✓ check all that apply)

**In the lunch line near food items**       **On electronic screen(s) in the cafeteria**  
 **on the salad bar**       **inside the cafeteria on posters/signs**       **outside of the cafeteria on posters/signs**  
 **other places (please describe):** \_\_\_\_\_

4.) Does the symbol help you decide what to buy?

**Yes**       **No**

5.) Does having this symbol in the cafeteria take away from your enjoyment of cafeteria meals?

**Yes**       **No**

6.) Do you use nutrition information in restaurants to help you decide what to buy?

**Yes**       **No**

## Appendix C: Student Focus Group Questions

Are you ready to begin? Let's find out some more about each other by going around the room one at a time. Tell us your name and what you like to eat for lunch.

- 1.) What kinds of things do you like to eat at lunch?
- 2.) How do you think students choose what to eat for lunch?
- 3.) Why do students choose to eat food from the cafeteria?
- 4a.) How many of you have seen the nutrition symbol? Please raise your hand.
- 4b.) Tell us what you noticed about the nutrition symbol in the cafeteria this year.
- 5.) What kind of a difference did the symbol make in what students chose to eat for lunch?

*In the next question I am going to ask you about enjoyment of cafeteria meals. For this question, enjoyment does not refer to how food tastes. Rather, we want to know about your experience and reactions of having the symbol in the cafeteria. How does the symbol impact students' experience of cafeteria meals?*

- 6.) How does the symbol impact students' enjoyment of cafeteria meals?

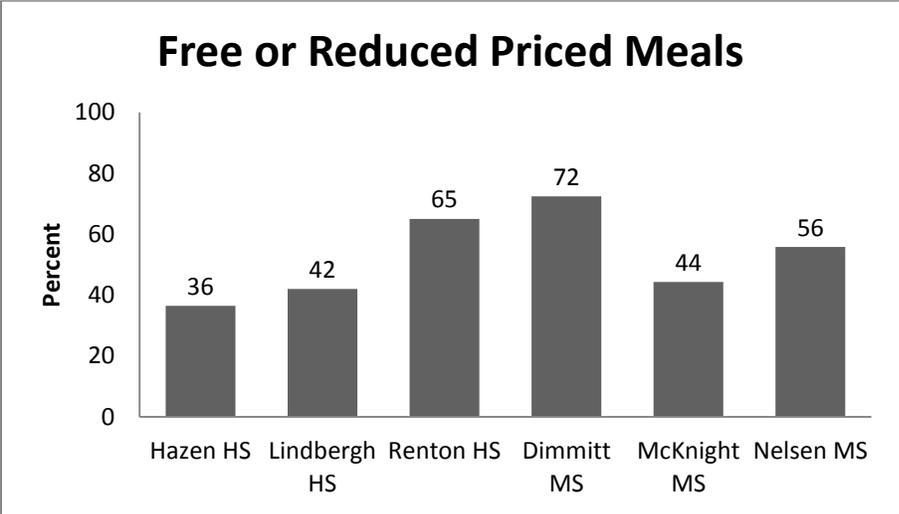
*Recently fast food restaurants have started to post calorie information on their menus. Have you noticed nutrition information in fast food restaurants?*

- 7.) For students your age, what kind of difference does having nutrition information in fast food restaurants make?

*At this time the moderator will summarize the main summary points and ask if this perception is accurate. Invite corrections or comments.*

- 8.) Final Question. Have we missed anything?

**Appendix D: Proportion of Free or Reduced-price Meal Enrollment**



**Source:** Podrabsky, Mary. *Renton Menu Labeling Project: An Impact Evaluation of the “Healthy is Happy” Campaign Final Report*. University of Washington Center for Public Health Nutrition. March 19, 2012.