Education and Praise as a Mechanism for Increasing Healthy Choices in Children

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Submitted as partial fulfillment of the Senior Thesis requirement of the Psychology major at Wofford College
Abstract

Obesity is a serious medical condition that affects children worldwide. In the United States, childhood overweight and obesity rates have tripled since 1980 resulting in a prevalence of 17.1% and 16.5%, respectively (Garasky et al, 2009). Currently, South Carolina is the 8th ranked obese state in the United States with a 29.1% childhood overweight or obesity prevalence. In particular, 34.4% of children residing in Spartanburg county of South Carolina are either overweight or obese.

A higher energy intake and lower energy output leads to weight gain, thus resulting in overweight or obese conditions over time. Increased sedentary behaviors, such as television viewing, and decreased physical activities as well overeating, soft drink consumption, and excessive calorie and fat intake have been identified as the major contributors to childhood obesity. Childhood overweight and obesity has become a critical health-related issue because it has been attributed to the development of secondary diseases such as diabetes and cardiovascular disease. But, through proper nutrition, fat and sugar intake, physical activity, and overall lifestyle, obesity is a preventable disease.

It is so important that children learn early to make healthy choices and limit their caloric intake to the sufficient amount for their bodies. Nearly every child attends a public or private school, at least through adolescence, and therefore, schools are favorable environments in which to deliver health programming (Sahota et al, 2001). In this study, experimenters targeted a local elementary school and implemented a program to instill intrinsic reward for balanced lunch choices. The cost-free, non-intrusive, and sustainable reward program produced increases in healthy food selection and decreases in flavored milk consumption, demonstrating that when given education and encouragement, children tend to improve their dietary habits.
Introduction

Obesity is a serious medical condition in which a surplus of body fat begins to negatively affect one’s health and level of physical activity. Obesity has been described as a complex and chronic medical disorder in which sedentary lifestyle and dietary intake are crucial determinants (Chen & Mao, 2006). Obesity is highly related to the development of secondary diseases such as type II diabetes, hypertension, cardiovascular disease, certain kinds of cancer, and early death (Salazar-Martinez et al, 2005). In the United States, obesity is the second leading factor of premature death (Rashad, 2006), and sedentariness has been deemed yet another leading cause of premature death (Bernstein et al, 2004).

Body mass index (BMI) compares a person’s height and weight, and thus defines an individual as underweight (<18), normal weight (18-25), overweight (>25), or obese (>30). The use of BMI has introduced a standardized body weight calculation, which has been used across various studies that permits global conduction of obesity research. BMI is used differently for children. Children’s weight is calculated the same way as for adults but then is compared to the typical values for other children of the same age group. Instead of using specific thresholds for underweight and overweight, the children’s BMI percentile allows comparison with children of the same sex and age. The Centers for Disease Control and Prevention has issued classification criteria for childhood BMI by age and gender such that a child with a BMI-for-age under the 5th percentile is classified as underweight, at or above the 85th percentile but below the 95th percentile is classified as high-risk for becoming overweight, and at or above the 95th percentile is classified as overweight or obese (Boumtje et al, 2005).

In the United States, childhood overweight and obesity rates have tripled since 1980 resulting in a prevalence of 17.1% and 16.5%, respectively (Garasky et al, 2009). The prevalence of childhood obesity has increased 23% in just the past 5 years (Fuentes-Afflick &
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Hessol, 2008). Not only have childhood overweight and obesity rates increased, but also today’s overweight children are substantially heavier than in the past. The highest overweight and obesity rates have been attributed to those populations of lowest SES and ethnic minority groups. As of 2005, South Carolina was the 8\textsuperscript{th} ranked obese state in the US with a 29.1\% childhood obesity prevalence (DeNoon & Chang, 2006). According to the Eat Smart, Move More South Carolina program, a coalition to prevent childhood obesity, 40.7\% of third graders in 2006 were obese (Eat Smart, Move More, 2006). Now in fifth grade, 39.5 \% of those same students are considered obese. A 2007-2008 survey conducted in Spartanburg County of South Carolina, 34.4\% of children were obese (Pittman, 2009).

Obesity is a chronic problem with 70\% of obese children and adolescents becoming obese adults (Dietz, 1998). When even just one parent of an obese child is also obese, there is an 80\% chance that the child will become obese as an adult (Dietz, 1998). Having previously been obese as a child leads to a significant level of worsened health concerns for obese adults due to a lifespan of strain on the person’s physical condition. This means that as more and more children become obese, a larger portion of adults will also become obese, giving way to a greater perpetuation of obesity related health problems in adults. When followed into adulthood, people who were obese as children show higher levels of cardiovascular and digestive diseases. They are also more susceptible to any cause of death than non-obese adults (Denghan et al, 2005). As a result of these negative consequences, childhood obesity ultimately results in billions of dollars spent for health care during childhood and also later in life (Vuegeler & Fitzgerald, 2006).

Childhood overweight can be attributed to multiple causations including genetic predisposition, cultural influence on unhealthy lifestyles, obesogenic (or obesity encouraging) environments, unhealthy eating habits, and lack of exercise (Crawford, 2004). More specifically, increased sedentary behaviors, such as television viewing, and decreased physical activities as
well overeating, soft drink consumption, and excessive calorie and fat intake have been identified as the major contributors to childhood obesity (Vuegelers & Fitzgerald, 2006). Overweight in anyone, including children, is ultimately caused by an excessive or prolonged energy imbalance; when energy (calorie) consumption overtakes energy expenditure, the result can be obesity (Denghan et al, 2005).

The presence of high fat and high sugar foods abound in the U.S. These high-calorie, low-nutrient foods greatly contribute to the rise in childhood obesity levels. It is so important that children learn early to make healthy choices and limit their caloric intake to the sufficient amount for their bodies. Liquid calories consumed in the form of beverages are not as satiating as solid foods that may contain an equivalent amount of calories (DiMeglio & Mattes, 2000). Thus, intake of empty liquid calories contributes to further perpetuation of childhood obesity because liquid caloric intake is generally an additional contribution to the total amount of energy consumption. This is especially important in the case of sugar-sweetened beverages such as soft drinks. There has been an increase in the percentage of daily caloric intake that children consume from soft drinks from 3.0% in 1977 to 6.9% in 2001 (Nielsen & Popkin, 2004). This issue is also important when considering the flavored milk consumption. The extra sugar that is present in the flavored milks, such as chocolate, vanilla, and strawberry, contains unnecessary calories. White milk provides similar satiation and nutritional value as flavored milks while limiting calories and sugar consumption.

Nearly every child attends a public or private school, at least through adolescence, and therefore, schools are favorable environments in which to deliver health programming (Sahota et al, 2001). Moreover, since, during the school year, over a quarter of a child’s day is spent in school and one to two meals are consumed in a cafeteria, the school system has the potential to create a significant impact on the treatment and prevention of childhood obesity (Budd & Volpe,
It is more effective, both with cost and outcomes, to target already established systems, such as schools, in which to incite change and prevention of public health issues (Denghan et al, 2005). Children are easier to influence and their environments are easier to control and restructure; therefore, it is likely most effective to target younger children in these efforts (Denghan et al, 2005). Also, if successfully created, these changes in behavior, choice, and attitude surrounding health will likely be maintained into adulthood if they are sustained and become habitual (Sahota et al, 2001).

Not only is school a convenient setting for change, but the public school system is also technically required to help combat the chronic disease in its students. Since childhood obesity has been classified as a chronic disease and schools are responsible for the wellbeing of students with a chronic disease, schools cannot perpetuate the disease of childhood obesity (Budd & Volpe, 2006). In efforts to reduce and prevent childhood obesity through use of the school system, the CDC has created specific guidelines for school programs to follow (CDC, 1997). These programs have been created with a focus on encouraging healthier eating patterns and more physical activity within school children. The CDC requires a child to be provided with a variety of foods with a strong emphasis on grains, vegetables, and fruits and a reduced emphasis on sugars, fat, and cholesterol; to balance their consumption with physical activity; and to be exposed to educational material concerning nutrition (Wechsler et al, 2004).

The National School Lunch Program (NSLP) is the federal school lunch program operating in both public and non-profit private schools in the US. Its goal is to provide nutritious, balanced, and low-cost or free, lunches to over 30.5 million children every school day (NSLP, 2004). Schools that participate in the NSLP receive subsidies, donations of food, and other assistance from the US Department of Agriculture (USDA), which is a part of the federal government. Therefore, the schools participating in the NSLP must meet certain requirements in
order to satisfy the receipt of federal assistance. The lunches they serve must be made available for free or at a reduced cost to those children eligible, and the lunches must meet Federal requirements. At least one third of the students’ calorie intake must be satisfied with the school lunches, which is 664 calories for kindergarten through sixth grade (US Government, 1988). The Dietary Guidelines for Americans state that only 30 percent or less of a child’s calorie intake may come from fat and only 10 percent or less may come from saturated fat (US Government, 1988). It is also required that a school lunch provide a third of the daily intake of protein, Vitamins A and C, iron, and calcium (US Government, 1988). Though these school lunches must meet Federal guidelines on nutrition requirements, the foods that the dining service opts to provide can be individually selected. There is no restriction on the type of food that can be served. The governmentally enforced minimum calorie content requirement aims to serve those children receiving free lunches out of concern that the student may not get adequate energy intake at any other time throughout the day or anywhere outside of school. Unfortunately, these well-intended requirements can at times promote the service of less healthy, high-energy foods. The USDA, in partnership with the school system, has started a program to provide fresh produce for service in NSLP schools that should be expanded to all states by 2012 (NSLP, 2004; US Government, 1988).

In order to combat the negative effects that could possibly result from a lunch program that must achieve a minimum content of calories, some large dining service providers have created a type of balanced meal option, allowing the minimum calorie requirement to be achieved while a healthy balance of nutrients. The balanced program implemented by several of the widely used dining service providers may sometimes only reach a small portion of the overall students served, as the balanced option exists as one of many available selections to students who must choose to participate. Other services may alter the entire menu to make every
option nutritious. The three largest service providers of lunches for public and non-profit private
schools in the US are Sodexo, Aramark, and Chartwells. Each of these service providers keeps
registered dieticians on staff.

Sodexo has created an age specific program for the preschool through elementary school
students. Their Kids’ Way Café uses healthful imagery and marketing with bold and colorful
fruits and vegetables to target those children entering the cafeteria. Sodexo has hired chefs who
aim their focus at young children and create menus geared towards them. They offer several
entrée choices and many side item choices everyday, trying to ensure nutritious choices with any
combination selection. For instance, when Sodexo offers chicken nuggets, they use whole grain
breading (Sodexo, 2009).

Aramark works individually with each school system to alter their “healthy programs” on
an individually requested basis. In 500 of the 4,000 schools for which they provide breakfast and
lunch services, Aramark has created and implemented a system called the “Cool*Caf.” This
program creates a school environment with bright colors, messaging created by the elementary
students, and animation. There are no trans fats used in Aramark’s foods. The use of processed
foods is greatly reduced, while the use of local fresh product and produce is greatly increased in
the Cool*Caf program. As a part of the Cool*Caf, Aramark provides a fresh fruit and vegetable
bar as well as a hot bar. Schools that have implemented the Cool*Caf show that students
increased their fruit and vegetable intake by 50 percent (Aramark, 2009).

Chartwells employs their Balanced Choices® program in all of their schools, aiming to
provide a pre-set option of the most balanced arrangement of a given day’s selections, including
a entrée, three sides, and a milk. The Balanced Choices® strategy is the comprehensive
approach to students’ health because it teaches students how to make a balanced dietary choice.
It is a guidance system in which students are assisted in selecting the balanced meal through
highlighted indication of what constitutes the balanced meal on any given day. Chartwells makes an effort to incorporate whole grains, low-fat options, and fresh produce into their menus everyday. Chartwells also uses educational materials in the elementary school specifically targeted towards children of that age group, such as the cartoon characters Theodore Eat, Sydey C. Learn, and Ava Live (Chartwells, 2009).

This study aimed to increase selection of balanced lunch choices within a pilot elementary school. Jessie Boyd Elementary (JBE) was selected due to the demographic similarity to its county, Spartanburg, South Carolina. Data was collected in the form of entrée, side, and milk selection and every balanced choice was recorded. Prior to receiving any information about the project, baseline data collection was recorded for 9 lunch periods for all grades, K-6. Following baseline data collection experimenters provided an education day where they performed skits demonstrating the importance of choosing white milk and the incentives granted for choosing the balanced options. Students were also shown a video clip notifying them of baseline data collection, the incentive phase, and the importance of choosing a balanced lunch. They were given brochures to take home to their families which informed them about the project and gave them a website to visit for additional information and updated results during the incentive phase. During the incentive phase, data was collected in the same manner as the baseline phase over 9 lunch periods. During this phase, incentives of ringing a bell during lunch in the cafeteria, receiving a sticker, and competition between grades provided reinforcement for choosing the balanced option with white milk. It was hypothesized that there would be an increase in the selection of the balanced meal during the incentive phase as well as an increase of white milk over flavored milks during the incentive phase. We expected that the increase in balanced lunch options and milk choices would be greater for the younger grades than the older-
elementary grades, reflecting a greater influence of the positive reinforcement on the younger age students.

Methods

Participants

Students in grades K-6 at Jesse Boyd Elementary School that bought a Chartwells provided lunch were the participants in this study. The school population consisted of 525 male and female students ranging from 5 to 13 years in age. There were an average of 44.23 students per grade that bought a cafeteria lunch over the course of the study. Table 1 summarizes the student participation in the lunch service during the 9-day baseline and incentive phases.

<table>
<thead>
<tr>
<th></th>
<th>K</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>All Minimum</th>
<th>All Mean</th>
<th>All Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>38.72</td>
<td>46.56</td>
<td>43.44</td>
<td>41.94</td>
<td>39.21</td>
<td>46.28</td>
<td>43.00</td>
<td>271.50</td>
<td>292.78</td>
<td>324.50</td>
</tr>
<tr>
<td>Incentive</td>
<td>38.50</td>
<td>50.22</td>
<td>53.89</td>
<td>46.78</td>
<td>40.83</td>
<td>46.81</td>
<td>43.06</td>
<td>259.50</td>
<td>310.11</td>
<td>348.50</td>
</tr>
</tbody>
</table>

This study was conducted in collaboration and with the support of Chartwells, the district superintendent, and principal of Jesse Boyd Elementary School. The experimental design and all protocols were approved by the Wofford College Institutional Review Board.

Data Collection

During baseline and incentive phases each student’s selection of entrée, side item, milk type, and balanced choice were recorded. Each day three entrée selections were provided with one option designated as the balanced choice entrée. Up to four side item selections were also provided daily with one to four choices designated the balanced lunch side item selections on a given day. Four milk choices were available each day of the study; 1% white milk was always the balanced option while chocolate, strawberry, and vanilla milk were the other flavored milk selections. As shown in Table 2, flavored milks contained more than twice the sugar and 40-70% more calories than white milk.
Table 2. Nutritional analysis of the available milk choices.

<table>
<thead>
<tr>
<th>Type of Milk</th>
<th>1% White</th>
<th>Chocolate</th>
<th>Strawberry</th>
<th>Vanilla</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calories</td>
<td>100</td>
<td>140</td>
<td>150</td>
<td>170</td>
</tr>
<tr>
<td>Sugar (g)</td>
<td>11</td>
<td>23</td>
<td>24</td>
<td>30</td>
</tr>
<tr>
<td>Fat (g)</td>
<td>2.8</td>
<td>0</td>
<td>2.5</td>
<td>2.5</td>
</tr>
<tr>
<td>Protein (g)</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>7</td>
</tr>
</tbody>
</table>

A selection of the identified balanced entrée and all identified side items with 1% white milk qualified as the balanced choice for our study. Selection of an entrée other than the balanced option or insufficient selection of all balanced side items was recorded as a not balanced choice. The study was carried out over a period of 19 days, which consisted of 9 baseline collection days, 1 day of education, and 9 incentive collection days. Data was collected by two experimenters. Each experimenter collected primary data on one-half of the cafeteria and recorded the other half on a secondary sheet. Since each experimenter collected data for the entire cafeteria the data was effectively recounted. The primary and secondary data were averaged for data analysis.

**Education**

Following the baseline phase and two days prior to the incentive phase of the study experimenters conducted an education day during lunch. During this phase experimenters demonstrated the importance of choosing white milk and the incentives granted for choosing the balanced option. The students were also shown a video clip prior to and on the education day explaining the purpose of the baseline data collection and the upcoming incentive phase data collection. The video clip also explained the importance of choosing a balanced lunch. Students were given brochures to take home to their families, and were informed about a website explaining the study. Each morning during the incentive phase the students watched a short (20-
30 second) video clip informing them which entrées and side items were the balanced lunch choices for that day.

**Intervention**

During the incentive phase of the study if a student successfully chose the balanced choice entrée, sides, and white milk they received reinforcement of ringing a bell and receiving a healthy choice sticker. The stickers and the bell ringing were administered as the students ate in the cafeteria. In addition, bar graphs comparing the grades’ percent balanced choice selections from the previous day were posted to promote competition between grades. Another graph displaying the comparison between baseline milk choice and incentive phase milk choice was posted each day on the door entering the cafeteria.

**Data**

Repeated measures ANOVAs were used to analyze the effects of the intervention on each grade’s choices of balanced versus not balanced meals and milk selections during baseline and the incentive phase. Post-hoc t-tests were used to further analyze the source of significant effects. There were 5 days in which data from a particular grade was omitted. This was due to insufficient sample sizes as the result of field trips or special events. Each of the three daily entrées was also ranked using a composite score based on each item’s caloric, fat, and carbohydrate content with entrée 1 having the lowest score (most healthy) and entrée 3 having the highest score (least healthy).

**Results**

As can be seen in figure 1, there was a significant main effect of the intervention on the percentage of not balanced choices chosen \[F(1,5) = 112.26, p < 0.001\]. An interaction was found between the effect of the intervention and the grade \[F(7,35) = 21.59, p < 0.001\]. T-tests revealed significant reductions in not balanced choices during the incentive phase in each grade.
with the exception of 5th grade. When all the grades were averaged there was a significant reduction of 38% fewer elementary school students choosing the not balanced meal from baseline to the incentive phase. There was also a main effect of the intervention on the percentage of balanced choices \[F(1,5) = 98.22, p < 0.001\], and there was an interaction between the effect of the intervention and grade \[F(7,35) = 20.71, p < 0.001\]. T-tests revealed a significantly higher percentage of balanced choices during the incentive phase in every grade. The percentage of balanced choices across all grades significantly increased 40% from baseline to incentive phase.

Figure 1. Percent of Not Balanced Choices during baseline and the incentive phase (A). Percent of Balanced Choices during baseline and incentive phase (B). The asterisks \((p < 0.01)\) and crosses \((p < 0.05)\) indicate significant differences between phases for each grade and all grades.

Figure 2 shows the percentage of students choosing chocolate (A), white (B), strawberry (C), and vanilla milk (D) during the baseline and incentive phases. There was a main effect of the intervention on the percentage of students who selected chocolate milk \[F(1,6) = 244.98, p < 0.001\], white milk \[F(1,6) = 114.04, p < 0.001\], and strawberry milk \[F(1,6) = 69.48, p < 0.001\]. There was no main effect of the intervention for vanilla milk. This is most likely due to the small percentage of students that chose vanilla milk during both phases. There was also an interaction between the effect of the intervention and grade on the percentage of students who chose chocolate \[F(7,42) = 34.81, p < 0.001\], white \[F(7,42) = 47.67, p < 0.001\], strawberry
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[F(7,42) = 10.87, p < 0.001], and vanilla milk [F(7,42) = 2.30, p < 0.05]. T-tests revealed significant decreases in the percentage of students in every grade except 5th grade that selected chocolate milk between the baseline and incentive phases. There were significant increases in the percentage of students in each grade that chose white milk during the incentive phase. T-tests revealed significant decreases in the percentage of students in grades K, 1, 2, 3, 6, and the average of all grades that chose strawberry milk during baseline and the incentive phase. Only the percentage of Kindergarten students who chose vanilla milk decreased significantly from baseline to the incentive phase.

Figure 2. The percentage of students that chose chocolate milk (A), white milk (B), strawberry milk (C), and vanilla milk (D) during baseline and the incentive phase. The asterisks (p < 0.01) and crosses (p < 0.05) indicate significant differences between phases for each grade and all grades.

Figure 3 compares the raw numbers of students who chose white, chocolate, strawberry, and vanilla milk during baseline and the incentive phase. There was no main effect of treatment,
which signifies that the same number of students drank milk in both phases. A main effect of milk type was found \( F(3,27) = 63.99, p < 0.01 \). Pairwise comparisons revealed differences between the number of students who bought milk such that white = chocolate > strawberry = vanilla. There was a significant interaction between the type of milk selected and the intervention \( F(3,27) = 57.56, p < 0.001 \). There was a significant increase of 130 students selecting white milk each day during the incentive phase. There was a significant decrease of 91 students selecting chocolate milk and 20 fewer students selecting strawberry milk each day during the incentive phase. There was no effect on the number of students who selected vanilla milk during baseline and incentive phase.

Figure 3. The average number of students who bought white, chocolate, strawberry, and vanilla milk each day at lunch during baseline and the incentive phase. The asterisks indicate that there were significant differences \( p < 0.01 \) between the baseline and the incentive phases.
It is interesting to compare the percentage of students who bought white milk (63.9%) and the percentage of students who were reinforced for the balanced choice + white milk (40.3%) during the incentive phase. An extra 23.60% of students selected white milk during the incentive phase even though they did not choose the balanced choice or receive any reinforcement for selecting white milk, this increase shows that students were willing to make a healthier choice by choosing white milk with their meal even when they were not being rewarded for that choice.

Figure 4. Percentage of all elementary students who chose entrees ranked 1, 2, and 3 according to increasing caloric, fat and carbohydrate content during baseline and the incentive phase. The asterisk indicates that the percentage of students who chose entree 1 during the incentive phase was significantly (p < 0.01) higher than during baseline.

During days 6, 7, and 8 the entrée with the lowest composite score for calories, fat, and carbohydrates (Entrée 1) was also the balanced choice. There was a significant interaction
between intervention and ranked entrée selections \( F (2,4) = 10.33, p < 0.05 \) for all JBE students. Post-hoc paired t-tests revealed a significant increase (35.8%) in entrée 1, the healthiest choice. As shown in Figure 4, comparable reductions in selections of both ranked entrée 2 and entrée 3 accounted for increase in entrée 1 selection during the incentive phase.

**Discussion**

There was an overall positive response to the implementation of the balanced lunch incentive program. Following education about the program as well as education concerning balanced meals and milk differences, the amount of participation in the Chartwells balanced meal program dramatically increased at Jesse Boyd Elementary School. Balanced meals were virtually never chosen during baseline, and after education and implementation of the incentive phase, approximately half of the students were selecting the balanced meal option. The most dramatic increase was seen in milk selection. Chocolate milk selection decreased and white milk selection increased exorbitantly. Vanilla milk selection was also slightly decreased, but not significantly. This is likely because vanilla milk was not selected enough at baseline for incentive phase to show a dramatic decrease. These data support the hypothesis that offering a cost-free and sustainable incentive to children for choosing balanced lunches would be sufficient to influence their lunch meal choices.

Children on some days made more healthy choices than on other days. For example, when cheese pizza was an entrée on the same day that the balanced meal option was a broccoli stuffed baked potato, the number of pizza selections superseded the number of potatoes chosen. Conversely, contrary to predictable expectations, when the fruit and yogurt tray was the balanced entrée on the same day as a Sloppy Joe entrée, the fruit and yogurt was chosen a higher amount. Early in the incentive phase all of the choices were not sufficiently made available. On the first incentive day, so many students were choosing white milk that at one point that the providers
actually ran out of white milk. Also, when the fruit and yogurt entrée was the balanced lunch, the Chartwells manager had to supplement the yogurt supply from a local grocery store in order to complete all of the orders. These issues were the product of unpredicted success of the incentive program. Therefore, in the future, suppliers should prepare adequately for changes in students’ selections when implementing this program.

One issue of concern that arose was the assignment of entrées and side items as the balanced meal. Often, the entrée assigned to the balanced choice was not the entrée with the lowest composite score, which assessed fat and calorie content. Also, selections for the side items that were balanced did not always appear to be the healthiest choice or the healthiest and most balanced combination. For example, on one day, given the choice of fresh grapes or a sugary mixture of strawberries and bananas in gelatin, more students chose fresh grapes instead of the strawberry-banana gelatin that was identified as a part of the balanced meal option. The inclusion of the strawberry-banana gelatin was likely due to the need to meet the minimum level of 600 calories. Also, at least one student noted that if the white milk had been made available in skim instead of only one percent, she would have selected it. Instead, she selected the balanced meal and chocolate milk, which is made with skim milk.

Children in the lunchroom setting have the option of choosing white, chocolate, strawberry, or vanilla milk to consume during the lunch period. With free choice, children often choose the milk that tastes better, and this usually tends to be the milk with a higher content of sugar and added flavorings. If children have no knowledge of the ingredients that are in each of these different milks, they will have no motivation to make the healthy and lowest-sugar milk choice. With the help of influential adult figures such as parents, teachers, and other school administrators, children can be educated on the long-term health benefits of choosing white milk for lunch instead of the artificially flavored and sugar-added milks. Once education has been
established, these same adult figures must take on the role of positive reinforcement for healthy choices.

Some issues that arise regarding reinforcing behaviors include sustainability, cost, child acceptance, teacher and administration acceptance, and extrinsic versus intrinsic reinforcement. These issues, specifically sustainability and cost of reinforcement, show benefits for intrinsic reward beyond external reinforcement. For example, rather than receiving only an extrinsic reinforcer, such as a sticker, it is much more effective to include intrinsic reinforcement, such as the instillation of positive feelings, pride, and a sense that they have made a good choice. Public recognition, and in the case of our program, ringing a bell, is a positive reinforcer providing an outward, social acknowledgement that these individual children have made the balanced lunch choice with white milk.

It is also important to consider the impact of this program on those children who consistently choose the balanced choice with flavored milk or those who choose a not balanced meal with the white milk. These students made a conscious effort to choose a healthier option for lunch, but they are not being reinforced for their choice. Perhaps these children have an established sense of healthy eating knowledge or simply want to drink the healthiest milk or eat the healthiest entrée.

With applied social reinforcement, two problems arise: some children choose the balanced lunch option so that they can be positively reinforced, but do not eat any of the healthy food items; or children who did not choose the balanced choice may have gained a negative sense of self because they are not being positively reinforced. The goal of the balanced lunch program is to instill positive intrinsic emotions within each child. Such a program is centered on healthy eating education. Rather than teaching children to focus on gaining a reward, these children should be educated on why they should make the healthy choice and of the health
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benefits that are associated with this choice. For example, during the incentive phase of the program, a teacher commented that she had never seen her students taste fresh spinach. The program had instilled knowledge within these children that encouraged them to try a new vegetable. Similarly, children should not have lowered self-esteem or a negative sense of self because they were not reinforced. After children have been exposed to this program, they should understand that reinforcement is not the primary concern; instead they should be proud of having gained health knowledge and application of such knowledge.

Previous studies have focused on eliminating high-sugar foods and milks from school systems in an attempt to decrease consumption of these products and to increase consumption of healthier items. Results from these studies show that by eliminating flavored milks, total milk consumption in schools significantly decreases among children. Our balanced lunch program focused on educating children about making healthier food choices, so that these unhealthy items do not need to be eliminated. Our research shows that with gained health knowledge, children will voluntarily choose the white milk over the flavored milks without eliminating any choices.

At the elementary school age, children look to adult figures as role models. If teachers and school administration are not excited about an implemented balanced lunch program, it will negatively impact the students’ participation. Positive reactions from teachers can powerfully influence their students’ lunch choices and actions. Identifying the next day’s balanced lunch option through an announcement everyday makes children made aware of the lunch choice that they should make. It is essentially up to the child whether he or she actually chooses the balanced option. If the child does make the balanced choice, he or she will be positively rewarded but is not punished if he or she makes a not balanced choice. Before reinforcement takes place, children must be made aware that a lack of reward simply indicates a lack of the balanced choice, not a lack of value as a student. The reinforcement should encourage further
Increasing Healthy Choices

positive dietary choices. The ultimate goal of a balanced lunch program is that through praise and positive reinforcement, children will learn to recognize how to make a good choice, and to continue these good choices in the future.

Sustainability is crucial. Success of the program does not depend on short-term implementation. Rather, the program’s ultimate goals of reducing childhood obesity through healthier eating can only be achieved through long-term effects. If the program can instill such positive reinforcement within the child, he or she may be inspired to make consistent balanced food choices outside the school cafeteria. The internalization of such choices requires sustained reinforcement of positive choices. A two-week long program is likely not going to be as effective in instilling the internalization of healthy choices as a longer sustained program. The two-week program may yield short-term effects such as changes in eating habits, but longer programs are more likely to result in long-term effects such as changes in BMI. A longer program could have the benefit of measuring initial and final BMI percentiles among children who have been exposed to the program in order to assess its effectiveness in reducing childhood obesity. Regardless of the potential long-term positive impact on children’s health, our program clearly showed that cost-free positive reinforcement through public recognition of healthy choices in the school cafeteria is an effective and sustainable mechanism to influence the eating behaviors of elementary students.
References


