Does the Presentation Format of Nutrition Education Determine Behavioral Change

By

Romaine S. Hanson

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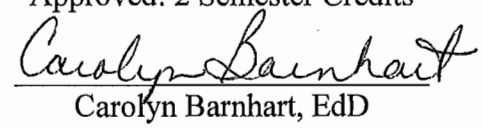

Carolyn Barnhart, EdD

The Graduate School
University of Wisconsin-Stout
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The Graduate School
University of Wisconsin-Stout
Menomonie, WI

Author: **Hanson, Romaine S.**

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ABSTRACT

This study was conducted to further the understanding of nutrition education and behavior change in kindergarten and fourth grade students. Three kindergarten and three fourth grade classes completed the study with an n=134. The subjects attended a public elementary school, in the School District of River Falls located in River Falls, Wisconsin. Data was collected during spring 2009. The subjects received a pre-test to identify their preferred snack from five snacks displayed on a piece of 8 ½ x 11 inch paper. After making the paper selection by circling their preferred snack they were presented with the identical snacks choices and asked to choose one snack to eat. This was followed in the afternoon by a lesson on snacks presented by the classroom teacher using one of the three teaching methods: lecture, gaming or matching. After the lesson a post test was administered by the teacher asking the subjects to circle their preferred snack choice. Again the subjects were presented the snacks appearing on the post-test and were

asked to choose a snack to eat. The results were analyzed using SPSS, crosstabs and Pierson Chi-Square. Significant statistical differences, <.005, were identified in relation to choice of snack on paper and the actual snack chosen to eat. Specifically the kindergarten subjects had fewer positive behavior changes in snack choice than the fourth graders. The teaching method resulting in the greater behavior change, for this study, was the lecture method.

The Graduate School

University of Wisconsin-Stout

Menomonie, WI

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Chapter I: Introduction

In recent years there has been an overall decline in the healthy weight of children in the elementary school age group in the United States. As a result there have been several nutrition education programs focusing on the improvement of food intake by this group. DeVault et al, (2008) concluded that "documenting and evaluating school-based intervention programs is critical for setting evidence based- health policy, justifying funding, and achieving broader implementation of successful interventions" (p. 680). As the prevalence of childhood obesity increases, the message of healthy lifestyle choices has been a focus for those at the elementary age. Fahlman found that "the situation is even bleaker for elementary and middle school children where only 5% had eaten the recommended servings of fruits and vegetables and 9% had met the recommendations for dairy products" (p. 217). According to Birch and Fisher (1998): As we examine the evidence on children's food preferences and dietary selections, we see that achieving the objective of the 2005 dietary guidelines to reduce fat intake and increase complex carbohydrate intake may constitute a formidable challenge: "The most familiar and preferred foods in childhood tends to combine these two principle ingredients: sugar and fat" (p. 541). If and when children are given the opportunity to make a food choice, they would more likely make the choice based on their preference and not on what would be considered healthy for them. For this reason, it is extremely important in the early years for parents, teachers and caregivers to understand their role in the child's food choices because, according to Birch and Fisher (1998) "...the factors that shape food preference in early life is critical..." (p. 541).

Research shows the environment in which a child is exposed will have some influence on their food choices (Position of the American, 2008). Young people are especially dependent on parents and other caregivers to provide food that will promote optimal health, growth and

development. For children, eating typically is a social occasion, and other eaters, including parents, other adults, peers, and siblings, as well as children's observation of others' eating behavior, influence the development of their own preferences and eating behaviors (Birch & Fisher, 1998). Although much is known about the cause of ill health in children, determining how to present nutrition education content in a way that fosters behavior change has seemed to pose a challenge.

Statement of the Problem

The purpose of this study was to determine if the teaching method used would impact a positive behavior change in a child's snack choice. The study was conducted with kindergarten and fourth graders at a public elementary school in the School District of River Falls, in River Falls, Wisconsin. The study was conducted in June of 2009.

Research Objectives

1. Determine whether the teaching method used in delivering nutrition education makes a difference in behavior change as it relates to making healthy snack choices by children in three kindergarten and three fourth grade classrooms.
2. Establish whether the level of cognitive development of a child in kindergarten as compared to a fourth grader is a determining factor in knowledge retention and behavior change.
3. Evaluate the basic knowledge of the research subjects as it relates to snacking.

Assumptions and Limitations

It was assumed because of the educational nature of the study, parents would allow their children to participate, and the principal as well as the teacher would be eager to participate in this study. It was also assumed the results of the study would show that the nutrition education

lesson taught on snacking using games as a method to present the material would result in better retention of the content as opposed to content taught using the lecture format, and as a result, the snacks chosen on paper would reflect this expected learning and anticipated behavior change. It was also assumed that there would be a significant difference in the results between the kindergarteners and the fourth graders as well as among the boys and girls relative to their choices made on the pre test compared with the post test.

It became evident the timing for conducting the study would be a limiting factor. The research study was conducted during the end of the school year, and this was also the time teachers were using to wrap up any unfinished reporting and curriculum evaluations. As a result of this there may not have been adequate time given for the nutrition education lesson presented, which could have potentially affected the results collected. The return of the permission forms by the parent or guardian allowing the students to participate took two weeks, this was particularly true for the fourth grade group.

Definition of Terms

Activity Based Intervention (ABI). "Is child directed, transactional approach that embeds interventions on children's individual goals and objectives in routine, planned, or child-initiated activities, and uses logically occurring antecedents and consequences to develop functional and generative skills" (Circle of Inclusion, 2009).

Body Mass Index (BMI). "A mathematical formula that correlates with body fat and is expressed as weight in kilograms divided by height in meters squared" (Mahan & Escott-Stump, 2008, p. 532).

Center for Disease Control and Prevention (CDC). This is a government agency in the United States that focuses on the health of the public. (CDC, 2009)

Cognition. To become acquainted with or come to know (Merriam -Webster online Dictionary, 2009)

Coordinated School Health Program (CSHP). This is a program that works in concert with school food services, curriculum developers as well as community members, to create a program that covers all aspects of a healthy school program.

Curriculum. A set of courses constituting an area of specialization (Merriam-Webster Online Dictionary, 2009)

Daily Recommended Intake (DRI). A set of values established by the Food and Nutrition Board, in partnership with Health Canada, which identify acceptable levels of nutrient intakes (Institute of Medicine, 2005).

Early Childhood Education. Education from preschool to kindergarten.

Elementary Education. Consisting of the basic, essential, or fundamental part of education, taught in Kindergarten through fifth grade (School District of River Falls, 2009)

Everyday Snack. A snack that is healthy and can be eaten at any time and is usually not found in the fats section the food guide pyramid promoted by the United States Department of Agriculture and the United States Food and Drug Administration.

Expanded Food and Nutrition Education Program (EFNEP). The Expanded Food and Nutrition Education Program (EFNEP) is designed to assist limited resource audiences in acquiring the knowledge, skills, attitudes, and changed-behavior necessary for nutritionally sound diets, and to contribute to their personal development and the improvement of the total family diet and nutritional well-being (United States Department of Agriculture, 2009).

Gaming. The playing of games that stimulate actual conditions… especially for training or testing purposes. (Merriam Webster's online dictionary, 2009)

Paradigm. An example serving as a model (Random House Webster's Unabridged Dictionary, 2009, p. 1406)

Recommended Daily Allowance (RDA). Levels of essential nutrients that meet the nutritional needs of healthy people while decreasing the risk of certain chronic diseases (Brown, 2005, p. G-6).

Snack. Small serving of food that is eaten between meals to supplement a meal or to satiate the feeling of hunger.

Sometimes Snack. This is a snack that can be found in the fats and sweets category of the food guide pyramid, or made from high, calorie low nutrient dense foods. It should be consumed in moderation.

Student-centered Learning. This philosophy of teaching takes into consideration the different modalities by which children learn and provides an environment allowing the child to guide their own learning. This requires the teacher to be familiar with each individual's learning style in order to incorporate appropriate learning activities enabling each student to work to their fullest potential within their styles of learning.

Theory. A particular concept or view of something to be done or of the method of doing it; a system of rules or principles. (Random House Webster's Unabridged Dictionary 2009, p. 1967)

Methodology

The purpose of this study was to determine whether there is a difference in the retention of knowledge depending on the way nutrition education material is taught, specifically when games are used as a teaching method, as well as the age at which the material is presented. The study also determined whether there is a behavioral change based on the teaching method used,

and if cognition levels have any impact on the learning outcome. A pre test will be administered followed by the intervention which was in the form of a lesson on snack choices. This was followed by the post test. The way the lessons are taught in the kindergarten classes will be replicated in the fourth grade classes using the same teaching methods.

The research was conducted using a convenient sample made up of kindergarteners and fourth graders who attended an elementary school in the School District of River Falls. The school was chosen, based on the willingness of the principal to allow the researcher to work in the school. Informed consent forms along with an allergy statement form were sent home with each student in the chosen classes for signatures of the parent(s) or legal guardian(s).

The study was designed with a pre and post test component. The subjects were divided by classes. The nutrition lesson to be taught was called Snack Choices. It was an existing lesson plan adapted by the researcher and taught by the classroom teachers.

One class in kindergarten and one class in fourth grade had the snack choices lesson presented using lecture as a teaching method. The second kindergarten and the second fourth grade class had the snack choices lesson presented using games as a teaching method. The third class of kindergarten and the third class of fourth graders had the snack choices lesson presented using matching as a teaching method. The subjects were all provided a snack choice to eat along with the pre and post test.

Chapter II: Literature Review

Introduction

There are four key points addressing the effectiveness of nutrition education as it relates to behavior change in elementary age children. First, the nutritional health status of elementary school students and the role schools can play. Second, snacking and its affect on overall dietary intake and health. The third point addressed, are the modes by which nutrition education is presented and their affect on positive behavioral outcomes. Finally, the role cognition plays in the ability of children to make behavioral changes when nutrition education is presented to them.

Nutritional Health Status of Elementary School Students and the Role Schools Can Play

The most recent prevalence estimates from the National Health and Nutritional Examination Survey 2003-2004 indicate that 33.6% of individuals, 2 to 19 years, were at risk of overweight and 17.1% were overweight compared to 28.2% and 13.9% in 1999-2000 respectively (Ogden et al , 2006).

With these increasingly troubling health statistics, according to (Pyle, 2006):

> Schools are logical treatment arenas given their unparalleled access to children in terms of time and attention. Because most treatment and prevention programs for obesity focus a significant amount of attention on education about proper nutrition, exercise, and the dangers of poor health habits, the existing educational mission of schools makes them an ideal avenue for dissemination of this information. In addition, because schools already provide a captive audience of children, school-based interventions are capable of providing treatment to a large population of children in an economically efficient manner. Furthermore, because children are at school for the majority of their

waking hours during the week, comprehensive interventions are feasible. Interventions could implement increased physical activity throughout the day as well as address food choices made while at school. (p. 365)

Nutrition-related problems in elementary school – aged children include proper growth and development; immediate health problems such as dental caries and overweight; and long–term health problems such as heart disease, cancer and diabetes (Powers, Struempler, Guarino & Parmer, 2005). Not withstanding the aforementiond, when parents were dichotomized into whether they were in favor or they were opposed to the idea of schools as places for treatment of overweight, more parents opposed (38%) than were in favor (18%). This would indicate that perhaps parents would prefer schools to focus on prevention rather treatment of childhood overweight or that the issue was beyond the skills of school personnel (Murnan, Price, Telljohann, Dake, & Broadly, 2006). Numerous factors influence classroom implementation, such as support of school administrators, resources and teacher training (Auld, Romaniello, Heimendinger, Hambridge, & Hambridge, 1999).

The mission of the Center for Disease Control and Prevention (CDC) Division of Adolescent and School Health "is to prevent the most serious risks among children, adolescents and young adults" (Addressing Nutrition, n. d.). In order to stay true to their mission, the CDC has put five strategies in place to achieve their goal. Of the five, "Funding to State Departments of Education and Health and National Nongovernmental Organizations for Policy and Program Development" has the most relevance to this study. As a result of this assistance states can:

1) Implement effective nutrition policies, programs, curricula and standards.

2) Provide professional develpoment, consultation, and technical assistance to schools and school districts.
3) Implement strategies to reduce health disparities.
4) Collaborate with local health and education departments, community planning groups, parents, students and other groups or coalitions (Addressing Nutrition, n. d.).

Schools cannot solve the obesity epidemic, but the epidemic is unlikely to be halted without strong school-based policies and programs (Wechsler, McKenna, Lee & Dietz, 2004).

Teaching Methods: Their Affect on Nutrition Knowledge and Behavior Outcome

To facilitate dietary behavior changes, education can be effective. Nutrition educators must consider factors to effectively reach children. They should carefully determine the purpose and goals of a nutrition education program (Powers, Struempler & Parmer, 2005).

The most successful programs to combat youth obesity use a combination of techniques including behavior management counseling, teaching strategies to identify healthy foods and avoid unhealthy foods, implementing physical activity into the daily routine, and involving parents and other family members in the treatment (Moran, 1999; Sheslow & Hassink, 1997; Spencer, 1998). The National Institute of Health (1998) also suggested the use of a broad range of intervention techniques. Interventions may depend on age, severity of obesity, gender, and socioeconomic level (Sheslow & Hassink, 1997). However, research has identified effective elements across interventions within behavioral, educational, and physical domains (Ledford, 2003; Wolf, Cohen, & Rosenfeld, 1985), that school psychologists can use to address obesity. There are several

styles of teaching that can be employed to get the message of nutriton across to students. (McCarthy, 1992) (as cited in Sovyanhadi & Cort, 2004)

Teaching styles may be classified as: (1) visual – utilizing pictures, sketches, diagrams, graphs, and other related illustrations, (2) auditory – teacher lectures or gives explanations, (3) tactile – teacher uses hands-on activities, (4) kinesthetics – students engage in physical movements, (5) group – teacher adopts group interaction and discussion, and (6) individual – teacher uses recitations, individual projects and attention. (Soliven, 2003) (as cited in Sovyanhadi & Cort, 2004)

The lecture method is regarded as the most basic presentation and style for factual material in direct logical manner (Sovyanhadi & Cort, 2004). Wolf et al., (1985) posit, nutrition education programs instruct students regarding basic dietary information such as appropriate daily caloric intake, a balanced daily diet, and the health advantages associated with particular foods (as cited in Welcher, 2004). Addressing nutrition and how to make healthy eating choices at school can occur in many settings with diverse strategies including school personnel modeling healthy food choices; advocating for healthy eating at school through providing healthy school lunches and snacks; incorporating nutrition education classes into the curriculum and exposing students to the selection, preparation, and taste of healthful foods (Blom-Hoffman, 2004).

Used as an alternative to more traditional forms of teaching, games keep students from becoming bored, generates enthusiasm, and stimulate thought processes (Royse & Newton, 2007). Henry (1997) and Henderson (2005), state, although games have been played for centuries, their use as a teaching strategy is relatively new (as citeded in Royse & Newton, 2007).

Lieberman (2001) hypothesized that game playing may enhance: 1) self-concept, self-efficacy, and knowledge; 2) skills, 3) communication; and 4) social support which led to improved health behaviors resulting in better health ...playing some interactive health games can become a stepping stone for improving children's self-management behaviors (as stated in Yoon & Goldwin, 2007).

Fenty (1991) and Saydak (1989) agree when the teaching/learning process is perceived as fun, stress and anxiety may be reduced. In addition, gaming alters the role of students and teachers, resulting in an environment that is more relaxing and conducive to learning (as cited in Royse & Newton, 2007). Some literature supports the notion that a combination of methods, along with the teacher's own unique talents, which translates to what Soliven (2003) terms style, can be very effective (Sovyanhadi & Cort, 2004). Though nutrition programs have been found to improve the efficacy of comprehensive interventions, they have not been found effective on their own (Ledford, 2003). This implies that knowledge may be a necessary first step to healthy weight management, but is not sufficient to promote behavioral change (Pyle et al., 2006).

Schools are important settings to implement prevention and intervention services to reduce the prevalence of obesity due to their access, duration of exposure, and subsequent impact on the behavior of children and adolescents (Ledford, 2003). In general, eating habits are very difficult to change (Wolf et al.,1985); thus, targeting children's nutritional habits as early as possible is the best way to produce lasting effects. To achieve optimal success, school districts should start in preschool and continue through high school (Ledford, 2003).

The Role of Snacking in Overall Dietary Intake

Snacking can be an important part of the diet especially for children, "because they usually do not eat enough at mealtime to sustain their blood-sugar levels between meals (Hark, 2006, p. 128). When choosing a snack the guidelines for a healthy diet should be followed. A snack is considered a small serving of food eaten between meals to supplement a meal that may be lacking in adequate nutrients or to satiate the feeling of hunger. A snack does not have to be solid food (Appendix A), but could be a liquid such as a fruit smoothie. Unfortunately, " many children like to snack on sweets, chips, cookies, doughnuts and other foods low in nutritional value, but high in calories" (Hark, 2006, p. 129). These types of foods are referred to as empty calories and coupled with the potential inactivity of the child, have come to symbolize the vehicle for promoting childhood obesity which results in other diseases as well as dental caries (Fisher, 1995, Thomson, 1996, Birch, 1979, Domel, 1993) states, Children eat what they like and leave the rest, food preferences are especially important determinants of the food intake of young children (as cited in Fisher, 1998). The choices children make are important in considering the overall nutritional quality of their diets (Birch & Fisher, 1998). If certain foods are restricted from a child's diet it will produce positive behavior change relative to healthy or unhealthy foods eaten. Birch et al (1998) notes, "contrary to these parental beliefs, restricting children's access to foods does not produce food dislikes for the restricted food; instead, such practices enhance liking and can increase intake" (p. 544).

Cognition and Behavior Change as Related to Nutrition

As children grow, they acquire knowledge and assimilate concepts by leaps and bounds. The early years are ideal for providing nutrition information and promoting positive attitudes about all foods (Mahon & Escott- Stump,2004, p. 275). To facilitate dietary behavior changes,

education is an effective beginning. Nutrition educators must consider certain factors to effectively reach children. They should carefully determine the purpose and goals of a nutrition education program. In addition, educators must determine the theory used to develop and deliver nutrition education topics (Powers, et al. 2005). Some components of Piaget's theory that may have relevance to nutrition education and intervention may be, as suggested by (Rickard et al., 1995) (a) emphasis on child centered approach to learning; (b) the importance of play and self-discovery; (c) the notion that education should be a develop-mentally based, that is, instruction should be appropriate to the child's developmental status; and (d) the recognition that children learn a great deal more from peer interaction.

Nutrition education has traditionally focused on what changes should be made, and behavioral psychology has emphasized how to make the changes. These two fields must come together, and there must be recognition that nutrition education can provide necessary information, and behavioral change strategies can provide the necessary skills (Brownwell & Cohen, 2005). The concept of nutrition is abstract and so may not be understood by preschoolers and most primary school children. Some nutrition curricula are too sophisticated for the children's conceptual abilities, and modifications may be necessary to make the educational experiences meaningful (Mahon & Esctott-Stump, 2004, p.275). Although current guidelines attempt to convey the importance of variety and moderation, these nutrtitional guidelines are cognitively complex (Birch & Fisher, 1998). For children, eating typically is a social occasion, and other eaters, including parents, other adults, peers, and siblings, as well as children's observations of others' eating behavior, influence the development of their own behaviors (Birch & Fisher, 1998). Rozen et al (1987), states, in a study of adults' understanding of nutritional concepts concluded that even well educated-educated adults engaged in categorical thinking , ie,

grouping foods as either "good" or "bad," and a monotonic mind belief that something that is harmful in large quantities (such as dietary fat) is also harmful at low levels. Nutritional messages interpreted with such categorical thinking may result in parental attempts to restrict children's intake of "bad" foods and encourage the intake of "good" foods (as cited in Birch & Fisher, 1998). Learning … is a complex process that incorporates the specific task to be learned with the uniqueness of the individual learner and the immediate learning environment in all domains of human behavior – motor, cognitive social and emotional (Rickard, et al. 1995). Given all that has been mentioned, the accountability for recognizing the abilities of the students in the classroom and creating an atmosphere and curriculum that best convey the lesson and moves the learner from knowing to doing, thus creating the necessary nutrition behavior change sits squarely on the shoulders of the teachers when the student is in the charge of the instructor.

Chapter III: Methodology

Methods and procedures used in the study of kindergarten and fourth graders and their knowledge of snacks are explained in this section. A description of respondents, instrumentations and data analysis are also discussed.

Research Design

The design of this study was both quantitative and qualitative. Primary goal was to determine whether the way nutrition education is presented makes a difference in behavioral change in kindergarten and fourth grade students. The lesson on "snack choices" was presented using a lecture format, lecture combined with a nutrition bingo game as well as a combination of the lecture and an interactive component where the subjects were asked to categorize and match "Sometimes Snacks" and "Everyday Snacks". This study also sought to find out whether cognitive development plays a role in the retention of knowledge that may lead to behavioral change.

Subject Selection and Description

The research was conducted using a convenient sample n=134, made up of kindergarteners and fourth graders between the ages of six and eleven years of age, in the School District of River Falls School, River Falls, Wisconsin. Since the focus of the study was on the efficacy of nutrition education as it relates to behavioral change, the investigator sought out an elementary school principal who was willing to allow the study to be conducted in their school. The kindergarten and fourth grade classes were chosen because the subjects were at different cognitive stages. The willingness of the teachers to participate in the study was also a factor in how many classes were involved. The subjects were asked to complete and return to their teacher a consent form (Appendix B) and have their parent(s) or guardian(s) sign the form. The consent

form was preapproved by the Institutional Research Board at the University of Wisconsin-Stout (Appendix C). The IRB required the use of an allergy notification form (Appendix D). This form was attached to the consent form.

Instrumentation

The pre assessment questionnaire used was created specifically for this study. The questions that were compiled sought to determine what knowledge the subjects had regarding snacks prior to the treatment. The kindergarten classes were given a picture questionnaire (Appendix E) to assess their knowledge and the fourth graders were given the questions (Appendix F). The reason for the difference in the format of the questions was because the kindergarteners were not able to read as well as the fourth graders, and it would have taken more time than was available to complete the questionnaire. The lesson taught was "Snack choices" (Appendix G). The pictures of snacks on each sheet (Appendix H) were randomly placed in an attempt to prevent bias which could potentially skew the results. The snacks were chosen because they were familiar to the subjects.

Data Collection Procedures

Before the study began, the subjects were told of their rights to participate in the study, and they did not have to participate if they did not want to, they all agreed to participate. There were three sets of information collected from the subjects, first, the five part questionnaire which assessed their knowledge and was a part of the pre test. Then the pre and post snack choice sheets were administered (Appendices E, F, H).

There were a total of six classes that participated in the study, three kindergarten and three fourth grade classes. Each of the kindergarten classes used a different method of presenting the same lesson on snack choices. The kindergarten class using the lecture (Appendix G)

consisted of n= 21, bingo, (Appendix I) n=19, and matching (Appendix J) n= 21. This plan was duplicated in the fourth grade where the class using the lecture consisted of n= 23, bingo n=22, and matching n= 24.

The subjects in the kindergarten classes were first each given a special number tag which was used to identify them while the study was being conducted. They were then given a questionnaire (Appendix E) that was labeled with the number that corresponded to the number tag they were assigned. The directions on how to complete the questionnaire were given by the classroom teacher. The completed questionnaires were collected and given to the investigator/researcher. Next, the subjects were given the snack choice sheet (Appendix H) with color pictures of "Everyday Snack" and "Sometimes Snack" and asked to draw a circle around the snack they would like. The teacher or investigator collected the sheets with the choice the student had circled. The same snacks that were on the snack sheets were then brought in and the subjects were asked to select a snack they would like to eat. Their choices were marked with a red check on the sheet they handed in with the snacks they had circled. The same procedure was followed for the fourth grade students.

The following day each teacher taught their lesson on snacks using their assigned format of presentation (Appendix G, I, J). The post test (Appendix H) was conducted the following day for the fourth graders and the same day for the kindergarten subjects, and followed the same format as the pre test.

Data Analysis

The data collected from this study was analyzed using the Statistical Program for Social Sciences, version 10.0. Crosstabs and Chi-square tests (Appendix K) were performed on the

data. Qualitative data was recorded and assembled to check for patterns and themes (Appendix L).

Limitations

The most notable limitation in this study was time. Since the study was conducted at the end of the semester the teachers had very little time to incorporate a lot of extra material into the curriculum, as the students had to attend end of semester field trips as well as make up any course work that was missed because of inclement weather. Getting all six of the classes to conduct the study at the same time on the same days also proved to be a logistical challenge. Since the teachers were not familiar with the lesson plan, and had not taught it prior to the study, coupled with not having enough time to properly review and reflect on the lesson, it was soon realized that simply because the teachers were experts in the content that they taught, nutrition education with the anticipation of promoting behavior change proved to be a challenge. Because of this, the material may not have been adequately presented to the subjects, which could have presented some margin of error in the results.

Having six different teachers present the same lesson could be considered another limitation because multiple presenters could have introduced a number of variations in the way the material was presented.

Chapter IV: Results

Introduction

This chapter reports the findings of the study: Does the Presentation Format of Nutrition Education Determine Behavioral Change. The data was analyzed at the University of Wisconsin-Stout using the Statistical Program for Social Sciences, Version 10.0 (SPSS, 2002). The analysis was done using Crosstabs, and Pierson Chi-square. Statistical significance was judged using a significance level of 0.05 and 2-tailed tests (where appropriate). This means that a test result was deemed statistically significant if the calculated significance value was less than 0.05.

Preselected

Crosstabulation of snack (Chips, Apples, Rice Krispies Treats ™, String cheese, Banana) (Table 1) that were chosen on paper (Appendix K) and snacks chosen on paper and eaten, in the pre-test are described in the following four paragraphs.

The most frequent to least frequent snack choice, on paper: Apple, Banana, Cheese, Chips and Rice Krispie Treats™ respectively. Changes between circled snacks and actually eaten snacks are indicated by up and down arrows and numbers. The actual snack eaten in order of frequency were: Rice Krispie Treats™ ↑↑ +15 subjects, Apple ↓ -6 students, Chips ↑ +7 subjects, String Cheese ↓ -6 subjects, Banana ↓↓ -10 subjects. Subjects were least likely to switch from their snack choice on paper if they had circled Rice Krispies Treats™ or chips. This data indicates, students were least likely to change if they had circled a Sometime Snack.

Students were most likely to make a change between their paper choice and what they actually ate if they had circled apple, banana, or string cheese. That is, students were most likely to change if they had circled an Everyday Snack. This too would be considered a negative outcome.

Sometime Snacks were most likely to gain adherents between the paper circling and actually eating: Rice Krispie Treats™ (+15) and chips (+7). Everyday Snacks were most likely to lose subjects between making their choice on paper and what they actually took and ate.

The most common changes were from: apples to chips (+10), cheese to Rice Krispie Treats™ (+7), Banana to apple (+6), Apple to Rice Krispie Treats™ (+5), Chips to Rice Krispie Treats™ (+4), Rice Krispie Treats™ to apple (+4), banana to Rice Krispie Treats™ (+4).

Table 1

Pre-lesson Crosstabulation of Everyday and Sometimes Snacks, With Snacks That Were Circled on Paper and Eaten in the Classroom at Morning Snack Time, Where n=130

			Pre selected and eaten		
			Everyday	Sometimes	Total
Pre selected on paper	Everyday	Count	55	31	86
		% within pre selected on paper	64.00%	36.00%	100.00%
		% within pre selected and eaten	85.90%	47.00%	66.20%
	Sometimes	Count	9	35	44
		% within pre selected on paper	20.50%	79.50%	100.00%
		% within pre selected and eaten	14.10%	53.00%	33.80%
Total		Count	64	66	130
		% within pre selected on paper	49.20%	50.80%	100.00%
		% within pre selected and eaten	100.00%	100.00%	100.00%

Note. Highlighted numbers indicate statistical significance p=.050

Comparison of Table 1 and Table 2. In Table 2, 35% of subjects n=106 circled an Everyday Snack but less than half of the subjects actually ate an Everyday Snack. Of this data 64% of subjects who made the choice to circle and Everyday Snack actually ate the Sometimes

Snack, and 86% of those who made the choice to circle an Everyday Snack actually ate the snack.

Table 2

Crosstabulation of Snacks in the Pre Test That Were Selected on Paper, and Selected on Paper and Eaten

			Pre selected and eaten		
			Everyday	sometimes	Total
Pre selected on paper	Everyday	Count	55	31	86
		% within pre selected on paper	64.00%	36.00%	100.00%
		% within pre selected and eaten	85.90%	47.00%	66.20%
	Sometimes	Count	9	35	44
		% within pre selected on paper	20.50%	79.50%	100.00%
		% within pre selected and eaten	14.10%	53.00%	33.80%
Total		Count	64	66	130
		% within pre selected on paper	49.20%	50.80%	100.00%
		% within pre selected and eaten	100.00%	100.00%	100.00%

Table 3

Post Lesson Snack Selection on Paper Crosstabulated With Post Lesson Snack Selected and Eaten

			Post selected and eaten		
			Everyday	Sometimes	Total
Post selected on paper	Everyday	Count	48	17	65
		% within post selected on paper	73.80%	26.20%	100.00%
		% within post selected and eaten	96.00%	30.40%	61.30%
	Sometimes	Count	2	39	41
		% within post selected on paper	4.90%	95.10%	100.00%
		% within post selected and eaten	4.00%	69.60%	38.70%
Total		Count	50	56	106
		% within post selected on paper	47.20%	52.80%	100.00%
		% within post selected and eaten	100.00%	100.00%	100.00%

Comparison of Table 2 and Table 3. When comparing Tables 2 and 3 it is evident that after the nutrition education lesson, slightly fewer students chose an Everyday Snack on paper, but of those who did choose an Everyday Snack on paper after the lesson, a somewhat higher percentage of them maintained their Everyday Snack choice by actually eating it.

Table 4

Indicate the Result of (Chips, Apple, Rice Krispie Treats™, String Cheese, and Banana) That Were Chosen on Paper in the Pre Test and Snacks That Were Chosen on Paper in the Post Test

			Post selected on paper		
			everyday	sometimes	Total
Pre selected on paper	Everyday	Count	49	16	65
		% within pre selected on paper	75.40%	24.60%	100.00%
		% within post selected on paper	76.60%	41.00%	63.10%
	Sometimes	Count	15	23	38
		% within pre selected on paper	39.50%	60.50%	100.00%
		% within post selected on paper	23.40%	59.00%	36.90%
Total		Count	64	39	103
		% within pre selected on paper	62.10%	37.90%	100.00%
		% within post selected on paper	100.00%	100.00%	100.00%

Comparison of Table 3 and Table 4. There was not consistency in which snack students circled pre-lesson and post-lesson. For example, it was thought that maybe students who loved Rice Krispie Treats™ would circle Rice Krispie Treats™ both times, but the data did not support this assumption.

Table 5

Crosstabulation of Snacks From the Pre Test Selected on Paper and Snacks from the Post-Test Selected on Paper

			Post selected on paper		
			Everyday	Sometimes	Total
Pre selected on paper	Everyday	Count	49	16	65
		% within pre selected on paper	75.40%	24.60%	100.00%
		% within post selected on paper	76.60%	41.00%	63.10%
	Sometimes	Count	15	23	38
		% within pre selected on paper	39.50%	60.50%	100.00%
		% within post selected on paper	23.40%	59.00%	36.90%
Total		Count	64	39	103
		% within pre selected on paper	62.10%	37.90%	100.00%
		% within post selected on paper	100.00%	100.00%	100.00%

Comparison of Table 4 and Table 5. Of the subjects evaluated n=103, 25% of students circled a 'less healthy' snack post-lesson vs. pre-lesson. That is, of those who circled an Everyday Snack on the first day of the study, 77% of the subjects picked an Everyday Snack post-lesson and 26 % of them picked a Sometime Snack post-lesson. 40% of students who circled a Sometimes Snack pre-lesson circled a healthier snack post-lesson. That is, of those who circled a Sometimes Snack on day one, 60% again circled a Sometimes Snack on day three, but 40% circled an Everyday Snack. This data indicates a positive result due to the lesson when all of the lesson formats (lecture, bingo and matching) are looked at as a whole.

Table 6

Pre-test Snack Selection of Everyday and Sometimes Snacks Crosstabulated by Fourth Grade and Kindergarten

			Grade		
			Fourth Grade	Kindergarten	Total
Pre selected on paper	Everyday	Count	57	29	86
		% within pre selected on paper	66.30%	33.70%	100.00%
		% within grade	82.60%	47.50%	66.20%
	Sometimes	Count	12	32	44
		% within pres selected on paper	27.30%	72.70%	100.00%
		% within grade	17.40%	52.50%	33.80%
Total		Count	69	61	130
		% within pre selected on paper	53.10%	46.90%	100.00%
		% within grade	100.00%	100.00%	100.00%

Note. Highlighted areas indicate statistical significance at 0.05

Table 7

Pre-lesson Snack Selection of Everyday and Sometimes Snacks Crosstabulated by Fourth Grade and Kindergarten

			Grade		
			Fourth grade	Kindergarten	Total
Post selected and eaten	Everyday	Count	39	26	65
		% within post selected on paper	60.00%	40.00%	100.00%
		% within grade	88.60%	41.90%	61.30%
	Sometimes	Count	5	36	41
		% within post selected on paper	12.20%	87.80%	100.00%
		% within grade	11.40%	58.10%	38.70%
Total		Count	44	62	106
		% within post selected on paper	41.50%	58.50%	100.00%
		% within grade	100.00%	100.00%	100.00%

Comparison of Table 6 and Table 7. There was almost no change in what kindergarteners circled on paper pre-lesson and post-lesson. There was a slight decline in the healthfulness of what they circled. Fourth graders were much more likely to circle an Everyday Snack than kindergartners, both pre-lesson and post-lesson. However, the fourth graders seemed to show a slight increase in the healthfulness of snacks circled from pre-lesson to post-lesson.

Comparison of Table 8 and Table 9

Table 8

Crosstabulation of Everyday and Sometimes Snacks Selected and Eaten in the Pre Lesson by Grade Level

			Grade		
			4th Grade	Kindergarten	Total
Pre selected and eaten	Everyday	Count	43	21	64
		% within pre selected and eaten	67.20%	32.80%	100.00%
		% within grade	62.30%	33.90%	48.90%
	Sometimes	Count	26	41	67
		% within pre selected and eaten	38.80%	61.20%	100.00%
		% within Grade	37.70%	66.10%	51.10%
Total		Count	69	62	131
		% within Pre selected and eaten	52.70%	47.30%	100.00%
		% within grade	100.00%	100.00%	100.00%

Table 9

Crosstabulation of Everyday and Sometimes Snacks Selected and Eaten in the Post Lesson by Grade Level

			Grade		
			Fourth grade	Kindergarten	Total
Post selected and eaten	Everyday	Count	44	20	64
		% within Post selected and eaten	68.80%	31.30%	100.00%
		% within grade	66.70%	32.30%	50.00%
	Sometimes	Count	22	42	64
		% within Post selected and eaten	34.40%	65.60%	100.00%
		% within grade	33.30%	67.70%	50.00%
Total		Count	66	62	128
		% within post selected and eaten	51.60%	48.40%	100.00%
		% within grade	100.00%	100.00%	100.00%

Comparison of Tables 8 and 9. When looking at the actual snacks consumed pre-lesson and post-lesson, there was almost no change for kindergarteners or fourth graders. What they consumed was not really altered by the lesson. There was virtually no change in behavior between the pre-lesson and post-lesson among the kindergarteners and fourth graders for the snack they actually consumed.

Table 10

Crosstabulation of Everyday and Sometimes Snacks with Teaching Method (Bingo, Lecture, and Matching)

			Type			
			Bingo	Lecture	Matching	Total
Post selected on paper	Everyday	Count	20	19	26	65
		% within post selected on paper	30.80%	29.20%	40.00%	100.00%
		% within Type	51.30%	82.60%	59.10%	61.30%
	Sometimes	Count	19	4	18	41
		% within Post selected on paper	46.30%	9.80%	43.90%	100.00%
		% within Type	48.70%	17.40%	40.90%	38.70%
Total		Count	39	23	44	106
		% within Post selected on paper	36.80%	21.70%	41.50%	100.00%
		% within type	100.00%	100.00%	100.00%	100.00%

Type of Instruction Method- Table 10

Instruction utilizing the lecture method resulted in significantly healthier snacks circled on paper (post test) than either the Bingo or Matching instructional methods. Many of the above results are statistically marginal, in Table11, but this conclusion is very clear, i.e., quite statistically significant, the percentage of children circling an Everyday Snack post-lesson is 0%, 32%, and 83%, respectively, for the Bingo, Matching, and Lecture instruction methods. The Bingo method of instruction is apparently ineffective, especially for kindergarteners for this study. No kindergarteners ate an Everyday Snack post-lesson (Appendix, K) after being instructed using the Bingo game. The results gathered when using the Matching method of instruction did not prove to be effective in this study (Appendix, K). The percentage of children

who ate an everyday snack post-lesson is 0%, 27%, and 61%, respectively, for the Bingo, Matching, and Lecture instruction methods.

Impact of Gender on Snack Choices

Table 11

Snacks Selected and Eaten in the Pre Assessment Crosstabulated by Gender

Crosstab

			gender		
			boy	girl	Total
Pre selected and eaten	Everday	Count	31	32	63
		% within pre selected and eaten	49.20%	50.80%	100.00%
		% within gender	43.70%	55.20%	48.80%
	Sometimes	Count	40	26	66
		% within pre selected and eaten	60.60%	39.40%	100.00%
		% within gender	56.30%	44.80%	51.20%
Total		Count	71	58	129
		% within pre selected and eaten	55.00%	45.00%	100.00%
		% within gender	100.00%	100.00%	100.00%

Table 12

Post Test -Snacks Selected and Eaten in the Post Assessment Crosstabulated by Gender

			Gender		
			Boy	Girl	Total
Post selected and eaten	Everyday	Count	35	27	62
		% within post selected and eaten	56.50%	43.50%	100.00%
		% within gender	51.50%	48.20%	50.00%
	Sometimes	Count	33	29	62
		% within post selected and eaten	53.20%	46.80%	100.00%
		% within gender	48.50%	51.80%	50.00%
Total		Count	68	56	124
		% within post selected and eaten	54.80%	45.20%	100.00%
		% within gender	100.00%	100.00%	100.00%

When analyzing the statistical results by gender (Table 11 and Table 12) it shows girls may have circled healthier choices pre-lesson, but any gender difference in circling was not significant in post-test, (Appendix K) for the breakdown by individual snacks. These Tables, 11 and 12, indicate that the lesson slightly improved the choice of consumption of an Everyday Snack by boys, and slightly decreased the Everyday Snack consumed by girls: What the girls consumed pre-lesson was slightly better than what the boys consumed pre-lesson, with a significance of .052. What the girls consumed post-lesson was much the same as what boys consumed post-lesson because the boys slightly improved the healthfulness of what they consumed and the girls slightly decreased the healthfulness of what they consumed. Although there were differences in choices made across gender, they were not statistically significant.

Summary of Results

One hundred and thirty four (134) subjects were included in this study. Of this number 65 kindergarteners and 69 fourth graders completed the pre tests on Snack Choices. The researcher

provided a lesson method to each teacher in the study. In the kindergarten classes teacher A presented to 23 students (13 boys and 10 girls) using the Lecture method. Teacher B, presented to 20 students (11 boys and 9 girls) using the Bingo Method and teacher C presented to 22 students (12 boys and 10 girls) using the Matching method. In the Fourth grade classes teacher D presented to 23 students (13 boys and 10 girls) using the Lecture format. Teacher E presented to 22 students (10 boys and 12 girls) using the Bingo method and teacher F presented to 24 students (13 boys and 11 girls) using the Matching method (Appendix K). In this study teacher D for the fourth grade failed to have ten students complete the post test but she did have the ten students record their snacks that were eaten. This Explains the n=124 usable pre and post test as opposed to the n=134.

Chapter V: Discussion

Introduction

This study was designed to assess the efficacy of nutrition education as it relates to behavior change in kindergarteners and fourth graders in a public elementary school in the school district of River Falls, in River Falls, Wisconsin. The study investigated the student's ability to make healthier choices after an educational lesson on snacks was presented to them. Accurate assessment of the children's dietary intake is central to understanding predictors and outcomes of children's diets, identifying targets for intervention, developing an understanding of behavior change process, and evaluating interventions (Moore, Tapper, Moore, & Murphy, 2008). Consequently, the results of this study were designed to assist in furthering the body of knowledge regarding appropriate methods to use in nutrition education resulting in behavior change in kindergarteners and fourth graders.

Limitations

The most significant limitation of this study was the timing of the study. The study was conducted in the final two weeks of the school year, making it difficult for the teachers to adequately incorporate the lesson into their curriculum. The teachers were also unfamiliar with the lesson and may not have had enough time to spend reviewing and reflecting on the lesson prior to presenting it to the students. Teaching content that is unfamiliar to the teacher and subsequently asking the teacher to use a particular teaching method in presenting the content, the intended outcome may not be realized. Another way to minimize this limitation of the study would be to have the investigator present the lessons to all subjects; this could ensure more consistency of the material presented for each teaching method used.

Data collection posed some concern in the fourth grade class that used matching as a component of their lesson plan. This group did not circle their snack choice prior to taking and eating their snack in the post test. The classroom teacher forgot to have the subjects circle their snack choice prior to selecting and eating their snacks, which resulted in post test numbers for the fourth graders being much lower that their pre test numbers. The pre-test of the kindergarteners using the five part questionnaire (Appendix E) were not completed in their entirety due to time constraints. Since the kindergarteners were not able to fluently read and comprehend the two questions that were in sentence form, the decision was made not to include questions four and five of the questionnaire (Appendix E). Both of the limitations were in part due to lack of time.

Methods of Lesson Presentation

This report offers results from a study comparing three nutrition education teaching methods and their impact on behavior change among three kindergarten classes and three fourth grade classes, n=124 when teaching a lesson plan on snacks. The study consisted of a pre, post and an intervention component. The delivery systems used were in the form of, (a) lecture, (b) gaming and (c) matching. The lessons lasted between twenty five minutes and one hour, and were taught by the classroom teachers. The study compared the change in behavior among the kindergarten and fourth grade classes relative to the delivery method assigned, as well as the changes in behavior across grade levels.

As part of the pre test, a questionnaire was administered to all six classes to assess prior knowledge about snacks (Appendix E, F).

Discussion

Prior to this study the investigator thought that the earlier nutrition education is taught the more effective the intervention would be, and would result in positive behavior change. However, after careful literature review and having conducted this study, it was realized that behavior change as a result of nutrition education in any form does not begin to take place until children are in the concrete stages of cognitive development. According to Piaget's theory, children in the pre operational stages are between the ages of two and six years old. The kindergarteners in this study are five and six year old. Pre-operational activities revolve around replicating modeled behaviors and the wish by the preoperational subject to please the adult. This partially explains the results that were observed after statistical analysis of the kindergarteners.

When analyzing the pre-lessons concerning what the subjects would choose and actual choices made crosstabulated with Sometimes and Everyday Snack, the significance was (p=.000). This meant that the subjects knew what Everyday and Sometimes Snacks were, as evidenced by the compilation of answers (Appendix K). The difference was tabulated when the transition from telling what they knew to demonstrating the behavior by eating the snack that was considered the healthy choice or the Everyday Snack.

After the lessons were presented to the subjects as a whole (n=124), there were significant differences when the question of what would you choose and the actual choices made were looked at and crosstabulated with Everyday and Sometimes Snacks among kindergarteners and fourth graders. The result showed that there was a significance of p =.000 and df =1. In the pre test 86% of all subjects (n=134) circled and ate an Everyday Snack as opposed to the post test n=124 where an improvement was seen. The study revealed 96%, n=106 chose and

consumed a healthy snack. The difference in the number of total subjects in the post test was due to the students not circling their choice on paper prior to consuming their snack. However, the trend did show improvement with the lesson.

A closer examination of the numbers illustrate the differences in improved behavior change came mainly from the fourth graders. This change is congruent with the theory that says at this age the subjects are in the concrete operational stage. Piaget determined children in the concrete operational stage were fairly good at the use of inductive logic (Wagner, n. d.). This means that the fourth graders are more capable of taking an idea that is more abstract, such as healthy choices and its affect on health and making a behavioral choice based on that knowledge.

The post test of behavior change indicated after the lesson on snacks was presented to the kindergarteners, their behavior did not change with any statistical significance. This result corroborates the theory that suggests, children in the preoperational stage are not able to make the connection of action and consequence in order to make behavioral change. However when comparing results of the behavior of kindergarten and fourth grade subjects (Table 9), as it relates to making healthier snack choices after the lesson on snack was presented, the fourth grade class showed a marked improvement in their snack choice. When looking at what the subjects selected on paper in the pre-test it showed the fourth graders chose Everyday Snacks 69% of the time while the kindergarteners chose Everyday Snack 31% of the time. The Sometimes Snacks were chosen and eaten 34% of the time by fourth graders and 66% of the time by kindergarteners on the post test. This result supports the research suggesting that abstract ideas are not understood by children in the preoperational age group (younger than seven) and as a result behavioral change could not be made based on a concept that is not understood.

There was a statistical difference of $p = 0.20$, when the results of Sometimes and Everyday Snacks that were selected on paper and eaten in the pre test were crosstabulated with Sometimes and Everyday Snacks that were selected on paper and eaten in the post assessment (Appendix K).

There were no statistical differences found across grade levels or among grade levels relative to knowledge when using crosstabulation and Pierson Chi-Square. The results also show after the lesson was taught to the kindergarten class using the bingo game (Appendix I), 0% of the subjects chose an Everyday Snack. There are several possible reasons why this may have been the case. First, there may not have been adequate time for the subjects to learn a new game and at the same time process the purpose of the lesson. They may have been more focused on the game and not the content of the game. The students had to learn a new game, and at their ages (five and six), according to research they would be unable to make the transition from something abstract like the idea of Sometimes Snack and Everyday Snack to something concrete like the Everyday Snack being better for their health and they should eat it. When examining nutrition education and behavior change, age should be definitely be taken into account, as certain abstract concepts like nutrition can generally not be understood by children younger than the age seven.

Conclusion

When conducting a study such as this with multiple classrooms and teachers it should be noted that time for reflection and incorporation of the lesson in the curriculum needs to be provided in order for each teacher to be confident with the content the assigned teaching method for the content. The School Health Education Evaluation found that a minimum of 50 hours were needed to impact behavior (Powers, Struempler & Parmer, 2005). However, students in this study only participated in a maximum of one hour of nutrition education. As a result the changes

in dietary behavior depending on the presentation format were marginally significant. In an ideal setting, the teachers would have more time to teach the lesson which would possibly result in more of a significant, positive impact on behavior. In this study, more instructional time could not have been provided due to time constraints.

It is suggested that future research be done in the area of cognitive development and nutrition education as it relates to behavior change in order to make a definitive statement regarding the efficacy of nutrition education and behavior change in children. Nevertheless, this study indicates that nutrition education has a positive impact on behavior change, and with kindergarteners and fourth graders in this study the method of delivery preferred was in the form of a lecture.

Nutrition education should be introduced to children as early as possible, but behavior change will align with their cognitive development. For children younger than seven years of age modeling healthy behavior practices should be the teaching method of choice. This will serve as a solid foundation for the child as they move into the next cognitive phase which indicates that they are able to make behavior change as a result of cognitively processing nutrition information.

It is important to understand the learner and equip the teachers with developmentally appropriate nutrition education. Expectations for the Pre-operational stage of development should invite Everyday Snacks and the learner should observe others consuming Everyday (healthy) Snacks. As the child advances in their cognitive development, nutrition education should expect behavior changes resulting in the choice of healthier Everyday Snacks. Teaching methods and expected behavior change related to snack choices should align with cognitive development.

In order to meet the current nutrition guidelines for the United States, nutrition education will need to align the message, the teaching method and cognitive development of the learner. Developmentally appropriate learner centered curriculum related to snack choices is essential (C. Barnhart, personal communication, July 28, 2009).

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Appendix A

Snack Classification Sheet

Snacks Classification Sheet

For educator's reference <u>only</u>

"Everyday" Examples	"Sometimes" Examples
Applesauce Banana Berries (strawberries, blueberries, etc.) Burrito, Bean Carrots Cheese, especially Low-fat (in both categories because people watching fat should not eat it every day) Chips, Baked Tortilla & Salsa (emphasize "baked") Cottage Cheese, Low-fat Crackers, Soda (such as Saltines®) and Graham Dried Fruits (dates, raisins, apricots, etc.) Egg, hard-boiled Juice, Vegetable and 100% Fruit Kiwi Meat, Lean Cuts Milk, Plain or Flavored, Low-fat (except for children under two) Peaches Pita Bread Pretzels Pudding (made with milk) Rice, including Spanish Rice Sandwiches: Meat (especially lean cuts) and Peanut Butter & Jelly Tamarind Yogurt, Low-fat with Fruit	Cake Candy, including Hard Cheese (especially for people who need to watch fat) Chips Chocolate Candy Cookies Crackers, High-fat Doughnut Egg Roll Fruit Rollup, Fruit Snacks Ice Cream, including Low-fat Muffin Pastry Pie Soda Pop

Appendix B

Consent Form

Consent to Participate In UW-Stout Approved Research

Title: Does the Presentation Format of Nutrition Education Determine Behavioral Change?

Investigator:

Romaine Hanson

715-426-2262

hansonrom@uwstout.edu

Research Sponsor:

Not applicable

Description:

The purpose of this study is to determine whether there is a difference in retention of nutrition knowledge depending on the way information is relayed to students as well as the age at which the material is presented. The study also seeks to find out if knowledge translates to behavioral change.

A pre test will be given to the students to evaluate their knowledge of nutrition and making healthy snack choices. A variety of snacks will be offered to the students to see what type of snacks they choose. The students will then be divided into two groups, one group will be taught a nutrition lesson about making healthy snack choices using games to enhance the lesson, and the other group would be taught the same lesson using the traditional format of a lecture. After the lessons have been taught, both groups of students will be evaluated for a second time on the lesson to determine if there was any change in knowledge or snack choices made.

The results will be analyzed to determine whether or not there is any correlation between the format of teaching nutrition lessons, and the choices they make when selecting snacks, as well as whether age has any impact on when nutrition education is taught and how it affects behavioral change.

Risks and Benefits:

The risk of one or more of the subjects having an allergic reaction exists since food products will be offered to the subjects as a component of the study. In order to alleviate this risk, parents will be asked to identify whether or not their child has any known allergic reactions to any type of food. Measures will be taken to avoid the subject being offered any food of that nature or any food that could have potentially come in contact with the known allergen.

The study would directly benefit the subjects in that they would be taught how to make wise food choices. Based on the age group, instructors would be able to determine what method of teaching would be best to get the message of making healthy food choices across to students.

Special Populations:

Informed consent form that addresses the special population is included with IRB request.

Time Commitment and Payment:

This research will take place during the hours that your child is at school. No outside of class time will be necessary. There will be no monetary compensation for participation. As a gesture of appreciation for participation, the school will be presented with nutrition education games for any teacher to access when wanting to teach nutrition education.

Confidentiality:

Neither you nor your child's name will be included on any documents associated with the reporting of this study. We do not believe that you can be identified from any of this information. This informed consent will not be kept with any of the other documents completed with this project.

Right to Withdraw:

"Your child's participation in this study is entirely voluntary. You may choose not to have him or her participate without any adverse consequences to them. Should you choose to have your child participate and later wish to withdraw your child from the study, they may discontinue their participation at this time without incurring adverse consequences." Please explain this to your child.

IRB Approval:

This study has been reviewed and approved by The University of Wisconsin-Stout's Institutional Review Board (IRB). The IRB has determined that this study meets the ethical obligations required by federal law and University policies. If you have questions or concerns regarding this study please contact the Investigator or Advisor. If you have any questions, concerns, or reports regarding your rights as a research subject, please contact the IRB Administrator.

Investigator Romaine Hanson 715-426-2262 hansonrom@uwstout.edu **Advisor:** Dr. Carolyn Barnhart 715-232-2545 barnhartc@uwstout.edu	IRB Administrator Sue Foxwell, Director, Research Services 152 Vocational Rehabilitation Bldg. *UW-Stout* Menomonie, WI 54751 715-232-2477 foxwells@uwstout.edu

Statement of Consent:

"By signing this consent form you agree to allow your child to participate in the project entitled, *(*Does the Presentation Format of Nutrition Education Determine Behavioral Change?*)*."

_____

Signature..... Date

_____

Signature of parent or guardian:..... Date

(If minors are involved)

Appendix C

IRB Exempt Form

STOUT
UNIVERSITY OF WISCONSIN

Research Services
152 Voc Rehab Building

University of Wisconsin-Stout
P.O. Box 790
Menomonie, WI 54751-0790

715/232-1126
715/232-1749 (fax)
http://www.uwstout.edu/rs/

Date: May 15, 2009

To: Romaine Hanson

Cc: Dr. Carolyn Barnhart

From: Sue Foxwell, Research Administrator and Human Protections Administrator, UW-Stout Institutional Review Board for the Protection of Human Subjects in Research (IRB)

Susan Foxwell

Subject: Protection of Human Subjects in Research

Your project, "*Does the Presentation Format of Nutritional Education Determine Behavioral Change?*" is **Exempt** from review by the Institutional Review Board for the Protection of Human Subjects. The project is exempt under **Categories 1 and 6** of the Federal Exempt Guidelines and holds for 5 years. Your project is approved from **May 7, 2009**, through **May 6, 2014**.

Please copy and paste the following message to the top of your survey form before dissemination:

> This project has been reviewed by the UW-Stout IRB as required by the Code of Federal Regulations Title 45 Part 46

If you are conducting an **online** survey/interview, please copy and paste the following message to the top of the form:

> **"This research has been approved by the UW-Stout IRB as required by the Code of Federal regulations Title 45 Part 46."**

Please contact the IRB if the plan of your research changes. Thank you for your cooperation with the IRB and best wishes with your project.

***NOTE: This is the only notice you will receive – no paper copy will be sent.**

Appendix D

Allergy Notification Form

This project has been reviewed by the UW-Stout IRB as required by the Code of Federal Regulations Title 45 Part 46

Allergy Notification Form

Dear parent/legal guardian,

Snacks will be offered as a component of the study: ***Does the Presentation Format of Nutrition Education Determine Behavioral Change?*** In order to ensure that no one gets ill from eating something they are allergic to, it is being asked that you indicate whether your child has any documented allergies/intolerance, if yes; please indicate what your child is allergic to, sign and return the form.

Child's Name (first and last) _____

Circle one

No my child does not have any known food allergies/intolerance

Yes my child does have food allergies/intolerance. (Please list)

_____

_____

_____

_____

X _____

Parent/Guardian

_____

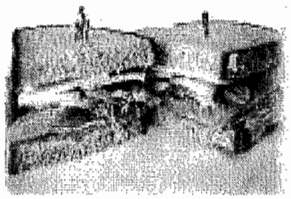
Please sign and return this form along with the consent to participate form

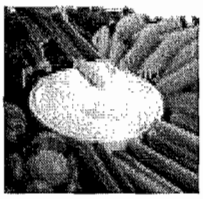
Appendix E

Pre lesson Assessment Questionnaire (Kindergarten)

Number _____ Quiz – Snacks, Pre –Test kindergarten

1. Draw a triangle around the food (s) that would be a snack.

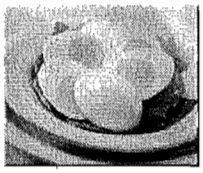
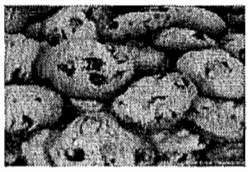
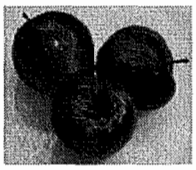
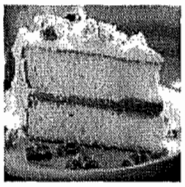




2. Draw a circle around the everyday snack




3. Draw a square around the sometimes snack


4. Why do children need snacks? (Ans. To be filled in by teacher/helper)

5. What is a snack?

Appendix F

Pre-test Questionnaire

Quiz – Snacks, Pre –Test 4th grade

Number _____

Write your answer below.

1 What is a snack?

2 Why do children need snacks?

3 What should you look for when choosing a snack

4 What is an everyday snack?

5 What is a sometimes snack?

Appendix G

Lesson Plan (Snacks)

Background

Eating snacks can be a healthy practice or an unhealthy practice depending on the choices participants make:

- Healthy: Nutritious snacks can be a helpful part of daily eating habits because they help a person maintain energy, consume a variety of foods, and avoid feeling hungry between meals or overeating at meals.

- Unhealthy: Too many snacks or the wrong kinds of snacks can cause weight gain or become an unhealthy habit. They can make a person feel too full and then unable to eat a well-balanced meal.

Therefore, it is important to make wise snack choices.

In general, children benefit the most from snacks. Because of their small stomachs and relatively high energy needs, children may need one or two small snacks during the day to keep them going between meals. However, too large of a snack or the wrong choice of snack foods may be more harmful than helpful. Parents need to make conscious decisions about their children's snacks and understand which foods are safe for small children and which foods can cause choking.
We have found that the issue of snacking is new to many immigrants. Snacks, including sweets, may have been eaten in their birth countries, but probably not often. In the United States, snack foods, especially unhealthy ones, are available wherever you go. Snack foods are found not only at grocery stores, where they are displayed in easy-to-see places, but also in vending machines at schools and workplaces, at gas stations, and even at children's sporting events. Moreover, families often eat when they are hungry, and parents may not wish to refuse their children a snack when they ask for one. For these reasons and many more, it is important to give participants correct information and more ideas about snacking

Lesson Plan (snacks)

Objectives

Participants will be able to:
- Identify a nutritious snack to eat every day
- Identify a snack to eat sometimes
- Identify a new food product that could be used as a healthy snack

Purpose:

To increase participants' awareness of healthy snacks, which may be eaten every day, and unhealthy snacks, which should be eaten sometimes.

Behavioral Goal:

Given a variety of snack choices, participants will make the healthy choice among the snacks offered. Thereby increasing their consumption of nutritious snacks and decreasing their consumption of high- sugar and or high-fat snacks.

Vocabulary List

Everyday: daily, Example: An apple is an **everyday** snack.

Snack: food or beverage eaten between meals to supplement meal or satiate hunger

Sometimes: at special times but not every day Example: An ice cream cone is a **sometimes** snack.

Unhealthy: bad for health, Example: Drinking too much soda can be **unhealthy**.

Weight gain: to become heavier or fatter
Example: Eating unhealthy food can cause **weight gain**.

Habit: a habit is something you do so often that you don't even think about it.

Teaching Vocabulary

a. List the vocabulary words on the board or on an overhead transparency at the beginning of the lesson.

b. Explain each vocabulary word when it is used in the lesson activities. Have participants say each word and read aloud the definition and the example. Repeat if necessary. Do *not* go through the vocabulary words all at once. You may want to check off the words one by one as you move through the lesson activities, or cover all the words and then uncover each one as you teach it.

Activity 1: Everyday and Sometimes Snacks

Purpose:

To increase participants' awareness of healthy snacks, which may be eaten every day, and the not so healthy snacks, that should only be eaten sometimes.

Items Needed:

"Snacks Classification Sheet"
Handout: "Snacks"

Headers: "Everyday Snacks" and "Sometimes Snacks," common snacks (food labels, packages, Dairy Council food cards, and/or *Fresh Fruit and Vegetable Photo Cards*)

Estimated time: 20 minutes

Preparation
Arrange the headers "Everyday Snacks" and "Sometimes Snacks" on a display board, felt board, or table so everyone can see them.

1. Introduction
a. Ask participants questions to get them thinking about their snacking behavior.
For example, ask, "What is a snack? Do you eat snacks? Which foods do you eat as snacks? How many times a day do you eat a snack? Why do you snack?

b. Emphasize that snacks can be helpful or harmful by saying, "Snacks are foods eaten between meals to help us keep our energy up during the day. Snacks can be especially important for children. But we must take care when choosing snacks, so we do not eat them instead of balanced meals. We also want them to contribute variety to our diet. Too much snacking can easily lead to weight gain (make you fatter)." You may wish to show participants the 1-lb. body fat model.

c. Then explain to participants, "We see a lot of TV advertisements for snacks.
Cashiers give children snacks in stores, and even teachers at school give snacks.
We see a lot of people eating snacks. But it does not mean that all snacks are healthy."

2. Participant Activity A
a. Tell participants that they are going to put snacks into two categories, "Everyday Snacks" and "Sometimes Snacks," using the headers. Explain, "Everyday Snacks are healthy choices. Everyday Snacks can be eaten daily. Sometimes Snacks are not as healthy, because they contain few nutrients and are usually high in fat and/or sugar. Sometimes Snacks should be eaten at special times but not every day."

b. Give each participant a snack food card, label, or package. Ask participants to say the names of their snacks and place each snack in the correct category, using the headers, based on whether they think the snack is healthy or not healthy. When a participant places a food in a category, ask who has eaten the food, especially if you think it may be unfamiliar. Stop sometimes and ask the group whether they agree with all the choices made so far. Make changes, as needed. Continue going through the rest of the foods.

c. After categorizing the foods, pass out the handout "Snacks." First, ask participants to write down the Everyday Snacks they would choose. Then ask them to write down the Sometimes Snacks that are important to them. Emphasize that older children and adults do not need to eat snacks every day, especially if the family eats regular meals. Finally, ask each participant to choose one new healthy snack to try that week. Encourage them to share their choices with the class.

d. Snacks can be an important part of the variety needed in a child's diet. We can offer Sometimes Snacks at special times but not every day. Generally, it is not a good idea to use food to reward a child."

Participant Activity B

a. The nutrition Bingo game Nuturio

3. Summary

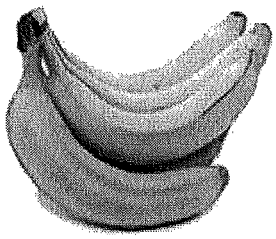
Remind participants, "Snacks can be used to give quick energy, to satisfy hunger, to eat a variety of foods, and to avoid overeating at mealtime because we are too hungry. Snacks can be important for young children but are not necessary for older children and adults if regular meals are eaten. When we eat snacks, remember to choose Everyday Snacks more often and Sometimes Snacks only at special times."

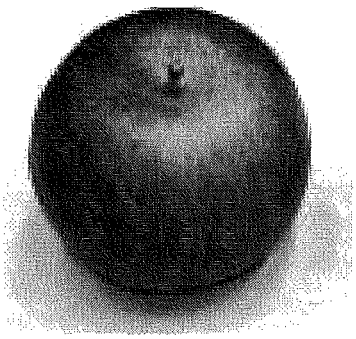
Appendix H

Snack Choice Sheet

Number _____

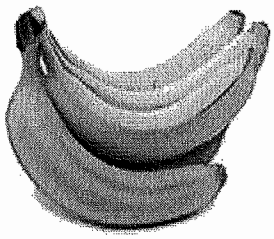
Circle the ***one*** that you would choose for a snack.

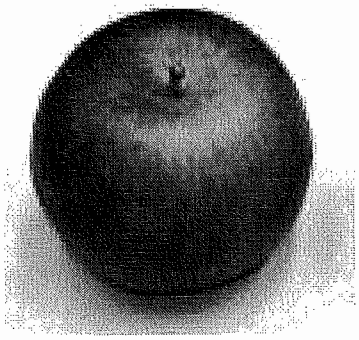




Number _____

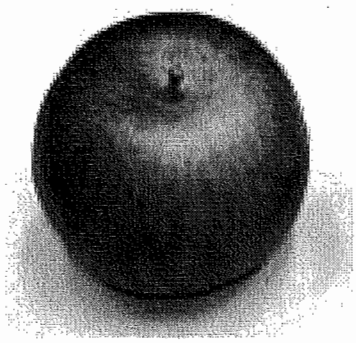
Circle the ***one*** that you would choose for a snack.

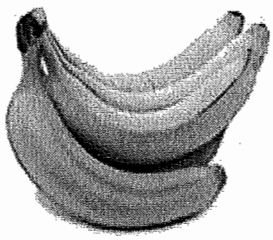




Number _____

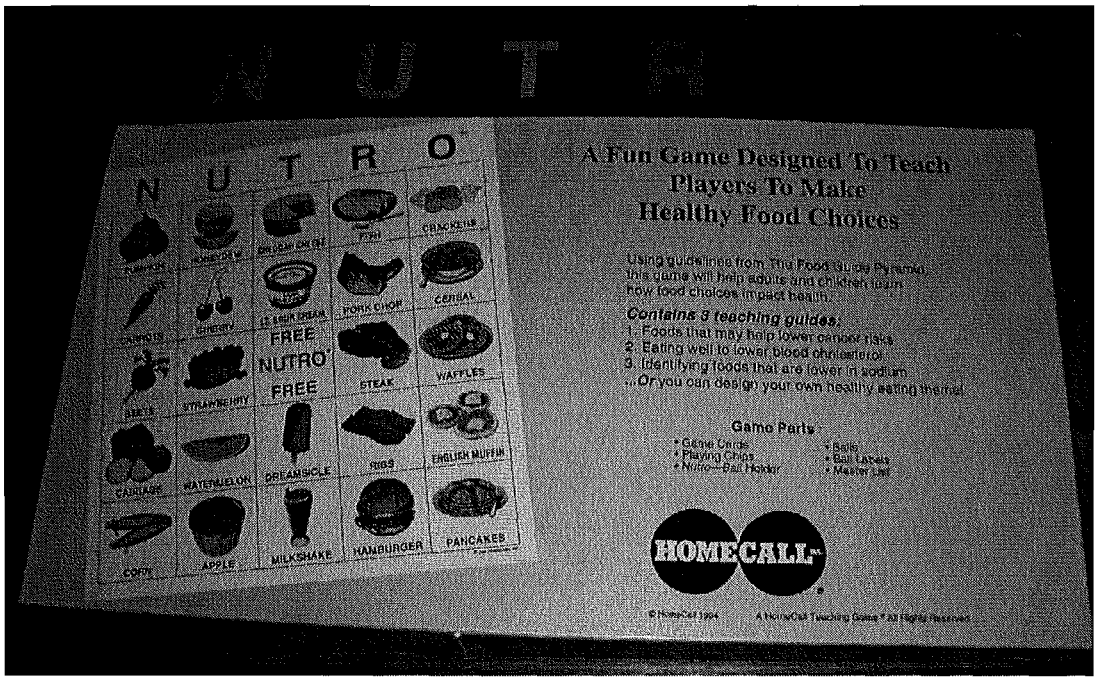
Circle the ***one*** that you would choose for a snack.

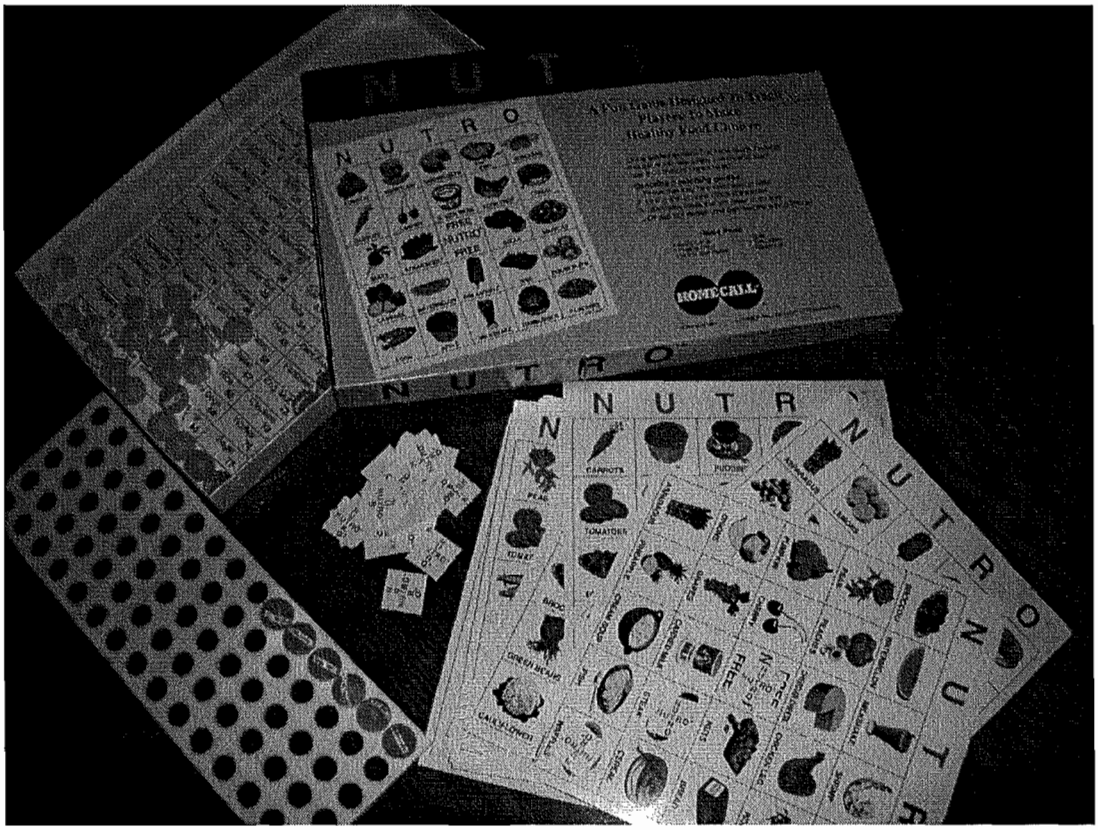




Appendix I

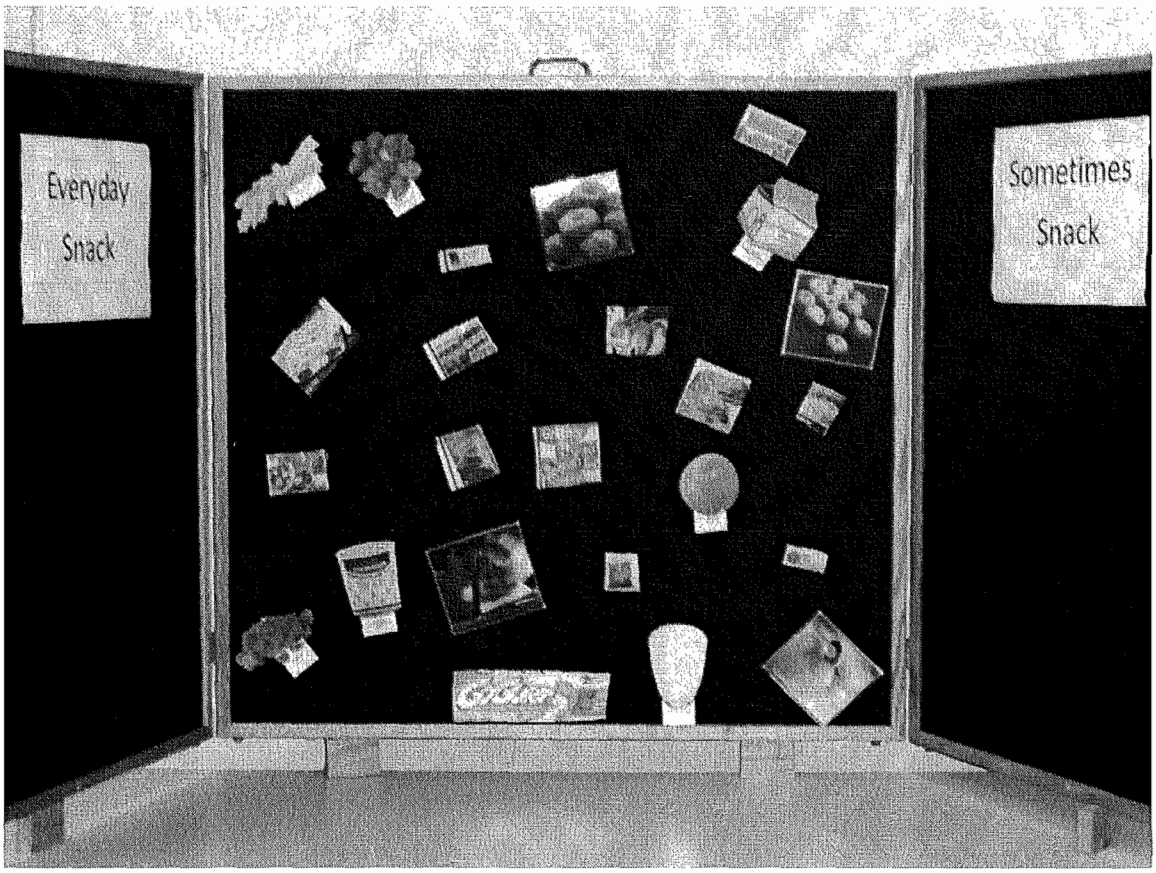
Nutrition Bingo Game (Nutro)


N U T R O
A Fun Game Designed To Teach Players To Make Healthy Food Choices
Using guidelines from The Food Guide Pyramid, this game will help adults and children learn how food choices impact health.
Contains 3 teaching guides:
1. Foods that may help lower cancer risks
2. Eating well to lower blood cholesterol
3. Identifying foods that are lower in sodium
...Or you can design your own healthy eating menu!
Game Parts
• Game Cards
• Playing Chips
• Nutro—Bar Nokkr
• Rolls
• Bar Labels
• Master List
HOMECALL
FREE
NUTRO
FREE
CARROTS
CHERRY
STEAK
WAFFLES
WATERMELON
CREAMSICLE
EGGS
ENGLISH MUFFIN
CORN
APPLE
MILKSHAKE
HAMBURGER
PANCAKES


N U T R O
HOMECALL
N U T R O
N U T R O
CARROTS
PUDDING
TOMATOES
PEAS
FREE

Appendix J

Everyday and Sometimes Snack Matching Format


Everyday
Snack
Sometimes
Snack

Appendix K

Supporting Tables

Crosstab[a]

			GRADE		
			Fourth Grade	Kindergarten	Total
POST SELECTED AND EATEN	CHIPS	Count	3	5	8
		% within POST SELECTED AND EATEN	37.50%	62.50%	100.00%
		% within GRADE	13.60%	21.70%	17.80%
	APPLE	Count	11	11	22
		% within POST SELECTED AND EATEN	50.00%	50.00%	100.00%
		% within GRADE	50.00%	47.80%	48.90%
	RICE KRISPIE BAR	Count	5	4	9
		% within POST SELECTED AND EATEN	55.60%	44.40%	100.00%
		% within GRADE	22.70%	17.40%	20.00%
	STRING CHEESE	Count	2	3	5
		% within POST SELECTED AND EATEN	40.00%	60.00%	100.00%
		% within GRADE	9.10%	13.00%	11.10%
	BANANA	Count	1	0	1
		% within POST SELECTED AND EATEN	100.00%	0.00%	100.00%
		% within GRADE	4.50%	0.00%	2.20%
Total		Count	22	23	45
		% within POST SELECTED AND EATEN	48.90%	51.10%	100.00%
		% within GRADE	100.00%	100.00%	100.00%

a. TYPE = LECTURE

Crosstab[a]

			GRADE		
			Fourth grade	Kindergarten	Total
POST SELECTED AND EATEN	CHIPS	Count	1	8	9
		% within POST SELECTED AND EATEN	11.10%	88.90%	100.00%
		% within GRADE	4.50%	47.10%	23.10%
	APPLE	Count	10	0	10
		% within POST SELECTED AND EATEN	100.00%	0.00%	100.00%
		% within GRADE	45.50%	0.00%	25.60%
	RICE KRISPIE BAR	Count	5	9	14
		% within POST SELECTED AND EATEN	35.70%	64.30%	100.00%
		% within GRADE	22.70%	52.90%	35.90%
	STRING CHEESE	Count	2	0	2
		% within POST SELECTED AND EATEN	100.00%	0.00%	100.00%
		% within GRADE	9.10%	0.00%	5.10%
	BANANA	Count	4	0	4
		% within POST SELECTED AND EATEN	100.00%	0.00%	100.00%
		% within GRADE	18.20%	0.00%	10.30%
Total		Count	22	17	39
		% within POST SELECTED AND EATEN	56.40%	43.60%	100.00%
		% within GRADE	100.00%	100.00%	100.00%

a. TYPE = BINGO

			GRADE		
			Fourth grade	Kindergarten	Total
POST SELECTED AND EATEN	CHIPS	Count	4	10	14
		% within POST SELECTED AND EATEN	28.60%	71.40%	100.00%
		% within GRADE	18.20%	45.50%	31.80%
	APPLE	Count	9	3	12
		% within POST SELECTED AND EATEN	75.00%	25.00%	100.00%
		% within GRADE	40.90%	13.60%	27.30%
	RICE KRISPIE BAR	Count	4	6	10
		% within POST SELECTED AND EATEN	40.00%	60.00%	100.00%
		% within GRADE	18.20%	27.30%	22.70%
	STRING CHEESE	Count	3	3	6
		% within POST SELECTED AND EATEN	50.00%	50.00%	100.00%
		% within GRADE	13.60%	13.60%	13.60%
	BANANA	Count	2	0	2
		% within POST SELECTED AND EATEN	100.00%	0.00%	100.00%
		% within GRADE	9.10%	0.00%	4.50%
Total		Count	22	22	44
		% within POST SELECTED AND EATEN	50.00%	50.00%	100.00%
		% within GRADE	100.00%	100.00%	100.00%

a. TYPE = MATCHING

PRE SELECTED AND EATEN * POST SELECTED AND EATEN Crosstabulation

			POST SELECTED AND EATEN		
			EVERYDAY	SOMETIMES	Total
PRE SELECTED AND EATEN	EVERYDAY	Count	38	24	62
		% within PRE SELECTED AND EATEN	61.30%	38.70%	100.00%
		% within POST SELECTED AND EATEN	59.40%	38.70%	49.20%
	SOMETIMES	Count	26	38	64
		% within PRE SELECTED AND EATEN	40.60%	59.40%	100.00%
		% within POST SELECTED AND EATEN	40.60%	61.30%	50.80%
Total		Count	64	62	126
		% within PRE SELECTED AND EATEN	50.80%	49.20%	100.00%
		% within POST SELECTED AND EATEN	100.00%	100.00%	100.00%

			GENDER		
			BOY	GIRL	Total
PRE SELECTED AND EATEN	CHIPS	Count	19	10	29
		% within PRE SELECTED AND EATEN	65.50%	34.50%	100.00%
		% within GENDER	26.80%	17.20%	22.50%
	APPLE	Count	16	14	30
		% within PRE SELECTED AND EATEN	53.30%	46.70%	100.00%
		% within GENDER	22.50%	24.10%	23.30%
	RICE KRISPIE BAR	Count	21	16	37
		% within PRE SELECTED AND EATEN	56.80%	43.20%	100.00%
		% within GENDER	29.60%	27.60%	28.70%
	STRING CHEESE	Count	4	13	17
		% within PRE SELECTED AND EATEN	23.50%	76.50%	100.00%
		% within GENDER	5.60%	22.40%	13.20%
	BANANA	Count	11	5	16
		% within PRE SELECTED AND EATEN	68.80%	31.30%	100.00%
		% within GENDER	15.50%	8.60%	12.40%
Total		Count	71	58	129
		% within PRE SELECTED AND EATEN	55.00%	45.00%	100.00%
		% within GENDER	100.00%	100.00%	100.00%

Crosstab

			GENDER		
			BOY	GIRL	Total
PRE SELECTED AND EATEN	EVERYDAY	Count	31	32	63
		% within PRE SELECTED AND EATEN	49.20%	50.80%	100.00%
		% within GENDER	43.70%	55.20%	48.80%
	SOMETIMES	Count	40	26	66
		% within PRE SELECTED AND EATEN	60.60%	39.40%	100.00%
		% within GENDER	56.30%	44.80%	51.20%
Total		Count	71	58	129
		% within PRE SELECTED AND EATEN	55.00%	45.00%	100.00%
		% within GENDER	100.00%	100.00%	100.00%

			GENDER		
			BOY	GIRL	Total
POST SELECTED AND EATEN	EVERYDAY	Count	35	27	62
		% within POST SELECTED AND EATEN	56.50%	43.50%	100.00%
		% within GENDER	51.50%	48.20%	50.00%
	SOMETIMES	Count	33	29	62
		% within POST SELECTED AND EATEN	53.20%	46.80%	100.00%
		% within GENDER	48.50%	51.80%	50.00%
Total		Count	68	56	124
		% within POST SELECTED AND EATEN	54.80%	45.20%	100.00%
		% within GENDER	100.00%	100.00%	100.00%

Crosstab

			GENDER		
			BOY	GIRL	Total
POST SELECTED AND EATEN	CHIPS	Count	18	13	31
		% within POST SELECTED AND EATEN	58.10%	41.90%	100.00%
		% within GENDER	26.50%	23.20%	25.00%
	APPLE	Count	23	19	42
		% within POST SELECTED AND EATEN	54.80%	45.20%	100.00%
		% within GENDER	33.80%	33.90%	33.90%
	RICE KRISPIE BAR	Count	15	16	31
		% within POST SELECTED AND EATEN	48.40%	51.60%	100.00%
		% within GENDER	22.10%	28.60%	25.00%
	STRING CHEESE	Count	8	5	13
		% within POST SELECTED AND EATEN	61.50%	38.50%	100.00%
		% within GENDER	11.80%	8.90%	10.50%
	BANANA	Count	4	3	7
		% within POST SELECTED AND EATEN	57.10%	42.90%	100.00%
		% within GENDER	5.90%	5.40%	5.60%
Total		Count	68	56	124
		% within POST SELECTED AND EATEN	54.80%	45.20%	100.00%
		% within GENDER	100.00%	100.00%	100.00%

Crosstab

			TYPE			
			BINGO	LECTURE	MATCHING	Total
POST SELECTED ON PAPER	EVERYDAY	Count	20	19	26	65
		% within POST SELECTED ON PAPER	30.80%	29.20%	40.00%	100.00%
		% within TYPE	51.30%	82.60%	59.10%	61.30%
	SOMETIMES	Count	19	4	18	41
		% within POST SELECTED ON PAPER	46.30%	9.80%	43.90%	100.00%
		% within TYPE	48.70%	17.40%	40.90%	38.70%
Total		Count	39	23	44	106
		% within POST SELECTED ON PAPER	36.80%	21.70%	41.50%	100.00%
		% within TYPE	100.00%	100.00%	100.00%	100.00%

Represent the pre test distribution of gender in each class, with the lesson applied and the time of day the snack was consumed.

		# of Students	M/F	Time of Day	Lesson/Method Applied
Kindergarten	Teacher A	23	13M/10F	Morning Snack	Lecture
	Teacher B	20	11M/9F	Morning Snack	Bingo
	Teacher C	22	12M/10F	Morning Snack	Matching
Fourth Grade	Teacher D	23	13M/10F	Morning snack	Lecture
	Teacher E	22	10M/12F	Morning snack	Bingo
	Teacher F	24	13M/11F	Morning snack	Matching

Represent the post test distribution of gender in each class, with the lesson applied and the time of day the snack was consumed.

		# of Students	M/F	Time of Day	Lesson/Method Applied
Kindergarten	Teacher A	23	13M/10F	Morning Snack	Lecture
	Teacher B	20	11M/9F	Morning Snack	Bingo
	Teacher C	22	12M/10F	Afternoon Snack	Matching
Fourth Grade	Teacher D	23	13M/10F	Afternoon snack	Lecture
	Teacher E	22	10M/12F	Afternoon snack	Bingo
	Teacher F	24	13M/11F	Afternoon snack	Matching

Appendix L

Compiled Answers from Fourth Grade Questionnaire

Question 1: What is a snack?

- Something to fill you up during your spare time.
- Food you eat but it is not a snack.
- A snack is a little serving between meals.
- A snack is a food.
- A snack is a food that will help children and grown ups go through the day smoothly and healthy
- A snack is a thing to eat when your hungry.
- It is a not meal but it is food smaller than a meal.
- A snack is a thing between meals.
- A snack is something you eat between meals.
- Cheese and Crackers.
- Snacks are something you eat that isn't as big as a meal.
- A snack is a food that you eat.
- A snack is ate between each meals.
- A snack is something that should be healthy to eat when you are hungry.
- Some food between meals.
- A snack is a treat or something you snack on.
- Something to tide you down before a meal.
- Cucumber
- A snack is a little bit of food that is quick to eat.
- A snack is an little bit of food that you eat at anytime.
- Something that you eat that is not a meal.
- Some thing you eat til the meal.
- Something that you can eat if your hungry before or after a meal.
- A snack is something that let's say you have a snack after school because its not a meal.
- A snack is something small and kind of healthy
- A small little meal
- Cokies.
- Something to sifti you.
- A small amount of healthy food that you eat between meals like chee-zits.
- A food you eat that is NOT BREAKFAST, lunch or supper- you just take it and eat it.
- A snack is something healthy.
- A snack is some thing that isn't a meal but still fills you up.
- A small amount of food for an extra serving.
- A small food that you eat anytime in the day.
- Something you eat between meals.
- Bananna.
- A snack is some thing to eat that isn't alot of food so it might be an apple.
- A food that you eat but is not as much food as a meal.
- A snack is something that fills your stomach up for a little bit.
- A snack is something you eat when you are hrangy but isint a meal.
- A food that you eat maby after school.
- Sancks are something you eat when your hangry you eat so your not so hungry.
- Something that is healthy.
- A snack is a small treat.

- A snack is food that is going to hold you untel the next meal.
- A snack is meal in the afternoon.
- A small meal.
- A snack is a fast meal.
- A food that helps tie you off until a meal.
- A small amount of food that you eat between meals.
- A small little snack in the day or night.
- A little thing that you eat when you'r hugry.
- A snack is something you can munch on if your hungrey during the day.
- A snack is something to eat between meals.
- Something between meals you eat.
- A snack is a food to tie you over between meals.
- Something to eat befor or after meals.
- Something to eat that is small.
- A snack is something that you eat betwen meals.
- A snack is not a meall it food that can fill you up intell a full meall.
- Something small you eat when your hungry but don't want a meal.
- I think a snack is a food that ties you over until you have a meal.
- A little bit of food when I get hungry.
- A snack is something you eat between meals.
- A snack is a small amout of food after a few hours after a meal you have a snack.
- A snack is something you eat between meals.
- A snack is a little kind of food you can have to tide you over till dinner but it doesn't fill you up.
- A snack is a small meall that fills you up just a littl

Question 2: Why do children need snacks?

- To stay healthy.
- If they need snacks, they must be hungury.
- Children need snack because it gives them energy.
- So they don't get hungry.
- To tide themself over.
- To keep them full.
- Children need's snacks because when diner isn't don you need snack.
- Children need snacks because they get hungrey during the day.
- So kids don't starve between meals.
- They get hungry betour ever meal.
- To tie you over.
- Because when they are hungry they need food.
- They get hungry between meals.
- Children need snacks so they stay full.
- Children need snacks to have enigy and to be full.
- So they stay healthy.
- Kids need snacks so they are not hungry during the day.
- If we had big meals always the are bellys would hert.

- Children need snacks so the don't get hungrey.
- Because they need them cause they're hurgry and so they stay healthy.
- Children need snacks because when they get home from the bus they'll be hungary after a big day and sometimes familys cant make dinner right away.
- Children need snacks so if they eat dinner later then expected
- Children need snacks becaus thuy ceep you going.
- To get enrgy and stay full.
- Sometimes kids dont always eat their main meals so in a hour or so they are hungry.
- To keep there energy up.
- They need snacks to help give them energy for the day.
- Children need snack to feede their brain to let them be smarter.
- To keep you going in between meals.
- They need snacks so they aren't hungry.
- Children need snacks so they can gain up there energy again.
- So they can have more energy between meals.
- Sometimes they get a little hungry.
- Children need snacks because they need more nutrients to help them grow.
- Children need snacks because they get hungry.
- Because they get hungry between meals.
- Children need to eat a healthy snack so they are the healthy zone and are not hungry.
- Children need snacks so they git more food if they need more food.
- Because it gets you active and even gets you thinken.
- Children need snacks because either they are board and want to eat or they are hungry.
- So they can have energy between meals.
- They eat snacks to fill themselfs up for a whiel.
- So it helps them though out the day.
- To stay healthy.
- So the stomecks are satisfied.
- So they don't go hungry befor of after a meal. so there parents don't have to make a meal.
- Children need snacks because they propibly need energy that they get from snacks.
- So they are not so hungry later on.
- For energy.
- For energy.
- So they can have energey.
- So they are not hungry between meals.
- To keep them from being hungory.
- To stay strong.
- Children need snacks because they can't have meals all the time.
- To keep full.
- So they don't get to hungery while waiting for meals.
- Because they are hungry.
- So they stay healthy.
- For energy and helth.
- For enegory.
- Children need snacks so they don't starve sometimes.
- Children need snacks because it hepls you grow.

- So the can have energy.
- So they can get food in thear stomech.
- So children will be healthy.
- So we don't have to starve.
- Children need snacks because it helps them stay active.

Question 3: What should you look for when choosing a snack

- I look for helth and something that tast good.
- Something heathy so you have energy the rest of the day.
- To keep there energy up.
- A healthy snack such as crackers.
- You should look for a healthy snack.
- Fruit and vegetables.
- Healthy foods.
- When your looking for a snack you should chose if it's healty or not.
- apple
- If it is healthy.
- You should look for healthy foods that have lots of vitamens and nutrients.
- A snack you should look for is healthy.
- Something healthy
- You should look for a snack that is healthy and something you are not alergic to.
- Something healthy.
- You should look for healthy food or if you had a lot of healthy have some sweets here or there.
- Fruit or vegetables.
- You should look for something quick and healthy.
- You should look out for bad snacks like chips and cookies.
- Something healthy.
- Carrots, apple, crackers.
- Healthy snacks.
- You should look for a healthy smack.
- Something healthy.
- Something filling and heathy.
- I would look for a cokkie.
- You should choose somthing helthy.
- You should look for something not to filling a little bit healthy and good.
- The "nutrision facts" block.
- Healthy snack.
- A healthy one.
- If it's helthey or not or if it's tasts good or not.
- You should lok=ok for something small.
- When choosing a snack it shoud be some thing hethey.
- A heathy food.
- Something healthy.
- I look for somthing filling and tasty.

- A heathey one.
- When choosing a snack you should look for something helthy.
- You should look for something healthy.
- I think you should look for something healthy and nutrisious.
- When you look for a snack you should try to have something healthy.
- You should look for notrisis foods.
- Not a meal a bag or a box of something.
- Something healthy.
- I would choose something healthy because if you have junk food all the time you will get fatter.
- You should look at the nutrition facts, sugars, calories, fats.
- A healthy snack.
- Healthy snack.
- Good healthy things or thing you don't have a lot.
- If its healthy and yummy.
- A healthy food.
- Something that is naturters.
- You should look for something helthy and small.
- A healthy food.
- A small food that is healthy.
- A healthy snack.
- Look for good food.
- Some thing healthy, frut, vegie.
- Thing that are healthy.
- You should look for an apple.
- Something healthey.
- Something hethey.
- Something heathy.
- Fruit vegedbles.
- Something heathy.
- You should chose a helthy snack.

Question 4: What is an everyday snack?

- Apple gram crackers chips
- An everyday snack is a snack you have everyday.
- Grapes, apples.
- Fruits, vegtables, all those kind of healthy foods.
- Frute or reschedules.
- A apple or a banana.
- Yogurt.
- An everyday snack is a banana, or apple.
- An everyday snack is like a friut, yogart or a vegteble.
- Apple, banana, or an orange.
- Fruit and veggies.
- Apples and other fruits and vegtebales,

- Apple.
- Orange, apple, bannana, peach, plum, strawberys, rubarb.
- Fruits and vegetables.
- An everyday snack is fruit.
- Chips.
- Fruit.
- Fruits, dairy products, and vegtibles.
- Carrots.
- An everyday is what you eat everyday.
- A everyday snack is fruit snacks.
- Applesauce.
- Friut ceral.
- A everyday shanck is fruit snacks.
- It's when you have a snack everyday.
- A everyday snack is like an apple of gonorrale bar.
- Bannanar.
- Apple.
- Cheese.
- An everday snack is granola bars.
- An everyday snack is a grnola bar.
- gram racers.
- Crackers or carrots.
- An everyday snack for me is apples and chips.
- Gronla bar.
- Everyday snack sould be something helthy.
- Crackers or yorgrut.
- An everyday snack for me is an apple or any kind of fruit.
- A everyday snack is like some crackers of fruit.
- An everyday snack is somthing like an apple or bananas.
- A simple snak you can grab right out of the pantry or refrigerator.
- Maybe something like a apple or orange or grapes and something like that.
- A lasting snack.
- Bannannas, apples, and ornges
- Apples.
- Fruit.
- An apple.
- Frute.
- Frute and veggies.
- Crackers.
- An apple.
- An apple.
- An everday snack is grapes.
- A small bowl of grapes.
- An apple.
- Cheese.
- Chichen.

- An everyday snack fruit, crackers.
- Apple,banana, orange, fruit salad.
- I would choose beef jerky.
- Apple.
- Chese.
- Bannanas.
- Apples bananas.
- An apple or goldfish.
- An orange or other frout like bannanas.

Question 5: What is a sometimes snack?

- Candy pop
- A sometimes snack is a snack you rarely have.
- Candy or chocolate.
- Unhealthy foods.
- Junk food or fast food.
- Ice-cream.
- Candy or sweets.
- Nutty bar.
- A sometime snack is a clif bar, or some crackers.
- A sometimes snack is like chips, cookies, rice crispes and brownies.
- Candy and sweets.
- Choclate and sugary things.
- Sweet things like candy and ice cream
- Chips.
- Chocoleat icecream twiy
- Junk food.
- A sometimes snack is unhelthy things like candy, cookies and junk food.
- Applecrisp.
- Potato chips.
- Candy bars, cookies and cake.
- Cookies.
- A sometimes snack is what you eat sometimes.
- A sometimes snack is a cinnamon rolls.
- Oreo cookies.
- Chips.
- A some times snack is a cookie.
- When you have a snack not everyday but somedays.
- A sometimes snack is like a sandwitch if your really hungry and chocolate.
- Chips.
- Icecream!
- Candy.
- A sometimes snack is nachos.
- An sometimes snack is crackers.
- Cocies.

- Cookies or sweets.
- A sometimes snack is a roll.
- Cokies.
- When you eat a snack sometines.
- Pretzels and M&M's yum?
- A sometimes snack is popcorn or icecream like my family we have a 1 day of the week that we have popcorn.
- A sometimes snack is like a cookie.
- A snak you sometimes have is like ice crem or stuff like that.
- Snacks you don't have very often.
- Pop-tarts, cheez-its, golfish, etc.
- Pie.
- Ice cream brownys cake cookies.
- Chips.
- Cookies.
- 1 cookie.
- Chips.
- Chips cokies rice crispies.
- Root beer.
- Ice cream.
- Candy.
- A sometimes snack is a rice crispy bar.
- Leftovers.
- Grapes.
- Leftovers.
- Cheese.
- Cheze.
- Cheese-it cookie.
- A sometimes snack is a bag of chips.
- Goldfish.
- Crackers.
- Cereal.
- Chips cheese cookies rice krispe.
- A bowl or cereal.
- Cereal or junk food are sometimes snack.