

External Scholars Contributing to Smarter Lunchrooms Research

Some of these studies have been funded by the BEN Center, using USDA Funds, others have been funded by other sources

April 2017

Karla Shelnutt, University of Florida

Current Research:

Main Dish Items Served with Incorporated Vegetables and Vegetable Consumption in School Lunch Programs. The Quarter-Waste method was used to estimate vegetable consumption to determine if combining vegetable side dish items with main dish items (bundling) increases vegetable consumption among elementary and middle school students. The meals and vegetable sides that were tested included broccoli and teriyaki chicken and lettuce/tomato cups and tacos. Bundling meals increased vegetable selection in intervention schools by 250%. Bundling significantly increased vegetable consumption in intervention schools compared to baseline ($p < 0.003$) and compared to controls ($p < 0.15$). Bundling vegetables with suitable main dish items is an effective and inexpensive means of increasing consumption with little impact on waste or cost.

Presentations and Publications:

Dunn, Caroline, Karla Shelnutt, J. Karavolias, L. House, and A. Mathews. 2016. "Better Bundled: Combined vegetable side and main dish items increase vegetable consumption among elementary and middle school students," *Journal of Nutrition Education and Behavior*, Abstract P17, 48(7): S15.

Further Research:

In collaboration with Dr. Jaclyn Kropp (University of Florida), I am studying plate waste in schools with the farm to school programs. Data has been collected both for this study and for future studies. We are in the process of submitting a paper for publication.

Janani Thapa, University of Georgia

Current Research:

Lunchroom Table Talkers Talk School Students into Eating Fruits and Vegetables. The overall goal of this project is to enhance selection and consumption of fruits and vegetables (F&V) by elementary and middle school children. Table talkers, displayed on lunch tables, will be used to nudge F&V selection and consumption. The table talkers will be professionally designed with fun facts that are carefully selected to relate F&V with areas not directly related to nutrition such as children's literature, science, math and sports. The table talkers will be used to associate F&V with fun. The specific objectives of the project are: 1) To observe and analyze the change in elementary and middle school children's F&V choice decisions by comparing non-intervened selection and consumption to intervened selection and consumption; 2) To compare the effect of intervention on food selection and consumption between student cohorts with different socio-economic and socio-demographic make-up; 3)



To analyze the cost effectiveness of using table talkers as a means to promote F&V consumption.

Carmen Byker, Montana State University

Current Research:

Improving Fruit and Vegetable Selection in High School Lunches through Student Involvement in Smarter Lunchroom Design. In 2015–2016, School Lunch Advisory Council (SLAC) teams were formed at 5 pilot high schools across Montana. SLACs chose, implemented, and measured behavioral economic strategies to decrease waste and increase consumption of fruits and vegetables. Based upon the process and these findings, *A Simple Guide for SLACs to Make Your Lunchroom Smarter!* is being piloted and tested with 5 additional schools and will be finalized and published in summer 2017.

Media:

Montana's Smarter Lunchroom Resources including videos, webinars, protocol, and slides: http://opi.mt.gov/Programs/SchoolPrograms/School_Nutrition/SmarterLunchrooms.html

Presentations and Publications:

Ashe C, Bark K, Byker Shanks C, McCauley K. 2015. "Smarter lunchrooms movement," Presentation for 2015 Annual Extension Conference. October 2015. Bozeman, MT.

Bark K, Byker Shanks C, Stenberg M. 2015. "Innovative strategies for creating smarter lunchrooms in Montana high schools," Poster for Society for Nutrition Education and Behavior. July 2015. Pittsburgh, PA.

Byker Shanks C, Orlowski M, Stenberg M. 2015. "Make your lunchroom smarter!" Oral Presentation for School Nutrition Association. July 2015. Salt Lake City, UT.

[https://schoolnutrition.org/uploadedFiles/Presentations/ANC_2012_-_Denver_CO\(1\)/4_Marketing_and_Communication/Make%20Your%20Lunchroom%20Smarter.pdf](https://schoolnutrition.org/uploadedFiles/Presentations/ANC_2012_-_Denver_CO(1)/4_Marketing_and_Communication/Make%20Your%20Lunchroom%20Smarter.pdf)

Byker Shanks C, Bark K, Stenberg M. Innovative strategies for creating smarter lunchrooms in Montana high schools. Poster for Childhood Obesity Conference. July 2015, San Diego, CA.

Byker Shanks C, Tsoni E, Bark K, Stenberg M, Ashe C. Smarter Lunchroom Advisory Councils (SLACs): Impacting Positive Changes in Cafeterias and Student Choices. Ohio Smarter Lunchrooms Blog.

<https://ohiosmarterlunchrooms.com/2016/01/27/smarter-lunchroom-advisory-councils-slacs-impacting-positive-changes-in-cafeterias-and-student-choices/>

Upcoming Presentations:

May 31, 2017, California Childhood Obesity Biennial Conference, "Smarter Lunchrooms: A Policy, Systems and Environmental Approach to School Meals" (Co-Presentation with Other Smarter Lunchroom Teams)



June, 2017 Montana School Nutrition Association, “Engaging Students in Marketing Your Program”.

July 2017, USDA TNT Grant 2015 Montana Report at the USDA Meeting.

July 22, 2017, Society of Nutrition Education and Behavior, “Students Shape School Lunches of Tomorrow. Co-presenter

September, 2017 Montana Student Council Association Conference (SLAC session pending approval)

October 2017, Food and Nutrition Expo, Academy of Nutrition and Dietetics, Poster Sessions, (pending acceptance), “Smarter Lunchroom Strategies Decrease Vegetable Waste in Montana High School Cafeterias; and Smarter Lunchroom Strategies Increases Vegetable Selection at Salad Bars”

Publications in Progress:

Development of a Guide for Improving Fruit and Vegetable Selection in High School Lunches through Student Involvement in Smarter Lunchroom Design. Describe process for developing, implementing, and measuring behavioral economic changes in the school lunchroom with the participation of a School Lunch Advisory Council (SLAC).

Smarter Lunchroom Strategies Decrease Vegetable Waste in Montana High Schools. Determine if behavioral economic strategies nudge teens to select and consume more fruits and vegetables.

Milk Waste Differs Based Upon Milk Type in High School Lunchrooms. Examine whether the type of milk chosen is related to the amount of milk wasted in the high school lunchroom.

Smarter Lunchroom Strategies Increases Vegetable Selection at Salad Bars. Implement and measure salad bar strategies in the high school cafeteria to “nudge” students to select and consume more and waste less fruits and vegetables.

Dipti Dev, University of Nebraska

Current Research:

An Ecological Approach to Family Style Dining: Encouraging Healthier Food Choices in Preschoolers in Childcare. The objectives of this study are to: (1) Identify the preliminary effects of an ecological intervention on family style dining (EAT-FSD), focusing on preschoolers’ healthy food selection, portion size, and intake in contrast to standard pre-portioned meal service in a USDA-CACFP funded childcare setting; and (2) Determine the acceptability, feasibility and fidelity of EAT-FSD intervention in a USDA-CACFP funded childcare setting.

Christopher Gustafson, University of Nebraska

Current Research:

Participatory vs. Non-Participatory Marketing of Fruit and Vegetable Consumption. Students who design vegetable promotion materials, which are then posted in the school lunchroom, and students who are exposed to promotional materials in the



school lunchroom increase consumption of vegetables. However, we find that students who design materials promoting vegetables increase consumption significantly more than when students are simply exposed to promotional materials. Students who design promotional materials double their consumption of vegetables relative to baseline when those materials were posted in the school lunchroom.

Presentations and Publications:

Gustafson, Christopher, Bryce M. Abbey, and Kate A Heelan (2017). Impact of schoolchildren's involvement in the design process on the effectiveness of healthy food promotion materials, *Preventive Medicine Reports*, 6: 246-250, <http://dx.doi.org/10.105/j.pmedr.2017.03.010>.

Dipayan Biswas, University of South Florida

Current Research:

Using Olfactory Cues to Nudge Schoolchildren towards More Healthful Food Choices. We found that prolonged exposure to the scents of unhealthy foods (e.g., pizza, cookie) led to higher likelihood of children purchasing healthy item than when exposed to scents of healthy foods (e.g., apple, strawberry) or when exposed to no additional scent. In addition, hunger moderated these effects.

Publications in Progress:

"Using Olfactory Cues to Nudge Schoolchildren towards More Healthful Food Choices" currently under submission at *Journal of Marketing Research*.

Further research:

We have developed multiple school-related research projects subsequent to the BEN Center funding. One of these projects examines the effects of aspiration on food choices and another relates to examining effects of undertaking a cognitive task right before making food choices

Jane Kolodinsky, University of Vermont

Current Research:

Sampling Tomorrows Lunch Today: Using Behavioral Economics to assess the efficacy of a farm to school programming element "taste tests". Sampling Tomorrow's Lunch Today addressed the school lunch trilemma. School lunches must maximize participation by full-paying students; school lunch guidelines MAY make it difficult to serve tasty, healthy meals students like; and school lunches must be affordable. The goal of this project was to Increase NSLP participation by providing samples of a lunch entrée the day before it is to appear on the school lunch menu. We tested the hypothesis that NSLP participation rates will increase on days where students have sampled the day's entrée the previous day. A before/after with baseline experiment was conducted using four entrees: Chicken & Broccoli Alfredo, Root Vegetable Stew, Savory Turkey Loaf and Eggplant Parmesan. These competed against packed lunch and Pizza, Deli, Salad Bar. Results show an increase in the percentage of students choosing school lunch. This is the first study we know of that provides evidence that taste tests might be valuable in trying new, healthier



options. Taste tests may be a behavioral approach to help solve the school lunch trilemma.

Presentations and Publications:

Kolodinsky, Jane, Elizabeth Pope and Erin Roche. 2017. "Sampling tomorrow's Lunch Today: Examining the effect of sampling on school lunch participation," *Journal of Nutrition Education and Behavior*.

Kolodinsky, Jane, Elizabeth Pope and Erin Roche. 2016. "Sampling tomorrow's Lunch Today: Examining the effect of sampling on school lunch participation," Track Session - Presentation. Agricultural and Applied Economics Meetings, Boston, MA.

Mallory Vestal, West Texas A&M University

Current Research:

The Impact a "Traffic Light" Labeling System has on Decisions Made by Adolescents.

This research project assessed four alternative low-cost preordering entrée methods in an elementary school setting. Further, the project assessed the impact a 'traffic-light' labeling system has on decisions made by adolescents. Over the 8-week data collection period, alternative low-cost preorder entrée methods were assessed and primary data collected for kindergarten through 4th grade. The first 4-week data collection period served as the control followed by 'traffic light' implementation and subsequent 4-week data collection of individual entrée selection. Upon completion of data collection, statistical analysis was conducted. Overall, there is minimal behavioral response to coupling nutritional labeling with low-cost preorder methods. However, there are observations of students changing their lunch entrée choices. Some students improved their dietary habits by preordering yellow labeled entrées instead of red labeled entrées, while others made improvements to their nutrition by preordering more green entrées rather than yellow. Is the behavior modification of a few students enough to justify schools coupling nutritional labeling with preorder methods? Further research is needed to adequately address the aforementioned question.

Publications:

Vestal, Mallory. 2016. "Using Nutritional Labeling with Preordering Methods to Influence Student Entrée Selection," MA Thesis, West Texas A&M University, <https://wtamu-ir.tdl.org/wtamu-ir/handle/11310/65>

Marietta Orlowski, Wright State University

Current Research:

Dress Your Dog – A Vegetable Topping Project. The purpose of this pilot project was to pair vegetable-based toppings with popular menu entrées. Ballpark Frank menu day introduced a Chicago Dog with cucumber and tomato relish and a Fenway Dog with baked beans and coleslaw. Pizzazz your Pizza menu day introduced a Double Pepper Power Pizza with green and banana peppers and the Southwest Pizza with Pico de Gallo and corn salsa. Overall, students were very receptive to vegetable-



based toppings. In the two schools that implemented the topping project, vegetable selection increased:

- 42% to 48% of students who purchased a hot dog also selected either a cucumber relish or baked-bean/coleslaw topping with their hotdog.
- 30% to 37% of students who purchased a pizza also selected either green/banana pepper or salsa topping with their pizza.
- In one school with complete post data, the percentage of students who ate at least one-quarter cup of vegetables with their lunch increased from 25.2% to 38.5%.

The small changes in vegetable consumption indicate that suggested vegetable-based toppings could be one of a combination of the strategies to increase vegetable consumption.

Presentations and Publications:

“Dress your dog – a vegetable topping project” results appear in a COP article in the Journal of School Health (May 2017).

John List/Anya Samek, University of Chicago

Current Research:

Using Behavioral Economics to Improve Child Food Choice: The Impact of Informational Signals. The objective is to investigate the impact of nonmonetary incentives on children’s milk choices—chocolate milk or white milk—in the school lunchroom. Children were randomized to either a baseline condition or an incentive condition where they can receive a glow-in-the-dark bracelet (valued at about US\$0.20) for selecting white milk. The field experiment was carried out over a series of nine days (two weeks) with over 1,500 students in grades K to 8 across seven different elementary schools. We recorded the selection of milk as children went through the lunch line. We find that at baseline, only 16 percent of children selected the healthier white milk relative to 84 percent choosing chocolate milk. We find a significant effect of incentives, which increased white milk selection to 40 percent. After interventions were taken away, 25 percent of those previously treated continued to select white milk, providing suggestive evidence of the longer-term benefits of incentives.

A Behavioral Economics Experiment on the Effect of Prosocial Incentives on Child Food Choice. The primary goal of the proposed research is to explore whether and to what extent small-scale “pro-social incentives” in the form of donations to a charity on behalf of a child can have a positive effect on consuming fruit/vegetables sides in the National School Lunch Program. We also propose to compare the effect of pro-social incentives to private incentives as linked to the decision to eat the healthy side. Private incentives have already been shown to be highly effective in the lunchroom. However, a few problems with private incentives emerge – including a possible negative impact on intrinsic motivation and backlash from school officials. Pro-social incentives, on the other hand, may not have either of these issues.



Presentations and Publications:

Samek, Anaya, "Encouraging Healthy Eating Among Children: It Turns Out We Just Have to Ask" The Evidence Base.

<http://evidencebase.usc.edu/?p=1596>.

List, John, and Anaya Samek. 2017. "A Field Experiment on the Impact of Incentives on Milk Choice in the Lunchroom." *Public Finance Review* 45(1): 44-67.

Publications in Progress:

Lai, Chen-Yu, John A. List, and Anya S. Samek. 2017. "How do information prompts affect choices in the school lunchroom?" CESR-Schaeffer Working paper No. 2017-001.

Sara Williamson, The City University of New York/St Joseph's University

Current Research:

Lunchroom Food Waste. Serve-ware disposability impacts the amount of food taken, consumed, and wasted in school lunchrooms. In a within subjects field study, we observed that students took more, ate more, and wasted less food when consuming lunch with permanent (vs. disposable) serve-ware. In other words, they took less, ate less, and wasted more food when consuming the same meal with disposable serve ware. These results may provide valuable insight for understanding the relationship between increasing levels of school lunchroom waste and the simultaneous transition from permanent to disposable serve-ware in recent years.

Presentations and Publications:

Williamson, Sara, Lauren G. Block, and Punam A. Keller. 2016. "Of waste and waists: The effect of plate material on food consumption and waste," *Journal of the Association for Consumer Research*, 1(1), 147-160.

Helen Jensen, Iowa State University

Current Research:

Building Healthy Habits in Social Networks: Making Fruits and Vegetables a Popular Choice during the School Lunch. Simple, explicit incentives to encourage 4th and 5th graders to increase their consumption of fruits and vegetables lead to increased fruit and vegetable consumption in school. The effects of incentives were compared when provided to individuals, simple paired teams, and social paired teams (i.e. friends). Results from two elementary schools in Des Moines, IA (control and treated) showed the treatment phase increased the fruit and vegetable consumption by almost 50% in the treated school. Although the effect weakens, the difference persisted 4 weeks after the intervention. There were no significant gender differences in the control school; females responded slightly more strongly than males to the social pair treatment in the treatment school. The treatment had a positive effect during both the treatment phase and in the post-treatment phase. The treatment with incentives was relatively low cost and effective. The treatment effect carried over after the intervention.



Presentations and Publications:

Results presented at the annual meetings of the Agricultural and Applied Economics Association meetings, 2013.

Ana McAlister, Michigan State University

Current Research:

Saliency and Understanding of School Lunch Interventions Involving Pre-Commitment to Purchase Decisions. The study investigated whether minimalistic lunchroom interventions (often referred to as “nudges”) work precisely because they are minimal in nature. We examined whether kids are less resistant to persuasive communications that they cannot detect. We found that the vast majority of children recalled the menu interventions, but that only about 50-60% were clued into the purpose (i.e., to promote healthy foods). Subtle nudges are not fully processed as persuasive communications and this may allow children’s food choices to be shifted without skepticism or resistance to the intervention.

Publications:

McAlister, Anna. 2017. “How Marketing Communications Influence the Formation of Food Habits Prior to Adulthood,” In A. Dudo and L. Kahlor (Eds.), *New Agendas in Communication*, NY: Routledge.

Cash, Sean B., Wiktor L. Adamowicz, Shannon Allen, and Anna R. McAlister. 2013. “Children’s Response to Food Price and Warning Interventions when Purchasing Snack Foods,” *Canadian Journal of Diabetes*, 37, S273.

Cash, Sean B., Anna R. McAlister, Wiktor L. Adamowicz, and Shannon Allen. 2013. *Children’s Snack Food Purchases are Affected More by Price than Warning Labels*, International Conference on Food Studies, Austin, TX.

Zata Vickers, University of Minnesota

Current Research:

Serving Vegetables First as a Strategy for Increasing Vegetable Consumption in an Elementary School Cafeteria. The objective of our proposed research was to build on our pilot test results to determine if the ‘serving vegetables first’ strategy works with a variety of vegetables and with different serving procedures. We served kindergarten through fifth-grade students a small portion (26-33 g) of a raw vegetable (red and yellow bell peppers or broccoli) while they waited in line to receive the rest of their lunch meal. They then had the options to take more of the served-first vegetable, a different vegetable, or no vegetable from the lunch line. We measured the amount of each vegetable consumed by each child. Serving vegetables first greatly increased the number of students eating vegetables. On intervention days most of the vegetables consumed came from the vegetables-first portions.

Publications:

Elsbernd, Stephanie L., Marla M. Reicks, Traci L. Mann, Joseph P. Redden, Elton Mykerezzi, and Zata M. Vickers. 2016. “Serving vegetables first : A strategy to



increase vegetable consumption in elementary school cafeterias,” *Appetite*, 96, 111–115. <https://doi.org/10.1016/j.appet.2015.09.001>.

Redden, Joseph P., Traci L. Mann, Zata M. Vickers, Elton Mykerezzi, Marla M. Reicks, and Stephanie Elsbernd. 2015. “Serving first in isolation increases vegetable intake among elementary schoolchildren,” *PLoS ONE*, 10(4), 1–14. <https://doi.org/10.1371/journal.pone.0121283>.

Alice Ammerman, University of North Carolina at Chapel Hill

Current Research:

Taste Texting: A Pre-Order System for Fresh and Healthy High School Lunch. To improve high school lunch participation in the new federal standards, Healthy Hunger Free Kids Act (2010), we developed *Taste Texting*, a web-based, behavioral economics-informed program that allows students to pre-order school lunch from their computers or mobile phones and retrieve meals from kiosks, thereby bypassing lunch lines. This study was combined mixed methods formative research and conducted in two high schools with identical menus in Chapel Hill and Carrboro, North Carolina (n = approx. 2300 students). In the formative phase of the project, we used a series of focus groups (n= 8 groups; 60 students) and surveys (n ~440) to identify the social norms surrounding school lunch and perceived barriers to participation. Longitudinal, student-ID linked transaction data and multinomial logistic regression modeling was used to estimate associations between student-level sociodemographic characteristics and weekly school lunch participation for the school year prior to program implementation (n ~ 2100 students, followed for 20 weeks). We found that school lunch participation decreased as grade level increased (OR = 0.87, 95% CI: 0.79–0.95, p<0.001), that males were more likely to participate than females (OR = 2.2, 95% CI: 1.78–2.71, p <0.001), and that whether a student received free or reduced price lunch was the strongest predictor of school lunch participation (OR = 14.63, 95% CI: 11.38–18.81, p <0.0001). No significant differences in school lunch participation were found by school or school week. Lastly, we implemented the *Taste Texting* program for 12 weeks (School 1) and 10 weeks (School 2) and examined the program’s impact on individual school lunch participation at 4, 6, and 8-weeks post-implementation. We found that although program adoption was minimal, the heaviest program users in one school exhibited and maintained a 12% increase in weekly school lunch participation.

Publications:

Smith, T.W., S. Forlenza, V. L. Flax, Seth M. Noar, Dianne S. Ward, Ty A. Ridenour, and Alice S. Ammerman. 2017. “Perceptions of school lunch and barriers to school lunch participation among high school students in two public high schools in North Carolina.” Under Review: *Journal of Nutrition Education and Behavior*.

Smith, T. W., Ty A. Ridenour, A. Vines, Dianne S. Ward, Robert Furberg, and Alice Ammerman. 2017. Sociodemographic factors associated with school lunch participation in two public high schools in North Carolina,” Under Review: *JAMA Pediatrics*.



Conrad P. Lyford, Texas Tech University

Current Research:

Fun in the Lunchroom: A Nudge to Develop Healthy Taste Buds. Coauthor Janani Thapa. The project was conducted in two elementary schools serving over 740 students, primarily Hispanic (Hispanic-90%, Black/AA-7%, White-3%), to instill long-term F&V consumption habits. The project modified the elementary school lunch room choice architecture to change the focus of the decision maker (lunch room participants) from food alone to food “with fun”. In this research cartoon characters were used to provide visual cues to nudge selection of F&V accompanied by an associated intervention of a reward-based game in the lunch room that encouraged students to finish their serving. The primary data was the tray waste data recorded at three phases: pre-implementation, implementation, and post implementation. Preliminary results show that the frequency of lunchroom trays with consumed serving of fruits in the implementation period increased by over 5% from the pre-implementation period for grades 1, 2, and 3. Similarly, the frequency of trays with a fruit serving has increased significantly by 17%, 7%, and 10% for grades 1, 2, and 3, respectively. The research actions undertaken are straight forward, easy to replicate, low-cost, and have a high potential for future implementation.

Publications:

Thapa, Janani R. and Conrad Lyford. 2014. “Fun in the Lunch-Room: A Nudge to Develop Healthy Taste Buds,” ASHEcon 2014, University of Southern California. <https://ashecon.confex.com/ashecon/2014/webprogram/Paper1801.html>

Elena Serrano, Virginia Polytech Institute

Current Research:

The Effect of School Cafeteria Noise on Student Food Consumption. The goal of the study was to explore the question: To what degree does school cafeteria noise influence food consumption and food waste of young children. Sound levels and food waste were collected in four schools. Then, food waste was collected in schools with the highest and lowest sound levels. The sound level for school 1 was 75 decibels (db) and school 2 was 80 db, both above what is recommended by the US Environmental Protection Agency to protect hearing. Across the schools, there was no significant relationship between food waste and sound levels. But, in school 1, the louder the sounds, the less food waste there was; the opposite was true in school 2. Overall, the findings highlight the complexity of understanding the interaction between auditory cues and food consumption. Future studies are warranted to further explore this interaction.

Deana Hildebrand, Oklahoma State University

Current Research:

Broadening use of choice architecture strategies in middle-school nutrition settings and understanding the extent to which use of strategies impact middle-school students selection of fruits and vegetables. Findings revealed a significant increase in the use of BE strategies. Managers’ support of BE was high throughout the project



and varied from very supportive to supportive. There was a moderate, positive correlation between managers' support and extent of BE strategy use. There was no increase in fruit and vegetable servings after the implementation of BE strategies, which may be due to timing of the project, and the recent implementation of the new NSLP meal pattern requirements. Use of the Diffusion of Innovation Theory may be useful in future efforts to further expand use of BE strategies in school cafeterias. Further research is needed to study the interaction of new meal pattern requirements and BE on students' food choices.

Publications:

Hildebrand, Deana, Carol Meredith, T. Kennedy, and G. Gates. 2014. "Evaluation of the Smarter Lunchroom Project: Broadening the use of behavioral economics in Oklahoma Middle Schools," *Journal of Nutrition Education and Behavior*, 2014;46(4):S132. Presented at the Society for Nutrition Education National Conference, Milwaukee WI.

