Childhood Obesity Intervention in Public Schools: Comparing the Influence of Nutrition Education Programs and Policies on Academic Performance and Nutritional Behavior Change in Southwest Virginia and the Republic of Palau

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Executive Summary:

Purpose:

• This report summarizes research conducted over the summer and fall of 2013 as part of Roanoke College’s Summer Scholars program and an independent study for Honors in the Major (Sociology). Data was collected from two study sites; an urban elementary school in the city of Roanoke, VA, and a large, urban elementary school in the Republic of Palau.

Background:

• The Republic of Palau is a Pacific island nation that declared an obesity epidemic in 2011, resulting from rapid changes in diet and lifestyle due to globalization.
• In Palau, 33% of children and 58% of adults are obese. The United States has obesity rates of about 35% for adults and 17% for children.
• One of the more successful strategies for nutrition and obesity intervention is starting in schools. Thus, it is crucial to understand the influence that these programs have on improving child nutrition and nutritional behavior change at home.

Methodology:

• A mixed-methods survey was distributed to 134 parents at the Palau study site, and 83 parents at the Southwest Virginia (SWVA) study site, and key informant interviews were conducted in Palau.
• Data analysis was performed using SPSS and hand-coding for the qualitative responses.

Results:

• 45% of parents in the Palau sample reported being able to be involved with nutrition-related activities at their child’s school, while only one respondent reported doing so in SWVA. Key barriers to parent involvement at both sites include busy work schedules and childcare.
• When asked about nutritional behavior change at home, parents at both sites reported assistance with grocery shopping as the most common activity, and reading nutrition labels as the least common. In Palau, a major area of change was eating more fruits and vegetables, whereas in SWVA, a major area of change was assisting with cooking at home, representative of how specific programs and policies can key in on specific behaviors.
• 56% of parents in Southwest Virginia (n=52) felt that the programs in place were either “somewhat” or “very” successful. More than 3/4 of parents in Palau felt that both the Healthy Snacks and the H20 Only policies were “somewhat” or “very” successful.
• Nearly one quarter of parents in Palau were “very unsatisfied” or “unsatisfied” with the nutritional value of the foods served at school, with 18.4% of parents in SWVA responding the same way. This was the main point of discussion for parents—incorporating healthier and less processed foods into school meals.
• The comparison between the two study sites provided valuable insight in light of the different leadership driving initiatives (coalition vs. PTA and local administration)
• Community Based Participatory Research (CBPR): Successful initiatives must rely on input from the community (stakeholder analysis) in order to improve chances of success and to benefit the community at large.
I. Purpose:

The main line of inquiry for this project was to attempt to understand attitudes toward school food and nutrition education in the both Republic of Palau and Southwest Virginia. My research sought to accomplish several goals:

1) gain a detailed knowledge of current activities and policies in place
2) gauge the attitudes of parents toward these activities
3) understand the effects of these policies on academic performance and nutritional behavior change (as relayed by parents)
4) gain an understanding of the assets and barriers surrounding school nutrition activities and policies, and ideas that informants have for expanding or improving such policies.

I also wanted to understand more about parent involvement in these programs and how involvement can be increased, as previous literature has emphasized the crucial role that parents play in shaping child eating habits, positing that parental involvement and support is a key factor in the success of school nutrition education efforts (Lindsay, Sussner, Juhee, and Gortmaker 2006). Further, I wanted to have knowledge of current best practices and parent ideas that can be shared with other schools and lead to improved programs and policies, and contribute to the expanding field of anthropological research as it applies to nutrition education and childhood obesity. The key methods utilized to gather the necessary data to answer these questions were as follows:

a. Conduct background research that compiles the current research being done regarding school nutrition programs and policies in the United States, particularly in Virginia, to be compared with the existing literature review that assesses the same information in Palau.

b. Construct a paper survey instrument that gauges current attitudes of adults toward nutrition education in schools in an effort to better understand the effects of these policies
on academic performance and nutritional behavior change (as relayed by parents), and to
gain an understanding of the assets and barriers surrounding school nutrition activities and
policies. The survey was distributed via school administrators to parents at two schools.
c. Conduct key informant interviews with important figures and stakeholders in school food
and nutrition education in the Republic of Palau.
d. Perform qualitative and quantitative analysis of survey and interview data to construct a
report for distribution to the Ministries of Education and Health in the Republic of Palau,
local school officials in Southwest Virginia, as well as to school principals and community
stakeholders in both areas. The report has been designed to inform policy and
programming in Palauan and Virginian schools to improve nutrition education. Further, the
research has been presented at the Society for Applied Anthropology 2014 Annual
Meetings in Albuquerque, New Mexico as part of a session on community obesity
prevention efforts, and a manuscript for scholarly publication will be developed.

II. Background:

Childhood obesity is one of the biggest health problems facing the United States today.
Since 1980, the rate of obesity in children ages 6-11 has tripled, and among children ages 12-19,
this increase was even higher, “going from 5% to 17.6% in the same period” (Li and Hooker
2010:96). Obesity is a problem that has plagued American children for decades, but the number
of children facing obesity has increased rapidly in the last several years, and the number is still
growing.

The Republic of Palau (a small island nation of about 20,000 inhabitants) has seen
similar staggering statistics. 33% of children and 58% of adults in Palau are obese (Kuartei
2011), and this number is increasing. The main causes of death in Palau are attributed to noncommunicable diseases (heart disease and Type II Diabetes, specifically, plague many Palauans) (Cassels 2006). Noncommunicable disease rates are on the rise in Palau. This is largely of result of a long history of colonial influence followed by a heavy economic dependence on the United States (and other wealthy nations), as well as rapid changes in diet and lifestyle due to globalization. Programs in both countries have been implemented in recent years to combat obesity and poor nutrition; one of the main foci for change among policymakers is nutrition for children in schools, due to the fact that children consume a large portion of their daily food intake at school. Further, school serves as the primary venue for learning about nutrition and modeling positive nutrition-related behaviors (Crooks 2003, Wechsler et al. 2001).

Thus, it is crucial to understand the influence that these programs have on improving child nutrition (both at school and via nutritional behavior change at home) and nutrition-related problems such as poor academic performance. These are important areas to address in order to continue to fight obesity both in the United States and in Palau. Critical medical anthropology (CMA) tells us that there are a variety of factors that influence health beyond biomedical explanations. It does so by looking at structures of power and access to economic resources alongside cultural histories to arrive at explanations of health behaviors and outcomes (Singer 2004). Using CMA, we can see that the political and historical factors influencing school nutrition decision-making in Palau as a result of feeling economically beholden to larger world powers are similar to those present in the United States as well. Disparities in power and influence resulting from differences in wealth lead to large-scale
policies being developed and implemented in small-scale communities and school systems with little thought to how it will affect individual communities, and communities themselves lack the ability (or the venue) to voice their opinions of such policies. These decisions throughout the U.S. are largely informed by a reliance on greater federal funding (Crooks 2003), and many of the cultural factors (long parent work hours and cultural beliefs about status-associated food items) are present in both of these societies (Cassels 2006). Economic, political, and cultural factors all require analysis from the individual level through the policy level, and by linking these levels of analysis we can understand how culture intersects with politics and economics in community, national, and global systems. New crossnational research can help anthropologists understand which aspects of food and eating are limited by culture, and which can be generalized to contribute to greater theoretical explanations (Sobal 1998).

III. Framing the Research: Models for Community Obesity Intervention

Though there are many similarities in both the problems facing these two countries, and their strategies in addressing issues from a school nutrition education perspective, the ways in which these programs are developed and implemented differ significantly. In Palau, decisions about school programs and policies are largely made by local administrators and spurred on by input from the Parent-Teacher Association (PTA). In the United States, the “coalition”\(^1\) often plays a major role in the development, implementation, and funding of such programs, and this role was significant at the Southwest Virginia study site.

\(^1\) Feighery and Rogers (1990) define a coalition as “an organization of individuals representing diverse organizations, factions or constituencies who agree to work together in order to achieve a common goal.”
The coalition model for community change has become increasingly popular, and for good reason. Everett (2011) posits, “a coalition framework is a good fit for [community health promotion] because partnerships require the coordination and mobilization of multiple stakeholders” (10). This emphasis on partnerships between stakeholders is important to successful initiatives because it increases the reach of the coalition, allowing for the understanding of more barriers, assets, and ideas for change.

Coalition involvement in community health initiatives can be positive in that it seeks to involve several levels of what Robinson (2008) refers to as the socioecological model of health: intrapersonal, interpersonal, organizational, community, and public policy (in line with the discussion of linking levels of analysis, above). This serves as a much more holistic approach to health improvement, as it seeks to look beyond individual behaviors and risk factors and shifts the focus to improving health outcomes for an entire community (Everett 2011). However, an emphasis on singular levels of the socioecological model of health (organizational, public policy, interpersonal) by coalitions often results in an oversight that reduces the effectiveness of the coalition’s work—neglecting to gain the perspective of “members of the community groups that coalitions themselves purport to represent” (Morris and Luque 2011). Coalitions provide a key access point for community members, marginalized groups, and grassroots leaders to create positive and sustainable changes within a community, particularly in regards to public health initiatives, but only when they are given the opportunity to create connections with coalition members from powerful institutions (Everett 2011). This is the key to successful coalition work, and is necessary to consider in an analysis of the community health efforts in Southwest Virginia, where the coalition model plays a major role.
Further, this type of health intervention outcome study confirms the importance of a community-based participatory research (CBPR) approach (Israel et al. 2001). This is different from the standard evidence-based medicine (EBM) approach that is often used in implementing programs in schools but “fundamentally ignores the multiple school-level variables that may affect intervention effectiveness (such as financial concerns, labor issues, staff behavior, parental reactions, etc.)” (Coleman et al. 2012:81). My own approach sought to understand these factors and analyze them alongside the programs and policies in place for a more thorough understanding of nutrition related activities at each school and how they could be improved in light of these variables.

In analyzing the specific differences in this study from a CBPR perspective, there are several factors that could be considered to determine what accounts for these differences. Leadership, resources, and parent involvement could all play a role in the efficacy and success of nutrition education programs, and these factors differ quite significantly between the two sites.

There are often four major shortcomings (outlined by Coleman et al., 2012) that can account for the lack of success of programs in schools, defined as: 1) inability to change certain aspects of the school nutrition environment; 2) inability to restrict unhealthy foods brought to school from home; 3) “lack of integration of the intervention into daily school practice because of delivery by research staff”; and 4) problems implementing curriculum alongside the necessary curriculum for standardized testing. Often, any combination of these four shortcomings can result from a lack of a CBPR approach in designing these programs and
policies from the beginning (oversights not unlike those often made by community health
c煤itions, as mentioned above).

Within the framework of CBPR, it is possible that a major point of comparison in the
Republic of Palau and Southwest Virginia is looking at who is driving the changes and
interventions at each school. Based on what we know about community health coalitions and
their influence on health intervention programs in communities and, specifically, in schools, it is
important to look at how successful the programs put in place by the coalition can be, and how
they can be improved. Conversely, in the Republic of Palau, where changes are largely driven by
the Parent-Teacher Association (PTA) and local administrators it is possible that there is a
different sense of buy-in in place, and thus, we may see differences in levels of success and
parent attitudes. My research was designed in part to examine these differences.

IV. Method:

Palau Data Collection:

The site for this study was Koror Elementary School, a K-8 school in Ngerbeched, an
urban neighborhood located in the capital city of Koror in the Republic of Palau. This research
was completed over a 12-week period as part of Roanoke College’s Summer Scholars program
and was approved by Institutional Review Boards both at Roanoke College (IRB #13SO137) and
the Republic of Palau (IRB #2013-01).

Parent and Teacher Surveys: Two mixed-method surveys were constructed for parents
and teachers. The surveys combined both quantitative and qualitative questions that asked
about school food, child nutritional habits, academic performance, and opinions regarding the
school’s current policies and programs. All teachers at the school received the survey (n=33).
The principal distributed these surveys and returned them to the researchers via U.S. Postal Mail. Parents were given the survey at a Parent Teacher Association meeting, which usually has over 50% of parents in attendance (n=134). After completing the surveys, the principal collected the surveys all and sent them back to the researchers via U.S. Postal Mail.

Data analysis took place using SPSS software for the quantitative survey questions, and hand coding for the qualitative questions. A total of 167 parents and teachers completed the survey (33 teachers and 134 parents). 27 female and 6 male teachers were surveyed, and 90 female and 41 male parents (with 3 missing).

Interviews: Three interviews were conducted by phone with Palauan teachers and local school officials. These interviews were recorded using computer software and transcribed as needed to provide contextual detail to assist with interpretation of survey data.

Southwest Virginia Data Collection:

The site for this study was Hurt Park Elementary School, a K-5 school in Roanoke, Virginia. Survey formation and distribution was completed over the Fall 2013 semester as part of an independent study and was part of an approved ongoing study with Dr. Elizabeth Holbrook.

Parent Surveys: Parents were given a mixed-method survey that combined both quantitative and qualitative questions that asked about school food, child nutritional habits, academic performance, and opinions regarding the school’s current policies and programs. Surveys were sent home with students (grades K-5) as a homework assignment from their physical education teacher. Students were asked to complete the surveys with their parents at home and return them to the teacher, who then gave them to the researchers (see Appendix).
Data analysis took place using SPSS software for the quantitative survey questions, and hand coding for the qualitative questions. A total of 83 parents completed the survey with their children.

V. Results:

Parental Involvement

The extent to which parents were involved in the nutrition programs at each study site was perhaps one of the most obvious differences. While 45% of parents at the site in Palau said that they had been involved with activities at their child’s school to some extent, only one parent expressed being able to be involved with nutrition-related programs and activities at their child’s school in Southwest Virginia.

Parent involvement is a crucial element to carrying healthy eating messages through from school to the home. In Palau, About 49% of teachers (n=31) said that they believed more than 75% of parents were involved with nutrition programs and activities at school in the past year, but 55% of parents (n=129) reported that they had not been involved with these school activities. Parents who were involved said that they enjoyed spending time with their children, and believed it was very good for their child’s overall health to be involved, but they also expressed many difficulties in being involved.

Time: Parents at KES consistently cited time as the biggest barrier for being involved with activities. 37 parents mentioned work schedules as a major issue. One parent explained, “sometimes the program falls during work and my wife and I have to decide who should come because we are both working”. Another parent explained, “I have to take off or break at work
because I work 7 days”. Parents mentioned other time constraints, like childcare for younger children, as a barrier as well.

Other parents: Parents at KES also mentioned that a major difficulty was coordinating with other parents. “When not enough parents show up for the activities”, wrote one parent. “Inconsiderate parents”, wrote another.

These barriers from the study site in Palau are mirrored by current literature on parent involvement at their children’s schools in the U.S., particularly when it comes to nutrition-related activities (Lamb-Parker et al. 2001, Sook-Lee and Bowen 2006, Hornby and Lafaele 2011). Parents in our study in SWVA mirrored this as well, offering up statements like, “provide more programs”, and “I wish they did the program more than once a week so I could be involved”.

Nutritional Behaviors

One of the survey questions asked about nutritional behavior of students at home with their parents. First, the survey asked how often parents participated in various healthy eating activities with their children. Possible responses included assisting with cooking at home, grocery shopping, trying new foods, and reading nutrition labels (see Appendices for survey instruments). In Palau, the activity that parents reported participating in with their children in most often was grocery shopping, and the least common activity was reading nutrition labels. In Southwest Virginia, both the most and least frequent behaviors were the same (78.3% and 28.9%, respectively, n=82, n=74).

Then, parents were given various activities related to nutrition, and were asked to define whether or not they had seen this change in their child as a result of the programs or
policies in place at each study site. In both Palau and Southwest Virginia, one of the most frequent changes in behavior was choosing healthier snacks, showing that having these programs and policies in place in general can cause general improvements in nutritional decision-making for children. However, the other frequent behavior changes at each site show the direct effects of the programs in place. In Palau, the other most commonly cited change in behavior was willingly eating more fruits and vegetables (68%, n=125). In Southwest Virginia, it was assisting with cooking at home (31.2%, n=77) that garnered the most frequent responses from participants. This data is representative of the influence that programs can have on specific behaviors; in Palau, the Healthy Snacks policy that requires children to bring fruits and vegetables to school positively influences their choices to consume these items more often. In Southwest Virginia, the programs in place consist largely of cooking demonstrations and lessons; thus the tendency for children to practice more cooking with parents at home.

**Attitudes Toward Programs and Policies**

Another important area of exploration was an investigation of parent attitudes toward the Healthy Snacks and H2O Only policies in place in Palau, and the activities and programs at Hurt Park Elementary in Southwest Virginia. At the study site in Palau, policies in place only allow children to bring healthy snacks (fruits and vegetables) and water to class. At the Southwest Virginia site, programs in place focus primarily on hosting cooking demonstrations and teaching children how to eat and prepare fresh foods. School gardening is present at both sites, as well; parents and students are both involved with the school garden in Palau, while the garden program in SWVA is less popular for students and parents alike: very few parents that indicated their child had participated in the garden program, and no parents indicated being
involved themselves. Variables measured included level of satisfaction with the policy or program, challenges associated with enforcing the policies, as well as ways the policies could be improved or changed.

**Perceived success of Healthy Snacks and H₂O Only policies.** 75% of parents who responded (n=124) were in agreement that the Healthy Snacks policy was “somewhat” or “very successful”. Meanwhile parents believed the H₂O Only policy to be more successful, with 82% (n=127) responding the same way (see fig. 1 and 2). Parents who felt that the Healthy Snacks policy was successful expressed a decreased consumption of junk food and healthier choices being made by their children as the key positive outcomes of the policy, writing “my son does not ask for junk food anymore”, and, “he is choosing more healthy foods”. With this policy, however, many parents expressed their own problems with enforcement. “I need to continuously encourage my child the importance of water. Also, with her peer group, they tend to drink sweets”, wrote one parent, and many other parents said they experienced the same challenges with the H₂O Only policy. Discussion of the Healthy Snacks policy saw many of the same issues: “I still see children bringing unhealthy snacks to school”, wrote one parent. “Healthy fruits are kind of expensive”, wrote another. The issue of consistency both at home and at school was present here as well. One parent described it best by saying, “at home she can eat whatever she likes to eat”.

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Figure 1: Parents’ perceived success of the Healthy Snacks policy at Koror Elementary School (n=124)

Figure 2: Parents’ perceived success of Koror Elementary School’s H₂O Only policy (n=127)
Perceived success of programs and activities at Hurt Part Elementary. In Southwest Virginia, when asked how successful parents felt these programs were in improving their family’s overall knowledge of nutrition, about 56% of parents (n=52) felt these programs were either “somewhat” or “very successful” (see fig. 3). Programs that parents cited their children had participated in included Healthy Happy Cooks (44.9%), the school garden (16.5%), Food for Thought (5.1%), Chef Z demonstrations (1.3%), or other (5.1%).

![Figure 3: Parents’ perceived success of programs put on by Hurt Park Elementary School. Parents who indicated their child had not participated but still answered this question were excluded (n=52).]

Satisfaction with School Food. 23.5% of parents (n=119) in Palau were “very unsatisfied” or “unsatisfied” with the nutritional value of the foods served at school (see fig. 4). 25 parents in the Koror Elementary surveys mentioned improving school food as the main idea for improvement of school programs and polices in general. “Maybe school should charge (on a
sliding scale) for lunch so more nutritional lunches can be provided instead of hot dogs, can food”, said one parent. “School has to invest in healthy food. Charge parents if they have to as long as they get healthy food”, wrote another.

At the study site in Southwest Virginia, 18.4% of parents were “very unsatisfied” or “unsatisfied”, (n=76), while 56.6% of parents were “satisfied” or “very satisfied” (see fig. 5). Parents in Southwest Virginia, too, cited changes or improvements in school foods served most often when asked for their general ideas. “All schools should provide healthy lunches”, wrote one parent. “Making sure that the school lunches are better quality”, wrote another. Parents also talked about healthier school breakfasts, a meal that many students at the SWVA study site depend on. “The breakfast looks like a lot of sugary cereals”, and “the food choice for breakfast could be a little more healthy”, were two of the responses.

On the whole, parents seemed less satisfied with the foods served at school in Palau, but a significant number of parents at both study sites showed a certain level of disapproval, creating opportunities for change. These opinions of school foods served are significant: we know that involving parents in school nutrition activities makes them more successful (Lindsay, Sussner, Juhee, and Gortmaker 2006), and parents at both study sites were largely supportive of current practices in place. In light of this, seeing areas where parents are largely unhappy with current practices can create a key moment of discussion and opportunity to involve them in brainstorming ideas for improvement. However, parents at both study sites, along with administrators and teachers interviewed from Koror Elementary, noted the economic constraints associated with this change. At Hurt Park Elementary, 93% of students qualify for free lunch (National Center for Education Statistics 2012). In Palau, school lunch is always free
for students, but constrained by financial challenges and a national policy that requires each school to serve the same foods in every school across the country (thus limiting the nutritional quality of the foods served). While parents in Palau noted they would even be willing the pay for lunch (perhaps, one parent suggested, on a sliding scale) if fresher foods were more available for their children, but this could still prove to be difficult to implement or create changes at either study site because of the obvious financial constraints.

![Figure 4: Teachers’ level of satisfaction with the nutritional value of the foods served in the cafeteria at Koror Elementary School (n=33)](image-url)
Figure 5: Parents’ overall satisfaction of nutritional value of foods served in school at Hurt Park Elementary (n=76)

Academic Performance and Nutrition

Parents in Palau were, on the whole, more inclined to believe that nutrition (and the programs and policies surrounding nutrition in place at school) had an effect on their child’s academic performance. 70% of responding parents (n=97) in Palau said they had seen an improvement in their child’s academic performance (see fig. 6) as a result of healthier eating (either slight or significant). Palauan parents cited improved concentration, working independently, and improved grades as areas that they believed were most heavily influenced by nutrition. A parent stated that her child was “more alert in class”, while another expressed that his child “is energetic about school work”. 14 parents also expressed that their children’s
grades had improved as a result of healthier eating. Parents in Palau also cited improved reading skills, children working more independently, and improved behavior.

In Southwest Virginia, less than half (48.6%, n=68) of parents believed that their child’s academic performance had been influenced for the better either slightly or significantly as a result of nutrition education programs and improved overall nutrition in their children (see fig. 7). 30.9% of responding parents believed this had no effect at all. Of the parents that did feel the two were positively correlated, however, parents most often cited improved grades and improved concentration as the most remarkable changes. “Their grades have improved and so has their focus on homework”, explained one parent. “Seems to have more energy now”, and “[My son] has been bringing home good grades...he made the A&B honor roll”, wrote others.

![Bar Chart: How much improvement have you seen in your child's overall academic performance since their school started implementing nutrition-related programs and activities?]

Figure 6: Parents’ opinion of overall change in their child’s academic improvement since Koror Elementary began implementing nutrition programs and policies (n=97)
VI. Recommendations:

Based on data from 133 parents at Koror Elementary School and 83 parents at Hurt Park Elementary School, there are a few recommendations that can be made to improve upon and expand the programs and policies currently in place. These recommendations are broken up by study site (followed by more general “lessons learned”), and come largely from the section of the instruments that asked parents for their own ideas for improvement:

Palau:

a. Choose a variety of times for programming and activities

Parents would greatly benefit from having more scheduled times for programs and activities to choose from. With conflicting work and childcare schedules, having a variety of activities scheduled would help parents plan which they can attend and coordinate busy schedules. Utilizing the PTA in this case could be useful—in the Palau school, PTA
attendance is reported to be over 50% at each meeting, a much higher statistic than in many U.S. PTAs.

b.  *Create a health class as a mandatory core class for students*

Offering the class as a mandatory core class would take some of the pressure off of teachers to share these messages during other classes, and would allow for the training and provision of resources for a few specific teachers, as opposed to trying to equip them all with such knowledge and resources. There could be financial barriers to implementing this health class, but a redistribution of resources (as many teachers try to incorporate some level of nutrition education in each class, often with great difficulty) could help to alleviate the stress that many teachers are feeling and streamline the nutrition education process.

c.  *Continue “Walkathon” program*

Parents consistently cited enjoying the Walkathon, a school-wide event that encourages school administrators, teachers, parents and children to all walk together around a set course, and it seemed that the majority of parents and teachers felt this event had high attendance and was successful.

d.  *Involve additional policymakers in planning phases of programs and activities*

While KES successfully incorporates parents, teachers and community-level stakeholders in decision-making, further levels of analysis could be incorporated here, too, such as state and national policymakers and administrators.

**SWVA:**

a.  *Involve parents in planning phases of programs and activities*

Parents repeatedly cited difficult work and childcare schedules as one of the main reasons why they were unable to attend activities at their child’s school. Many households include two full-time working parents, or parents who are responsible for the care of younger children. Parents described the difficulties associated with scheduling. Capitalizing on the parents’ desire to be involved would likely be one of the most effective ways to strengthen consistent parent participation in events
b. *Involve teachers in incorporating the curriculum developed by the coalition*

The coalition working in the SWVA region (made up of local non governmental organizations, representatives from a large hospital chain, and researchers) is tasked with designing and implementing programs and specific classroom curricula. In this endeavor, they would find great assistance in hosting focus groups, meetings, etc. with teachers early on in the design and development process of these programs, in order to meet specific instructor needs, gain ideas on how to make these programs as easy as possible to incorporate into preexisting classes, and find out what teachers believe their students will respond to best. This would be best facilitated by a CBPR-approach to build community level buy-in and enthusiasm.

**Both:**

* a. *Emphasize school garden: expand program and encourage parent sign ups*

Parents expressed general approval and support for the school garden program, but no parents at Hurt Park (and only a few at KES) were able to participate in the program. Further, very few students were reported to be active with the school garden program at Hurt Park. Schools should increase student participation with after school programming, and encourage parents to sign up to supervise students groups in the garden and volunteer to help maintain the garden. Present in both study sites is the ability to build school gardening into classroom curricula, as well, and this would be extremely useful in encouraging school garden participation among the students and building enthusiasm for the students to encourage their parents to participate with them.

* b. *Develop farm-to-school/school garden policies that incorporate fresh fruits and vegetables grown at the schools*

Incorporating more fresh fruits and vegetables into school food was an area of change that a vast majority of parents at both study sites were quick to write about in the surveys. To do so would require a great deal of policy and procedural change in both study communities. The Republic of Palau requires the same foods to be served in all schools across the country each day, so incorporating fresh fruits and vegetables, particularly from local sources or the school garden itself, would require a change on a national level. In
Southwest Virginia, national Farm-to-School programs are being implemented and 
promoted by the United States Department of Agriculture already, but more influence from 
the local community (and perhaps the coalition) will be required to bring such a program to 
Hurt Park Elementary.

**c. Offer parent workshops to be attended with children, parent support network**

Additionally, parents mentioned that attending events with their children was a 
rewarding endeavor, and it seems they would be most likely to interact with other parents 
in a workshop-like setting, where they can discuss different concerns, ideas, and challenges.

**d. Emphasize consistency in messaging between home and school: sending home child 
friendly recipes, fridge magnets, and/or in home activities to be completed with parents 
for homework**

A useful way to get parents more involved is to send tangible messages home from 
school with children that reinforce the positive messages about healthy eating they are 
learning. Sending handouts, pamphlets, or workbook activities about nutrition home with 
students to be shared and completed with parents has been shown to be very effective in 
brining healthy eating into the home, particularly for parents that find it difficult to be 
involved with activities at the school because of busy schedules (Blom-Hoffman, Wilcox, 
Dunn, Leff, and Power 2008). Other possible ways to send information home include child-
friendly recipes using fruits and vegetables grown in the school garden, fridge magnets with 
nutrition “fun facts”, and different in-home activities to be completed with parents for 
homeork (for example: a mapping activity where children and parents pick items from 
their pantry and locate where in the world they came from).

**VII. Contributions to Anthropology and Public Health**

On the whole, this comparative approach to school nutrition research provided great 
insight into similarities, differences, and best practices at both study sites, leading this work to 
add to a canon of cross-cultural research that has become increasingly valuable in a globalized 
world. Sobal (1998) outlines this comparative approach to cultural research as it applies to food
and nutrition, and calls for new research in this area. New cross-national research can help anthropologists understand which aspects of food and eating are limited by culture, and which can be generalized to contribute to greater theoretical explanations. In this way, we learn how to best create nutrition education and obesity intervention programs that can be as successful as possible, that maximize positive, sustainable outcomes for as many people and communities as we can.

The main takeaway from current policies and practices in Palau is the strong sense of parent and teacher buy-in and involvement that is present at many levels of program development and implementation. Of the four shortcomings delineated by Coleman et al. (2012), they have taken great steps to avoid several: their Healthy Snacks and H₂O Only policies restrict unhealthy foods from schools, and they have few concerns over integration of programs because of the strong community involvement and buy-in that was so important in the development phases of the programs and policies in place at Koror Elementary School, as explained by a teacher and a local school official during phone interviews. KES is already doing the work to address many of the issues that still plague U.S. school nutrition programs (such as restricting junk food consumption at home, involving parents in programs, and building parent and teacher buy-in for program development), and this cannot be overlooked. Their struggles, however, lie with changing the nutrition environment at school in terms of school lunch policy and the foods served at school. This is largely a result of national leadership and minimal food sovereignty resulting from globalization.

In Southwest Virginia, at Hurt Park Elementary School we see more of the effects that standardized testing policies have on classroom curriculum building, and see more difficulties
with integration and curriculum reliance as a result. Similarly, the EBM approach to health interventions and program development is utilized more often by the coalition than public health-based CBPR approaches; thus many of the socioecological levels of health (interpersonal, community), and school-level variables (leadership, resources, teachers and parents) are often overlooked or underemphasized. As a result, the parent and teacher support and buy-in is less present or enthusiastic as it could be, and is certainly far less prevalent here than in Palau. However, there is much that Palauan decision-makers could learn from the programs at Hurt Park, as well; programs at Hurt Park are part of greater policy initiatives on state and national levels, and thus the ability to fund, evaluate, and spread these programs is much stronger.

The importance of CBPR or a public health-based approach to school nutrition interventions lies in several of its key components: recognizing the importance of a whole community as an identity, not just as a physical location; building on the strengths that are already present in the community; utilizing a thorough understanding of all stakeholders involved; and facilitating a collaborative approach of all of these stakeholders in all phases of research, program design and implementation, and follow up (Israel et al. 2001). The integration of all of these aspects, and the heavy reliance on community makes programs at Koror Elementary School seem more successful and better supported by members of the community than those at Hurt Park Elementary School, and this can be seen by the stark contrast in levels of parent involvement and engagement in the two study schools. Again, This is not to say that the programs at Hurt Park are not beneficial, but that their benefit could be heightened by greater reliance on stakeholder voices. Similarly, the Palau efforts could be
improved were the schools better able to affect change at a policy level – something the coalition driving the Hurt Park programming is perhaps better positioned to accomplish.

Moving forward, this community involvement and integration aspect of school nutrition education research cannot be overlooked; in fact, it must be emphasized. Without the backing of the community, and without acknowledging the various socioecological factors at play throughout the community that are of crucial importance to health outcomes, programs in schools will be less successful and they will lack the potential for any further reach throughout the community.

VIII. Reflections:

There were a few aspects of this research that made it difficult to conduct. Firstly, the Palau phase of the project was more challenging because of the distance involved. However, there was a stronger sense of rapport between the study community and the researchers at this site because of the nature of ongoing projects in Palau. Conversely, there was less of a sense of rapport between the researcher and the study community in Southwest Virginia, because of the more bureaucratic environment and the involvement of the coalition. In Palau, teachers and school officials were also involved in this study, and I was able to survey parents and teachers, as well as conduct key informant interviews over the phone. Because of the bureaucratic constraints and the perceived climate of the study site in Southwest Virginia, teachers were less accessible and interviews were unable to be conducted in the time and scope of this research.
IX. Areas for Further Research

Future research that seeks to address school nutrition from various angles should consider the importance of a public health CBPR model, even when looking at policy reformation on organizational, local, and national levels. School food and nutrition policies are the next area that needs to be explored, and in doing so, it is easy to overlook the communities in which these policies are being implemented and having the greatest effect. Instead, Israel et al. (2001) suggest that in working with communities (often marginalized ones, as in the case of Hurt Park Elementary), when looking at socioecological and structural determinants of health outcomes, “the potential for translating research findings into policy is especially critical. CBPR results will be grounded in the experiences of the communities involved, and reflect a comprehensive understanding of the complex issues under investigation and addressed through action” (192). Thus, future research into policy should continue to utilize and emphasize the importance of community through a CBPR approach.

Undoubtedly, the next area to explore along this line of inquiry is to examine the relationships between these different levels of analysis (individual, community, policy makers, local and national) under a CBPR approach. The role of local and national policies (and policy makers) is clearly a major one, and yet little has been done to explore how these policies are made, developed, and then implemented in various communities—particularly from the perspective of the communities. In the case of the Republic of Palau, a national policy greatly hinders local communities’ ability to serve fresh, nutritious foods for school lunch. Throughout the United States, cities, counties and communities are consistently provided with a variety of programs and policies they must implement with little regard to the individual identity,
strengths and challenges of each community resulting in varying levels of success for such programs. In order to explore these issues, I plan to pursue school food policy formation and implementation as a graduate student of Applied Anthropology at the University of South Florida. I plan to continue working in the Republic of Palau and more local public school communities (potentially in the south Florida area) to further examine the CBPR model in examining the formation and implementation of large-scale policies in communities.
You have been selected to participate in a project that seeks to describe the influence of current nutritional policies in place in schools in Palau. This survey is completely voluntary. You may skip questions you do not wish to answer. This survey is completely confidential and your responses will not be identifiable in any way.

Please select your gender:  ☐ Male        ☐ Female

How long have you lived in your current neighborhood? __________________

How many children do you have living at home? ___________ What are their ages? __________________

Please indicate how often you and your child/children participate in the following activities together:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Often</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>Never</th>
<th>Don’t Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Looking at nutrition labels</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Grocery shopping</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Trying new fruits</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Trying new vegetables</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Discussing healthy eating</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

What kinds of messages about healthy eating do your children bring home from school?

_________________________________________________________________________________________

_________________________________________________________________________________________

Have you been involved in any healthy eating or nutrition programs at your child’s school, such as school gardens or other activities? Yes ☐  No ☐  Briefly list programs: _______________________________________

What do you enjoy about being involved with activities at your child’s school?:

_________________________________________________________________________________________

_________________________________________________________________________________________

What is difficult about being involved with activities at your child’s school?

_________________________________________________________________________________________

_________________________________________________________________________________________

How successful do you feel the water only, or “H2O” policy at school has been at improving your child’s overall nutrition?

☐ Unsuccessful  ☐ Somewhat unsuccessful  ☐ Neutral  ☐ Somewhat successful  ☐ Very successful

Why? ________________________________________________________________________________________

_________________________________________________________________________________________

How successful do you feel the policy at school has been at improving your child’s overall nutrition?
What nutritional behavior changes have you seen in your child since their school began implementing nutrition-related programs and activities? Check all that apply.

☐ Asking to try new foods at home
☐ Choosing healthier snacks/beverages
☐ Willingly eating more fruits and vegetables
☐ Willingly assisting cooking at home
☐ Other, please list: _____________________
☐ Asking to try new foods at home
☐ Reading nutrition labels
☐ Choosing healthier snacks/beverages
☐ Sharing nutrition information with family
☐ Willingly eating more fruits and vegetables
☐ Improved food choices when grocery shopping
☐ Willingly assisting cooking at home
☐ Pointing out unhealthy eating behavior in others
☐ Other, please list: _____________________
☐ Encouraging friends to choose healthier foods

How much improvement have you seen in your child’s overall academic performance since their school began implementing nutrition-related programs and activities?

☐ There has been no change in my child’s academic performance
☐ There has been slight negative change in my child’s academic performance
☐ There has been significant negative change in my child’s academic performance
☐ There has been slight positive change in my child’s academic performance
☐ There has been significant positive change in my child’s academic performance
☐ I don’t know

Can you give examples of positive academic changes you have seen in your child, if any?
____________________________________________________________________________________

____________________________________________________________________________________

How satisfied are you with the nutritional value of the foods that your child is served at school?
☐ Very unsatisfied ☐ Unsatisfied ☐ Neutral ☐ Satisfied ☐ Very satisfied

In an average week, how many nights do you eat dinner together at home with your children? ________________

What ideas do you have for improving nutrition programs and activities at your child’s school?
____________________________________________________________________________________

____________________________________________________________________________________

Thank you very much for your participation in this survey.
If you have any questions, please contact Dr. Chad Morris (cmorris@roanoke.edu), or Dr. Ed Hamilton (hamilton@roanoke.edu)
For homework tonight, please complete this form with your parent/guardian.

Name: _____________________________ Age: ___________ Grade: ______  □ Male □ Female

How many children live in your home? ______________ What are their ages? ______________________________________________________________________

**For Students and Parents/Guardians:**

How often do you and your parents/guardians participate in the following activities together?

<table>
<thead>
<tr>
<th>Activity</th>
<th>Often</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>Never</th>
<th>Don’t Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Looking at nutrition labels</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Grocery shopping</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Trying new fruits</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Trying new vegetables</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Discussing healthy eating</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Shopping at Farmers Markets</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>

Where do you grocery shop? ______________________________________________________________________

How often do you eat already prepared foods as a family each week (fast food/restaurant/pre-packaged foods)? □ Never □ 1-3 meals □ 4-6 meals □ 7-9 meals □ 10 meals or more

How often do you prepare meals at home each week? □ Never □ 1-3 meals □ 4-6 meals □ 7-9 meals □ 10 meals or more

In a given week, how many nights do you eat dinner at home as a family? □ Never □ 1-3 nights a week □ 4-5 nights a week □ 5 or 6 nights a week □ Every night

Do you think the foods you eat affect your physical health? □ Not at all □ very little □ neutral □ somewhat □ very much

Which of the following programs have you (the student) participated in at school?

□ Happy healthy cooks □ Chef Z
□ School garden □ Other: __________________________________________
□ Food for thought

How successful do you think these programs have been at improving your family’s overall knowledge of nutrition? □ Unsuccessful □ Somewhat unsuccessful □ Neutral □ Somewhat successful □ Very successful

Why do you feel this way? ______________________________________________________________________

___________________________________________________________________________________________

What kinds of messages about healthy eating do you bring home from school? ______________________________

___________________________________________________________________________________________

Is your parent/guardian involved in any healthy eating or nutrition programs at your school? Yes □ No □
Briefly list programs: __________________________________________
What have you changed about yourself since participating in nutritional programs and activities at school? Check all that apply. (If you have not participated in nutritional programs/activities, you may skip this question).
☐ Asking to try new foods at home ☐ Reading nutrition labels
☐ Choosing healthier snacks/beverages ☐ Sharing nutrition information with family
☐ Willingly eating more fruits and vegetables ☐ Improved food choices when grocery shopping
☐ Willing to assist with cooking at home ☐ Pointing out unhealthy eating in others
☐ Other, please list: _____________________ ☐ Encouraging friends to choose healthier foods

For Parents/Guardians:
How much improvement have you seen in your child’s overall academic performance since their school began implementing nutrition-related programs and activities?
☐ There has been no change in my child’s academic performance
☐ There has been a slight negative change in my child’s academic performance
☐ There has been a significant negative change in my child’s academic performance
☐ There has been a slight positive change in my child’s academic performance
☐ There has been a significant positive change in my child’s academic performance
☐ I don’t know

Can you give examples of positive academic changes that you have seen in your child, if any?
_____________________________________________________________________________________________
_____________________________________________________________________________________________
_____________________________________________________________________________________________

How satisfied are you with the nutritional value of the foods that your child is served at school?
☐ Very unsatisfied ☐ Unsatisfied ☐ Neutral ☐ Satisfied ☐ Very satisfied

What ideas do you have for improving nutrition programs and activities at your school?___________________________________________
_____________________________________________________________________________________________
_____________________________________________________________________________________________

Dear students and parents/guardians,

A group of researchers at Roanoke College would like to see your responses to this questionnaire. Your answers will not be graded, but will be used to try to improve nutritional programming in your school. Students’ names will be removed before the researchers use the questionnaire. If you give permission for the research group to view your responses, please sign below. If you do not want the research group to use this questionnaire, you do not need to sign this form.

Parent/Guardian Name: __________________________________________________ Signature: ________________________________
Student’s Name: __________________________________________________ Signature: ________________________________

If you have questions about how the research group will use this questionnaire, please contact Dr. Elizabeth Holbrook at Roanoke College, 540-375-5292 or Holbrook@roanoke.edu. You may also contact the Roanoke College Institutional Review Board at 540-375-2409 or Hamilton@roanoke.edu.
References:


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