The Childhood Model of Eating, Its Influences, and Its Consequences
Jenelle Townsend
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20 Pages
Three Pages of References Cited
One Table and Three Figures
What children are eating has become one of the most important issues facing health professionals, parents, and children alike in the 21st century. In Alabama more than half of the adult population is considered to be overweight or obese (Alabama Center for Health Statistics 2003); many more suffer from other nutrition-related problems, such as cardiovascular disease and diabetes. Since children’s eating habits are established early and will affect the rest of their lives, understanding not only what children are eating but why they are making the choices they do is crucial to decreasing the prevalence of contemporary nutrition problems and improving overall health.

To address this issue, students \((n=38)\) from two city schools in Tuscaloosa, AL, completed a pilesort activity; were asked to rate the healthiness of a list of food items; and answered questions about various activities outside of school, including media use and helpfulness with chores at home. Finally, the students were weighed and measured. The data gathered from these tasks were used to determine the extent to which children share, or do not share, knowledge of food and eating with one another, and to see how their model is similar to, or different from, the adult model in the same community using both qualitative and quantitative methods, including cultural consensus analysis.

**Background**

Anthropological studies on both food and children have been a part of the discipline practically since its inception. As early as 1888, the *American Anthropologist* published a piece entitled “Manners and Meals” in which Mallery discusses the history of a wide range customs involved in eating from the use of forks to the appropriate position in and time at which to eat. His discussions of both his Western contemporaries and non-Western groups shows its emphasis on food and food customs as important to human
beings and its desire to include cross-cultural information show that it has distinctly anthropological roots.

Like research involving food, research dedicated to children has been a part of the discipline for more than a century. Many researchers credit Mead’s work in the Pacific (Harkness and Super 1996:4)(LeVine 2007:248) and the work of Malinowski in the late 1920s (LeVine 2007:248) as two of the earliest examples of such studies. Benthall (1992:1) even pushes the date back to 1899 with the publication of a “social Darwinist” piece *Education on the Pueblo Child: A Study in Arrested Development* by F.C. Spencer. Individuals like these were among the first to expose the world to the idea that although childhood is universal biologically, it is ultimately culturally constructed.

Cognitive anthropologists have also continued the tradition of studying children and food. The job of cognitive anthropology, as with most types of cultural anthropology, is to understand the concept of culture. Culture is understood to be the knowledge individuals need to possess in order to function adequately within their social environment (Goodenough 1996). For cognitive anthropologists, anthropological research is concerned with understanding the way people—often very different from ourselves—structure their own knowledge about a particular domain; in this case, the domain is food. These emic classifications have provided great insight into food research in places like Brazil (Dressler et al. 2004, Newkirk 2004, Oths et al. 2003) and the United States (Szurek 2004, Roos 2000).

Using a wide variety of cognitive anthropological tools for his research, Roos (2000) attempted to understand the structure of the cultural model of food for children in a Kentucky school. The children’s freelists and unconstrained pilesorts suggest that
preference played a big part in their understandings of foods. Many of the foods elicited from the pilesort, for example, were foods most commonly associated with children, such as pizza and candy. The children also separated foods as healthy or not and thought that healthier foods were more likely to be associated with dieting and women. This paper is an interesting one in that it demonstrates that the children are clearly transitional beings; they have accepted parts of the adult model but still continue to distinguish themselves as eaters from it. It shows that often children have the understanding of health and other aspects of eating that are considered to be important for adults, but they may still choose to disregard this adult knowledge.

Szurek’s (2004) work in the southeastern United States continues the tradition of using cognitive methodology to examine people’s knowledge and beliefs about food. Her study focused on understanding how three different groups of adult eaters (traditional, healthy, and athletic; see Szurek 2004:22-25 for sampling techniques) organized their knowledge about food. Evaluations of foods based on the dimensions of health and tradition were extremely common across all groups (Szurek 2004:52-56,64-68). Building off of this adult model of food and eating within Tuscaloosa, this research project is aimed at trying to understand the composition of the childhood model of food and eating—should one exist—in the same community.

Methods

Research Setting

Tuscaloosa, located 50 miles southwest of Birmingham, Alabama’s largest city, is home to 80,000 people. In 2000, 83.1% of the city’s residents had a high school education or higher and 30% of all adults also had at bachelor’s degree or higher (U.S.
Census Bureau 2006)—perhaps because of the University of Alabama’s accessibility to local residents. Despite such achievements in education, nearly a fourth of the city’s residents fell below the poverty line, and residents as a group earned a median income of a little less than $28,000—roughly $10,000 less than the state’s average (U.S. Census Bureau 2006).

During the 2006-2007 school year, the Tuscaloosa City School District was responsible for the education of more than 10,000 students at 19 different schools. Out of these 19 schools, two elementary schools, Verner Elementary and Woodland Forrest Elementary, were chosen to participate in this project. They were primarily chosen because they most closely represented the proportion of black to white students found in the state school system, which is comprised of approximately 35.7% black and 59.0% white students (for 2006-2007 school year, Alabama Department of Education 2007). From these two schools, 38 students between the ages of 7 and 11 were interviewed.

**Research Methods**

Over the summer, each of the 38 children was interviewed individually at home, school, or at a public place in Tuscaloosa for approximately one hour. First, the children’s sex was identified, and then they were asked questions about age, the grade of school just completed, race or ethnicity, and what types of jobs their parents did. The last question was initially going to be used as a rough estimate to gauge socioeconomic status. The children often had a very limited notion of what their parents actually did for a living, and the measure was discarded.

Next, the children were presented with a stack of 33 cards, each with the name of a food and a corresponding picture of the food. They were then asked to complete an
unconstrained pilesort; that is they were told to sort the foods into piles using any criteria they chose (“just use your imagination”). After they were finished, the children were asked to explain why they put the foods into the groups they did. The pilesort activity is an important one because each child’s individual unconstrained pilesort can be compared to the pilesorts of the group to see if there is a general way of grouping the cards (e.g. by food group).

For the third part of the interview, the children were asked to tell how often they ate each of the 33 foods used on the cards in the previous exercise using a 5-point scale ranging from never to always. After this was completed, the children were presented with the same list of foods and asked to rank how healthy they thought each of the foods was (“not healthy,” “some healthy,” “healthy,” and “I don’t know”).

Before moving on to the final part concerning behaviors at home, the children were weighed (in pounds) and measured (in inches). These data were used to calculate body mass index (BMI, measured in kg/m²). Measuring BMI is painless and relatively unobtrusive and has been shown to relate to measures of body fat (Dietz and Bellizzi, 1999; Himes and Dietz, 1994). Finally, the children were asked a series of questions about their involvement in household chores, media usage, and perceived social influences on food choice.

The data gathered during the interview process were analyzed using ANTHROPAC 4.0 (Borgatti, 1996) and SPSS 13.0 for Windows. ANTHROPAC was used to complete the multi-dimensional scaling, consensus analysis, and property-fitting analysis (PROFIT). SPSS used to conduct a series of statistical tests, including Mann-Whitney independent samples t-tests and correlations, which appear below.
Results

Out of the 38 children interviewed, 20 (52.6%) were male and 18 (47.4%) were female. The children were students who had finished 1st through 5th grades during the previous year, and they ranged in age from 7 to 11. Although there was a fair distribution of students across all years, half of the participants were either 9 or 10 years old (n=19). A total of 35 students identified themselves as either white (n=21) or black (n=14). As of 2000, Alabama’s population was 70.4% white (alone) and 26.3% black (US Census Bureau 2006). The 55.3/36.8 split of white/black students in this study means that the white students are underrepresented.

Body mass index (BMI) was obtained for 37 children. This was calculated using the formula BMI = (weight)(703)/(height^2) where weight is measured in inches, height is measured in pounds, and 703 serves as a conversion factor (CDC 2007a). Although the National Health and Nutrition Examination Surveys found nearly 20% of children between the ages of 6 and 11 to be overweight in 2003-2004 (CDC 2007b), only 4 students (10.8%) in this study qualified as such. Three of these were male, and three were 10 years old (the other was 8). The other 33 students were considered to be “healthy” based on their BMI-for-age percentiles.

Television Usage

Perhaps not surprisingly every child in this study reported that there was at least one television in his or her house, and nearly two thirds of the children reported that they had TVs in their bedroom. On average, 18.4% of the children guessed that they spent less than an hour a day watching television. Approximately 60% of the children thought that they watched 2 or fewer hours of television a day. More than 60% of the students

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reported that they could also watch TV during meals. Despite these figures, three fourths of the children did not feel as though the TV was on all the time at their homes.

All of these measures were combined during data analysis to give one “television score.” This combined measure was seen as the amount of impact that television could potentially have on the child’s life.

Other Media Usage

While TV use was ubiquitous, internet use among the children was less so. About 70% of the children reported using the internet for less than an hour—if at all—on an average day. Levels of reading outside of school (and not school-related) were more varied although less than 15% of students reported reading “never” or “rarely” outside of school. Nearly 50% of the students said they “sometimes” read outside of school.

Measures of internet and book/magazine use were combined with the television score above to create a “total media score,” which was used in additional data analysis below.

Perceived Social Influence

The measure of “perceived social influence” was created by summing the scores of five different categorical variables. These variables had to do with the influence that different members of the person’s family (e.g. grandparents) and their friends exerted on their eating habits. Out of a possible score of 5 (with “0” representing the lowest amount of perceived influence and “5” the highest), 19 children (54% of the 35 children) had a score of “1,” 8 a score of “2,” 4 with a score of “3,” 3 with a score of “4,” and 1 with a score of “5.” Interestingly, more children reported that they ate the same foods as their grandparents than any other group—over parents, siblings, and friends.
Additional questions about the social nature of eating were asked as well. All children reported that their parents wanted them to eat healthy foods, and nearly 90% of the children claimed to eat food that was good for them. When asked if they would eat foods that were not good for them but tasted good, however, 34.2% of the children agreed.

Helpfulness Around the House

During the interview, the children were asked to tell how often they completed 10 different chores around the house on a five-point scale (“never,” “rarely,” “sometimes,” “usually,” “always”). These scores were summed to produce a measure of overall helpfulness around the house. The average helpfulness score for all students was 30.55 (SD = 6.22) with the scores ranging from 14.00 to 46.00. The scores did not differ considerably by age (figure below). Though girls had a higher mean helpfulness score (mean = 32.22) than boys (mean = 29.05), the difference was not statistically significant. There were statistically significant differences in the helpfulness scores of black and white children. Black children had a mean helpfulness score of 33.64 compared to the mean score of 28.48 for white children (t = 2.545, p < 0.05).
**Pilesort Data**

The first task the interviewed children were asked to complete was an unconstrained pilesort in which cards labeled with foods are sorted freely into different piles. Every child’s piles were then inputted into ANTHROPAC 4.0. ANTHROPAC is a useful program because it generates an aggregate proximity matrix, which is useful for producing a measure of how often foods are sorted together in the same pile by all children in the sample. It is based on a combination of all individual proximity matrices (individual’s personal pairings of foods). The closer the number between a pair of foods is to 1, the more often they are sorted together. In contrast, a value close to 0 suggests that the foods are rarely sorted together.
The values obtained from the aggregate proximity matrix can then be transformed using non-metric multidimensional scaling (MDS) into a map. Those pairs of foods that had a higher value in the aggregate proximity matrix appear close together in the MDS. An MDS graph is important because it is a visual representation of how the children as a group sorted the foods. The figure below shows the MDS diagram for the unconstrained pilesort for all children in the sample. A stress of value of 0.213 would conventionally be considered too large to indicate a good fit between the original and the transformed similarities; however, Sturrock and Rocha (2000) generated observed stress values for random matrices of varying size, and with 33 sorted objects, a random matrix would scale with a stress value less than 0.337 only 1% of the time. Therefore, it is reasonable to conclude that, in this case, the 2-dimensional representation has a reasonable fit with the original similarities.
From the graph, it is possible to see that foods like “broccoli” (which appears on the left side of the graph) appear far away from foods like “sweet tea” (on the right side of the graph). This means that the two foods are rarely sorted together. “Broccoli” is next to the foods “vegetables,” “green beans,” and “salad,” which means that the children are sorting them together often—probably because they have something in common.

**Consensus Data**

In her study of adults within the Tuscaloosa community, Szurek (2004) found that the most important way for adults to sort foods was by their healthiness. To see if healthiness was used as a criterion during the pilesort, consensus analysis was conducted.
The purpose of consensus analysis is to determine if sharing—in this case, sharing of the concept of “healthiness”—occurs among children.

The children were asked to say how healthy they thought 32 different foods were, and their answers were inputted into ANTHROPAC. The factor analysis revealed an eigenvalue of 20.548 for the first factor. This explains 84.6% of the variance. The eigenvalue ratio between factors 1 and 2 for the interval format was 9.052 to 1—higher than the value of ‘3’ needed to establish consensus.

Additionally, the consensus analysis produces a cultural competence score for each child. The higher the child’s competence score is, the more closely he or she matches the shared model of healthiness for foods. The range in competence scores for this task was 0.11 to 0.88; the mean competence score was 0.721 (SD= 0.146).

A series of statistical tests were conducted to see if differences in cultural competence existed among the children. A Mann-Whitney test revealed that there were no significant differences in health consensus agreement scores based on gender ($U = 167.500$, $p= 0.714$). There were also no significant correlations between consensus agreement score and age ($\rho_s= 0.040$, $p= 0.813$), grade finished ($\rho_s=0.082$, $p=0.626$), helpfulness ($\rho_s= -0.217$, $p= 0.197$), TV score ($\rho_s= -0.056$, $p= 0.743$), total media score ($\rho_s= -0.099$, $p= 0.560$), height ($\rho_s= -0.112$, $p= 0.502$), weight ($\rho_s= -0.098$, $p= 0.566$), and BMI ($\rho_s= -0.098$, $p= 0.640$).

There was a significant difference, however, between the consensus agreement scores of black and white children at the $p= 0.10$ level (Mann-Whitney $U = 90.500$, $Z= -1.906$, $p= 0.057$). Black children had a mean consensus score of 0.6771 (median= 0.7000) while white children had a mean consensus score of 0.7486 (median= 0.7600).
This means that, as a group, black children agree less among themselves as to which foods are considered healthy or not than do white children.

**Property Fitting (PROFIT) Analysis**

Since consensus analysis determined that the children shared a concept of “healthiness,” PROFIT analysis was conducted. PROFIT analysis is used to determine whether or not the children are using this concept of healthiness to sort the foods during the pilesort task.

![MDS Diagram with Regression Line](image)

The figure above shows the MDS diagram with a regression line representing health.

From the graph, it is possible to see that health is an important dimension children are
using to sort the foods from the pilesort activity (multiple R = 0.808). As one moves from right to left on the graph, it is possible to see that the foods become healthier.

The most important thing gained from this analysis is that children as a group share an understanding of health and are widely using this dimension of to organize this list of foods from a very early age. It was also important to see if the children’s understandings of health matched the adults’ understandings of health in the same community. The children’s health ratings obtained from the cultural answer key produced through the consensus analysis were compared to the health ratings produced by adults (Szurek 2004:56).

The table below shows the children’s health ratings compared to those of the adults. The ratings of the foods for the children are very similar to the ones produced by the adults.

<table>
<thead>
<tr>
<th>Food</th>
<th>Children</th>
<th>Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td>water</td>
<td>3.00</td>
<td>2.94</td>
</tr>
<tr>
<td>oranges</td>
<td>2.97</td>
<td>3.00</td>
</tr>
<tr>
<td>broccoli</td>
<td>2.95</td>
<td>2.95</td>
</tr>
<tr>
<td>fruit</td>
<td>2.95</td>
<td>2.98</td>
</tr>
<tr>
<td>green beans</td>
<td>2.95</td>
<td>2.78</td>
</tr>
<tr>
<td>vegetables</td>
<td>2.95</td>
<td>2.93</td>
</tr>
<tr>
<td>bananas</td>
<td>2.92</td>
<td>2.97</td>
</tr>
<tr>
<td>milk</td>
<td>2.92</td>
<td>2.65</td>
</tr>
<tr>
<td>peas</td>
<td>2.79</td>
<td>2.82</td>
</tr>
<tr>
<td>salad</td>
<td>2.82</td>
<td>2.85</td>
</tr>
<tr>
<td>vitamins</td>
<td>2.66</td>
<td>2.66</td>
</tr>
<tr>
<td>potatoes</td>
<td>2.63</td>
<td>2.43</td>
</tr>
<tr>
<td>fish</td>
<td>2.58</td>
<td>2.89</td>
</tr>
<tr>
<td>whole wheat bread</td>
<td>2.63</td>
<td>2.90</td>
</tr>
<tr>
<td>eggs</td>
<td>2.47</td>
<td>2.42</td>
</tr>
<tr>
<td>bread</td>
<td>2.58</td>
<td>1.87</td>
</tr>
<tr>
<td>organic food</td>
<td>2.53</td>
<td>2.81</td>
</tr>
<tr>
<td>cheese</td>
<td>2.39</td>
<td>1.85</td>
</tr>
<tr>
<td>cornbread</td>
<td>2.32</td>
<td>1.72</td>
</tr>
<tr>
<td>meat</td>
<td>2.42</td>
<td>2.13</td>
</tr>
<tr>
<td>carbohydrates</td>
<td>2.37</td>
<td>2.37</td>
</tr>
<tr>
<td>sweet potatoes</td>
<td>2.18</td>
<td>2.43</td>
</tr>
<tr>
<td>Food</td>
<td>Children Score</td>
<td>Adults Score</td>
</tr>
<tr>
<td>----------</td>
<td>----------------</td>
<td>--------------</td>
</tr>
<tr>
<td>pasta</td>
<td>2.32</td>
<td>2.01</td>
</tr>
<tr>
<td>chicken</td>
<td>2.18</td>
<td>2.81</td>
</tr>
<tr>
<td>pork</td>
<td>2.13</td>
<td>2.10</td>
</tr>
<tr>
<td>casserole</td>
<td>2.13</td>
<td>1.56</td>
</tr>
<tr>
<td>beef</td>
<td>2.05</td>
<td>1.99</td>
</tr>
<tr>
<td>sweet tea</td>
<td>1.87</td>
<td>1.15</td>
</tr>
<tr>
<td>cobbler</td>
<td>1.71</td>
<td>1.03</td>
</tr>
<tr>
<td>ice cream</td>
<td>1.53</td>
<td>1.06</td>
</tr>
<tr>
<td>fast food</td>
<td>1.24</td>
<td>1.00</td>
</tr>
<tr>
<td>chips</td>
<td>1.16</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Table 1: A comparison of the consensus analysis cultural answer key for children and parents (from Szurek 2004:56) for the health dimension

There are, however, several foods whose scores are considerably different between the children and the adults in Tuscaloosa: sweet tea (difference of 0.72), bread (0.71), cobbler (0.68), chicken (0.63), cornbread (0.60), casserole (0.57) and cheese (0.54). Interestingly, the adults in Szurek’s (2004:68) study rated all of these foods as very traditional to the area—with each food receiving a score of 2.80 or higher (out of 3.00). Although differences do exist between the individual food scores produced by the children and adults, the correlation between the child and adult scores was extremely high ($r(30) = 0.893, p < 0.01$). This suggests that children not only share a meaning of health with one another but they also share a meaning of health with adults in the same community.

**Discussion**

In his book *The Omnivore’s Dilemma*, Pollan attempts to explore the relationship between humans and the food they eat in modern society. The dilemma omnivores face is one of choice; a person’s food choice made at the local grocery store, a health foods store, or at a farm impacts his or her life in more ways than perhaps he or she will ever know. Pollan writes, “We are not only what we eat, but how we eat, too… Eating puts us
in touch with all that we share with the other animals, and all that sets us apart. It defines us” (2006:6-10).

Although it is easy to dismiss Pollan’s statements as being too romantic, it is undeniable that food plays an important role in the lives of humans. In an age of increased chronic diseases, many of which have been exacerbated by flaws in diet and nutrition, understanding the structuring of food knowledge and how that knowledge shapes behavior is necessary. This is especially true for children whose early eating decisions can create to a lifetime of dietary consequences.

This research project was designed to search for and understand a childhood model of food and eating in a southern town where similar research had already been conducted for adults in the same community. The results of the consensus and PROFIT analyses presented here provide a good description of how the children in this community are thinking about the foods they eat and how they are applying that knowledge, particularly in the dimension of health, to the foods they choose to eat. Consensus analysis revealed that the children shared an understanding of health—although this understanding differed significantly by ethnicity. The PROFIT analysis determined that the children were using the dimension of health to sort the various foods in the pilesort activity. Children share an understanding of what “healthy” is with one another as well as with their parents. These children—some as young as 7 years old—have already internalized an adult model of food that is based largely on an understanding of health. It is important to learn how this knowledge actually affects the food choices children actually make. Such a question can only be answered with more research in this area.
Though this project offers an insightful glimpse into the childhood construction of food knowledge, there are several limitations. Cognitive anthropologists have long recognized the importance of emic classifications in understanding the structuring of local domains. The list of foods used in this project were those generated by adults in the community and may have limited meaning for the children themselves. Also, although there was a fair representation of white and black children within this study, other ethnic minorities, including Hispanics, are not represented at all. Future research could benefit from including other groups like these. Finally, socioeconomic status (SES) was originally measured during data collection (in terms of parents’ occupational status), but it was discarded because the children as a group tended to have a poor understanding of the jobs their parents did. A better measure of SES could offer additional information on this subject.

Though necessarily limited in scope, the research presented her paints a fascinating picture of the childhood model of food and eating in a southern community. Additional research is necessary to illuminate further insight into this model and to expand the working knowledge of childhood nutrition.

Note:
1. The list of foods used in the health rankings is identical except that cereal was omitted. This occurred accidentally and was not discovered until the interview process was complete.

Alabama Department of Education. 2006. Public data reports: attendance by ethnicity and gender. (February 2008)  


Center for Disease Control. 2007a. Division of Nutrition, Physical Activity, and Obesity: Formula for Body Mass Index (May 22, 2007)  


