

Impact of the Environment on Food Choices and Eating Habits of School-Age Children: A USDA-Sponsored Research Agenda Conference

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ABSTRACT

While it is generally agreed that school-age children's dietary habits are influenced by personal and environmental factors, literature and research on interventions aimed at reinforcing healthy eating habits in the school environment are lacking. To address this gap, the U.S. Department of Agriculture (USDA) sponsored a conference to prioritize future research on this issue.

The goal of the conference was to: (1) identify gaps in the existing research related to the environmental impact on food choices and eating patterns of school-age children, (2) develop research priorities regarding the impact of school environments on students' food choices and eating patterns, and (3) obtain the support of participants in constructing a research agenda around the conference topic.

Researchers, practitioners, and government officials representing diverse communities throughout the United States named and focused on six key issues: important research topics on eating choices and patterns in school children, limiting factors of research in this area, outcome measures for a research agenda, influential individuals who have the potential to impact school factors, factors that influence eating patterns, and significant benefits of the research.

The conference resulted in a model for future research in children's eating habits that incorporated the goals of several agencies and institutions in ways that will further research and education, which are necessary to understand and improve the environmental and behavioral impact of children's food choices.

INTRODUCTION

Healthy eating habits among school-age children play a key role in the mental and physical development of our nation's youth. Healthy eating habits promote growth and reduce many risks associated with both immediate and long-term health problems. The importance of nutrition education for our youth and of developing healthy eating patterns at an early age have been recognized and supported as a nationwide initiative. However, while the importance of education and other initiatives have been recognized, we are still far from a comprehensive understanding of how children develop eating behaviors and what influences children's food choices.

While initiatives are being developed to promote the nutritional habits of school-age children, research continues to look at how those habits and behaviors are developed and what factors influence food choice. Different researchers have identified a number of meta-categories, including the role of sensory attributes (Cardello, 1992), the socio-cultural context (Rozin, 1996),

the physical and social environment (Meiselman, 1996), marketing (Van Trijp & Schifferstein, 1995), and economic influences (Bonke, 1996).

METHODOLOGY

Literature Review and Background

Environmental influences on food choice. Dietary guidance and nutrition promotion are recognized as necessary to change consumer behaviors (Porter, Kris-Etherton, Borra, Christ-Erwin, Novelli, Foreyt, Goldberg, Nabors, Schwartz, Lewis, Layden, & Economos, 1998). Determinants of food choice consist of much more than the instance in which a consumer selects a product or ingests it. It is a complex process that involves many contextual and environmental factors through a range of decisions and evaluations. Marshall (1993) explains that choice is the result of a sequence of stages through which the consumer navigates from "problem recognition through search, alternative evaluation, choice, and finally [to] post-purchase evaluation." It is clear that the sensory acceptability of the item is only a small part of this complex process. Different researchers have noted a number of important factors of influence in the choice process.

One such factor is food acceptance, the interaction of the consumer with the sensory qualities of the item. This includes appearance, texture, and flavor. Researchers speak of the affinity for certain sensory attributes as a "food preference." Preference, Cardello (1992) explains, is subject to a variety of factors outside of the physiological response, including culture, expectations, and previous experience. Furthermore, in evaluating food acceptance one also must consider the individual's attitudes and behaviors that mediate or moderate their preference, as well as situational influences such as physiological state, time of day, and occasion (Rolls, Rowe, & Rolls, 1982).

Another dynamic meta-factor that is especially salient among school-age children is the socio-cultural context of food choice. Rozin (1996) outlines a range of socio-cultural influences, including both indirect effects (influences not contingent upon a social agent) and direct effects (social agents such as peers, parents, or teachers as the source of influence). A large number of indirect social-cultural effects have been identified, including availability, which is a supply-related issue that reflects cultural and economic factors such as price (Ritson & Hutchins, 1995; Rozin, 1996).

Rozin (1996) also illustrated a number of indirect personal effects. These include norms, beliefs, knowledge, and attributes of the consumer. Within this category are some important factors to consider when looking at school-age children's food choice, including body image. Rozin (1996) found that a culture's ideal body shape affects both how much and what is eaten. This focus on body shape has special implications for females. Knowledge and beliefs about food, such as which foods are thought to be "good for you," are other indirect personal effects that influence food choice. Knowledge and beliefs have special implications for those concerned with schoolchildren's food choice as they point explicitly to the importance of nutrition education.

The U.S. Department of Agriculture (USDA) has made the implementation of dietary changes during childhood a priority (USDA, U.S. Department of Health and Human Services, 1995).

Concerns now are focused on the eating patterns of young people and the risk factors for the development of chronic diseases as they age. Research suggests that both adults and children are consuming more than the recommended amounts from energy and fat and not following the recommendations for fruit, 100% juice, and vegetables (Cullen, Baranowski, & Smith, 2001). One study noted that healthful behaviors often shift as a child matures due to increased independence in making food choices, as well as to environments that offer a greater variety of foods (Lytle, Seifert, Greenstein, & McGovern, 2000).

Another socio-cultural factor involves *direct* effects such as social pressure. This includes such influences as role modeling and self-esteem. Research has shown that the food choices of peers and teachers can influence the choices made by children (Birch, 1979). However, a 1996 study showed that the self-esteem of obese students did not differ from that of students of normal weight (Pastore, Fisher, & Friedman, 1996). Furthermore, social agents also have direct and potent effects on the acquisition of the norms, beliefs, knowledge, and attitudes of the individual through social influence and pressure.

An important meta-factor in food choice is the context in which the food is served and consumed. This includes the physical environment, including lighting, decoration, and comfort. While suggestions and guidelines have been presented with regard to the physical environment, little is known about food choice from an empirical standpoint. Some studies on atmosphere have shown that music, climate, and other contextual factors influence choice and consumption (Meiselman, Johnson, Reeve, & Crouch, 2000).

The contextual factors also include the accessibility of food, which specifically relates to vendors, and the display of the food. This factor has direct implications for school foodservice layout. Meiselman (1996) found that requiring students to undergo more effort (by making them go through a separate cafeteria line to get dessert) resulted in a reduced selection rate for those items.

Another important meta-factor recognized by Van Trijp and Schifferstein (1995) includes marketing and consumer behavior. These researchers identified marketing instruments as the "4 Ps" of the marketing objective: product, price, promotion, and place/distribution. Product includes such aspects as quality, packaging, brand images, and loyalty. Price includes not only the costs of the product to the consumer, but also the perceived value of the good. Promotion covers brand recognition, and place/distribution is the specific visibility in the venue and or availability of unseasonable or exotic items. A wide array of tools available to marketers has significant influence on food choice. These include media, such as television, magazines, and the Internet. Children receive more information about food, nutrition, and health from media than from any other source (Porter et al., 1998).

Concerns have been raised about whether advertising may be harmful to children by sending harmful messages about eating behaviors (Stanbrook, 1997). Some educators and policymakers have begun to focus on the potential positive aspects of advertising, such as promoting health education and awareness through "healthier" products.

A number of economic influences on food choice also have been identified. These include considerations of family structure and economy. As more children live in single-parent households and homes with two working parents, the economy of time becomes a major consideration in the types of foods prepared for children. Other concerns in this category include discretionary income and the amount of money available for food purchase.

The Research Conference

The purpose of the conference was to address gaps in current research and literature related to the impact of environment on food choices and eating patterns of school-age children. Two primary goals guided the conference:

1. To develop research priorities around the impact of school foodservice environments on students' food choices and eating patterns.
2. To obtain support of invited participants in building a research agenda around the conference topic.

Participants, including researchers, practitioners, and government representatives, were brought together at The Pennsylvania State University (Penn State) on March 19 and 20, 2000. Invitations to participate were made by the conference committee based on an individual's personal research agenda or on this person's active involvement in the school food environment. Forty-three participants were chosen by Penn State and USDA's undersecretary to attend the conference, with 23 individual contributors accepting.

The conference committee consisted of 14 researchers, 4 facilitators, 3 USDA representatives, and 2 representatives of the National Food Service Management Institute (NFSMI). Committee co-chairs Peter Bordi, PhD and Sara Parks, PhD, RD also developed a research model for conference participants to review and provide feedback. The committee collaborated on the development of the key questions that would drive conference discussions, and created a set of topics that would evolve as a result of the participants' and facilitators' efforts prior to, during, and after the conference.

During the opening session, Dorothy Caldwell, then-special assistant for nutrition and nutrition education, USDA, clarified the purpose and goals for the conference and charged participants with creating a research agenda and model that would inform and guide nutrition research over the next three years. Shirley Watkins, USDA's then-undersecretary, also joined the conference and highlighted the agency's position in the conference's guiding themes and agenda.

Conference format. The format for the conference was unique, as participants worked simultaneously in Penn State's Management Development Technology Center (MDTC) using the GroupSystems® software to collect information from participants regarding the following key issues:

- Important research topics on eating choice and patterns among schoolchildren;
- Limiting factors of research in this area;
- Outcome measures for a research agenda;
- Influential individuals who have the potential to impact school factors;

- Factors that influence eating patterns; and
- Significant benefits of the research.

Groupsystems software is considered a Group Support System (GSS), which is an interactive computer-based environment that supports the involvement and simultaneous participation toward completion of joint tasks. Groupsystems is a collaborative software tool utilized on a Local Area Network (LAN) that allows for simultaneous input of ideas or issues by all participants in a shared work environment using a laptop computer. GSS frequently is used in the MDTC to enhance strategic planning, new product development, and training needs assessment. Any mechanical limitations have been addressed through time and development; however, personal limitations such as typing speed, conference time, and participants' personality can hinder the full effective use of the Groupsystems program.

Use of Groupsystems for this project provided each participant equal opportunity to input ideas or issues in an environment that allowed for anonymous discussions and evaluation based on merit, not source. The participants developed raw, brainstormed lists of responses to the conference's guiding questions and, through facilitated discussions, identified themes in the data and grouped the data accordingly. The participants invested time in online and offline discussions, delving deeper into the six key issues guiding the conference. Research topics were identified from the data and prioritized. The committee analyzed responses and presented findings in an executive summary and set of recommendations. Results are outlined in the following section.

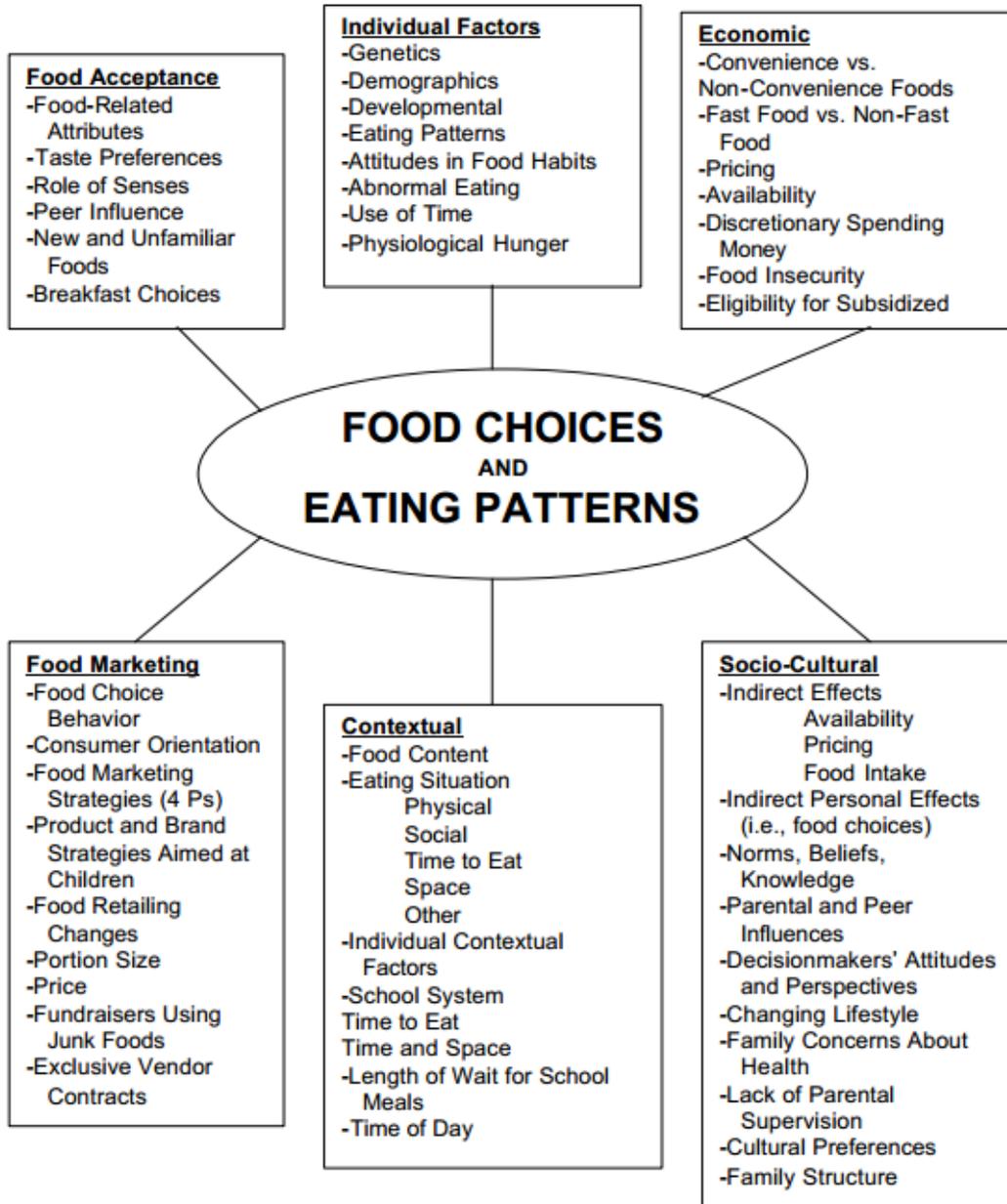
RESULTS AND DISCUSSION

Recommendations

The following recommendations were developed to serve as a foundation for future research and investigation:

1. The revised research model (**Figure 1**) should serve as a basis for encouraging multi-disciplinary research focusing on the environmental impact on school-age children's food choices and eating patterns. Based on participants' prioritization, the research priorities that need immediate attention are influence of school staff, the physical environment, and children's eating patterns. The top research priority was the impact of the home and mealtime environments.

Figure 1. Selected factors affecting school-age children's food choices and eating patterns



2. Conference results should be broadly disseminated to all major professional organizations and to all of the following key constituent groups: researchers, child nutrition practitioners, policymakers, superintendents, principals, teachers, and parents, to name a few.
3. USDA may:
 - Facilitate the research agenda investigating the priorities listed above;
 - Develop guidelines for model programs;
 - Expand partnering opportunities among research teams;
 - (Plan future conferences and campaigns;
 - Encourage the development of graduate/undergraduate courses to prepare future practitioners and researchers in this area;
 - Consider establishing a special incentive fund for faculty for new research development initiatives to encourage and facilitate their entry into this under-researched arena; and
 - Develop marketing campaigns to create an awareness of the key issues identified during the conference. This campaign can be facilitated through print, radio, television, and Internet media.
4. Higher Education Institutions/Organizations may:
 - Develop partnering opportunities, especially with other higher education institutions, to expand opportunities for students to develop research;
 - Consider the development of a Center for Excellence to Study the Factors Impacting Healthy Eating Environments for School-Age Children;
 - Strengthen their relationships with USDA, the American School Food Service Association, and NFSMI to provide leadership in implementing this research agenda.
 - Host an annual national forum to facilitate and support the exchange of ideas;
 - Facilitate these activities through print, radio, television, and Internet media; and
 - Offer internships and practica that provide practical opportunities for undergraduate and graduate students in the area of environmental impacts on food choices and eating habits of school-age children in concert with the students' academic preparation.
5. Researchers could pursue funds from private foundations that will be used for new research initiatives in this area.
6. There should be increased publishing of current research in existing journals.

CONCLUSIONS AND APPLICATIONS

It is clear that changes in eating environments can have profound effects on children's behaviors. These findings can be useful for those individuals involved in changing food choices in a more healthful direction. In the early 1990s, healthful eating was directed at altering food products and altering children's attitudes and behavior. Altering the school environment by manipulating physical and social dimensions is a very inexpensive and simple alternative that needs to be better understood. Results of this conference can provide meaningful direction to practitioners actively involved with feeding our nation's children.

Further, those actively engaged with public policy issues now have a standard upon which to base their platforms. More work is needed to support specific guidelines and policies.

This conference was the initial step in the formulation of a framework to guide the research in this area. Additional research focused on specific issues will be the logical next step. However, the interest and enthusiasm brought to the conference by participants indicated the existence of a core group of researchers and practitioners who can champion the movement.

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