HOW ADULTS CONSTRUCT FOOD CHOICE:

CATEGORIES, CONTEXTS, AND SCRIPTS

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Christine Elizabeth Blake

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Christine Elizabeth Blake, Ph. D.

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People are more likely to accept, integrate, and act on nutrition information that corresponds with their food cognitions. The purpose of this project was to explore and describe how adults construct food choices using schema theory as a way to understand food cognitions. Forty-two purposively recruited, employed US adults completed repeated card-sort tasks and in-depth, qualitative interviews related to different eating contexts. They sorted 59 food cards across multiple contexts. These data were analyzed for the types of categories that participants used to organize the cards using grounded theory approaches. Personal-experience-based ways of classifying were specific to the individual. Context-based ways of classifying were related to different characteristics of eating episodes.   Food-based ways of classifying were related to properties of food. Cluster analysis was used to identify clusters of participants according to salience of their ways of classifying the food cards. Seven clusters were identified. To gain understanding of how participants constructed food choice in a specific eating episode, the researcher analyzed passages from the interview transcripts related to the evening meal. Analysis identified participants' scripts for this meal in terms of interconnected dominant values, general expectations, and plans that included strategies and procedures. Scripts varied in scope and flexibility. The following eight kinds of scripts were identified and labeled using

participants words: "providing dinner for my family," "head of the table cooks," "head of the table does not cook," "trying unsuccessfully to have a family meal," "share the work," "anything goes," and "live alone entertaining." The application of schema theory provided important insights into the mental processes involved in food choice. Individuals' unique food schemas consist of rich and complex categories that are differentially accessed depending on the food context. Food choice scripts demonstrate how individuals' mental processes are linked to behavior. These findings provide insights useful to nutrition professionals interested in promoting adoption of healthy eating habits.

BIOGRAPHICAL SKETCH

Christine E. Blake received here bachelor's degree in nutrition from State University of New York at Plattsburgh in 1995. She then went on to complete a dietetic internship at Cornell University in Ithaca, New York and pass her exam to obtain the Registered Dietitian credential in 1997. In 2000 she completed her master's degree in community nutrition at Cornell University. While completing her degree she worked as a nutritionist for the Tompkins County Women, Infants, and Children's (WIC) nutrition program. She then went on to work as a clinical dietitian at Cortland Memorial Hospital. Following this she worked as a nutrition consultant for the Cortland County Office for the Aging Meals on Wheels program. Upon returning to Cornell University to complete her PhD in nutrition, she served as a lecturer for a clinical dietetics undergraduate class for two semesters.

To Patrick who supported me every step of the way

and Thomas and Samuel who came into being during this process.

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER 1

INTRODUCTION

Nutrition problems in the United States can be characterized in many different ways from deficiencies to excesses. Regardless of whether the problem is related to too much or too little of a food or nutrient, many of these problems could be treated or prevented with changes in food-choice behavior. For example, mothers whose children are enrolled in the Women, Infants, and Children's (WIC) program are often counseled about different ways to increase their own and their children's intake of certain vitamins and minerals (Besharov and Germanis, 2000). People suffering from obesity and related complications are bombarded with advice that includes recommendations to limit foods high in fat, simple sugars, and overall calories (Contaldo and Pasanisi, 2005; Nestle, 2003). Most people, regardless of age, gender, or health status, are advised to increase consumption of fruits and vegetables for optimal health (Stables and Heimendinger, 2001; Stables et al., 2002).

These dietary recommendations seem relatively straightforward, yet many people have difficulty incorporating these behaviors into their day-to-day eating. Research on dietary change among cardiac patients has demonstrated that even people with the best intentions have trouble implementing recommended dietary practices because of the situations that they eat in (Falk et al., 2000a; Janas et al., 1996). Researchers have suggested that in order to design effective behavior change programs, a better understanding of how people think about foods and approach their particular eating situations is needed (Axelson and Brinberg, 1992; Baranowski et al., 1999; Blake and Bisogni, 2003; Campbell et al., 1994; Connors et al., 2001; Furst et al., 2000; Olson, 1981; Shepherd and Sims, 1990; Worsley, 2002).

People are more likely to accept, integrate, and act on nutrition information that corresponds with their existing food cognitions (Axelson and Brinberg, 1992; Janas et al., 1993; Miller et al., 2003; Shepherd and Sims, 1990). One perspective on food choice proposes that people construct their understanding of food and eating based on life-course experiences and various contextual influences (Furst et al., 1996). Prior investigations of food choice using this perspective have attempted to explain how people conceptualize foods through an exploration of personal food systems (Connors et al., 2001; Smart and Bisogni, 2001). The personal food system involves the mental processes people use to construct the ways they make food choices including negotiation among food-choice values, balancing priorities across personally meaningful time frames, and formation of strategies to construct options, trade-offs, rules, and routines for food choice (Connors et al., 2001; Falk et al., 2001; Furst et al., 2000; Smart and Bisogni, 2001). These studies demonstrate the complexity of the mental processes that guide food-choice behaviors and stress "further research is needed to explain the intricacies of the processes" (Falk et al., 2001).

Schema theory provides a useful framework for conceptualizing cognitions related to food. Schema theory has roots in cognitive anthropology, cognitive psychology, linguistics, and artificial intelligence and has been used to explain how people store, retrieve, and use information (Abelson, 1981; Cicchetti and Toth, 1995; D'Andrade, 1995; Feldman, 1998; Fiske and Taylor, 1991; Markus, 1977; Rumelhart, 1984; Schank and Abelson, 1977; Spradley and McCurdy, 1972). Schemas are generalized collections of knowledge constructed from past experience that contain organized related categories that guide behavior in familiar situations (Axelson and Brinberg, 1992; Blake and Bisogni, 2003; Cooper, 1997; Olson, 1981). Schemas develop through direct (e.g., eating, preparing) or indirect (e.g., conversation, education) experiences and are strengthened and modified by new experiences

(Axelson and Brinberg, 1992; Nishida, 1999; Rosch and Lloyd, 1978). Scripts draw on numerous schemas and contain detailed sequential information about key events that occur in well-known situations (Abelson, 1981; Baldwin, 1992; Feldman, 1998; Holmberg and MacKenzie, 2002) . Scripts allow a person to do less cognitive processing, thereby simplifying interpretation and decision making (Schank and Abelson, 1977).

Research on food schemas and scripts can help understand the individual differences that occur in food choice within populations (Axelson and Brinberg, 1992; Olson, 1981). The study of schemas can involve exploration of schema structures or processes (Nishida, 1999). Schemas are made up of categories of similar information (Nishida, 1999). Exploration of the categories an individual uses to classify food provides insight into food schema structure (Ross and Murphy, 1999). Scripts can be examined by exploring how people draw on a variety of different kinds of information, including food categories, to guide behavior in familiar contexts (Baldwin, 1992).

A serious challenge for researchers is that schemas and scripts are often not readily accessible to the participant being interviewed. Techniques that allow the individual to express internal cognitions are necessary. There are a wide variety of tools or methods that have been employed in the study of cognitions related to food and eating, including in-depth, open-ended interviewing (Blake and Bisogni, 2003; Connors et al., 2001; Falk et al., 2000a;b; Furst et al., 2000; Gittelsohn et al., 2000), and card sorting (Gittelsohn et al., 1996; Weller and Romney, 1988).

In-depth, open-ended interviewing is a method used by qualitative researchers from many different disciplines from a variety of different research traditions (Creswell, 1998; Denzin and Lincoln, 2000; Schensul et al., 1999a). In-depth, open-ended interviewing involves posing a series of open-ended questions related to the

domain of interest using an interview guide with probes to ensure that all topic areas are covered. The open-ended nature of the interview guide allows the interviewer to explore new themes as they emerge during the interview (Schensul et al., 1999b).

Card sorting is a method that has long been used, especially by psychologists and anthropologists, to examine cognitive structures and processes (Alvarado, 1998; Christensen and Olson, 2002; D'Andrade, 1995; Gopnik and Nazzi, 2003; Harman, 2001; Holmberg and MacKenzie, 2002; Lecacheur et al., 1999; Mohlman et al., 2004; Pelto and Pelto, 1975; Spradley, 1979; Waxman et al., 1989; Weller and Romney, 1988; Zaltman, 1997). The card-sort method assumes that the ways people sort cards into categories, the items included in the categories, and the way categories relate to one another represent their underlying cognitive structures and processes (D'Andrade, 1995; Spradley, 1979; Weller and Romney, 1988). Card sorts have been used to study schema (Evans and Arnoult, 1967; Lecacheur et al., 1999; Mohlman et al., 2004) and food classification (Gittelsohn et al., 1996; Matheson et al., 2002; Perchonock and Werner, 1968; Ross and Murphy, 1999). However, none has explored food schema categories across different food and eating contexts.

The data analyzed in the following chapters were collected as part of a larger project on the situational eating of adults. This larger project focused on the meanings and expectations of food eaten at-home and away-from-home that were held by adults working in non-managerial, non-professional positions. Study participants provided several types of data about their food choices that were collected over nine different contacts (Figure 1.1). Three interviewers conducted interviews and each participant worked with the same interviewer for all nine contacts.

Day 1	First in-person interview with situational 24-hour recall
↓	↓
Day 2	Phone situational 24-hour recall
↓	⌶
Day 3	Phone situational 24-hour recall
↓	⌶
Day 4	Phone situational 24-hour recall
↓	⌶
Day 5	Phone situational24-hour recall
↓	⌶
Day 6	Phone situational 24-hour recall
↓	⌶
Day 7	Phone situational 24-hour recall
↓	↓
~ 2 week later	Qualitative in-depth interview with food card sorts
↓	↓
~ 2 months later	Final in-person interview

Figure 1.1 Sequence of data collection activities for the situational eating project

Forty-two men and women residing in Central New York were recruited through community agencies, employers, advertisements in local newspapers, and personal contacts. Participants were purposively sampled to vary in gender, age, occupation, and living situation. All potential study participants were screened to be sure that they met the following criteria: employed at least part-time in a non-managerial, non-professional position; between the ages of 20 and 62 years; not a full-time student; and not pregnant or lactating. The methods for recruiting and collecting data from participants were approved by the Cornell University Committee on Human Subjects.

The first in-person contact was conducted at a time and place convenient for the participant, typically at the participant's home. At the first in-person contact participants provided demographic information (Appendix A), completed a Willett food frequency questionnaire (Willlet et al., 1985), and answered open ended questions about their food preferences (Appendix B). They also completed a qualitative 24-hr situational recall of food-choice episodes (Appendix B). For the next six days, interviewers phoned participants and asked them to complete six additional 24-hr situational recalls of food choice episodes to yield a total of seven consecutive days of situational recalls (Appendix C). The eighth contact was a two hour in-person interview during which the participant sorted sets of food cards (Appendix D) for different contexts and answered questions about different food and eating contexts (Appendix E). In the ninth contact conducted in-person, the interviewers asked participants open-ended questions about their personal food systems and meanings for healthy eating (Appendix F). At this time participants also provided information about their income, use of food assistance programs, time/distance traveled to work, time/distance travel to acquire food, smoking status, height, weight, and form of transportation to work and for food shopping (Appendix G).

The objective of this project was to explore and describe how adults construct food choice using schema theory. The data analyzed for this project were primarily collected during the eighth interview that was conducted in-person. This contact involved in-depth interviewing and card sort activities. The combined use of in-depth, open-ended interviewing and card sorting allows for a comprehensive investigation of food schemas. The three papers in the following chapters present the results of this investigation. The first paper describes the categories participants used to conceptualize foods in different food and eating contexts. This study sought to advance understanding of food-schema structures. The second paper demonstrates the

inter-subject variation in the use of food categories by examining individual variation in food category use. The objective of this study was to examine individual differences in food-schema structures. The third paper depicts how people construct food choice using scripts for one important eating episode, the evening meal. The results provide insight into processes involved in food choice by depicting how an individual's mental representations of an eating episode are translated into action.

The final chapter presents a summary of the results and an interpretation of findings. That chapter integrates the results from the three papers and discusses overall findings of how adults construct food choice in relation to past findings on this important topic. The strengths and weaknesses of the current investigations are reviewed, important theoretical, methodological, and practice implications are considered, and future directions are suggested.

CHAPTER 2

EXAMINING FOOD SCHEMAS IN CONTEXT: FOOD CATEGORY MEANINGS,

TYPES, CLASSIFICATION BASIS, AND ORIENTATION

2.1 Introduction

Foods mean different things to different people. Foods may also mean different things to the same person in different contexts. The ways people label and organize foods is an important consideration in food choice (Baranowski et al., 1999; Falk et al., 1996; Falk et al., 2001; Furst et al., 2000; Shepherd and Sparks, 1994). Scientists and clinicians often focus on chemical and health-related properties when they classify foods, while the public uses many other considerations (Axelson and Brinberg, 1992; Furst et al., 2000; Murcott, 1982; Schutz et al., 1975; Sobal and Cassidy, 1987;1991;1993; Worsley, 1980). The most effective nutrition education messages are assumed to be those that are compatible with the cognitions of the target audience, including how people classify foods (Baranowski et al., 1999; Shepherd and Sims, 1990; Worsley, 2002).

The categories that people use to classify foods have been examined from different perspectives (Chapman and MacLean, 1993; Costa et al., 2001; Douglas, 1972; Falk et al., 2001; Furst et al., 2000; Lennernas and Andersson, 1999; Matheson et al., 2002; Murcott, 1982; Roininen et al., 2000; Ross and Murphy, 1999; Schutz et al., 1975; Sobal and Cassidy, 1987;1991;1993). Food marketing professionals have examined people's food classification systems and categories to develop meaningful messages for use in advertising and promotion (Costa et al., 2001; Gains and Thomson, 1990; Gutman, 1982; Macfie and Thomson, 1994; McEwan and Thomson, 1989; Schutz, 1988; Thomson and McEwan, 1988). Psychologists have studied food classification to better understand how people store, retrieve, and use information in

memory (Ross and Murphy, 1999). Nutrition professionals have studied food classification to examine nutrition knowledge (Worsley, 2002) and to inform nutrition education efforts (Douglas, 1972; Murcott, 1982; Shepherd and Sims, 1990). Many of these studies have used predefined categories to guide participants' classification of foods (Axelson and Brinberg, 1989; Costa et al., 2001). Other studies have allowed personally relevant food categories to emerge through interviews and observations (Falk et al., 2001; Furst et al., 2000; Ross and Murphy, 1999). Allowing study participants to identify their own categories provides a clearer understanding of the categories people use when making food choice decisions in real life eating contexts.

Researchers have assumed that food category generation and use is often determined by the eating context (Murcott, 1982). Furst et. al., (2001) describe how food classification is influenced by both social and physical contexts where single foods were classified in different ways depending on the context. Although context has been identified as an important influence on food classification, the way people classify foods into categories in specific food and eating contexts has not been explicitly examined (Achterberg, 1988; Meiselman and MacFie, 1996).

Schema theory provides a useful framework for conceptualizing the way people classify foods. Used to explain how people store, retrieve, and use information, schema theory has roots in cognitive anthropology, cognitive psychology, linguistics, and artificial intelligence (Abelson, 1981; Cicchetti and Toth, 1995; D'Andrade, 1995; Feldman, 1998; Fiske and Taylor, 1991; Markus, 1977; Rumelhart, 1984; Schank and Abelson, 1977; Spradley, 1972). Food schemas are generalized collections of knowledge constructed from past experience that contain organized related categories that guide food-choice behavior in familiar situations (Axelson and Brinberg, 1992; Blake and Bisogni, 2003; Cooper, 1997; Olson, 1981). Food schemas develop through direct (e.g., eating, preparing) or indirect (e.g., conversation,

education) experiences with foods (Nishida, 1999). Schemas are stored in long-term memory, are accessed to guide behavior in subsequent experiences, and are strengthened and modified by new experiences (Nishida, 1999). These processes result in some schema categories being unique, based on an individual's own personal experiences, while other categories may be culturally shared. Researchers have identified sets of socially derived food categories that are shared by individuals in a culture or social group (Backstrom et al., 2003; Moscovici, 2001), but the importance of understanding individuals' unique categories has also been emphasized (Furst et al., 2000; Olson, 1981).

Schema theory has been applied to the domain of food in studies of food restraint (Neimeyer and Nermine, 1985), eating disorders (Cooper, 1997; Fairburn et al., 1999; Meyer and Waller, 2000; Schotte et al., 1990; Spranger et al., 2001; Waller et al., 2000; Young, 1999), conceptualization of body weight (Vitousek and Hollon, 1990), food novelty (Loewen and Pliner, 2000), beliefs in health anxiety (Wells and Hackman, 1993), and consumer food-choice behavior (Blake and Bisogni, 2003; Olson, 1981). A study of low-income rural women found that women had different schemas for personal and provider food-choice behaviors (Blake and Bisogni, 2003). These results highlighted the need to further examine the nature and operation of food schemas, including food schema categories, across different contexts in different populations (Axelson and Brinberg, 1992; Cooper, 1997; Fischler, 1988).

A complication for researchers is that food schemas are not readily accessible to the participant being interviewed. Techniques that allow the individual to express internal cognitions are necessary. Card sorting is a method that has long been used, especially by psychologists and anthropologists, to examine cognitive structures and processes (Christensen and Olson, 2002; Harman, 2001; Holmberg and MacKenzie, 2002; Lecacheur et al., 1999; Mohlman et al., 2004; Pelto and Pelto, 1970; Spradley,

1979; Waxman et al., 1989; Weller and Romney, 1988; Zaltman, 1997). The card sort method assumes that the ways people sort cards into categories represent their underlying mental processes (D'Andrade, 1995; Spradley, 1979; Weller and Romney, 1988). Card sorts have been used to study schema (Evans and Arnoult, 1967; Lecacheur et al., 1999; Mohlman et al., 2004) and food classification (Gittelsohn et al., 1996; Matheson et al., 2002; Perchonock and Werner, 1968; Ross and Murphy, 1999).

This study sought to advance understanding of how people classify foods across different food and eating contexts using schema theory. The focus of this study was to develop a general understanding of schemas by studying the different categories people used to classify foods and how the use of categories varied across different eating contexts. The unique feature of this study was the exploration of food classification in multiple contexts by having participants sort food cards multiple times in contexts representative of their everyday eating.

2.2 Methods

This paper reports on results from a qualitative in-depth interview designed to explore food schema structures and processes (Appendix E). This interview was conducted as part of a larger project exploring situational eating. This investigation used a combination of card sort activities and qualitative interviewing to examine food schema structures and processes. Card sorts were repeated across different food and eating contexts to explore the card sort pile labels people used as the context changed. Qualitative interviewing techniques allowed the researcher to probe for the deeper meanings behind the card sort pile labels. The combination of card sort data and qualitative interview data required the use of analysis methods that were flexible

enough to accommodate emergent themes while still providing adequate structure to depict category organization.

Participants were informed that the project was a study of their eating in different situations. Three trained interviewers conducted all interviews at times and in locations chosen by participants such as their homes, workplaces, or public places, including libraries, restaurants, and parks. Each participant worked with the same interviewer for all parts of the study. Interviews were audio-tape recorded and transcribed verbatim.

2.2.1 Participants

Forty-two adults living in Upstate New York were purposively sampled through community agencies, employers, advertisements in local newspapers, and personal contacts. Recruitment efforts were focused on finding participants who worked full-time or part-time in different non-managerial, non-professional positions. This provided a sample of participants similar in occupational status but with potentially different eating environments and schedules. Participants were also selected to vary in age, gender, and living situation (Table 2.1). Participants were between the ages of 20-61 years, were not full-time students, and were not pregnant or lactating. This study was part of a larger project investigating situational eating of adults. All recruitment and data collection activities were approved by the Institutional Review Board (IRB) University Committee on Human Subjects (UCHS).

Table 2.1 Characteristics of study participants (n=42; 21 men, 21 women)

Characteristic		Participants
Age	Mean (sd)	39 (11) yrs
	Range	20-61 yrs
Education	12th grade or less, no diploma	3 (7%)
	High school graduate or GED [a]	9 (21%)
	Some college, no degree	18 (42%)
	Associates degree or more	12 (29%)
Ethnicity	White	33 (79%)
	Black	2 (5%)
	Hispanic/Latino	4 (10%)
	Mixed ethnicity (including Native American)	3 (7%)
Living arrangement	Alone	11 (26%)
	With spouse/partner	27 (64%)
	With relatives or unrelated adults	4 (10%)
Children in the household	None	21 (50%)
	One or more	21 (50%)
Type of employment	Buildings and grounds	7 (17%)
	Office and administrative	7 (17%)
	Sales	6 (14%)
	Personal care and service	4 (10%)
	Transportation and moving	4 (10%)
	Community and social services	3 (7%)
	Installation and repair	3 (7%)
	Foodservice	2 (5%)
	Production	2 (5%)
	Education, training, library	2 (5%)
	Health care practice and technical	1 (2%)
	Protective services	1 (2%)

[a] GED = General Equivalency Diploma: A document in the US certifying someone passed a

government exam equivalent to graduating from secondary school (12th grade/year education).

2.2.2 Cards for Sorting

The focus of this investigation was the food schema categories people used

across different eating contexts. Therefore, a set of 59 food cards was developed to

elicit as many food categories as possible from participants (Appendix D) (Murphy

and Lassaline, 1997). Cards were developed through pilot testing, member checks (Lincoln and Guba, 1985), and peer review (Denzin and Lincoln, 2000). Five pilot study participants each provided 7 day, qualitative 24-hour situational recalls of all foods and drinks consumed. All 149 foods and drinks mentioned by the pilot sample were listed and ranked in order of frequency. This list was condensed by the researchers into a final set of 59 food cards that best represented the most commonly consumed foods and drinks and the researchers' added foods or beverages of interest to nutrition professionals. The initial set of food cards were presented to these same five pilot participants and important additional foods were added based on their feedback.

The final set of 59 food cards included both foods that are familiar (e.g., cheese) and unfamiliar to participants (e.g., tofu) (Maurer, 1996). Food cards were designed to represent various levels of categorization, including subordinate level categories (e.g., french fries), basic level categories (e.g., potato), and superordinate level categories (e.g., vegetable), in order to elicit as many category labels as possible during card sort activities (Murphy and Lassaline, 1997). In addition, during the card-sort interview participants were asked to inform the interviewer if any important foods were missing from the food cards. Each set of cards was arranged alphabetically when presented to participants.

2.2.3 Interview Protocol

This study employed the combined use of repeated card-sorting activities to elicit food categories, and open-ended, in-depth interviewing to define food and eating contexts and determine food category meanings. A semi-structured interview guide and card-sort protocol was developed for the interview (Appendix E). In this interview, participants were asked to sort food cards four separate times for four

different contexts; 1) no context defined; 2) the non-work eating context with family or friends most common for them; 3) the work eating context most common for them; and 4) the eating alone context most common for them.

First, participants sorted the food cards with no context defined (open food card sort). Participants were presented with the set of 59 food cards. They were asked to sort these cards into piles that made sense to them, and were told that there was no limit to the number of piles or the number of cards in a pile. Once they were finished sorting these cards, participants were asked to label each food-card pile using their own words (e.g., "breakfast foods", "foods I like", "never eat," etc.). They were then asked if piles could be sorted into any other piles, and if so to label each of the new piles. The interviewer removed the labeled pile sorts from the table and secured them for later data recording.

Second, starting with the participants' non-work eating context, a series of open-ended questions were asked about the context including description of the setting, people present, and related roles, food identity, feelings, and goals and objectives. The purpose of this questioning was to gain an understanding of the participant's experience of the context and to help the participant place themselves in this context before sorting the next set of food cards. Participants were asked to consider this non-work eating context when presented with a new set of the 59 food cards. They were asked to sort these cards into piles that made sense to them in this eating context. As in the open food card sort, participants were asked to label the card sort piles using their own words, split them into different piles if possible and label the new piles, and report any other possible categories that they thought of using. Cards were again removed from the table and secured for later data recording. This entire process of open-ended questioning and card sorting was repeated for the work context and then again for the alone context.

The category labels for each of the four separate card sorts (open, non-work, work, alone) were recorded on separate data sheets by the interviewer following each interview. Participants took about two hours to complete the entire card sort interview.

2.2.4 Analysis

Data analysis was conducted using grounded theory (Glaser and Strauss, 1967; Strauss and Corbin, 1990) and schema analysis (D'Andrade, 1991). Grounded theory methods are systematic inductive guidelines for analyzing data to build theoretical frameworks that explain the data with the focus of the analysis on the discovery of emergent categories (Denzin and Lincoln, 2000). Schema analysis involves inferring meaning from text with special attention to organization of and linkages between categories (D'Andrade, 1991). Food card sort labels were recorded on a data management sheet following the interview and verified. All labels were transferred to the SPSS-PC software package for data management purposes (SPSS, 2003). A total of 991 labels were used by the 42 participants to identify food card sort piles.

Food category meanings were identified by interpreting the meanings of the food card sort labels (D'Andrade, 1995; Spradley, 1979) using the full interview transcripts to gain an understanding of the labels in the context of the overall interview (Strauss and Corbin, 1990). NVivo qualitative analysis software was used to organize and manage interview transcripts (QSR, 2002). The researchers used qualitative coding techniques (Denzin and Lincoln, 2000) to group food card sort labels with similar meanings (e.g., a breakfast thing, foods I eat at breakfast) into food category meanings. A total of 124 food category meanings emerged from the label data. Many of the food card sort labels were included in more than one food category meaning. For example, "healthy snack food" would be included in the "Healthy" meaning and

the "Snack" meaning (Figure 2.1). Therefore, the food category meanings were not mutually exclusive but overlapped with other related category meanings suggesting a non-hierarchical structure (Ross and Murphy, 1999).

Food-category types were identified by the researchers' grouping of similar food category meanings according to the ways of sorting (e.g., time, location, physical characteristics etc.). Twelve food-category types emerged. Through further examination of the 12 food-category types, researchers identified three different groups on the basis for classifying. The three food-category bases were food-based, context-based, and personal-experience-based. The researchers then examined food category meanings, types, and bases for their use across eating contexts. In summary, the analysis grouped 991 participant food card sort labels into 124 food category meanings (representing similar label meanings), 12 food-category types (representing similar ways of classifying), and 3 food category bases (representing foundations for classifying) as shown in Figure 2.1.

The quality of the data and analysis was enhanced through prolonged engagement with participants, member checking, team analysis, and peer debriefing (Denzin and Lincoln, 2000). Multiple contacts between interviewers and participants allowed for establishment of rapport and member checking of preliminary results. Card sort data were verified to ensure accuracy at each step in the transformation. Data analysis was conducted by a team of researchers that included the interviewers and preliminary findings were presented to others outside of this team for review and comment.
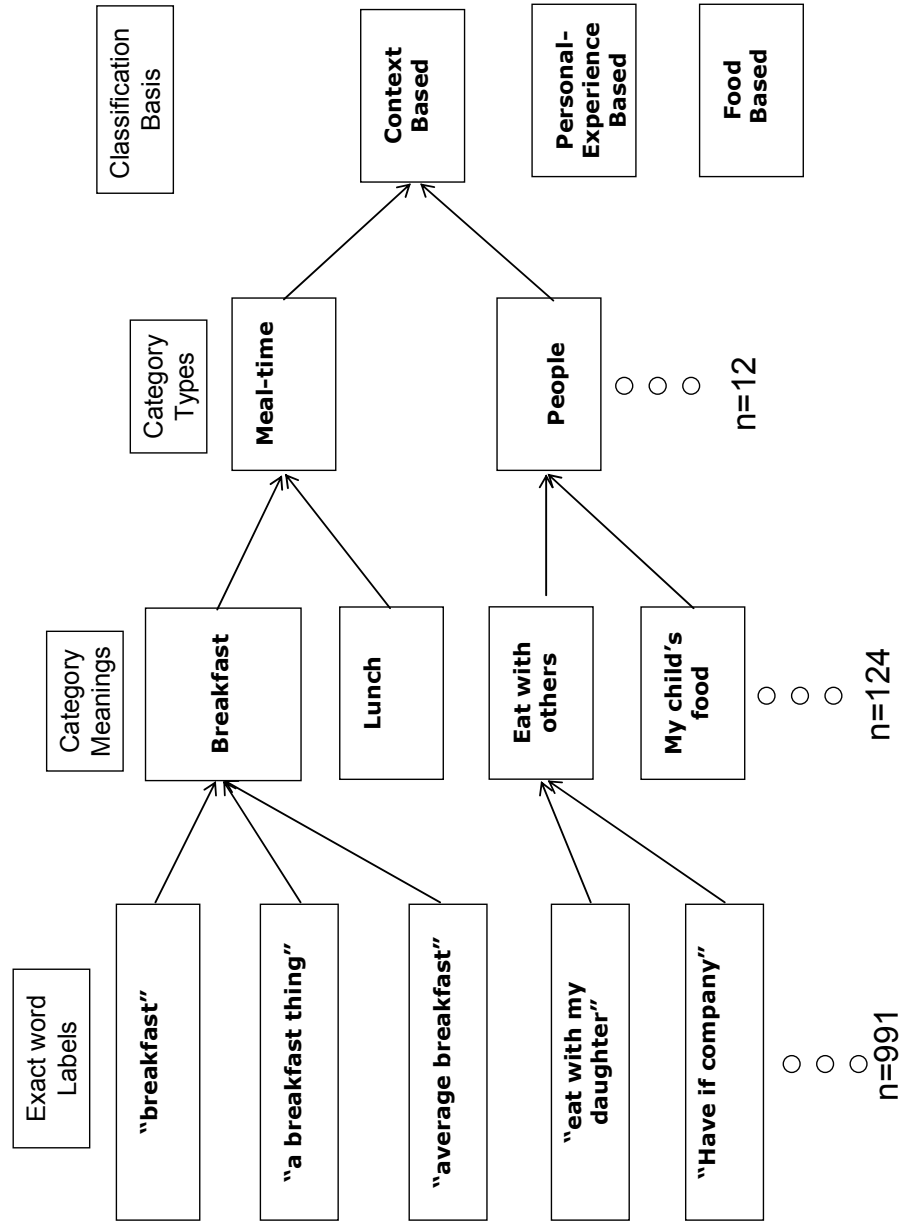
Figure 2.1 Analysis process example for the 991 exact word labels used by participants in all four food card sort contexts.

2.3 Results

The 12 category types representing the ways that participants sorted the food cards and the ways these category types are used across contexts are described in the sections that follow. The category types are presented in groups according to their classification bases – personal experience, context, or the food itself. Tables 2.2, 2.3, and 2.4 summarize the meanings within each category type and give examples of the labels that participants used for each meaning. Participants used combinations of 'personal-experience-based,' 'context-based,' or 'food-based' category types across the four separate card sort activities. The use of category types across contexts is summarized in Table 2.5.

2.3.1 Personal-Experience-Based Food-category types

The three personal-experience-based food-category types all were ways of sorting the food cards related to the individual participant (Table 2.2). The labels and meanings included in this food-category type referred to participants' own day-to-day experiences with food, such as routines, preferences, physical sensations, and emotional satisfaction related to foods (Table 2.2).

Routine: The food-category type 'Routine' included food category meanings related to the regularity of eating specific foods. The 'Staple foods' meaning was used to describe indispensable foods that were eaten on a regular basis. Some category meanings such as, 'Eat most often' and 'Never eat,' were used as a continuum. Other category meanings, such as 'Weekly' and 'Daily/ Not daily,' were based on frequency in specific calendar time. The category meanings 'Change of pace' and 'Used to eat' referred to changes in routine. Some of these participants split food cards into two piles, 'Foods I eat' and 'Foods I don't eat,' and then elaborated this simple classification system using other food-category types. Others used the category

meanings 'Foods I eat' and 'Foods I don't eat' in various ways throughout the card sort activities.

Preference: The food-category type 'Preference' included category meanings related to participant's personal food preferences and degree of preference such as, 'Favorite' and 'Hate.' The 'Treat' meaning was used to identify preferred foods that were used in special ways such as a personal reward. Meanings such as 'Don't like but might eat' conveyed degree of preference with the added dimension of likelihood to consume. The 'My food/Not my food' meaning was used to indicate whether the participant thought of these foods as being compatible with their own food identities.

Well-being: The food-category type 'Well-being' included food category meanings related to the emotional and physical consequences of eating certain foods and the personal health importance of foods. The three category meanings, 'Healthy,' 'Unhealthy,' and 'Very unhealthy,' were used as a continuum by many participants to portray the degree of healthiness of the given food items. The 'Should eat/avoid for health reasons' meaning was used to classify foods related to personal health needs of the participants, such as cholesterol or digestive issues. The 'Medicine' meaning was used to classify foods considered to have healing properties. The 'Light foods' and 'Heavy foods' category meanings were used to distinguish between foods that did or did not leave an overfull, heavy feeling. The 'Refreshing and cleansing foods' meaning was used to describe foods that contribute to a revitalized feeling. The 'Mood and cravings' meaning was used to classify foods that were craved in certain emotional states.

Table 2.2 Personal-experience-based food-category types, meanings, and card sort label examples

Types	Meanings (Card sort label example)
Routine	Foods I eat/ Foods I don't Eat (e.g., "foods I eat"/"foods I don't do") Eat most often (e.g., "I'd eat most often") Once in a while (e.g., "once in a while") Hardly ever (e.g., "hardly ever") Never eat (e.g., "never eat") Monthly (e.g., "one time per month") Weekly (e.g., "once a week") Daily/ Not Daily (e.g., "daily" and "not everyday") Staple food (e.g., "staples") Change of pace (e.g., "stuff I would have for a change of pace") Used to eat (e.g., "in my past life at home")
Preference	Favorite (e.g., "favorite") Like (e.g., "I like it") Do not like (e.g., "do not like") Hate (e.g., "I hate") Treat (e.g., "treat") My food/ Not my food (e.g., "personal for me", "they eat, not me") Like but might not eat (e.g., "like it but don't do it") Don't like but might eat (e.g., "don't like but would eat") Don't like and won't eat (e.g., "wouldn't' eat period")
Well-being	Should eat/avoid for health reasons (e.g., "should have everyday", "do not eat for health reasons") Healthy food (e.g., "healthy") Unhealthy food (e.g., "bad for you") Very unhealthy (e.g., "pathological") Medicine (e.g., "medicinal") Diet food (e.g., "allowed on my diet") Energy food (e.g., "I would definitely eat to gain energy") Light food (e.g., "light food") Heavy food (e.g., "heavy food") Refreshing and cleansing food ("foods that are refreshing and cleansing") Mood and cravings (e.g., "mood foods") Hungry (e.g., "might eat if I felt really hungry")

2.3.2 Context-Based Food-category types

Context-based food-category types were ways of sorting the food cards related to specific characteristics of the food and eating situation such as time, location, people, and Convenience (Table 2.3). Six context-based food-category types were identified.

Meal/Time: The food-category type 'Meal/Time' included category meanings related to temporal aspects of eating including specific meals or events and time of day, week, or year. Category meanings such as 'Breakfast/ Not breakfast' were used to classify foods using conventional meal names. The 'Break/ Not break' meaning was used to identify foods eaten or not eaten on work break. The 'Meals' and 'Between meals' category meanings were used to classify foods more broadly than the conventional meal category meanings. 'Meals' referred to any foods eaten at either 'Lunch' or 'Dinner' while 'Between meals' referred to those foods eaten outside of these two specific times. Category meanings such as 'Morning' or 'Evening' were used to classify foods according to the time of day they were eaten. The 'Weekend' and 'Weekday' category meanings were used to classify foods by the day of week and for identifying work schedules, where weekends usually referred to days off and weekday represented work days. The category meanings, 'Party food' and 'Holiday food' were used to classify foods according to specific eating events.

Meal Component: The food-category type 'Meal component' included category meanings that were used to distinguish between parts of a meal or eating episode. Some of these category meanings indicated the order of consumption in a meal such as 'Appetizer' or 'Dessert.' Other category meanings referred to relative parts of a meal such as 'Main dish' or 'Side dish.' The category meanings, 'Condiment,' 'To put on bread,' and 'Extras' were used to identify items used at any

point in a meal, depending on the accompanying food items. The meaning, 'Foods that go together' was used to specify appropriate food combinations.

Convenience: The food-category type 'Convenience' included category meanings related to the ease of eating, obtaining, preparing, or transporting foods. The meaning, 'Quick and easy' was used by participants to identify foods that were very simple to put together and eat. The 'Portable' meaning referred to foods that were easy to transport. The 'Time consuming' meaning was used to identify foods that took a considerable amount of time to eat or prepare. The 'Logistically difficult' meaning was used to identify foods that required particular types of space or equipment to deal with. The "Available/ Not available' category meanings were used to identify foods that participants would eat if available or were unavailable in the settings that participants found themselves. The 'Buy/Do not buy' meaning referred to the participants' willingness or ability to purchase specific food items which affected availability of foods within their homes. The 'Expensive foods' meaning identified foods that are difficult to acquire because of their high cost.

Location: The food-category type 'Location' included food category meanings related to a specific place where the food is eaten. Category meanings such as, 'Eat at home' and 'Car food/ Not car food' referred to places where foods may or may not be eaten. The category meanings, 'Sit down food' and 'On the go food/ Not on the go food' were used by participants to describe other details about where the foods are eaten

Source: The food-category type 'Source' included food category meanings related to specific places where the food is prepared and where the food is from. Category meanings, such as 'Homemade,' 'and 'Already prepared at the store,' were used to identify where foods were prepared. Category meanings, such as 'Food from home' and 'Vending machine food' also provided some information about where

foods were prepared but were used more specifically to identify where foods were obtained or purchased.

Person: The food-category type 'Person' included food category meanings that related to a specific person, people, or group of people and who the food is eaten with. 'Foods for other people' was a particularly rich food category meaning that included foods for specific people other than the participant sorting the cards. The 'Eat with others' and 'Eat alone' category meanings were used to identify who foods were eaten with.

Table 2.3: Context-based food-category types, meanings, and card sort label examples

Types	Meanings (Card sort label example)
Meal/Time	Breakfast/ Not breakfast (e.g., "breakfast", "not breakfast")
	Brunch (e.g., "brunch")
	Lunch/ Not lunch (e.g., "lunch", "not lunch")
	Dinner/ Not dinner (e.g., "dinner", "not dinner")
	Snack/ Not snack (e.g., "snack", "just aren't snack foods")
	Break food/ Not break (e.g., "break food", "never for break")
	Meal (e.g., "more of a meal")
	Between meals (e.g., "goes in between meals")
	Morning food/ Not morning food (e.g., "a morning thing", "not have in the morning")
	Eat at noon (e.g., "eat at noon")
	Not afternoon food (e.g., "things that don't fit [then]")
	Evening food (e.g., "stuff in the evening")
	Anytime food (e.g., "eat anytime")
	Weekend food (e.g., "special week-end food")
	Weekday food (e.g., "during the week")
	Winter food (e.g., "winter food")
	Summer food (e.g., "summer")
	Party food (e.g., "party food")
	Holiday food (e.g., "holiday's etc.")

Table 2.3 (Continued)

Meal component	Appetizer (e.g., "appetizer") Salad (e.g., "salad course") Soup (e.g., "soup") Main dish (e.g., "main dish") Casserole (e.g., "casseroles") Side dish (e.g., "side dish") Condiment (e.g., "condiment") To put on bread (e.g., "things you can put on bread") Dessert (e.g., "dessert") Drink (e.g., "drinks") Foods that go together (e.g., "goes together") Extras (e.g., ("extras")
Convenience	Quick and easy (e.g., "quick and easy just for me") Portable (e.g., "packable") Time consuming (e.g., "require certain time/equipment to deal with") Logistically difficult (e.g., "logistically difficult") Available/ Not available (e.g., "if available", "not available") Buy/ Do not buy (e.g., "I buy", "do not buy") Expensive food (e.g., "expensive food")
Location	Eat at home (e.g., "eat at home") Eat at home or out (e.g., "eat at home or out") Restaurant food/ Not restaurant food (e.g., "restaurant food", "not restaurant food") Work food/ Not work food (e.g., "at work", "not work food") Eat at someone's house (e.g., "might have in [someone's house]") Car food/ Not car food (e.g., "foods I have in the car in the morning", "can't eat in the car") Rood food when traveling (e.g., "road food") Sit down food (e.g., "stuff I would eat sitting at the table") On the go food/ Not on the go food (e.g.,"stuff I would eat on the go", "not on the run snack food")
Source	Homemade (e.g., "make at home") Other people prepare (e.g., "prepared for me") Already prepared at the store (e.g., "would stop by store and get") Make or buy (e.g., "make or buy") Food from home (e.g., "made at home and brought in") Eating out (e.g., "food if we go out") Take out food (e.g., "take out") Vending machine food (e.g., "get out of the machine")
Person	Foods for other people (e.g., "foods for my child") Eat with others (e.g., "company food") Eat alone (e.g., "just myself")

2.3.3 Food-Based Food-category types

The three food-based food-category types all were related to characteristics intrinsic to the food itself regardless of context or personal experience (Table 2.4). The category labels and meanings included in these types refer to the origin of the food, nutrient makeup, and physical characteristics (Table 2.4).

Food Group: The food-category type 'Food Group' included food category meanings that involved grouping foods based on origin of food. Participants cited the government food recommendations (e.g., basic four food groups or food guide pyramid) and grocery store organization as guides for this categorization. Some of these food category meanings were used to group foods into broad categories, such as 'Grains,' 'Fruits and vegetables,' 'Meat,' and 'Dairy.' Other food category meanings included in this type are more specific, such as 'Candy,' 'Poultry,' and 'Soda.' The 'Mixed composition' meaning was used to classify foods that contained numerous different food groups, such as pizza.

Nutrient Composition: The food-category type 'Nutrient composition' included food category meanings related to specific nutrient make-up of the foods, such as macronutrients (e.g., 'Fats), available energy (e.g., 'Calorie/ No Calorie'), and caffeine (e.g., 'Caffeinated'). The 'Calorie/ No calorie' category meanings were used more often by participants who mentioned dieting as important influences.

Physical characteristics: The food-category type 'Physical characteristics' included food category meanings that are based on physical properties and state of the foods. 'Salty food' and 'Savory food' are examples of category meanings that were used to classify foods based on flavor. Other category meanings, such as 'Crunchy food', were used to classify foods according to mouth feel and texture. The 'Ingredient' and 'Premade food' category meanings were used to classify foods according to their degree of preparation. The 'Processed foods' meaning had negative

connotations and was used to classify foods that were made using extensive physical or chemical processing methods. The 'Hot food/ Cold food' category meanings were used to classify foods according to the temperatures at which they were usually eaten.

Table 2.4 Food-based food-category types, meanings, and card sort label examples

Types	Meanings (Card sort label example)
Food Group	Grains (e.g., "breads and grains") Fruits and vegetables (e.g., "fruits and vegetables") Dairy (e.g., "dairy") Meat (e.g "meats") Fish/seafood (e.g., "seafood or fish") Poultry (e.g., "poultry") Beans and nuts (e.g., "beans and nuts") Vegetarian (e.g., "vegetarian") Butter/margarine (e.g., "butter/margarine") Alcohol (e.g., "alcohol") Water (e.g., "water") Soda (e.g., "soda") Baked goods (e.g., "baked goods") Candy (e.g., "candy") Mixed composition (e.g., "mixed") Extras "(e.g., "extras")
Nutrient Composition	Carbohydrates (e.g., "starches/ carbohydrates") Proteins (e.g., "proteins") Fats (e.g., "fats") Calorie/ No calorie (e.g., "calorie", "no calorie") Caffeinated (e.g., "caffeinated")
Physical Characteristics	Sweet food/ Not sweet food (e.g., "sweet food", "not sweet food") Salty food (e.g., "salty") Savory food (e.g., "savory food") Crunch food (e.g.,"crunch") Dry food (e.g., "dry snack food") Cooked food/ Uncooked food (e.g., "cooked", "not cooked") Ingredient (e.g., "cooking ingredients") Leftovers (e.g., "leftover from the night before") Premade food (e.g., "prepared foods") Processed food (e.g., "too processed") Hot food/ cold food (e.g., "hot" and "cold") Frozen food/ Non-frozen food (e.g., "frozen food", "non frozen food") Juice/ Non-juice (e.g., "juice", "not juice") Finger food (e.g., finger food")

2.3.4 Use of Food-category types across Contexts

The use of food-category types across contexts was examined from four perspectives. First, the number of participants who used each food-category type overall was examined. Second, the food-category types that were used most frequently in each card sorting contexts were identified. Third, how frequently each of the food-category types were used in each context was considered. Fourth, how individuals used the different category types across contexts was examined. The number of participants using each category type in each of the contexts is summarized in Table 2.5.

Table 2.5 Count of participants who used category types at least once in each food card sorting context and overall (n=42).

Food-category types *	Card Sorting Context				Overall
	No-context	Alone	Work	Non-work	
Meal/Time (C)	35	34	33	34	42
Routine (P)	30	33	33	35	40
Preference (P)	25	17	20	22	38
Meal component (C)	30	19	19	30	36
Well-being (P)	21	12	9	13	28
Food group (F)	22	10	9	14	27
Location (C)	11	15	25	8	25
Convenience (C)	11	8	15	10	22
Source (C)	14	4	12	14	22
Physical Characteristics (F)	14	10	7	10	20
Person (C)	5	7	4	10	13
Nutrient composition (F)	10	4	2	4	10
Total participants	42	42	42	42	

*C = context-based: P = Personal-experience-based: F = Food based

The following patterns emerged in the commonness with which different category types were used by participants. The 'Meal/time' and 'Routine' types were used by almost all participants and were used consistently across all food card sort activities. The 'Preference' and 'Meal component' types were also used by many participants, but their use was not consistent across card sort contexts. The 'Well-being,' 'Food group,' 'Location,' 'Convenience,' 'Source,' and 'Physical characteristics' types were commonly used by some participants, and their use varied across contexts. The 'Person' and 'Nutrient composition' types were used by few participants overall.

As stated above, 'Meal/time', 'Routine', 'Meal component', and 'Preference' were used frequently across card sort contexts. The other eight category types varied in their use across contexts. When no context was defined, 'Food group,' 'Well-being,' 'Physical characteristics,' and 'Source' category types were frequently used. In the non-work eating contexts participants frequently used 'Food group,' 'Source,', and 'Well-being' category types. In the work context participants frequently used 'Location,' 'Convenience,' and 'Source' category types. In the alone context participants frequently used 'Location' and 'Well-being' category types.

Exploring each category type across the card sort contexts revealed that 'Food group,' 'Well-being,' 'Nutrient composition,' and 'Physical characteristics' were used more often when no context was defined than in any other context. 'Location' and 'Convenience' were used in the work context by more participants than in any other context. The 'Person' food-category type, while not frequently used overall, was used most often in the non-work eating context.

Finally, examining how category types were used by individuals across each of the four card sorting contexts revealed that individuals' patterns of category type use across contexts varied. Some category types were used by different participants as the

context changed (e.g., 'Convenience'), while others were used by the same participants across all four card sort activities (e.g., 'Preference').

2.4 Discussion

The goal of this project was to advance understanding of adults' cognitions related to food by applying schema theory to examine how a group of adults categorized foods across different contexts. The intent was to develop a general model of food schema. New approaches were used to study adults' ways of classifying foods. First, repeated, context-specific card sorts encouraged elicitation of many food categories and labels by participants. Second, qualitative interviewing techniques enhanced the understanding of the categories that participants generated. Third, the combination of grounded theory and schema analysis methods provided insight into both the structure and processes of food cognitions.

Study participants generated a rich set of categories and labels for researchers to examine. Although many of the category meanings that emerged from these labels are consistent with the findings reported by other researchers (e.g., "breakfast foods," "healthy foods," "like," "try to avoid") (Falk et al., 2001; Furst et al., 2000; Lennernas and Andersson, 1999; Matheson et al., 2002; Murcott, 1982; Ross and Murphy, 1999; Sobal and Cassidy, 1987;1991;1993), numerous additional category meanings were generated (e.g., "refreshing and cleansing," "change of pace," "other people prepare"). The emergence of different category meanings may have resulted from the method of repeated card sorts in different contexts but also may have resulted from the characteristics of the participants, the time and culture in which the study was conducted, and/or the particular set of food cards used.

The structure of an individual's food schema can be described in terms of hierarchy. A non-hierarchical structure is suggested if categories are not mutually

exclusive and items are placed in more than one category (Ross and Murphy, 1999). The results presented here demonstrate that food schema structures consist of many food categories that are linked in non-hierarchical ways. Participants used different categories for the same foods when the context changed, resulting in category contents that were not mutually exclusive. The personal-experience-based and context-based category types seemed to be particularly non-hierarchical compared to the food-based category types. The non-hierarchical nature of food cognitions has been reported by others (Furst et al., 2000; Ross and Murphy, 1999), and studies of other real life domains have also portrayed non-hierarchical cognitive structures (Barsalou, 1982;1991; Medin et al., 1997; Nelson and Miller, 1995; Smith et al., 1996; Zarate and Smith, 1990).

The use of different category types for sorting food cards in different contexts suggests that certain food schema categories may dominate in specific food settings. In this study 'Convenience' and 'Location were used most often in work contexts while 'Person' was used most often in non-work contexts. Situational variance in dominant cognitions has also been reported by identity researchers who focus on mental self-images and identities related to eating (Bisogni et al., 2002). Individuals' cognitive assessment of contexts leads to differential access of schema categories depending on the associated roles, identities, goals, and emotions (Nishida, 1999). The origins of these differences may relate to specific cognitions that a person develops based on his/her everyday interactions with people, groups, and objects.

This study was unusual in asking participants to sort food cards in the context of work. The distinction that emerged between the food-category types that participants' used more frequently in work settings ('Convenience' and 'Location') versus more frequently in non-work settings ('Person') is interesting and warrants further study. Work environments have been described as barriers to consumption of

fruits and vegetables (Cohen et al., 1998), and work as a context for eating is understudied (Devine et al., 2003).

Classification of foods in contexts elicited many different categories in this study and seems to be a rich and important area for research. In today's world, many people eat in diverse settings requiring them to flexible in their thinking about food. The finding that participants used different categories suggests that individuals' schemas are differentially applied as the contexts change. This parallels a prior study of food choice that reported repertoire's of strategies people use as contexts change (Falk et al., 2001). This study examined food classification using only a few variations of some characteristics of eating contexts (people, time, place). Eating contexts have other characteristics, such as activities, emotions, social processes, physical needs (Bisogni et al., 2006). Classification of food cards in more and different settings would generate further details about food schema structure, content, and processes.

The results of this study suggest a way to modify nutrition education messages to be more meaningful to target audiences. Some investigators suggest that health promotion messages are typically framed using food and nutrition categories (Axelson and Brinberg, 1992; Murcott, 1982; Sobal and Cassidy, 1987;1991;1993; Worsley, 2002). However, in this investigation of consumers, food and nutrition categories were used less commonly than context-based and personal-experience-based categories, particularly in the context specific card sorts. Many nutrition practitioners and educators already consider their clients' perspectives and experiences with food. A focus on individuals' food schemas could enhance practitioners' ability to understand clients' food-related cognitions, allowing practitioners to tailor education and counseling to their clients' schemas (Kreuter and Skinner, 2000). An exploration of population and community level food schema can provide information on important

culturally shared food categories and their variations among subgroups. Such information would be invaluable for targeting communication and developing programs to promote healthful food choice.

While this study extends understanding of food schemas, limitations of the study should be recognized. The findings cannot be generalized to other populations in different places or times. People living in other areas, other eras, and working in other occupations may use different categories to label and organize foods. In addition, the particular food cards used here may have limited the labels that participants used in the card sort activities. The inclusion or exclusion of selected foods or the decision to represent multiple levels of categorization on the food cards may have resulted in the emphasis and inhibition of some categories (Macrae et al., 1995). The order in which contexts were presented to participants may have influenced the sort results in a couple of different ways. First, the groups and labels used in the first card sort activity may have been more likely to be used in subsequent sorts. Second, participants may have been less focused due to fatigue as the interview progressed resulting in less thoughtful responses for the alone context. However, presenting card sort context in the same order for all participants allowed for comparison of contexts across people. Finally, there is no perfect substitute for data collection in a real life context. The researchers attempted to capture context specific experiences using a series of open-ended questions to frame the context, but some aspects of these experiences are likely to be lost in this abstraction. Examining food schemas in real life, real time settings may yield different results (Meiselman, 1992).

2.5 Conclusions

Food schemas consist of rich, complex, and context specific categories that are differentially accessed depending on the food context. The importance of personal-

experience-based and context-based categories that was found in this study, as well as the multitude of themes that emerged for these categories, emphasizes the need for further study of food classification across contexts. The methods used in this project were productive in shedding new light on food cognitions and should be further developed for food classification studies with different sets of participants, food cards, and contexts. Distinguishing among the bases for food cognitions (personal-experience, context, and food) offers conceptual guidance for future research and for scientists and clinicians who develop nutrition education messages for the public. Attending to the personal-experience-based and context-based food categories that people construct is necessary to be sure that new messages link in a meaningful way to audience cognitions.

CHAPTER 3

INDIVIDUAL DIFFERENCES IN THE CONCEPTUALIZATION OF FOOD

ACROSS EATING CONTEXTS

3.1 Introduction

Understanding what people already "know" about food is important for effective nutrition communication (Novak and Gowin, 1984; Olson, 1981; Shepherd and Sims, 1990; Worsley, 2002) because people are more likely to accept, integrate, and act on nutrition information that corresponds with their existing knowledge structures (Axelson and Brinberg, 1992; Janas et al., 1993; Miller et al., 2003; Shepherd and Sims, 1990). Although identification of shared ways of thinking about food and eating within a culture can inform health promotion (Moscovici, 2001; Rozin and Vollmecke, 1986; Sobal and Cassidy, 1987;1991;1993), these shared ideas may not capture important individual differences (Cullen et al., 2002; Pelto and Pelto, 1975). Better understanding of individuals' food related knowledge structures could improve nutrition education efforts (Axelson and Brinberg, 1992; Campbell et al., 1994; Furst et al., 2000; Olson, 1981; Worsley, 2002).

Schema theory provides a useful framework for exploring individual differences in food-related knowledge structures. Schemas are used to explain how people store, retrieve, and use information (Abelson, 1981; Cicchetti and Toth, 1995; D'Andrade, 1995; Feldman, 1998; Fiske and Taylor, 1991; Markus, 1977; Nishida, 1999; Rumelhart, 1984; Schank and Abelson, 1977; Spradley, 1972). Food schemas are generalized collections of knowledge constructed from past experience that contain domain specific multidimensional, interrelated categories of information that are drawn upon to guide and shape behavior in familiar relevant situations (Axelson and Brinberg, 1992; Blake and Bisogni, 2003; Cooper, 1997; Olson, 1981; Ross and

Murphy, 1999; Worsley, 1980). Food schemas develop through direct (e.g., eating, preparing) or indirect (e.g., conversation, education) experiences with foods (Nishida, 1999).

Individuals' food schema structures may be ascertained by assessing the different categories they use to classify foods in personally relevant situations. Asking someone to sort foods into personally relevant categories is an approach for understanding how they classify foods. Card sorts are an established method for examining cognitive structures (Christensen and Olson, 2002; D'Andrade, 1995; Spradley, 1979; Weller and Romney, 1988) and have been previously used for exploring schemas (Lecacheur et al., 1999; Mohlman et al., 2004) and food cognitions (Gittelsohn et al., 1996; Matheson et al., 2002; Ross and Murphy, 1999).

Card sorting is an elicitation method where participants sort sets of items written on cards into piles so that items within piles are more similar to each other than to items in other piles (Weller and Romney, 1988). A successive card sort involves sorting into preliminary broad category piles followed by sorting into smaller specific category piles. Card sorts are often used to examine which items are placed together in groups (Schensul et al., 1999a; Weller and Romney, 1988). Another approach is to examine the categories people use to group the cards. The latter approach focuses on the types of labels people use to describe the groups and can provide insight into knowledge structures (Ross and Murphy, 1999; Schensul et al., 1999a).

Context is a strong influence on the kinds of categories elicited by exposure to stimuli such as food cards (Barsalou, 1992). To understand the categories salient to an individual for a specific behavioral domain, category use needs to be examined across different contexts. In addition, the first categories that are elicited prime the elicitation of other categories. Therefore, when examining the kinds of categories used in

successive card sorts, the first stage of categories have a higher salience to the individual than second stage categories (Barsalou, 1992).

This study builds upon a prior analysis of food schema categories that provided a general framework for individuals' food schemas (Blake et al., 2005). Through a series of card-sort activities participants used many different labels to classify foods. Examination of these labels revealed 12 different food-category types (Table 3.1). Some of these category types were based on personal experiences with foods, including those labeled as Routines, Preference, and Well-being. Other category types were based on the food and eating context, including those labeled as Meal/time, Meal component, Person, Location, Source, and Convenience. One other set of food-category types was based on characteristics of food, including those labeled as Food group, Nutrient composition, and Physical characteristics of the food. Further exploration of the use of food-category types across different food and eating contexts revealed that participants used context-based and personal-experience-based food-category types most frequently. Also, specific category types were used more or less frequently depending on food and eating context (e.g., dinner at home versus lunch at work.) These prior results provided a general overview of different food schema categories and their use across different eating contexts. Those earlier findings, however, provided limited information on individuals' personal food schemas.

Table 3.1 Food-category types organized by basis for classification with corresponding food card-sort label examples.

Food-category types	Food Card-sort Label examples
Personal-Experience-Based	
Routine	"I'd eat most often", "hardly ever", "once a week"
Well-being	"healthy", "mood foods", "allowed on my diet"
Preference	"favorite", "I like it", "I hate", "treat"
Context-Based	
Meal/Time	"breakfast", "dinner", "snack", "summer"
Meal component	"main dish", "side dish", "condiment"
Convenience	"quick and easy", "logistically difficult"
Person	"foods for my child", "my boss' food"
Location	"eat at home", "at work", "road food"
Source	"homemade", "get out of the machine"
Food-Based	
Food Group	"vegetables", "dairy", "meats"
Physical Characteristics	"sweet food", "cooked", "cold", "finger food"
Nutrient Composition	"proteins", "fats", "calorie"

The objective of the present study was to examine individual differences in food schema structures. The focus of this study was on the food-category types that each individual used to classify foods for different eating contexts. The category types a person used were expected to reflect the individual's food schema structure.

3.2 Methods

This study explored individual differences in food-category type use without imposing preconceived conceptualizations or classification systems (Axelson and Brinberg, 1989). Five steps were used to identify individual differences in food schema structures represented by these food-category types. 1) Card-sort interviews were conducted with participants to elicit the labels people use to classify foods. 2) All participants' labels were pooled across contexts and organized into category types by the researchers. 3) Salience ratings were assigned for each category type for each participant. 4) Cluster analysis was used to identify clusters of participants with

similar salience ratings for the category types. 5) The clusters were evaluated for complexity of category types and consistency of category type use across contexts. Similar procedures have been used in prior studies (Dromi and Ingber, 1999; Guest and McLellan, 2003; Miller et al., 1997; Miller et al., 2003).

3.2.1 Participants

Forty-two adults living in Upstate New York were purposively sampled (Kemper et al., 2003). Participants worked full-time or part-time in non-managerial, non-professional jobs, but had different eating contexts and schedules. Participants also varied in age, gender, years of education, and living arrangement (Table 3.2). This study was part of a larger project investigating situational eating of adults. The project was approved by the University Committee on Human Subjects (UCHS) Institutional Review Board (IRB).

Table 3.2 Characteristics of study participants

Characteristic		Participants
Gender	Men	21
	Women	21
Age	Mean (sd)	39 (11) yrs
	Range	20-61 yrs
Years of Education	Mean (sd)	13.5 (1.6)
	Range	10-18
Ethnicity	White	33 (79%)
	Black	2 (5%)
	Hispanic/Latino	4 (10%)
	Mixed ethnicity (including Native American)	3 (7%)
Living arrangement	Alone	11 (26%)
	With spouse/partner	27 (64%)
	With relatives or unrelated adults	4 (10%)
Children in the household	None	21 (50%)
	One or more	21 (50%)

3.2.2 Data Collection

This analysis reports results from the eighth of nine participant interviews where food-card sorts were included (Figure 1.1). Three trained interviewers conducted all interviews at times and in locations chosen by participants. Each participant worked with the same interviewer for all parts of the study. Interviews were audio-tape recorded and transcribed verbatim.

Cards for Sorting. A set of 59 food cards was developed from a pilot study (Appendix D) (Murphy and Lassaline, 1997).   This set of food cards represented foods and drinks commonly consumed among the pilot sample, and the researchers added foods and beverages of interest to nutrition professionals (e.g., tofu) (Maurer, 1996). Food cards were designed to represent several levels of categorization, including subordinate-level categories (e.g., french fries), basic-level categories (e.g., potato), and superordinate-level categories (e.g., vegetable), to elicit as many category labels as possible during card-sort activities (Murphy and Lassaline, 1997).

Interview Protocol. An interview guide was used that included a structured card-sort protocol and open-ended interview questions (Appendix E). Participants sorted food cards four separate times for four different contexts: 1) no context defined; 2) their most common non-work eating context with family or friends; 3) their most common work eating context; and 4) their most common eating alone context.

First, participants sorted the food cards with no context defined (open food-card sort). Participants were presented with the set of 59 food cards and asked to sort these cards into piles that made sense to them (first stage). They were then asked if piles could be split into any other piles (second stage). Participants were asked to label each food card pile using their own words (e.g., "breakfast foods" or "foods I like"). Figures 3.1 and 3.2 are examples of two participants' food card sort labels.

Second, starting with the participant's non-work eating context, a series of open-ended questions were asked to gain an understanding of the participant's experience of the context and to help the participant place themselves in this context before sorting the next set of food cards. As in the open food card sort, participants were asked to sort the set of 59 food cards into piles that made sense to them, to further split these initial piles if possible, and to label the card-sort piles using their own words. This entire process was repeated for the work context and then again for the alone context.

3.2.3 Data Analysis

Participants in total produced 991 unique card-sort pile labels. These labels were pooled across all four card-sorting contexts and qualitatively classified by the researchers into 12 different category types (Table 3.1). These category types were identified by grouping labels with similar meanings using interview transcripts to guide interpretations. The detailed process is described elsewhere (Blake et al., 2005).

Category type salience. Comparison of individuals is difficult when using an unconstrained card-sorting task because some people make many piles (splitters) and others fewer piles (lumpers) (Schensul et al., 1999a; Weller and Romney, 1988). To compare individuals, a four-level scoring system specific to these data was developed to capture the overall salience of each category type for each participant. Salience of a category type was determined using the relative number of food card-sort labels representing each food-category type in each card sort and the stage the labels were used. As described above participants were asked to sort the cards into piles that made sense to them. These piles represent the first stage. They were then asked to split these piles into smaller groups if possible. These split piles represent the second stage

(Guest and McLellan, 2003; Miller et al., 1997; Miller et al., 2003; Novak and Gowin, 1984).

The researchers determined the salience of each of the 12 food-category types for each participant across all four card sorts (Blake et al., 2005). Four levels of salience were used to distinguish between food-category type use for each participant and corresponding scores were assigned, primary (4), secondary (3), tertiary (2), and quaternary (1). The higher scores indicated a higher level of salience. A category type was identified as primary if at least half of the labels used in a given card sort represented this category type, and if these were used more frequently in the first stage of classification. A category type was identified as secondary if at least half of the labels used represented this category type and these were used more frequently in the second stage of classification. A category type was identified as tertiary if less than half of the labels used represented this category type and these were used more frequently in the second stage of classification. A category type was identified as quaternary if less than half of the labels used represented this category type and they were only in the second stage of classification. When a category type was on the border of two different salience levels, the researcher used the interview transcripts to interpret participants' intent and assign either the higher or lower level of salience. Salience scores were assigned to each food-category type for each of the four food-card-sort contexts. Salience scores for each category type were then pooled across all four food card-sort contexts with possible values for each category type ranging from 0 to 16. Each person had a pooled score for each category type.

Comparison of this scoring system to a count of category types used by each participant had an overall Pearson correlation of 0.82. The four-level scoring system was chosen as a better representation of category type salience because it allowed flexibility in assigning scores based on the interpretation of participants' intents when

sorting and labeling food cards.   To confirm the reliability of the scoring system, a

second researcher independently scored food card-sort labels for salience. Intraclass

correlations averaged 0.88 and ranged from 0.68-0.96 for the twelve food-category

types. The researchers reviewed and discussed scoring discrepancies and scores were

revised accordingly (Guest and McLellan, 2003; MacQueen et al., 2001; Miller et al.,

1997; Morse, 1997). The average of the revised scores was used in subsequent

analyses.

Cluster analysis. The first step in clustering participants according to the ways

that they used category types in the sorting tasks was the creation of preliminary

groups. Two researchers independently grouped participants based on the pooled

salience scores for each category type and the researchers' in-depth knowledge of

participants from the interview transcripts. The inter-rater reliability for the groups

was 0.86. After researchers reviewed and discussed discrepancies, they established a

consensus for final assignment of group memberships (Morse, 1997). This

preliminary grouping of participants was used to compare the results of statistical

cluster analyses to aid in the identification of meaningful clusters of participants for

food schema typologies and to guide interpretation of results (Miller et al., 1997;

Schneider and Roberts, 2004).

Cluster analysis is a multivariate statistical technique designed to identify

relatively homogenous clusters of cases based on inter-subject similarity (Aldenderfer

and Blashfield, 1984; Gordon, 1999; Henry et al., 2005). The cluster analysis

literature is divided about whether or not to statistically standardize data to mean of 0

and standard deviation of 1 (z-scores) (Aldenderfer and Blashfield, 1984; Everitt,

2001; Gordon, 1999; Wirfalt et al., 2000). The data for this project were analyzed

using both standardized and unstandardized scores. Comparison of results using

standardized versus unstandardized scores yielded similar results. Therefore, to preserve differences between participants that might be useful discriminators of unidentified groups, unstandardized scores were employed (Aldenderfer and Blashfield, 1984; Everitt, 2001; Milligan, 1996; Wirfalt et al., 2000).

Hierarchical clustering techniques agglomerate objects into groups beginning with the most similar and progressing until all objects are linked. Non-hierarchical clustering techniques group objects into a predefined number of non-overlapping clusters. To capitalize on the strengths of both hierarchical and non-hierarchical clustering techniques, a multi-step approach was used in the current analysis (Aldenderfer and Blashfield, 1984; Henry et al., 2005).

First, pooled salience scores were analyzed hierarchically with Ward's method using squared Euclidian distances (Aldenderfer and Blashfield, 1984; Henry et al., 2005; Miller et al., 1997; Miller et al., 2003). The clustering of participants at different levels was compared, and a range of possible final cluster solutions was identified (Schneider and Roberts, 2004). Second, K-means non-hierarchical cluster analysis was performed for each possible cluster solution, and results were compared to identify the "best" cluster solution (Henry et al., 2005; Schneider and Roberts, 2004). The final cluster solution was chosen using one-way ANOVA, examination of cluster centers for homogeneity, and comparison to the preliminary classification to identify meaningful clusters (Aldenderfer and Blashfield, 1984; Henry et al., 2005; Schneider and Roberts, 2004).

Description of Clusters. The final step in the analysis involved characterizing clusters by the complexity and consistency of food-category type use (D'Andrade, 1995; Olson, 1981). Complexity was assessed in terms of number of different category types used (Olson, 1981). Consistency of the use of category types across

contexts was described as either consistent or inconsistent. In addition, food-category type use was examined by reviewing the exact wording of food card-sort labels and transcripts for quotes related to specific food-category types.

Clusters were also examined in relationship to the personal and household characteristics of participants. Mean differences in age and years of education were compared among clusters using analysis of variance. Chi-square analysis was used to compare the clusters for gender, ethnicity, living situation, and presence of any children in the household.

The hierarchical cluster analysis results indicated a range of five to eight possible final cluster solutions. The k-means non-hierarchical cluster analyses indicated that a seven cluster solution yielded clusters with statistically significant representations of category types and clusters with the highest levels of homogeneity based on comparisons of cluster centers. The cluster centers, which indicate the mean salience scores for food-category types for each cluster, represent groupings of participants based on dominant orientations toward one or more of the food-category types (Miller et al., 1997). Substantial agreement was found between the two clustering methods used in this study, confirming the stability of the classification (Henry et al., 2005).   The contingency coefficient is a measure of the degree of association based on the chi square. The seven cluster final solution closely corresponded to the preliminary clustering of participants carried out by two researchers having a statistically significant contingency coefficient of 0.89.

Figure 3.1 Food Card-sort Labels in Four Contexts for Participant Example 1

No Context

Dinner and Lunch

Dinner food

Lunch food

Breakfast food

Snacks

Drinks

Junkfoods

Hardly ever

Non-work

Never eaten at dinner

Rarely eaten at dinner

Sometimes eaten To break the routine a bit

Always eaten for dinner

Work

Foods I eat

Foods that don't apply

Alone

Usually

Sometimes

Never

Figure 3.2 Food Card-sort Labels in Four Contexts for Participant Example 2

No Context

Breakfast

Lunch

Dinner

Snacks

A must

Don't eat these

Sometimes

Non-work Context

Carbs

100% carbs

Could go In mixed pile

junkfood

dessert

condiment

Protein

meat

poultry

Seafood or fish

miscellaneous

Beverage

Vegetable

Dairy

Fruit

Mixed

Work Context

Mixed

Yes

No

Fruits and Vegetables

Fruits and Vegetables Yes

Vegetables No

Carbs

breakfast

dinner

snacks

Condiments

My favorite

Protein

Yes

No

Desserts

Yes

No

Beverage

Yes

No

Dairy

Yes

No

Alone Context

Mixed

Yes

No

Ideal breakfast

Fruits

Yes

No

Dairy

Yes

No

Beverages

Yes

No

Desserts

Yes

No

vegetable

Carbs

Yes

No

Protein

Yes

No

3.3 Results

This cluster solution procedure identified seven different food-schema clusters (Table 3.3). There were significant differences between these clusters in the salience of Routine, Meal component, Preference, Well-being, Person, Source, Convenience, and Food-group category types ($p < 0.05$). There were no significant differences between these clusters for the salience of Meal/time, Physical characteristics, and Nutrient composition category types. The Meal/time category type was the most salient category type overall and was used by most participants in most of the card-sort contexts. The Routine category type was highly salient to participants in all clusters except the Cluster 6. Well-being, Person, Source, Convenience, Meal component, and Food group category types varied in salience across clusters. Physical characteristics and Nutrient category types were much less salient than all other category types. There were no significant differences between clusters for age, gender, ethnicity, living arrangement, children in the household, or years of education. However, these clusters varied in food-category type complexity and consistency of use across contexts.

3.3.1 Food-Schema Clusters

Cluster 1. The nine participants in the Cluster 1 were oriented toward their personal food and eating habits and used Routine and Meal/time category types almost exclusively in all card-sorting contexts. They differed from others in using very few other category types and had simple and consistent card-sort patterns. Many of these participants did not elaborate beyond Routine or Meal/time, even with prompting, and stated that this is just the way they think about food and that there really was no other way to sort the cards. They used labels such as "foods I usually eat," "once in a while," "one time per month," or "never eat."

Table 3.3 Mean salience scores for a seven cluster solution using K-means cluster analysis. *

Food Category	Cluster 1 (n=9)	Cluster 2 (n=4)	Cluster 3 (n=3)	Cluster 4 (n=2)	Cluster 5 (n=9)	Cluster 6 (n=7)	Cluster 7 (n=8)	**Sig.
Meal/time	12.8	10.5	13.0	14.5	11.8	13.0	11.0	0.31
Routine	13.4	10.8	10.7	6.5	8.2	1.6	10.1	0.00
Meal component	1.4	7.5	1.3	4.5	6.7	11.3	7.4	0.00
Preference	2.9	5.8	7.0	4.5	4.3	3.7	1.4	0.03
Well-being	1.0	7.3	1.7	1.5	4.0	.4	1.6	0.00
People	.7	.3	6.0	.0	1.7	.3	.4	0.00
Location	1.1	4.3	5.0	1.5	2.9	2.9	.9	0.03
Source	.7	.3	3.7	8.5	1.2	2.9	.6	0.00
Convenience	.7	.5	3.7	.0	7.4	1.0	1.0	0.00
Food group	.1	2.0	.0	.0	1.4	4.1	7.1	0.00
Physical characteristics	.1	.5	.0	1.0	2.2	1.7	.5	0.08
Nutrient composition	.0	1.5	.0	.0	.1	.4	1.4	0.27

* Cells include mean salience scores for each food category of participants included in the cluster.

** Significance for comparison of mean salience scores using one-way-analysis of variance across seven clusters.

Some of these participants explained that food was not particularly important to them. Other participants in this cluster described being overwhelmed with work, family, and other obligations leaving little time for thoughts about food. All of the participants in Cluster 1 described well-established routines for eating that kept things simple, allowing them to focus on other more important concerns.

Cluster 2. Four participants were included in Cluster 2. These participants were oriented toward their personal experiences with foods, in focusing on personal preferences, the perceived personal health value of foods, and how foods made them feel, both physically and emotionally. Members of this cluster had complex, inconsistent sorting patterns. They frequently used labels such as "healthy," "unhealthy," "allowed on my diet," "refreshing and cleansing," or "mood elevations."

Two participants in Cluster 2 were concerned with their weight and talked about foods in terms of "allowed" versus "not allowed" on their diets. These same participants also mentioned overall health quality of the foods but in reference to their personal diet plans. One focused on personal preferences and the negative health aspects of different foods. She used labels such as "guilty pleasures" and "evil desserts." One other participant was focused on how foods made her feel physically and what she ate in certain emotional states.

Cluster 3. Three participants in Cluster 3 had complex, inconsistent card-sorting patterns. Cluster 3 participants frequently used a variety of different context-based food-category types (Table 3.1) including Person, Location, Source, and Convenience. These participants were distinctly different from all other participants in that they were more oriented to the needs and preferences of other people present in different food and eating contexts. They frequently used labels that referred to other people when sorting food cards such as, "boss's food," "husband's snacky things," or "kids food."

One single man in Cluster 3 reported that he was particularly focused on the needs and preferences of close friends and family members when they came to eat at his home. A woman in Cluster 3 explained that she often felt constrained by the needs and preferences of her son and husband. A third participant was a single woman who traveled extensively for her job and lived away from home half of the year. Oriented toward the context of the eating setting, she distinguished between foods she would usually eat when alone, foods she would eat with company, and foods she would eat if her children were visiting.

Cluster 4.   The two participants in Cluster 4 had complex, inconsistent card-sorting patterns. Cluster 4 participants were oriented toward where food was obtained. They frequently used labels such as "homemade," "food from home," "restaurant food," or "take out."

Participants in Cluster 4 gave descriptions of foods that often centered on their location at the time of consumption. These participants described wanting different foods and felt constrained in their food choices by locations, in particular work locations. Participants in Cluster 4 developed strategies to overcome these contextual constraints, like making extra food at dinner the night before in order to bring it to work the next day or leaving work on errands to get food from preferred restaurants.

Cluster 5. The nine participants in Cluster 5 had complex sorts but they varied in their consistency. Seven participants had inconsistent sorts, but two were fairly consistent across contexts, using similar food-category types in three of the four contexts. Participants in Cluster 5 were oriented toward ease, accessibility, and cost in different food and eating contexts. The complex sorting strategies used by these participants included numerous other category types like Well-being and Preference. Participants in Cluster 5 differed from others in their emphasis on the convenience of

different foods. They used labels like "quick and easy," "if available," "too expensive," and "packable" to describe foods.

Four Cluster 5 participants described choosing foods based on their ease of preparation, particularly in reference to work lunches and evening dinners. Another participant was very focused on using both time and money wisely. Three participants described foods in terms of portability and feasibility in different settings.

Cluster 6. Seven participants were included in Cluster 6. These participants were oriented toward characteristics of the meal, including meal time and Meal components. All of the Cluster 6 participants frequently used labels like "appetizer," "main dish," "side dish," and "dessert" when classifying foods.

Four Cluster 6 participants had simple and consistent card-sorting patterns. These four were classified in Cluster 6 both in the preliminary grouping and in the k-means cluster analysis. The other three participants had complex and consistent card-sorting patterns and had been classified in Cluster 7 in the preliminary grouping. While these three participants frequently used the Meal component category type, they also occasionally used the food-group category type when sorting food cards. Examination of card-sort labels and transcripts revealed that these three participants used Food group category types along with Meal component category types in the context of a meal. For example, they used "meat" and "main dish" interchangeably to describe the main component of their dinner meal. The Cluster 6 participants differed from Cluster 7 participants in their emphasis on the context of the meal versus the intrinsic properties of the foods.

Cluster 7. The eight participants included in Cluster 7 tended to have complex, consistent card-sorting patterns. These participants were oriented toward the origin and properties of foods in general, especially food groups but also physical

characteristics and nutrient composition. They frequently used food labels like, "bread", "grains," "fruits and vegetables,", "dairy," or "meats."

Cluster 7 participants were oriented toward intrinsic properties of foods in various ways. Two participants had simpler card sorts using mainly Routine and Meal/time category types. With prompting, these participants were able to further sort the card-sort piles using food groups, but they did not ascribe any personal or contextual relevance to these food group labels. Another Cluster 7 participant tried to incorporate foods from different food groups when cooking because of prior training as a cook. Three other Cluster 7 participants talked about health during the interviews and used the Food group category type when sorting food cards, however, they did not ascribe health values or personal relevance to their labels. Two other Cluster 7 participants had complex card-sorting patterns and used both Food group and Nutrient composition category types. These two participants discussed personal health concerns and linked these concerns to the Food group and Nutrient category types. These two participants were oriented toward characteristics of the foods that made them more or less healthful regardless of personal health needs and feelings, which made them different from participants in Cluster 2 who focused on personal well-being.

3.4 Discussion

The findings of this investigation provide insight about individual differences in food schema structures. Unique features of this study are the combined use of repeated card-sorting activities to elicit food-category types, open-ended interviewing to define food and eating contexts and determine food-category type meanings, and clustering of individuals based on food-category type use.

The identification of seven food-schema clusters in this study demonstrates the variation in food-schema structures among participants having similar socioeconomic

status and living in the same culture and geographic area. These findings are consistent with those reported in other studies of food (Cullen et al., 2002; Weller et al., 1999) and health related beliefs (Farnya and Morales, 2000; Weller and Baer, 2002). A study of food beliefs and consumption of fruits, juice, and vegetables in three different ethnic groups found more within- than between-group differences, suggesting that individual factors may be more important influences on food choice than ethnicity (Cullen et al., 2002). Furst et. al. (2000) also proposed that people have personally operational food classifications that are embedded in a nested set of social and cultural classifications. The individualization of food schema structures is consistent with models of food choices that emphasize unique construction of food choice based on a person's interpretation of influences and life course events and experiences (Devine et al., 1998; Furst et al., 1996).

The study findings support the idea that people use different fundamental bases for food classification (personal-experience-based, context-based, or food-based) (Blake et al., 2005). Each of the seven food-schema clusters demonstrated a focus toward one of the three bases of classification identified in an earlier report, although there was some overlap in the use of food-category types (Blake et al., 2005). Clusters 1 and 2 used more personal-experience-based food-category types. Clusters 3, 4, 5, and 6 used more context-based food-category types. Cluster 7 used more food-based category types. These findings suggest that while there are between-person commonalities in food classification, individual differences occur within those larger themes.

In spite of the many differences across the seven food-schema clusters, a commonality among most participants was the salience of Meal/time category types in their sorting of the food cards. The Meal/time (e.g., breakfast, lunch, dinner) food-category type represents common culturally shared labels used to organize thinking

about food and eating and for communication between individuals (Douglas, 1972; Furst et al., 2000). Meals have also been described as time markers, playing an important role in how people organize and remember their days (Makela, 2000; Meiselman, 2000; Pliner and Rozin, 2000).

Another shared category type across most participants was the Routine food-category type (e.g., usually eat, sometimes eat, never eat). The common use of labels in the Routine category type emphasizes the self-awareness that individuals have of their personal patterns in food choice and the importance of these typical ways in their lives. These findings are consistent with conceptual models of food choice and classification that emphasize an individual's construction of food choice (Furst et al., 1996; Furst et al., 2000) and the development of routines to simplify food choice (Connors et al., 2001).

Clusters 2 and 7 shared the use of traditional food-group category types in their card sorts (e.g., "fruit", "meat"). Cluster 7 participants did not ascribe personal or contextual relevance to the Food group category type. In contrast, when the participants in Cluster 2 used Food group labels, they frequently personalized those labels with qualifiers such as "pasta and bread group I avoid" or "starches that give stored energy." Individuals in Cluster 2 may have more fully integrated food groups into their food schemas while those in Cluster 7 were merely aware of their existence (Barsalou, 1992). This distinction in cognitive structures related to food group labels may help explain why many studies have failed to demonstrate strong relationships between nutrition knowledge and behavior (Axelson and Brinberg, 1992; Worsley, 2002). Individuals with different food-schemas may be demonstrating similar performances on knowledge assessment measures because knowledge assessment tools assess awareness or recognition but not the integration of this awareness with personal constructions of foods (Worsley, 2002).

This study provided insight about individual cognitive differences that may underlie food-choice behaviors in a sample of 42 employed adults living in one geographic region of Upstate New York. However, these results may not be generalizable to other people living in different areas, times, or situations. Other food-schema clusters may have emerged in a different sample or in different food and eating contexts. In addition, the limited number of food cards and the card-sorting tasks used to explore individuals food schemas are not perfect substitutes for real-life food and eating contexts. Other food-category types and different clusters may have emerged in a study using different sets of cards or in real-life contexts (Meiselman, 1992). Also, cluster analysis attempts to identify unknown patterns in the data by imposing patterns on the data, and different clustering techniques can yield different cluster solutions (Aldenderfer and Blashfield, 1984). This study attempted to overcome this limitation using previously tested validation techniques (Aldenderfer and Blashfield, 1984). However, confirmation of these clusters requires future follow-up investigation (Gordon, 1999; Henry et al., 2005).

3.5 Conclusions

Understanding individuals' existing food-schema structures could help nutrition practitioners tailor messages to maximize health impact (Axelson and Brinberg, 1992; Campbell et al., 1994; Kreuter and Skinner, 2000; Shepherd and Sims, 1990). Additional studies of individual differences in food schemas are needed, particularly with samples from other populations and in other food and eating contexts. Nutrition practice would also be informed by studies of how schemas relate to behavior and how education can shape or change schemas (Nishida, 1999; Worsley, 2002).

CHAPTER 4

HOW ADULTS CONSTRUCT EVENING MEALS: SCRIPTS FOR FOOD CHOICE

4.1 Introduction

The evening meal is an important eating episode in the lives of many people. This meal is seen as one of the most important of the day by many nutrition professionals because it has significant social and nutritional implications (Bove and Sobal, 2006; Gillman et al., 2000; Murcott, 1982; Rappoport et al., 2001; Sobal et al., 2002; Taveras et al., 2005). Evening meals have special meanings as family meals (Bove and Sobal, 2006; Holm, 2001; Murcott, 1982). Despite claims of the loss of the family meal (Murcott, 1997), the evening meal is the meal most commonly consumed with family members (Gillespie and Achterberg, 1989; Holm, 2001; Sobal and Nelson, 2003). This meal also has important implications for health and nutrition (Neumark-Sztainer et al., 2003; Taveras et al., 2005). Eating family meals has been associated with consumption of more fruits and vegetables, less fried food, less soda, less trans fat and saturated fat, and more fiber (Gillman et al., 2000). Understanding how people cognitively construct the evening meal could provide information useful to nutrition practitioners and educators interested in promoting healthy food-choice behaviors.

Food choice involves the processes by which people consider, select, and consume foods and beverages. More specifically, food-choice behaviors include a wide scope of activities including the acquisition, preparation, and consumption of foods. Food-choice behaviors include conscious decision making and automatic, habitual, and subconscious actions (Furst et al., 1996). A prior study of food choice among rural women concluded that women's food choices were guided by situation specific schemas (Blake and Bisogni, 2003). The authors suggested that future studies

should explore relationships between food-choice schemas and food-choice behaviors in different contexts. Adults trying to adopt dietary practices to promote heart health have also identified situational factors as barriers to dietary change (Falk et al., 2000b; Janas et al., 1993).

Schema theory provides a useful framework for the exploration of how people cognitively construct the evening meal. Schema theory is used to explain how people store, retrieve, and use information (Abelson, 1981; Baldwin, 1992; Cicchetti and Toth, 1995; D'Andrade, 1995; Feldman, 1998; Fiske and Taylor, 1991; Markus, 1977; Rumelhart, 1984; Schank and Abelson, 1977; Spradley, 1972) . Schemas are generalized collections of knowledge, stored in long term memory and constructed from past experience, that contain organized related categories that guide behavior in subsequent familiar situations (Axelson and Brinberg, 1992; Blake and Bisogni, 2003; Cooper, 1997; Olson, 1981).

Schemas include declarative and procedural knowledge. Declarative knowledge is semantic or abstract knowledge, such as representations of the self, the food, or the episode in general (Baldwin, 1992). Declarative knowledge is linked to research reporting that people interpret and explain eating episodes along different dimensions including time, reoccurrence, social context, physical state, location, food and drink, activities, and mental processes (Bisogni, et al 2005). Procedural knowledge is knowledge of what to do in different settings (Baldwin, 1992), such as eating episodes.

How a person interprets an eating episode is important because perception of a present episode as similar to a past episode can evoke the procedural knowledge in a person's schema and lead to specific behaviors (Baldwin, 1992). Called scripts in schema theory, this procedural knowledge informs a person about what to do in different settings because it contains sequential information about key events that

occur in well-known situations (Baldwin, 1992; Holmberg and MacKenzie, 2002). Scripts contain if-then statements to accommodate different possibilities within a given situation (Baldwin, 1992). Scripts allow a person to do less cognitive processing in repeated situations, therefore simplifying decision making in familiar episodes (Schank and Abelson, 1977). Scripts are derived from past planning, actions that "worked", or habitual actions, and their invocation in new situations is thought to immediately precede the initiation of action (Baldwin, 1992; Schank and Abelson, 1977).

The special meanings of evening family meals provide an interesting case for studying scripts for food and eating episodes (Charles and Kerr, 1988; DeVault, 1991). Schema theory assumes that people actively construct their lives, including ways of eating that are tailored to different situations. Constructions of choices within contexts is also the basis for the food choice process model, which proposed that people make food choices based on their interpretation of past experiences and many types of influences on food and eating (Furst et al., 1996). According to this model, people have personal food systems, which are mental processes that involve value negotiations and formation of strategies resulting in the establishment and employment of options, trade-offs, rules, and routines for food choice. However, elaboration of these cognitive processes is needed to provide a better understanding of how people translate the influences on food choice into particular ways of eating for different situations (Connors et al., 2001)

The purpose of this analysis is to use schema theory to identify and understand how people cognitively construct the evening meal. This was a qualitative study used a grounded theory (Glaser and Strauss, 1967; Strauss and Corbin, 1990), theory guided approach (Greene, 1993) to gain an understanding of the phenomenon of interest from the participants' perspective. Grounded theory methods are systematic inductive

guidelines for analyzing data to build theoretical frameworks that explain the data. A

theory-guided approach acknowledges that the researcher begins and conducts a

research project with certain theories in mind. Food choices in evening meals were

assumed to be guided by schemas which are cognitive constructions of food and eating

experiences. Understanding how individuals construct the socially and nutritionally

important eating episode of evening meals may enhance understanding of why people

eat as they do.

4.2 Methods

4.2.1 Participants

Adults living in Upstate New York were purposively sampled through

community agencies, employers, advertisements in local newspapers, and personal

contacts (Kemper et al., 2003). Recruitment efforts focused on finding participants

who worked full-time or part-time in different non-managerial, non-professional

positions, were not full time students, and varied in age, gender, and living situation.

This provided a sample of participants similar in labor force participation but with

potentially different eating environments and schedules. A total of 42 participants

were recruited. The current analysis is based on interviews with the 32 participants

who identified the evening meal at home as one of their most common eating

episodes. The other ten participants did not identify dinner at home as a common

eating episode. Three worked evening/night shifts and were not home for evening

meals, five lived alone and only ate an evening meal if they were at someone else's

house, and two did not regularly eat evening meals. The 32 participants who did

identify the evening meal as a common eating episode included 16 women and 16 men

between the ages of 24-61 years of age. Twenty-six participants identified themselves

as white and 6 identified themselves as black, Hispanic, Native American, or mixed

race. Twenty-four of the participants were either married or living with a partner.

Seven lived alone, and one lived with roommates. Eighteen had children living in the

household. All recruitment and data collection activities were approved by the

Institutional Review Board (IRB) University Committee on Human Subjects (UCHS).

4.2.2 Data Collection

The data analyzed for this paper were collected as part of a larger study on

situational eating of working adults. The current analysis focused on participants'

descriptions of their evening meal at home in an in-depth, qualitative interview with

particular attention to specific food-choice behaviors.

Participants were interviewed on nine separate occasions (Figure 1.1). Three

trained interviewers conducted all interviews at times and in locations chosen by

participants such as their homes, workplaces, or public places, including libraries,

restaurants and parks. Each participant worked with the same interviewer for all parts

of the study. Interviews were audio-tape recorded, transcribed verbatim, and

transcripts were verified by the interviewer. Participants were informed that the

project was a study of their eating in different situations.

The initial interview was conducted in person and included a series of

questions about food choices and a qualitative 24-hour situational recall of foods and

beverages consumed (Appendix B). The next six interviews were conducted over the

telephone and included the same 24-hour situational recall (Appendix C). The

purpose of the recalls was to understand what people ate and drank and the contexts in

which this consumption occurred. This interview protocol (Appendix B) was

developed specifically for this study and was adapted from the multiple pass dietary

recall approach developed for the United States Department of Agriculture (USDA)

Continuing Survey of Food Intakes by Individuals (CSFII) (Guenther et al., 1997).

Participants were first asked to report everything they had to eat or drink the previous day. They were then asked a series of clarifying and elaborating questions about each of these eating and drinking episodes.

The eighth interview was conducted in person typically two weeks after the last situational recall. This interview was designed to explore participants' schemas for food choice in different food and eating contexts. A semi-structured, open-ended interview guide with questions about different food and eating episodes was used (Appendix E). Participants were asked to identify three different food and eating episodes: 1) their most common non-work eating episode with family or friends; 2) their most common work eating episode; and 3) their most common eating alone episode. For each of these different food and eating episodes, a series of open-ended questions was asked to gain an understanding of the participant's experience of the episode. Participants were asked to talk about the things they do when they eat, how they do them, and why they do these things in each eating episode with further probing questions about the importance of the episode, foods, other people, roles, identities, emotions, and activities. The interview guide was designed to allow participants to clarify meanings and introduce other ideas not raised by the interviewer. Also, the interviewer used probes to explore deeper meanings and was able to add, drop, or rearrange questions based on participants' responses/reactions to the interview questions. Each schema interview lasted about two hours.

After the transcripts from each participant's eight interviews had been read and discussed by the research team, the interviewers conducted the final interview with the participant. This interview served as a member check (Lincoln and Guba, 1985) to review preliminary findings with the participant and to clarify earlier responses.

4.2.3 Data Analysis

Data analysis focused on transcript passages that dealt with evening meals. Using the constant comparative method (Strauss and Corbin, 1990), the researchers coded text passages for emergent themes related to participants' experiences at this meal with particular attention to descriptions of the evening meal and food-choice behaviors at that meal. Prominent themes included expectations the participants had for these meals, aspects of the evening meal that were important to them, and the general approaches and detailed actions for food choice. To gain understanding of these themes, the researchers drew upon schema theory and food choice research related to the following constructs: scripts (Baldwin, 1992; Holmberg and MacKenzie, 2002), goals (Baldwin, 1992; Schank and Abelson, 1977; Trzebinski, 1985), food choice values (Connors et al., 2001; Furst et al., 1996), strategies (Baldwin, 1992; Nishida, 1999; Schank and Abelson, 1977), and plans (Baldwin, 1992; Schank and Abelson, 1977).

Through an iterative process of reviewing this literature and analyzing the emergent themes from the data, the researchers formulated and delineated the key concepts for examining participants' cognitive constructions of the evening meal. Values, expectations, and plans emerged as important themes of participants' conceptualization of evening meals early in the analysis process. The construct of scripts was used to explain how these themes were related. Scripts were considered to include participants' interconnected values, expectations, and plans. Values for food choice were defined as the considerations participants explained were important for the evening meal (Connors et al., 2001). Expectations were participants' descriptions of how the evening meal would proceed and what would be happening, such as time, place, people, activities, and emotions. Plans consisted of the behavior sequences involved in the evening meal episode, such as shopping, deciding what to have for a

meal, and cooking. Each behavior in the sequence was associated with strategies and

procedures (Baldwin, 1992; Schank and Abelson, 1977). Strategies and procedures

were seen as typical approaches to the behaviors (Baldwin, 1992) or "knowing what to

do," such as sharing meal preparation responsibilities. Procedures were the "knowing

how" to do these behaviors, or the details of who would be doing what in preparing

the meal.

Using these concepts, the researchers summarized the food-choice script for

the evening meal for each participant. Each script was then compared to data from the

participant's seven 24-hour situational recalls to verify the description. The

researchers then examined scripts for the evening meal across participants using the

constant comparative method to identify commonalities and differences (Strauss and

Corbin, 1990). From this analysis, eight kinds of scripts for the evening meal

emerged, with all participants represented by one kind. The kinds of scripts were

labeled using participants' words.

The quality of the data and analysis was enhanced through prolonged

engagement with participants, the collection of multiple types of data about food

choice, the collection of extensive field notes, and member checking preliminary

findings (Denzin and Lincoln, 2000). The quality of the analysis was enhanced by the

involvement of multiple researchers and interviewers in the reading and analysis of

transcripts, by a detailed log of analytical notes, and by peer debriefing (Denzin and

Lincoln, 2000).

4.3 Results

Analysis revealed that participants' scripts for the evening meal at home varied

in scope and flexibility. Scripts depicted participants' interconnected dominant

values, general expectations, and plans that included strategies, procedures, and

behavior sequences. Participants' scripts closely corresponded to evening meal episodes reported in the 24-hour situational recalls. Discrepancies between evening meal scripts and 24-hour situational recall data were explained by unexpected events or situations that led to variations between usual scripts and particular meals.

4.3.1 Dominant Values

Participants emphasized specific goals or desired outcomes when talking about their evening meals. These goals and desired outcomes provided insight into what participants valued overall for these eating episodes. Many different dominant values for the evening meal emerged. The most common dominant value identified by participants was having "family time". For example, participants said, "the most important thing about dinner at home is for the family to be together eating together" and "that time is just family time." Another dominant value expressed by participants was to have uninterrupted quiet so they could relax during the evening meal. These participants said, "having some down time, relaxing….not rushing around [is important]" and "[I try to] eat without interruption. It don't happen that often. I mean that's my relax time. After a hard days' work, all I want to do is come home, chill out, relax." Other dominant values included getting the family fed, having foods that everyone likes, just eating, having a nutritious meal, recreating childhood experiences, and entertaining guests.

4.3.2 General Expectations

Participants' general expectations for the evening meal at home were represented in their overall summaries of how things would "go" for this meal. General expectations refer to what participants anticipated to happen at the evening meal. Participants explained their general scenarios for this meal, describing what

they saw as typical such as in time of day (e.g., "Dinner is usually about 6:30 to 7:00"), people present (e.g., "I expect anyone that sits at my kitchen table to be somebody who respects and cares about the people at that table"), their own emotional state (e.g., "So I usually feel relaxed and content and happy to be there."), satisfaction with the outcome ("[I'm satisfied] when things go smoothly and you don't burn anything and everything tastes good and everything goes together and it's a nice time together when there's not a lot of static"), and whether the episode would be a positive or negative experience (e.g., "[dinner is] the most relaxed situation, it's the best situation… because there's less pressure and we don't have to follow any food chain guidelines or whatever. (laughs) Just him and me. It's fun that way.") Participants' general expectations provided insight about their conceptualization of the evening meal as a whole.

4.3.3 Plans

Participants' scripts for the evening meal included sequences of behavior expected to occur. Participants' plans depicted their own behaviors and those of others involved in the evening meal. Participants described many different behaviors including but not limited to arranging, shopping, deciding what to have, getting input from others, preparing food, serving food, announcing the meal, arranging seating, eating, meal time conversation, other meal time activities, and cleaning up (Table 4.1).

Plans also included details about strategies for the different behaviors and specific procedures used to carry out these behaviors at the evening meal. These strategies and procedures were interconnected throughout the plan. The following sections describe these interconnected strategies and procedures and provide examples of each.

4.3.4 Strategies

Strategies were general approaches used for behaviors that participants used at the evening meal. Examples of different strategies that participants described for specific behaviors related to the evening meal are shown in Table 4.1. For example, participants described varied approaches for arranging the evening meal. Some participants usually anticipated the meal whereas others described a typically spontaneous approach of not doing anything "until hunger strikes." Still others reported that their typical approach was to fit in eating when they had time. Participants described different strategies for deciding what to have and for getting the food ready. Participants who valued eating together at the same table at the evening meal described strategies for getting everyone to sit together. The strategies for conversation behavior at the meal that participants explained ranged from not talking to encouraging talking or controlling the conversation to exclude certain topics. Participants who valued quality interactions and privacy during the evening meal described numerous different strategies they used to control meal time interactions and maintain privacy. Participants who explained that guests were common at their evening meal reported special strategies they used to entertain these guests. The strategies for cleaning up that the participants reported varied according to the people involved in these tasks.

Table 4.1 Examples of food-choice behaviors and strategies for the evening meal

Behavior Examples	Strategy Examples
Arrange the meal	Menu-planning Eat when there is time Wait until hunger strikes to eat
Decide what to have	Choose foods that family members and friends like Offer choices Try new things Eat whatever they desired Make selected foods healthier
Get the food ready	Share meal preparation responsibilities Do it all alone Nonworking spouse cooks
Get people together	Set the food on the table Have chairs ready for everyone to sit in Insist that all family members come to the table
Manage conversation	Avoid controversial issues during dinner Talk with others while eating Keep the conversation going Keep the conversation under control Avoid talk during dinner Separate work from home
Keep things private	Do not answer the phone Ask uninvited guests to leave Block the end of the driveway to discourage uninvited guests Limit meal time distractions
Entertain everyone	Make others comfortable Organize seating arrangement Keep things casual Be more formal Make more food Use good dishes
Clean-up afterward	Clean-up together Wife/mother cleans-up Non cooking partner cleans-up Kids clean-up Store leftovers

4.3.5 Procedures

Procedures were specific acts or methods participants used to carry out food-choice behaviors. Procedures included specific details such as explanations of steps that need to be taken and ways to do things at the evening meal. Procedures were specific to the different behaviors participants described for the evening meal such as planning, cooking, or interacting. For example when explaining how he prepared a meal that involved grilling, one participant said "If it's grilling, I'm out there grilling. But if it's something that needs to be, if I have like potatoes, somebody to turn the potatoes, the roasted rosemary potatoes, flip them over, then somebody's in the kitchen."

4.3.6 Script Scope and Flexibility

Participants' scripts for the evening meal varied in scope and flexibility. The scope of a script was defined as the starting and ending points and the detail of the plan. Scripts began and concluded at different points depending on participants' involvement and the importance they placed on the evening meal. Some participants' meal scripts began many hours before the actual consumption of food. The plans of these participants included multiple food-choice behaviors such as pre-meal arranging, shopping or buying food, preparing food, eating, meal interactions, and cleaning up. Although many of these activities occurred before or after consumption, participants still included them as part of their scripts for the evening meal. Other participants' plans began and ended at or near the consumption of food.

Participants with more meal responsibilities tended to provide more detailed strategies and procedures. These participants began their plans at menu planning or cooking and ended with clean-up including details of how these activities were carried out. These participants described thinking about the evening meal in advance and

making various decisions like where to eat, what to have, or who to eat with.

Participants with less detailed plans often limited their descriptions of what they did to

simple phrases. They began their plans with waiting for the food to be ready and did

not include much detail about meal preparation or clean-up.

Participants' scripts for the evening meal were also flexible to accommodate

day-to-day variations in timing, weather, people, foods, other activities, and moods.

Participants accounted for these day-to-day variations in their scripts using "if-then"

statements. If-then statements provided alternative behaviors, strategies, and

procedures when different aspects of the evening meal changed. Participants with

irregular evening meal routines provide more if-then statements than participants with

stable, consistent evening meal patterns.

The following two examples illustrate the range in script scope and flexibility.

One participant with a detailed script that covered a wide scope of food-choice

behaviors and variations explained;

> "I always cook. ..My kids will help me if they're there and it's just as far as
> cleaning and preparing it.…[I put the food] right in the kitchen and each gets
> what they like. I usually do the first serving and then if anyone wants seconds
> they get seconds… [during dinner we are] eating and talking, …I don't know
> sometimes we're going up for seconds, we just kind of do an open, everyone
> helps themselves… And we'll talk about things, the things going on or things
> with work up here maybe or with the family business or things like that, or
> their friends or things they're planning to do for the week, movies, whatever it
> is. …Everyone puts their plate in the sink. I'll clean up or we'll clean up, it
> depends on the night."

Another participant with a simple script that covered a narrow scope of food-choice behaviors reported;

> "It's usually ready about 20 minutes before I get home because I never get to leave on time. So dinner is ready at 5 and I don't get home until 5:30. Then [my husband] just pops it into the microwave….He does the clean up….Start to finish. I walk through the kitchen, that's about it. (laughs) And that's only because that's where the main entrance is. In other words I wouldn't even know where the kitchen is (laughs)."

4.3.7 Case Studies

The two evening meal case studies (Table 4.2 and 4.3) provide examples of different food choice scripts that demonstrate the relationships between values, expectations, and plans that included strategies and procedures. The first case presents a father who described himself as the head of the table (Table 4.2). His script covered a wide range of food-choice behaviors from planning to clean-up. He used many if-then statements to describe different possibilities and his script contained a lot of detail. His dominant value was "for the family to be together, eating together" and his script shows what this means and how he makes this happen.

The second case study (Table 4.3) presents the evening meal script of a man who lived with his girlfriend and had no involvement in meal planning, preparation, or clean-up. His script is very simple with limited detail. His dominant value was to "get full" and his script demonstrates how he does this.

Table 4.2 Evening Meal Script Case Study: "Head of the table cooks"

'Typically' me, my wife, and our two sons	
A. Dominant Value	"The most important thing about dinner at home is for the family to be together, eating together."
B. General Expectations	"I think that's the one time of the day that all other differences are set aside and that's why it's so special. It doesn't matter if we've all had a bad day. Dinner is when we're together, and, nothing else matters as far as, who did what, or, who's mad at who."
C. Plan	
C1: Behavior: Get Input	
Strategy	"somewhere during the week, I try to get it… we try to get input…from the kids mainly, on what they want to eat"
Procedure	"They give suggestions of things they'd like. They'll have eaten something in a restaurant and say can you make this. … Or they'll just, you know I've made something and they'll say wow that's really good … for example rice pilaf. Now that they know I know how to make rice pilaf… they don't buy the prepackaged mix…. So we make it from scratch and it's actually a lower cost…. And they actually eat everything that's there. Like I said their likes, their preferences. Like I said they make a lot of suggestions on different foods."
C2: Behavior: Shop together	
Strategy	"[my wife and I] do [the shopping] together….we make the decisions together… On food."
C3: Decide what to have for dinner	
Strategy	"[I think] 'what are we gonna eat and how can we do it without causing a battle?'… it doesn't makes sense to… make something and know the kids aren't gonna eat any of it…Or something that Tammy doesn't like."
Procedure	"There's enough foods out there that all four of us can be happy at the same time… as far as foods that we would eat for dinner, we never fix anything that the four of us won't eat…. If there's something I particularly want, I can have it for a different meal…. because we're talking dinner when it's the four of us… And if it's something I really want, I will make it to bring for lunch, or make it when the boys aren't there." "if it's just, my wife and the boys, we keep it pretty simple. we know they're not that vegetable eaters so, we don't, elaborate on vegetables… Almost all of our dinners are a protein based meal. So these are just our, again, proteins, um, and there's some fast foods in here. Um, we do eat fast food sometimes…. [protein food] is our main meal. … And then we build around it….Dessert…dessert, uh, for us is something that, we do have a couple hours later…beverages varies… I mean it goes from water, the boys drink regular soda. Tammy and I drink diet sodas. We only have 2% milk. Sometimes the boys drink juice, occasionally Tammy and I have a glass of wine."

Table 4.2 (Continued)

C4. Behavior: Deciding what to have if we have family or friends come	
Strategy	"[if we have family come] The quantity of food [is different]… And the variety."
Procedure	"If it's other family, we will, do a lot more salads, a lot more, variety in the meal. I mean everybody will, it's almost like a potluck dinner. Where everybody'll bring a lot more things…. So, it ends up being a lot more food. … if the whole family's there, we do desserts occasionally, they bring it… cause they bring it"

C5. Behavior: Cook	
Strategy	"I usually do all…I usually do the majority of the cooking."
Procedure	"I was in food service for 25 years before coming to computers. I like to really, well I guess I can say simplify. Last night's dinner was simple, it was just grilled chicken. But I also like at the same time to experiment with different sauces, like that. Or, there are times when I cook that I really super-garnish everything…. One thing is as far as the tasks, I am capable of having everything come off the stove at the exact same time. Or off of two different cooking surfaces. Like you know I can be out at the grill and have something on the stove or and in the oven and have everything get done at the exact same time. From years of experience for one thing. But also the task that has to go along with it that I'm not as good as I should be, or at least my wife tells me I'm not, is you know cleaning everything as I go. (laughs)… Although I have to some part managed that by if I'm prepping vegetables, I don't prep them on the counter next to the stove, I prep them on the counter next to the sink. Because that's where the garbage disposal is."

C6. Behavior: Sit together, eat, and talk cordially	
Strategy	"Typical dinner at home now is that we all sit at the dining room table, and eat dinner. Occasionally, we will, congregate in the, living room or the TV room. Typical dinner now is around the dining room table, all of us talking, eating, taking our time."
Procedure	"At our dinner table I think I'm Robert Young… I'm at the head of the table…Tammy's more at the other…opposite me, but, it's just that I am at the head of the table. I don't steer the conversation, but Tammy and I sit side by side. And the boys sit side by side… there's 4 of us at the table… Tammy sits across from Richard. I sit across from Alan. But we give the boys… they can talk to each other without talking across the table. …And, I really do at times feel like, Robert Young that I am, at the head of the table. And that's my spot at the table…. and we're cordial and, we don't argue at the dinner table."

Table 4.2 (Continued)

C7. Behavior: Sitting, eating, and talking if we have family or friends come	
Strategy	"So we all sit together"
Procedure	"When you have family come in, whether it's my mom or mother in-law, father in-law, sister in-law like that, it's typically around the dining room table unless it's a barbeque or picnic…but even then we'll set a table up outside and sit around a table…it takes a lot longer to eat because we're doing a lot more conversation."
Strategy	"It's a hit or miss thing where somebody might pop in, and, if they're there at mealtime, we eat…. I would just include them in the meal"
Procedure	"We don't hold off meals because somebody is there…we just go ahead and start eating, and invite them to stay. It would more than likely be at the dinner table, if it's dinner…we would pretty much make them part of the family for that meal."

Table 4.3 Evening Meal Script Case Study: "Don't decide anything, just eat"

A. Dominant Value	"To get full."
B. General Expectations	"[I'm usually] Glad to be home, relaxed…. …I'm just happy the way it is, [just me and] my girlfriend"
C. Plan	
C1. Behavior: Find out what is for dinner	
Strategy	"I don't decide anything for dinner."
Procedure	"Dinners there when I get there, so I don't know. I don't decide any dinners… I say what's for dinner…. I don't like that part of it, if I have to wait, that's why I'm glad dinners done when I get there…. I like it when I want it."
C2. Behavior: Talk with girlfriend while she prepares dinner	
Strategy	"[while she makes it I] Talk about what's going on, watch a little TV….That's about it really."
C3. Behavior: Eat and watch tv	
Strategy	"I really don't like to sit there and talk, I'd rather eat….We can talk after…. I don't want it to get cold…. Michelle's the same. She'd rather just eat unless something's important."
Procedure	"[I'm usually] Watching TV. Talking about what else I had to do at my house…. [we sit] in the living room. I don't eat at the kitchen table ever….I've got one there, it's stacked full of papers and everything else on it."
	"Some food is more heavier, makes me tired sometimes I don't know, it's just the way, more starches, I don't know. It's just something to do with the food."

4.3.8 Kinds of evening meal scripts

Eight kinds of evening meal scripts emerged from participants' descriptions, with each person represented in one kind. Kinds of scripts were 'Providing dinner for my family,' 'Head of the table cooks,' 'Head of the table does not cook,' 'Share the work,' 'Trying unsuccessfully to have a family meal,' 'Anything goes,' and 'Live alone entertaining.' Figures 4.1 through 4.8 portray the evening meal scripts of one participant example from each of the eight kinds. These figures depict general outlines of participants' food choice scripts for the evening meal, primarily information from plans including sequentially ordered food-choice behaviors and strategies. The figures also portray scope and flexibility of the scripts. In these figures, arrows indicate that one food-choice behavior follows another. Dotted lines indicate alternative possibilities for that food-choice behavior. Solid lines connect behaviors that occur simultaneously. The boxed in section represents the behaviors that occur while the evening meal is consumed.

My husband and I shop

↓

I cook ·············· sometimes the kids help

↓

I set the food up in the kitchen

↓

I do the first serving

↓

All four of us sit together at the table

We talk and plan   Eat

Everyone gets their own seconds

↓

Everyone puts their plates in the sink

↓

Usually I clean up ·············· Sometimes the kids
and my husband help
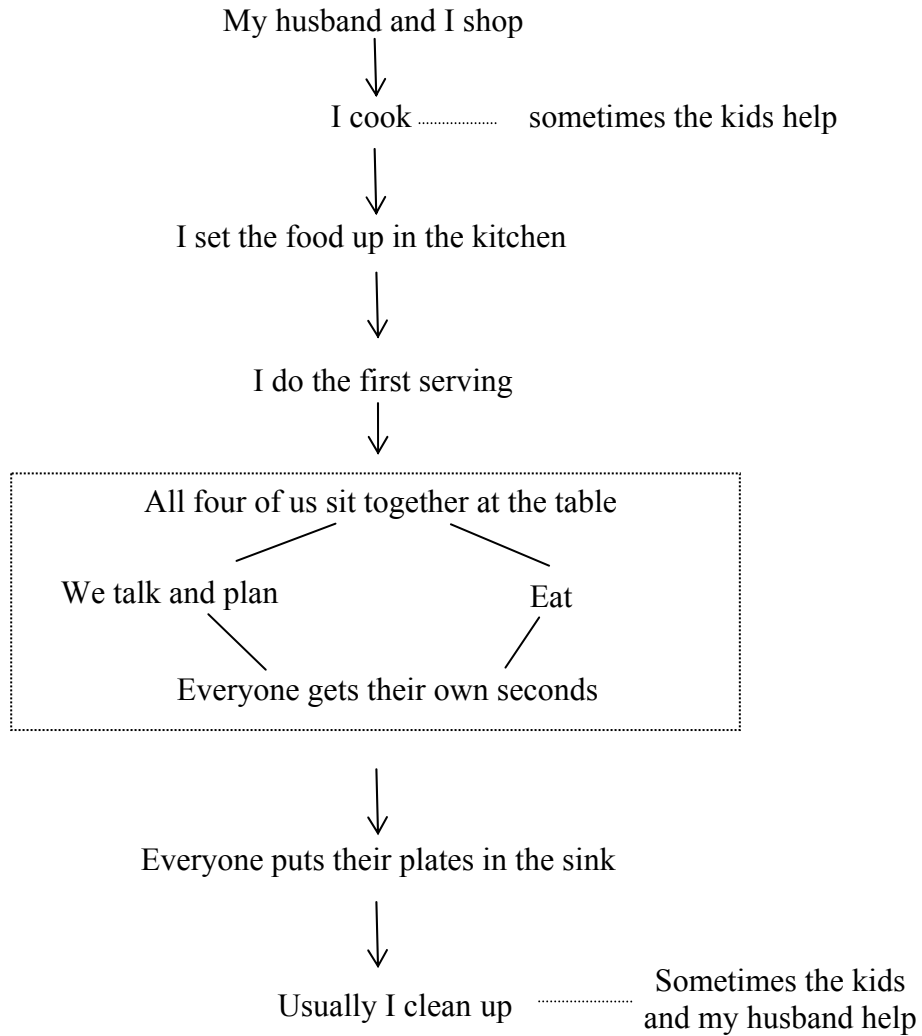
Figure 4.1 Summary of the "Providing dinner for my family" script for the evening meal for one participant

↓ represents a sequential behavior
… represents alternative behaviors
\ represents simultaneous behavior
☐ represents behaviors while a meal is consumed

I get input from the kids about what they want

↓

My wife and I shop together

↓

I decide what to have for dinner

↓

I cook ········· If family comes they bring food too

↓

All four of us sit together at the table
With me at the head of the table

We talk ——————— Eat

If family or friends
········come we include
them at the table

↓

My wife cleans up

Figure 4.2 Summary of the "Head of the table cooks" script for the evening meal
for one participant

↓ represents a sequential behavior
… represents alternative behaviors
\ represents simultaneous behavior
□ represents behaviors while a meal is consumed

My wife shops, plans, and chooses meals

↓

I help out when there is
grilling and we talk

My wife does all the meal prep

I'm usually doing other
things while my wife
gets dinner ready

↓

My wife calls me to the table when it is ready

↓

All four of us sit together at the table
With me at the head of the table

Eat

We talk and I keep a
handle on conversation

Listen

↓

My wife cleans up ⋯⋯ Sometimes I help
with clean-up

Figure 4.3 Summary of the "Head of the table does not cook" script for the
evening meal for one participant

↓ represents a sequential behavior
… represents alternative behaviors
\ represents simultaneous behavior
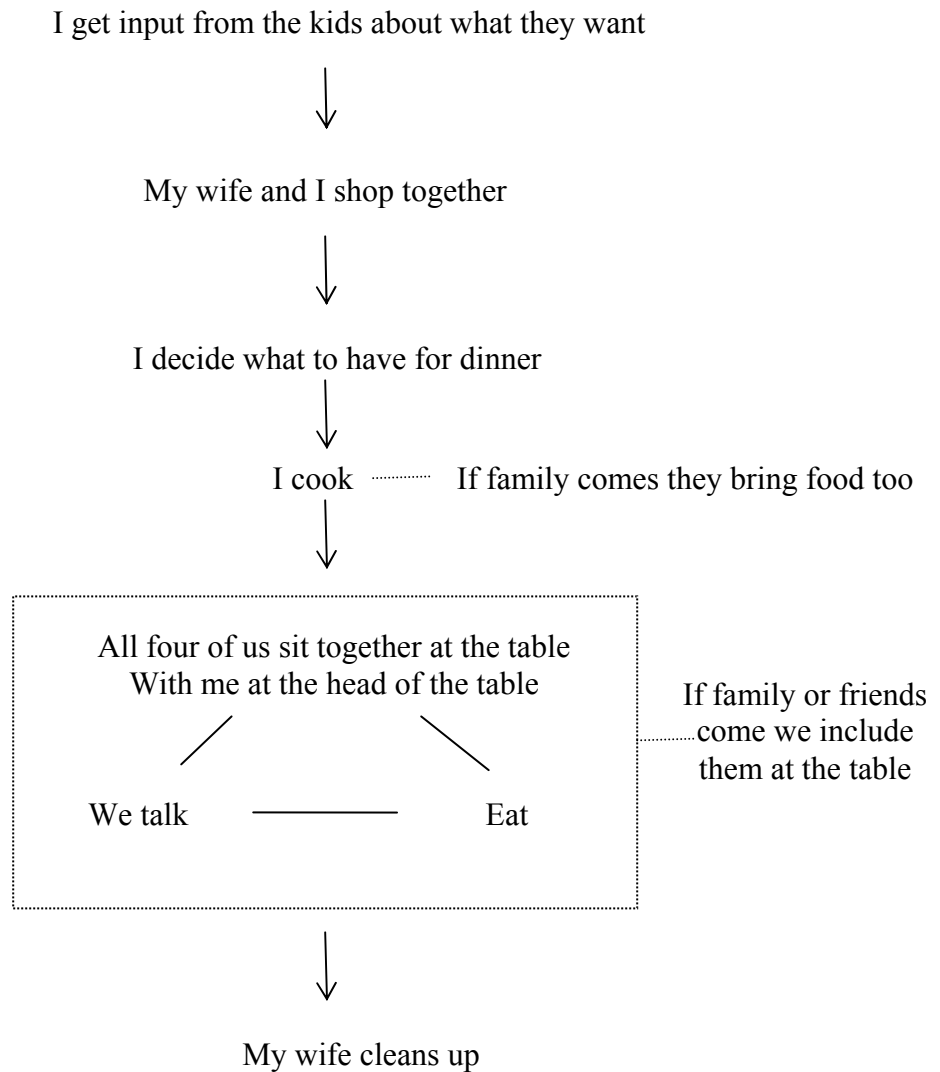☐ represents behaviors while a meal is consumed

We try to plan meals in advance

↓

I shop with coupons

↓

My husband chooses what to have nightly ---------- If it's my turn to cook
I make something
quick and easy
or we get take-out

↓

My husband usually cooks

/ \

I anticipate the meal,   I spend time with my kids
enjoy the smells \   /

We watch tv

↓

All four of us sit together at the table
or on the living room floor

We talk   We eat

We watch tv

↓

I clean up

Figure 4.4 Summary of the "Share the work" script for the evening meal for one participant

↓ represents a sequential behavior
… represents alternative behaviors
\ represents simultaneous behavior
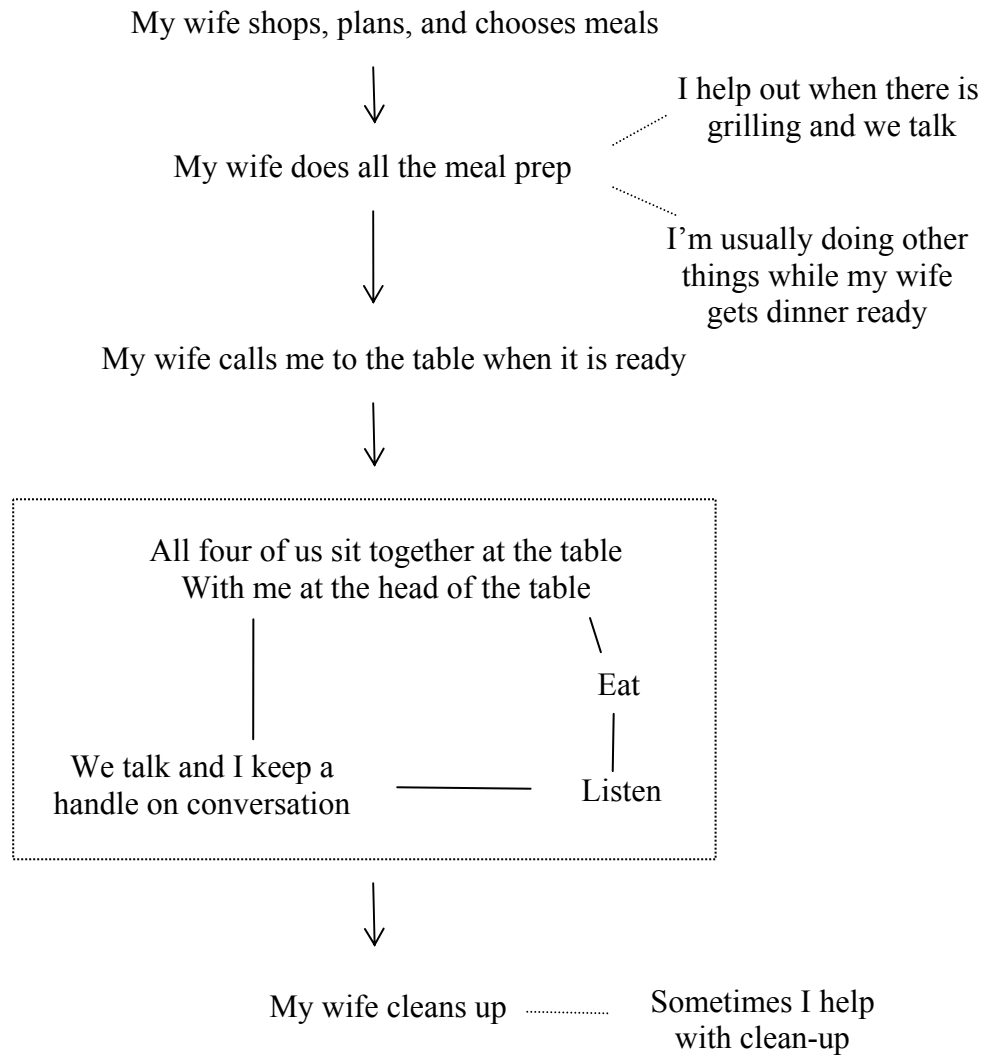□ represents behaviors while a meal is consumed

I ask everyone what they want →

I cook and try to make it healthier by using less fat →

My wife and step-son go to separate rooms

Watch tv — Eat

I sit alone at the table

Eat

If my son is there he sits with me

Talk and joke around

Eat

My wife yells at us

Figure 4.5 Summary of the "Trying unsuccessfully to have a family dinner" script for the evening meal for one participant

→ represents a sequential behavior
… represents alternative behaviors
\ represents simultaneous behavior
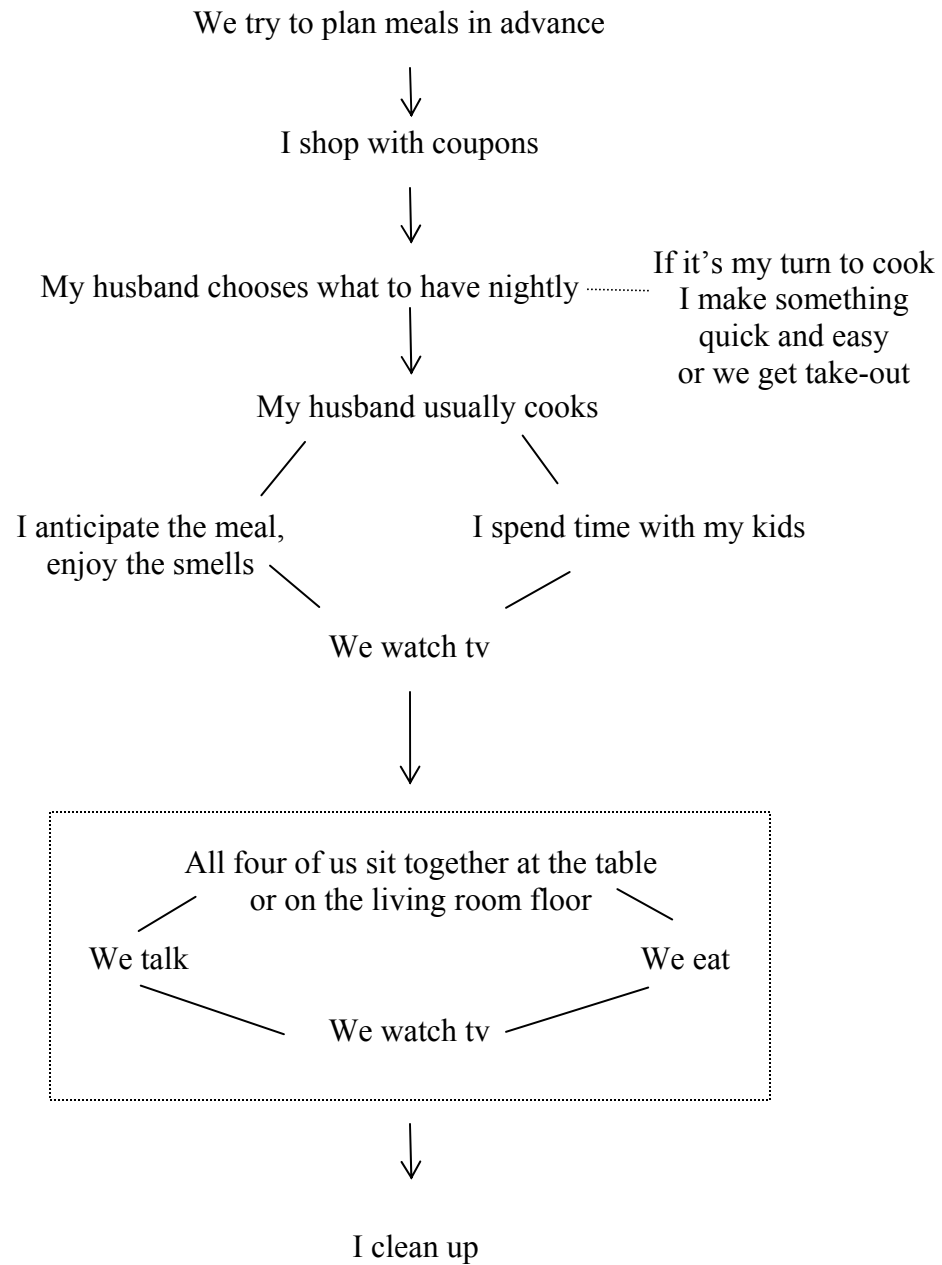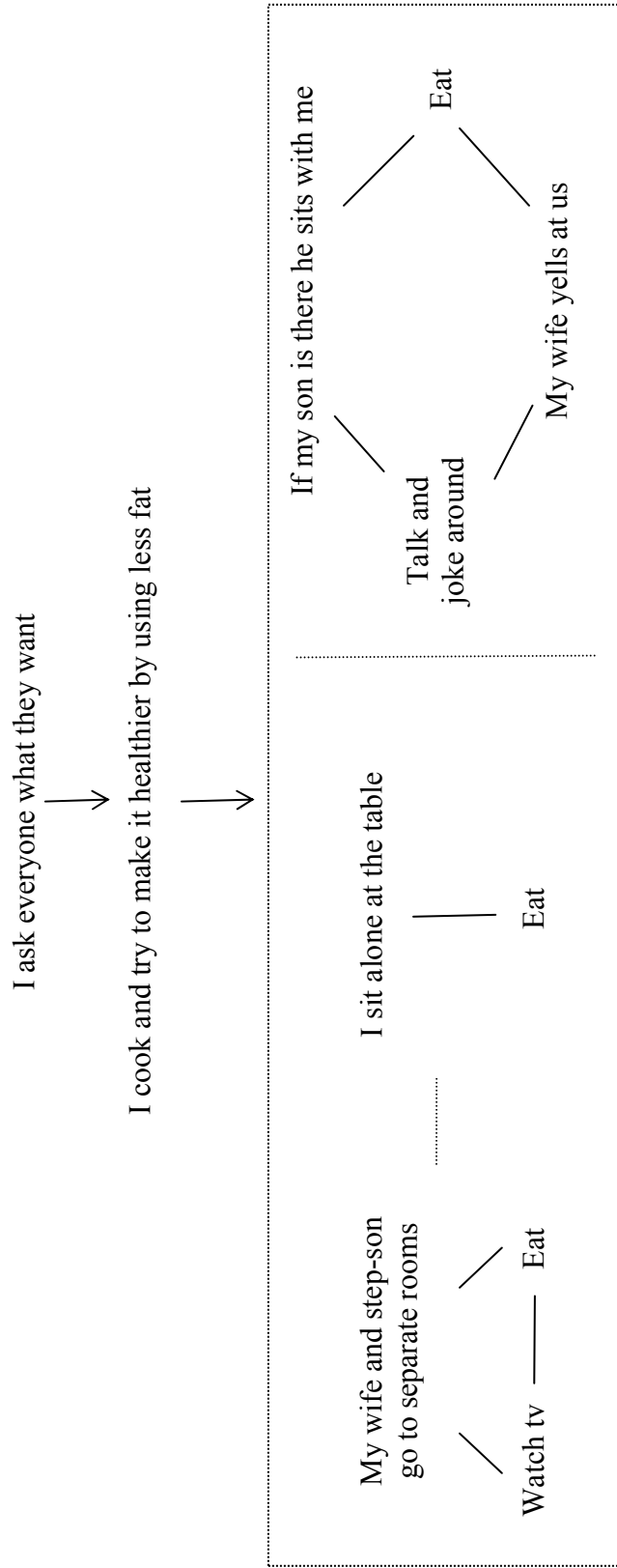□ represents behaviors while a meal is consumed

I watch TV

My girlfriend makes dinner

Sometimes we talk

We sit in the living room

We watch TV ——— Eat quietly

My girlfriend cleans up

Figure 4.6 Summary of the "Just eat" script for the evening meal for one participant

↓ represents a sequential behavior
… represents alternative behaviors
\ represents simultaneous behavior
□ represents behaviors while a meal is consumed

Usually I prepare it .... Sometimes we prepare it together .... Sometimes I come home and my husband already prepared it

Sometimes we sit in the tv room

Eat ——— Watch tv

Sometimes we sit in the kitchen – Especially if other people are there

Eat ——— talk

Sometimes I sit alone in the kitchen

Eat

Sometimes I stand alone in the kitchen

Eat ——— Clean

Figure 4.7 Summary of the "Anything goes" script for the evening meal for one participant

↓ represents a sequential behavior
... represents alternative behaviors
\ represents simultaneous behavior
□ represents behaviors while a meal is consumed

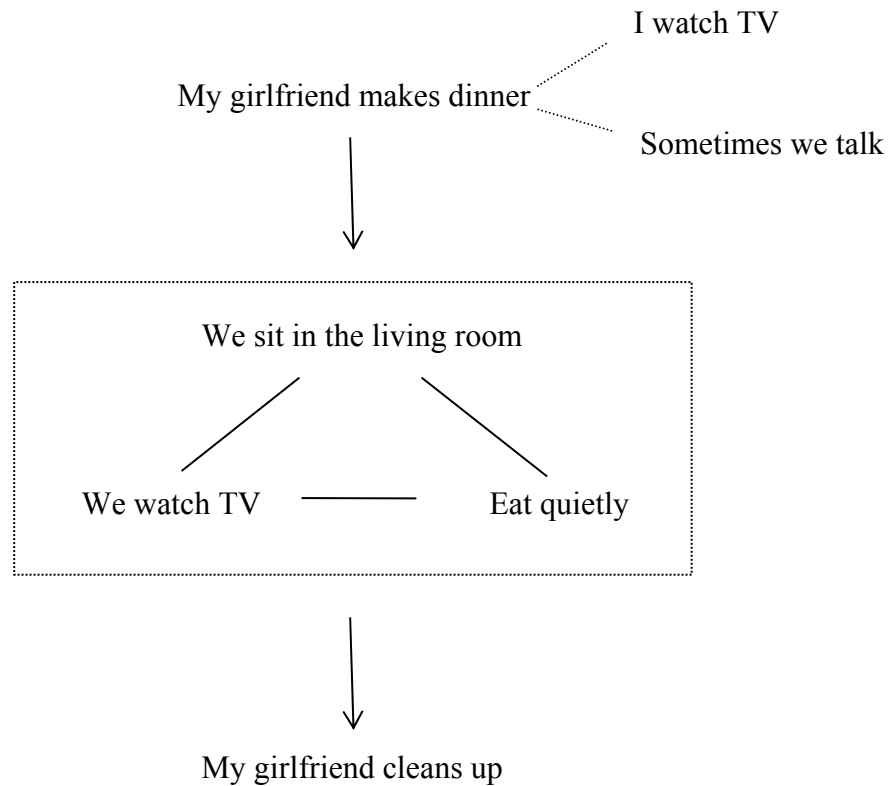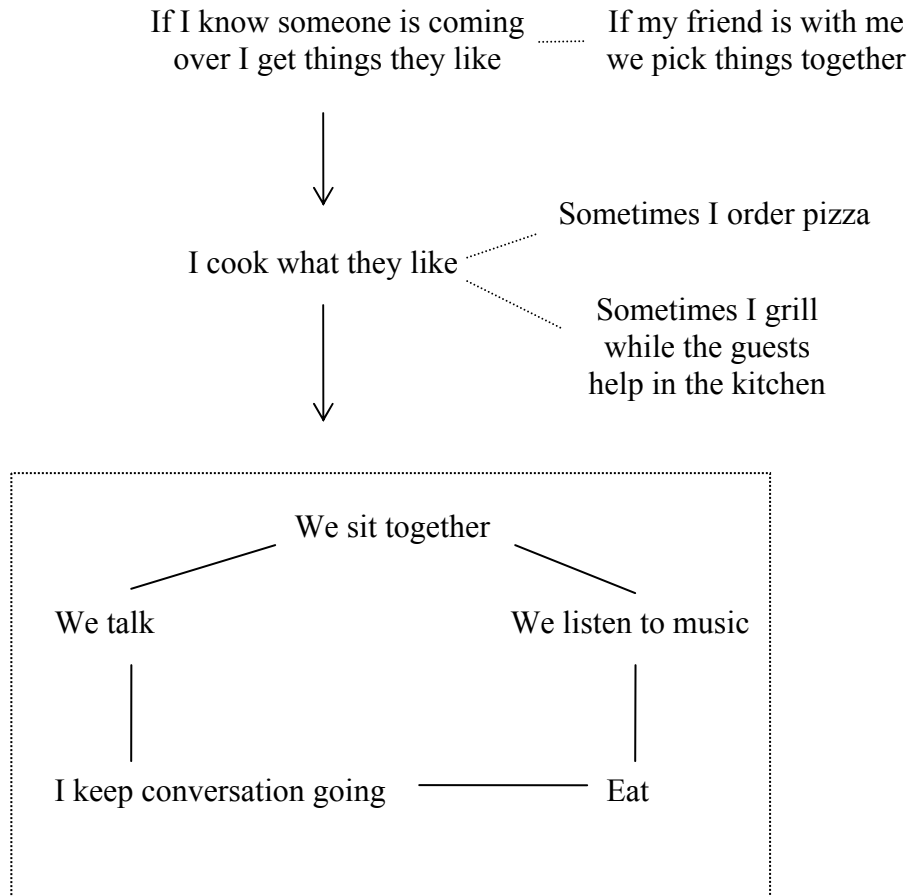If I know someone is coming .... If my friend is with me
over I get things they like   we pick things together

↓

I cook what they like .... Sometimes I order pizza

Sometimes I grill
while the guests
help in the kitchen

↓

We sit together

We talk   We listen to music

I keep conversation going ———— Eat

Figure 4.8 Summary of the "Live alone entertaining" script for the evening meal
for one participant

↓ represents a sequential behavior
… represents alternative behaviors
\ represents simultaneous behavior
☐ represents behaviors while a meal is consumed

The seven participants who used the 'Providing dinner for the family' script were all women (Figure 4.1). Most had children living at home, but two lived alone with their partners and talked about providing meals for other family members and friends. The two participants who used the 'Head of the table cooks' script (Figure 4.2) and four who used the 'Head of the table does not cook' script (Figure 4.3) were all men, and all but one had children living at home. The script summary portrayed in Figure 4.2 represents the same participant as the case study presented in Table 4.2. The five participants who used the 'Share the work' script were men and women who had spouses that liked to cook as much or as little as they did so they split the tasks (Figure 4.4). The four participants who used the 'Trying unsuccessfully to have a family meal' script were men and women who tried different strategies to have what they called nice family meals, but their partners did not cooperate (Figure 4.5). Their scripts dealt mainly with trying to sit together while eating the evening meal. The two participants who used the 'Just eat' script were both men who were not involved in meal planning, preparation, or clean-up (Figure 4.6). They did not see dinner as a time to socialize but preferred to just eat food. The script summary portrayed in Figure 4.6 represents the same participant as the case study presented in Table 4.3. The three participants who used the 'Anything goes' kind of script were men and women who did not place a lot of value on having a family meal (Figure 4.7). These people prepared food and ate when the mood struck, did not have set plans on who would do what or when things were done, and for whom the evening meal was more spontaneous than for others. The five participants who used the 'Live alone entertaining' script were men and women who lived alone and liked to have friends and family at the evening meal (Figure 4.8). They did a lot of entertaining and liked to satisfy others preferences.

4.3.9 Overlapping Scripts

Some participants provided scripts for dinner that overlapped with scripts from other kinds of episodes, such as shopping episodes, driving episodes, or family conversation episodes. In most cases overlapping episode scripts were compatible. For example, participants' shopping scripts resulted in the purchase of food that would be used in the dinner episode, or participants' family conversation scripts began before and continued through and after the dinner episode scripts. One participant described an eating episode that was embedded within a larger family time episode. Her goal for dinner was to feed her family healthy food while her goal for family time was to "catch-up" with her fiancé and spend time with him and the children. The strategies and plans she used in these episodes were compatible. She said,

> "It's play time, And then after that it's …"family time"… mom [I] make dinner and get in here and sit down and talk and then they'll get their little blankets from their beds and just lay on us and cuddle and watch TV… Talking, find out how his day is. When he walks in the door it's like 'hi honey', give him a kiss, give him a hug and then ask him how his day was and then it's the same thing. We usually … I cuddle up next to him and he puts his arm around me and whoever I have on my lap and whoever he has on his lap and we'll just sit there and watch TV. And eat."

4.4 Discussion

This project explored how adults constructed the evening meal at home. Schema theory was used to guide the analysis. The constructivist approach and qualitative methods allowed the perspectives, experiences, and interpretations of the participants to emerge. The results demonstrate the complex constructions that people may hold for a single eating episode like the evening meal. Food choice scripts depict

the relationships between expectations, values, and plans, including the behavior sequences, strategies, and procedures involved in the plans. Food choice scripts depict relationships between expectations, values, plans, strategies, and procedures. The current analysis demonstrates how these different concepts work together to guide and shape food-choice behaviors.

Viewing food choice as involving scripts provided useful concepts for identifying and understanding how different cognitions and cognitive processes worked together in food choice. Food choice scripts emphasize the relationships between expectations, values, plans, strategies, and procedures. Food choice scripts elaborate on the personal food system concept by demonstrating the relationship between value negotiations, strategies, and specific food-choice behaviors such as acquiring food, cooking, or eating (Falk et al., 2001; Furst et al., 1996). The present studies' results suggest that people have dominant values for specific eating episodes and that these values frame food choice scripts. The scripts include plans with sequentially ordered behaviors, strategies providing a general guide for behavior, and procedures that include relatively specific details about how the behavior will occur within the episode.

The findings highlight important individual differences in the conceptualization of a single eating episode among people from similar social, cultural, and economic backgrounds. Participants' scripts for the evening meal varied in scope, flexibility and the extent to which they overlapped with scripts for other behaviors. Participants who saw the dinner at home eating episode as an important, special part of their day had elaborate scripts involving many food-choice behaviors. In contrast, participants who viewed the evening meal at home as a time to get fed described simple scripts for this meal. This analysis focused only on the evening meal

at home, and the differences among participants may not apply to food choice scripts for other meals and snacks.

The findings provide useful insights about the values that may be salient for the evening meals in contemporary U.S. households. Many participants viewed the evening meal as an important time to be with family members, and single participants also saw the evening meal as a time to connect with friends. The findings link to other literature emphasizing social processes in food choice (Sobal, 2000). Participants' emphasis on relaxation and privacy for the evening meals suggests that some people may view the evening meal as a way of separating from the workday and an otherwise busy, interrupted lifestyle. The family reconnecting values that emerged in this study are linked to findings of prior studies, where researchers found that children who regularly eat evening meals with their family have higher school and psychological performance and healthy dietary intake patterns (Gillman et al., 2000). Surprisingly, health and nutrition did not emerge as important values in evening meals at home among the participants.

In this study, several men reported that they were very involved in the creation of the evening meal at home. Their involvement included taking responsibility for varying food provisioning activities as well as for actions to promote positive family interaction during the meal. In contrast, some women participants described being involved in this meal only as eaters. More inquiry into contemporary gender roles in evening meals at home is warranted (Bove and Sobal, 2006) because most prior literature on family food provisioning and the creation of family through meals has emphasized female gender roles (Charles and Kerr, 1988; DeVault, 1991; Murcott, 1983).

Food choice scripts provide health professionals with a new way to view food behaviors that offers insight about ways to promote healthy eating practices People

develop routines for food and eating behaviors as ways to provide predictability and simplicity in food choice decision making (Connors et al., 2001). However, when a particular eating episode is encountered repeatedly, parts of the episode script may begin to function automatically and may even be used in episodes where it is inappropriate (Baldwin, 1992). Asking people to add, modify, or delete a given food or way of eating may require them to adjust many aspects of their scripts including the values, expectations, strategies, and procedures for several different food-choice behaviors. Food choice scripts provide an alternative way to conceptualize routine food-choice behaviors and offer insights that may be useful to nutrition educators and practitioners who seek to promote the adoption of healthy eating practices.

Nutrition recommendations may be most easily adopted if it fits the individual's food choice scripts. For example, some participants reported that at the evening meal they valued preparing foods that everyone would like. Their scripts involved offering choices and preparing others' preferences. These participants would be unlikely to eliminate a family favorite from their food repertoire. Nor would they be likely to add something identified as a better option by the nutrition professional if they did not believe that their family would eat it.

This study provided insight into evening meals scripts of a sample of 42 employed adults living in one geographic region of Upstate New York. These findings may not be generalizable to other people living in different places and at different times or to other food and eating contexts. People who do not eat evening meals may not have evening meal scripts. Among those who do hold evening meal scripts, the details of those scripts may be different than the scripts identified in this study. Also, the scripts that study participants hold for other food and eating contexts may be different from evening meal scripts. Finally, there is no perfect substitute for data collection in a real life evening meal context. The researchers attempted to

capture participants' experiences with evening meals using a series of open-ended questions, but it is difficult to recreate real life experiences. Examining evening meal scripts in real life, real time settings may yield different results (Meiselman, 1992).

4.5 Conclusions

The identification and exploration of food choice scripts for the evening meal contribute to understanding how individuals cognitively construct food choice by demonstrating how an individual's values and expectations relate to behavior sequences, strategies, and procedures for food choice. Food choice scripts provide insight into the link between cognitions and behavior that may be useful to nutrition educators and other practitioners interested in promoting adoption of healthful eating habits. Future investigations should examine the processes proposed in this model with different participants, in different settings, and for different eating episodes.

CHAPTER FIVE:

GENERAL DISCUSSION

5.1 Introduction

 The three papers presented in the previous chapters show how people classify foods across different food and eating contexts and describe the food choice scripts people use to guide their behavior. Each chapter provided detailed presentations and discussions of analyses and results. The following sections focus on integration of the results, relationship of results to prior literature, strengths and limitations of the overall project, implications for research and practice, and conclusions.

5.2 Integration of results

 The purpose of this research project was to explore and describe how adults construct food choice using schema theory. Three papers each examined schema in a different way.

 The first paper explored the different categories individuals used to classify foods across four different card sort contexts, one with no context defined, one for the participant's most common non-work context, one for the participant's most common work context, and one for the participant's most common eating alone context. The results of the first paper demonstrated that people's food schemas contained different non-hierarchically arranged categories based on context, food, or personal experience. Twelve different category types were identified and described. Routine, Preference, Meal/time, and Meal component were the most commonly used category types in all card sorting contexts for most participants. This suggests that these types of categories provide the foundation for classifying foods among participants in this sample. Participants varied in their use of the other eight category types across the

four card sort contexts. Location and Convenience category types were used most often in the work context, Person category types were used most often in the non-work context, and health and nutrition related category types, including Food group, Well-being, Nutrient composition, and Physical characteristics, were used most often when no context was defined. Category types were also used by different participants in the four different contexts suggesting that individuals varied in their use of food-category types across contexts. Overall, these findings suggest that health and nutrition related categories, which provide the foundation of many nutrition education efforts, are less salient than other categories in real life eating contexts and that there may be important differences in the ways individuals classify foods across food and eating contexts.

The second paper used cluster analysis methods to compare participants' use of food categories in the card sorts to identify differences in individuals' food schemas. The analysis identified seven different clusters of participants based on their food-category type use. The clusters were oriented toward different food categories. Clusters 1 and 2 were oriented toward personal habits, preferences, health, and emotions. Clusters 3, 4, 5, and 6 were oriented toward contextual aspects of food and eating including who, when, how, and where. Cluster 7 was oriented toward properties of food, including origin, physical characteristics, and nutrient composition. Although some Cluster 7 participants mentioned health, they did not ascribe personal health relevance to their card-sort labels, which made them different from Cluster 2 participants. The findings highlighted the importance of individual differences in food conceptualizations that may be useful when developing nutrition education messages.

The third paper used in-depth qualitative interviewing to explore participants' constructions of the evening meal. Analysis revealed that participants used scripts for their evening meals that included interconnected dominant values (e.g., "to have

family time"), general expectations (e.g., time, people present), and plans. Plans included sequential behaviors, strategies (e.g., "don't argue at the dinner table," "if I'm hungry I'll eat"), and specific procedures that described steps or actions. Participants' food choice scripts varied in scope and flexibility depending on their involvement in the evening meal. Scope dealt with starting and ending points and level of detail, while flexibility was represented by the use of if-then statements to accommodate variation in the eating episode. Eight kinds of scripts for the evening meal were identified, including 'providing dinner for my family,' 'head of the table cooks,' 'head of the table does not cook,' 'trying unsuccessfully to have a family meal,' 'shared responsibility,' 'anything goes,' and 'live alone entertaining.' These findings reveal that people varied widely in their evening meal scripts even within this relatively homogenous sample.

Cognitive schema structures (Nishida, 1999) were explored and described in all three papers. The first paper provided a detailed description of categories that make up participants' food schemas. The results demonstrated that people's food schemas contained different non-hierarchically arranged categories based on context, food, or personal experience. The second paper provided insight about how individuals varied in their food schema structures as demonstrated by differential use of food schema categories. Individuals' use of different categories across contexts in paper one, and clusters of participants portraying different orientations across people in paper two reveal how food schema structures vary both within and between people. The third paper provided insight about the structures of scripts participants used for the evening meal. Summarization of participants' food choice scripts for the evening meal depicted participants' mental organization of food-choice behaviors.

Cognitive schema processes (Nishida, 1999) were explored and described in the first and third papers. The results in paper one demonstrated how food schema

category usage varied as the food and eating context changed. Paper three presented the cognitive processes involved in the construction of the evening meal by showing how interconnected values, expectations, and plans that included strategies and procedures formed scripts for food choice. The information contained in a script became increasingly more specific ranging from the general approaches of strategies to the detailed actions and rules of procedures, with procedures drawing on numerous different kinds of information, including food schema categories. The finding that participants' scripts for evening meal episodes included reference to food categories demonstrated how different kinds of information about food are interconnected to guide and shape food-choice behaviors.

Integration of results from the three papers presented here provides further insight about relationships between schema structures and processes. The results of paper two, that people vary in their use of food-category types overall, suggested that people who use different food choice scripts for the evening meal may also vary in their use of food-category types. A comparison of how food-category types were used by participants for each of the different kinds of food choice scripts is presented in Table 5.1. Each cell indicates the count of participants included in the identified script type who used each of the food-category types at least once in the evening meal food card sort. There was a great deal of overlap in the use of food-category types, but some important differences were noted. For example, participants who used the 'anything goes' script used Routine and Meal/time category types less frequently than any other group. The participants who used the 'live alone entertaining' script used the Person food-category type more frequently than any other group. These differences are consistent with what would be expected from participants using these kinds of scripts. Participants using the 'anything goes' scripts for the evening meal described little routine or planning of meals. Their less frequent use of Routine and

Meal/time food-category types is consistent with this finding. The participants using the 'live alone entertaining' script described focusing on others at the evening meal, therefore their frequent use of Person food-category types was consistent with their scripts. This suggests that scripts provide a way of understanding how cognitions (as the categories people use to conceptualize foods) are linked with behavior (as the strategies and procedures people used). However, the evening meal is only one episode that participants had scripts for, whereas the classifications presented in paper one resulted from data collected across several contexts. In addition, the scripts for the evening meal were explored for 32 of the total sample of 42 participants. Therefore, the relationships discussed here, while intriguing, may be limited and warrant further study.

5.3 Contribution to the literature

Context is an important influence on food classification. The ways people classify foods for specific contexts, however, had rarely been explicitly examined prior to this investigation (Achterberg, 1988; Meiselman and MacFie, 1996). By studying food classification across multiple eating contexts, the study identified a rich set of categories. Some of these food categories have been previously identified (e.g., "breakfast foods," "healthy foods," "like," "try to avoid") (Falk et al., 2001; Furst et al., 2000; Lennernas and Andersson, 1999; Matheson et al., 2002; Murcott, 1982; Ross and Murphy, 1999; Sobal and Cassidy, 1987;1993), while others were newly delineated in this investigation (e.g., "refreshing and cleansing," "change of pace," "other people prepare"). Also, the majority of the categories identified in this investigation were based on aspects external to the food, such as the person or the

Table 5.1 Count of participants in each kind of food choice script who used each food category type.

Food Category Type	Food Choice Script							
	Provider (n=7)	Head of table cooks (n=2)	Head of table (n=4)	Share the work (n=5)	Trying unsuccessfully (n=4)	Just eat (n=2)	Anything goes (n=3)	Live alone (n=5)
Routine	5	2	3	5	4	2	1	3
Meal-time	5	2	3	5	4	2	1	4
Meal component	5	2	2	4	4	2	2	2
Preference	0	2	2	4	2	2	0	3
Convenience	3	1	0	1	0	1	0	2
Location	0	0	1	1	1	1	0	1
Source	1	1	2	2	2	1	1	2
People	1	0	1	1	2	0	0	4
Well-being	2	0	2	2	0	1	1	2
Food group	3	1	1	1	0	1	1	1
Nutrient composition	1	0	0	0	0	0	1	0
Physical Characteristics	3	1	0	1	1	1	1	0

context, which is in contrast to many previous studies of food classification (Ross and Murphy, 1999). These findings suggest that studies of food classification should attend to important food and eating contexts.

Earlier studies of food choice have identified and described numerous different influential factors including aspects of the food such as taste or healthiness, aspects of the environment such as social setting or availability, and aspects of the person such as food identity or health concerns (Axelson and Brinberg, 1989; Bisogni et al., 2002; Blake and Bisogni, 2003; Booth, 1994; Falk et al., 1996; Macfie and Thomson, 1994; Meiselman and MacFie, 1996; Murcott, 1988; Shepherd, 1999). The food choice process model provides a broad framework for understanding how these factors shape individuals' food choices grounded in the publics' perspective (Furst et al., 1996) (Figure 5.1). The food choice process model depicts food choices based on life course experiences that result in major influences including ideals, personal factors, resources, social contexts, and food context. These influences shape individuals' personal food systems that involve cognitive processes such as value negotiations and formation of strategies. Value negotiations involve the weighing and accommodation of competing considerations for food choice. Strategies for food choice simplify food choice decision making and develop over time. The personal food system construct provides insight about the cognitions involved in food choice. Researchers working with this model have stated that elaboration on these relationships is needed to provide a better understanding of how these processes work (Connors et al., 2001). In particular, the way that these factors are translated by the person into food-choice behaviors has not been clearly explained.

Food choice scripts depict relationships between expectations, values, plans, strategies, and procedures. Some of these concepts, including strategies (Falk et al., 2001) and values (Connors et al., 2001), have been previously identified and described

for food choice. The current analysis demonstrates how these different concepts work together to guide and shape food-choice behaviors. These findings elaborate on the food choice process model by depicting how dominant values, general expectations, and plans that draw on relevant food categories are interwoven in food choice scripts for specific eating episodes (Figure 5.2). Food choice scripts provide a template for behavior in specific eating episodes. The identification and description of food choice scripts demonstrates a theoretical link between mental processes involved in the personal food system and food-choice behavior.

An individual's understanding of food and eating is based on cognitive constructions of past food and eating experiences (Furst et al., 1996). Schema theory provides a useful framework for understanding cognitions involved in food-choice behaviors. According to schema theory, these cognitive constructions include categories of different kinds of information organized in complex structures and scripts that draw on this information to guide behavior (Baldwin, 1992). Investigations of other types of complex behaviors, such as interpersonal communications, have resulted in the identification of numerous different kinds of schemas including fact-and-concept, person, self, role, context, goal, procedure, strategy, and emotion schemas (Baldwin, 1992; Markus, 1999; Nishida, 1999). Researchers have suggested that further study of how these schemas work together to guide behavior in various different domains is needed (Axelson and Brinberg, 1992; Baldwin, 1992; Blake and Bisogni, 2003; Cooper, 1997; Nishida, 1999; Olson, 1981). The work presented here informs schema research by exploring one specific fact-and-concept schema, food schema. These findings provide insight into the many different categories that make up individuals' food schemas and how these categories are differentially accessed by individuals' depending on the food and eating context.

Scripts for the evening meal presented in paper three provide a framework that depicts how different schemas interact in food-choice behavior processes. This is important because much of the literature on scripts deals with memory of text passages and problem solving with little emphasis on the relationship between scripts and behavior (Barsalou, 1992). The findings from this dissertation research suggest how scripts can be used to conceptualize linkages between cognitions and behavior. The evening meal scripts drew on many different kinds of information stored in memory (schemas) including values, expectations, plans that include sequential behaviors, strategies, and procedures, and food schemas (Figure 5.2). In this report, dominant values framed an individual's food choice script and are similar to goals described in the schema literature as a desired end to a sequence of actions (Baldwin, 1992; Schank and Abelson, 1977; Trzebinski, 1985). The expectations described by participants in this investigation dealt with various aspects of the eating context including time, place, people, satisfaction, emotions, etc. This component of participants' scripts is similar to the context and emotion schemas described in the schema literature (Nishida, 1999).

Plans, strategies, and procedures have been described as procedural schemas that include information about what to do in various situations (Baldwin, 1992; Nishida, 1999). The plans of participants' evening meal scripts included sequentially organized behaviors linked to strategies and procedures for action. Strategies described general behaviors directly related to dominant values. For example, a participant who stressed 'family time' as a dominant value for the evening meal described strategies that fulfilled that value such as having a sit-down dinner. Procedures differentiated the "knowing what" of strategies from "knowing how" by providing specific steps and rules for behavior. Procedures drew on food schema categories to guide selection of foods to fit the particular context. The findings in the first paper provide insight into the breadth, depth, and situational specificity of food

schemas, one important fact-and-concept schema involved in food choice processes. The exploration and description of food choice scripts provides deeper insight into how schemas operate in the cognitive behavioral domain of food choice. The project as a whole takes schemas and scripts which are usually used to describe memories and cognitions toward an understanding of behavior processes, demonstrating a link between cognitions and behavior.

5.4 Strengths and Limitations

This project used primarily qualitative methods to explore and describe how adults construct food choice based on a constructivist paradigm that assumes that individuals' knowledge of the world emerges through experience and social relationships (Fosnot, 1996). Criteria have been proposed for judging the soundness of constructivist, qualitative research including credibility, transferability, dependability, and confirmability (Lincoln and Guba, 1985; Trochim, 2001). Credibility involves ensuring that the results are believable from the participants' perspective. Transferability is similar to the concept of generalizability and refers to the extent to which findings can be transferred to other people or contexts. Dependability requires that the researcher account for the continual changes that occur in the research context during the study period. Confirmability refers to the degree to which study findings can be confirmed by others (Trochim, 2001). Several steps were taken at various points throughout the research project to ensure that these criteria were met.

The approach used in this investigation allowed the perspective, experiences, and interpretations of the participants to emerge, strengthening the credibility of findings. This project involved numerous contacts with participants providing more opportunity for establishment of rapport, extensive field notes, and a good
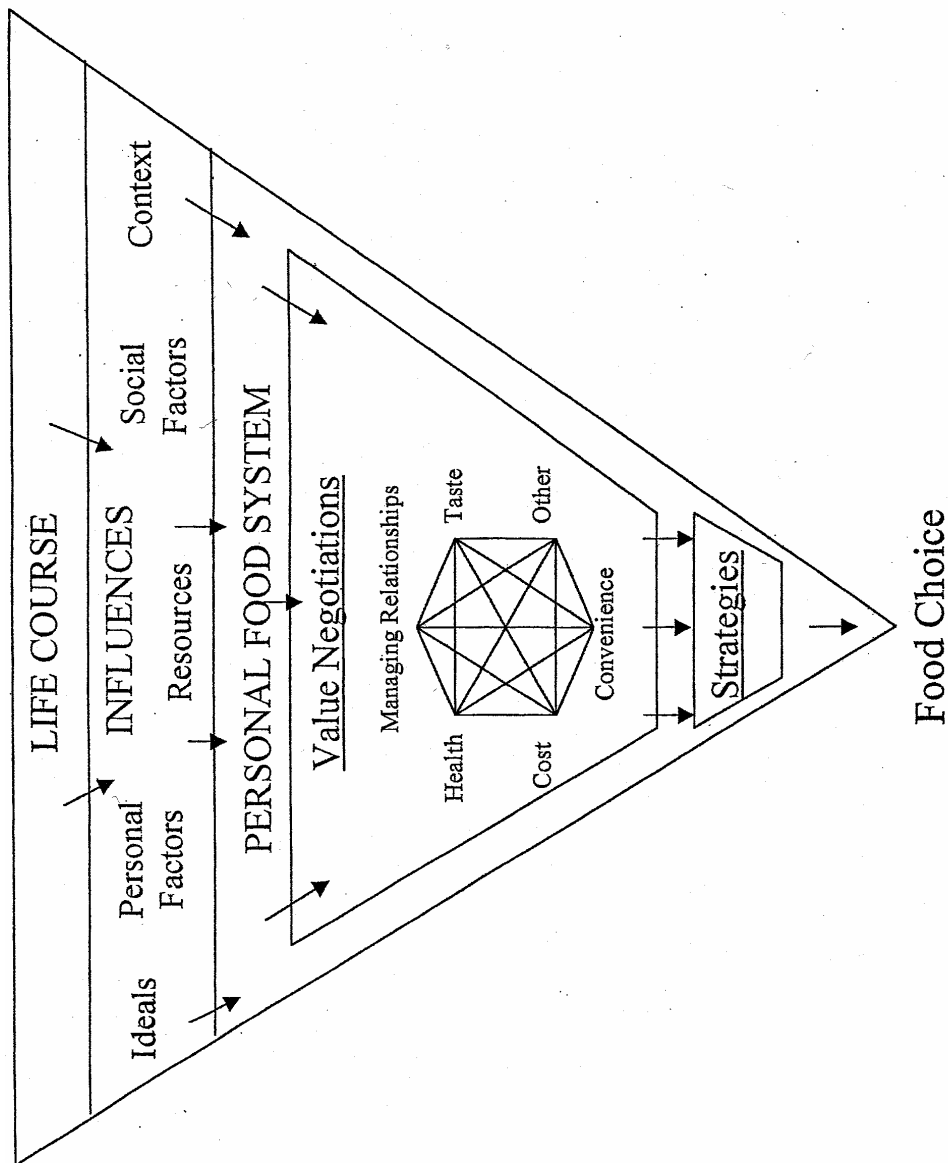
Figure 5.1 The food choice process model (Connors, M., Bisogni, CA., Sobal, J., & Devine, CM., 2001)
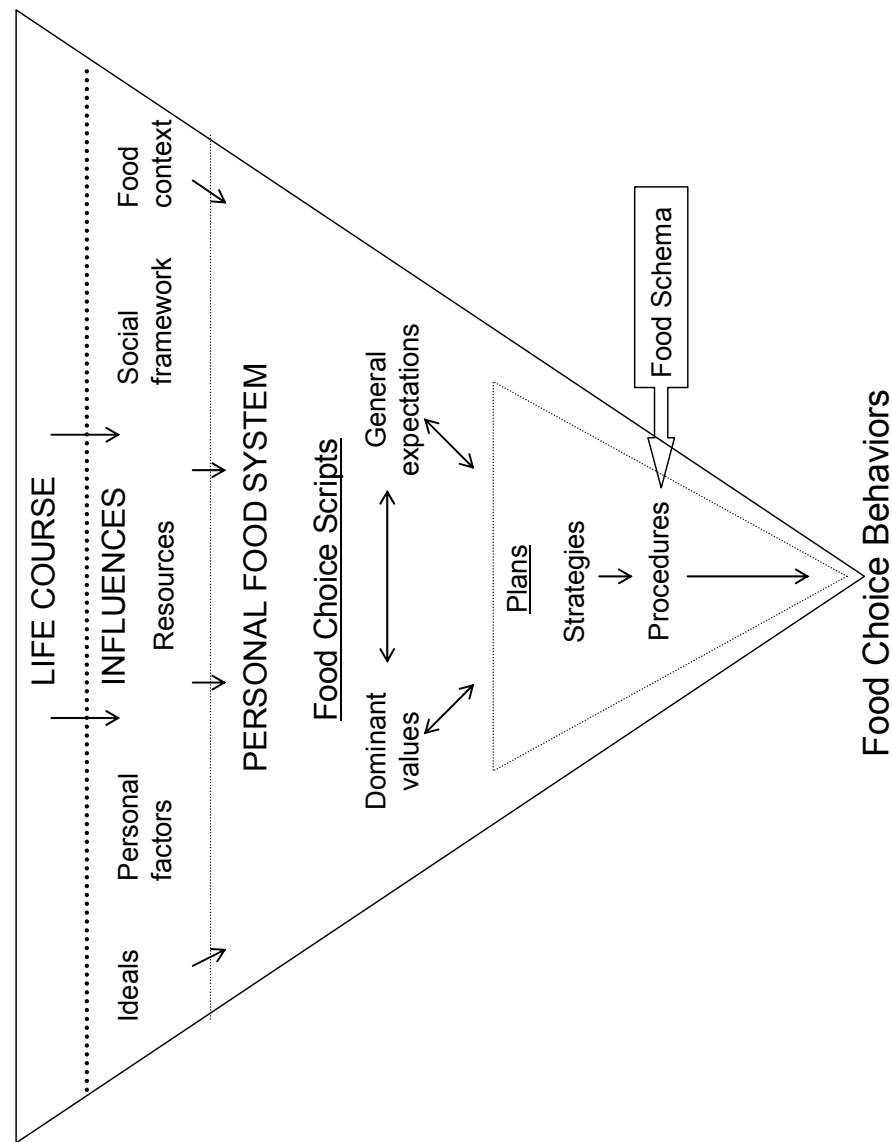
Figure 5.2 Food Choice Scripts in the Personal Food System: An elaboration of the Food Choice Process Model

understanding of the research context. Grounded theory methods provided analysis guidelines to ensure that results are grounded in the perspectives of the participants (Denzin and Lincoln, 2000; Glaser and Strauss, 1967; Strauss and Corbin, 1990). Also, member checking was accomplished through the presentation of preliminary analysis and interpretations during the final interview (Lincoln and Guba, 1985). This project involved an extensive exploration of participants' eating contexts including multiple qualitative, 24-hour situational recalls, extensive use of qualitative interview questions with probes, and card sorting activities. The combined use of these techniques provided an in-depth description of eating contexts that strengthen claims for transferability of results to other similar food and eating contexts. Dependability was enhanced through careful attention and adaptation to the changing research context. Research ideas were noted in an audit trail (Guba, 1981) and used to guide sampling and analysis. Ongoing purposive sampling allowed for recruitment of participants meeting criteria that the researchers identified as potentially informative through preliminary analysis. Multiple researchers were involved in all aspects of this project, including development of data collection tools, collection of data, analysis of data, and interpretation of findings establishing confirmability of results. In addition, interviewers were involved in the data analysis process, providing deeper insight into the meaning of participants' statements and allowing for clarification of confusing passages. Finally, peer debriefing was accomplished through poster sessions (Blake et al., 2004; Blake et al., 2003) and oral presentation (Blake et al., 2005) of preliminary results.

The limitations of the project must also be recognized. The findings propose some fundamental ideas about cognitive structures and processes as they link to behavior and context that should be common among people. The study participants were, however, a small, purposively selected sample of people who were willing to

volunteer for this in-depth project. Therefore, the findings may not be transferable beyond the study participants in all respects. Different types of category labels and different scripts for the evening meal may emerge from people living in other places and cultures, working in other occupations, and having different socioeconomic characteristics. The particular food cards used here may have limited the labels that participants used in the card sort activities. The inclusion or exclusion of selected foods or the decision to represent multiple levels of categorization on the food cards may have resulted in the emphasis and inhibition of some categories (Macrae et al., 1995). Also, the evening meal which was the focus of analysis in the third paper is likely to be different from other food and eating contexts. Therefore, it is possible that the results of paper three would be different if another eating context such as breakfast or lunch at work were the focus of analysis. Finally, there is no real substitute for data collection in a real-life context. The researchers attempted to capture context specific experiences using a series of open-ended questions to frame contexts, but some aspects of these experiences are likely to be lost in this abstraction. Examining food schemas in real life, real time setting may yield different results (Meiselman, 1992).

The backgrounds and orientations of the researchers involved in this project influenced all aspects from data collection to interpretation. The researcher came to this project as a registered dietitian oriented toward gaining a better understanding of how individuals interpret and understand foods in their own lives in order to improve nutrition education efforts. The research group was made up of nutrition faculty, registered dietitians, and nutrition students with similar orientations. A person interested in gender, social structures, culture, food access, etc. might have asked different research and interview questions and had a different interpretation of the food card sort results and in-depth interviews.

5.5 Implications for Research and Practice

The findings presented in this project highlight important directions for future research. An overriding theme of this investigation was the importance of attending to context in studies of food and eating. Participants' food schemas were made up of food categories that varied for different food and eating contexts and described food choice scripts that were unique to their own evening meal contexts. One particular aspect of food and eating contexts that warrants further study is the distinction that emerged between the food-category types participants used in work versus non-work settings. Work environments have been described as barriers to consumption of fruits and vegetables (Cohen et al., 1998), and work as a context for eating is understudied (Devine et al., 2003).

This study examined food classification using only a few variations of some characteristics of eating contexts (people, time, place). Eating contexts have other characteristics, such as activities, emotions, social processes, physical needs (Bisogni et al., 2006). Therefore, classification of food cards in more and different contexts would generate further details about food schema categories. Furthermore, an exploration of population and community level food schema would provide information on important culturally shared food categories and their variations among subgroups.

The identification of food choice scripts for the evening meal provides important insight about how people's mental processes are translated into action in a specific, common eating episode. Additional information about how scripts for food choice develop and change would provide valuable information for nutrition educators and practitioners who promote behavior change. In addition, studies of other eating contexts and episodes would provide a broader understanding of the different food choice scripts people use to guide their day-to-day eating.

The analyses presented in the preceding chapters explored schemas and scripts within and between people and contexts. Additional analyses could provide insight into how an individual differentially classifies foods or how an individual's script changes as the food and eating context changes. Such analyses would expand understanding of food schemas and scripts by demonstrating how individuals' cognitions and the environment interact to guide food choices.

The findings of this project provide a valuable set of conceptual tools for dietary assessment, nutrition counseling, message tailoring and targeting, and program design and evaluation. Scripts provide insight into how mental processes are linked to food-choice behaviors. Identification and exploration of an individual's food choice scripts could be useful in nutrition counseling sessions. Ascertaining food choice scripts for important eating episodes could be incorporated, in a small amount of time, into a typical dietary assessment interview to provide valuable information for use in nutrition education sessions. For example, a standard 24-hour recall interview asks a person to list everything they ate or drank the previous day, providing details about amounts consumed and cooking methods. In addition to this valuable information the interviewer could identify important eating episodes, such as those where most of the day's calories or specific foods of interest are consumed. Focusing on the specific episode, the interviewer could ask the participant to describe what is typically happening using probes like, "what is important to you in this situation?," "what is happening?," "who does what?," "how are things done?," "how do you usually feel?," "how do you decide what to eat?," "can you tell me about the foods you eat in this situation?," and "are there foods you always eat/never eat in this situation?" etc. This information could be used to sketch out a script summary, like those presented in paper three, to use as a visual teaching tool during the counseling session. The nutrition educator and the client could focus on this script summary to identify what

changes are feasible and how these changes could most easily be adopted. The advice provided should take advantage of existing schemas and scripts where feasible. If deviations from individuals' scripts are necessary, however, the educator should focus on promoting deviations from the previously established script (Werner et al., 1998).

The concept of script interruptions provides insight into promoting behavior change using script information. Script interruptions are deviations from a script that may result in behavior changes. Script interruptions are fostered by presenting people with information or situations contrary to their existing scripts. When attempting to interrupt a script, the message should be clear and memorable to promote changes in behavior. Studies on recycling behavior have demonstrated that signs and instructions that took customers recycling scripts into consideration and were clear and memorable had greater positive effects on behavior change than standard recycling signs. (Werner et al., 1998; Werner et al., 1996). The intent of script interruptions is not to rewrite a script but to use knowledge of peoples' scripts to identify where changes in that script would have the desired impact on behavior. Exploration and application script interruptions could provide valuable insights into food-choice behavior change processes.

The results of this study suggest ways to modify nutrition education messages to be more meaningful to target audiences. Some investigators suggest that health promotion messages are typically framed using food and nutrition categories (Axelson and Brinberg, 1992; Murcott, 1982; Sobal and Cassidy, 1987;1991;1993; Worsley, 2002). In this investigation, however, food and nutrition related category types including Well-being, Food-group, Nutrient composition, and Physical characteristics were used most frequently when no eating context was defined. Many nutrition practitioners and educators already consider their clients' perspectives and experiences with food. A focus on individuals' food schemas and scripts could enhance

practitioners' ability to understand clients' food related cognitions allowing them to better tailor nutrition education and counseling messages (Campbell et al., 1994; Kreuter and Skinner, 2000). This information is also useful when attempting to interrupt people's scripts to promote positive food-choice behavior changes.

The study of food schemas and scripts also provides valuable insights for nutrition program design and evaluation. The steps outlined above for ascertaining an individuals' important food choice schemas and scripts in counseling sessions could be modified for use in a program setting. For example, a weight-loss program for adults could be designed to ascertain participants' scripts, to use these scripts to guide behavior change, and to evaluate program success. Scripts could be used as a tool during one-on-one educations sessions to identify where changes could be made to promote positive health habits and to tailor nutrition advice. Scripts could also be used to evaluate the success of an intervention. It often takes many years for the impact of a nutrition intervention program to be translated into meaningful behavior changes or health improvements (Worsley, 2002). Positive changes in food choice scripts may be a useful way to demonstrate short term program success.

Schemas and scripts are formed and shaped through experience as a member of a cultural group living and working in a certain time and place. Some aspects of an individual's experiences are likely to be shared by members of a cultural group living in similar environments (Backstrom et al., 2003; Cullen et al., 2002; Moscovici, 2001). These shared experiences and corresponding shared schemas and scripts could be a useful point of focus for community level nutrition programs. For example, a worksite program designed to increase fruit and vegetable consumption of employees could begin by using methods outlined above to explore and describe food choice scripts for a representative sample of employees. Scripts could be analyzed for commonalities. Common aspects of food choice schemas and scripts could be used to

guide program design and messages. Evaluation of program success could be measured using both food-choice behavior data and follow-up analysis of employees' food choice schemas and scripts.

Thus far this discussion has emphasized changes in personal choice. The study of schemas and scripts may also provide useful information for programs that are designed to change food and eating environments. By analyzing schemas and scripts important aspects of food and eating environments may be identified. A study of recycling behavior used knowledge of recycling schemas and scripts to redesign recycling centers and signs. The results of this intervention demonstrated that schema and script compatible structural changes can change recycling behavior (Werner et al., 1998). A similar approach to food choice could be effective in promoting behavior change. For example, cafeterias and grocery stores could use knowledge of their customer's food choice schemas and scripts to position healthy foods to promote their selection. Work sites could explore employees' food-choice schemas and scripts to structure break times and eating areas, including access to vending machines, to encourage healthy work place eating habits. The interaction between individuals cognitive schemas and scripts and eating environments is an important area that warrants further study.

5.6 Conclusions

The application of schema theory to food choice provided important insights into the mental processes involved in food choice. Food schemas consist of rich, complex, and context specific categories that are differentially accessed depending on the food context. Individuals vary in their use of food categories demonstrating cognitive differences that may underlie food-choice behaviors. Food choice scripts contribute to understanding how individuals cognitively construct eating by

demonstrating how an individual's mental processes are linked to behavior through interconnected values, expectations, plans, strategies, and procedures for food choice. These findings provide insight into food choice schema structures and processes that may be useful to nutrition researchers, educators, and program planners interested in promoting adoption of healthy eating habits by individuals and populations. The methods used in this project were productive in shedding new light on food choice. Future investigations should examine food schemas and scripts using similar methods with different participants, in different settings, and for different eating episodes. Nutrition counseling approaches and interventions should consider food choice schemas and scripts when developing messages and designing programs. Such information would be invaluable for targeting communication and developing programs to promote healthful food choice.

APPENDIX A

<u>FIRST INTERVIEW</u>

<u>SELECTED DEMONGRAPHIC INFORMATION</u>

Participant #: _____

Are you: □ Male   □ Female

What is your age: _____ years

Are you currently:

□ Working at a job or business full time

□ Working at a job or business part-time

□ Retired

□ Student

□ Not working/ Unemployed

□ Other _____

If employed:

What is your current occupation: _____

What are your prior occupations:

_____

_____

_____

What is the highest level of education you completed?

☐ No schooling completed

☐ Nursery school to 6th Grade

☐ 7th or 8th Grade

☐ 9th to 11th Grade

☐ 12th Grade – No Diploma

☐ High School Graduate – High School diploma or Equivalent (Ex. GED)

☐ Some college credit, less than one year

☐ 1 or more years of college – no degree

☐ Associate Degree

☐ Bachelor's Degree

☐ Graduate/Professional Degree

What is your marital status?

☐ Never Married

☐ Married

☐ Married and separated

☐ Divorced

☐ Widowed

What is your current living arrangement?

☐ Live alone

☐ Live with spouse/partner

☐ Live with roommate/unrelated adult

☐ Live with relatives (not spouse/partner)

How may other adults over age 18 live in you household? _____

How many children live in your household who are:

     Less than 2 years old?_____

     2-5 years old?   _____

     6-12 years old?   _____

     13-18 years old?   _____

What is your Race/Ethnicity (check all that apply):

☐ White

☐ Black, African American, or Negro

☐ Spanish, Hispanic, or Latino

☐ American Indian or Alaska Native (Print name of enrolled or principle tribe)

_____

☐ Japanese

☐ Korean

☐ Vietnamese

☐ Native Hawaiian

☐ Guamanian or Chamorro

☐ Samoan

☐ Other Pacific Islander

☐ Asian Indian

☐ Chinese

☐ Filipino

☐ Other (print race) _____

FIRST INTERVIEW: QUALITATIVE 24-HOUR SITUATIONAL RECALL

Participant #:

Interviewer:

Day/Date:

Time:

Location:

Bring: Consent forms, Demographic form, Food Frequency Questionnaire

SITUATIONAL FREQUENCY: USE THE WHITE FOOD SITUATION CARDS. REMOVE CARDS 37-43, THE "OTHER" CARDS. START RECORDING

1. I have a stack of cards with the names of some eating times and places on them. Can you sort these cards into the following four piles based on your own eating routines?   Usually – Sometimes – Rarely – Never

Can you say what you are thinking while you do this out loud? Are there any situations missing?

IF YES, USE THE APPROPRIATE "OTHER" CARD AND INDICATE THE NAME OF THE NEW SITUATION IN INTERVIEW NOTES

2. In which of these situations do you most often eat with your family outside of work?   [if no family; friends, roommates etc.]

3. In which of these situations do you most often eat at work?

4. In which of these situations do you most often eat alone?

PROTOCOL IF PARTICIPANT HAS DIFFICULTY CHOOSING THESE THREE CARDS:

1. IF THEY TRY TO CHOOSE THE SAME CARD FOR #'S 3 AND 4 ASK THEM TO SELECT ANOTHER ALONE EATING SITUATION.

2. IF THEY ARE UNABLE TO SELECT A FAMILY EATING SITUATION PROBE TO SEE IF THEY REGRULARLY EAT WITH ANY OTHER PERSON (I.E. FRIEND, COWORKER ETC.)

3. IF THEY ARE UNABLE TO SELECT AN ALONE EATING SITUATION PROBE TO FIND OUT IF THEY ARE FORGETTING TIMES THAT THEY MIGHT EAT ALONE.

4. TRY YOUR BEST TO GET THES THREE TYPES OF SITUATIONS EVEN IF THEY ARE NOT THE **MOST** COMMON.

QUALITATIVE 24-HOUR SITUATIONAL RECALL

PASS 1: I'd like you to tell me everything you had to eat and drink all day yesterday from midnight to midnight. Include everything you ate and drank at home and away. [PROBES: Anything else? And after that? Did you have anything to drink with that?]

PASS 2: Now I'm going to ask you for more detail about the foods and beverages you just listed. When you remember anything else you at or drank as we go along, please tell me.

EATING SITUATION DETAILS

1. Can you give me as much detail as possible about [EATING EVENT IN PARTIICIPANTS WORDS]?

PROBES:

a. At what time did you begin to (eat/drink) the (FOOD)?

b. How much time did you have to eat?

c. Where did you eat this food?

d. Who was there? Anyone else?

e. What were these other people doing? Where they eating? IF YES: Where they eating the same food?

f. How did you decide to eat that?

g. Where did the food come from? [SKIP THIS QUESTION FOR FOODS EATEN IN A RESTAURANT]

h. Who made the decision to buy it? Or who made the decision to go to this restaurant?

i. Who prepared the food? [SKIP THIS QUESTION FOR RESTAURANT FOODS]

j. How were you feeling at that time?

k. What is most important to you in this situation? What are your priorities in this situation? PROBE: What about the food was important?

l. Are there ever any problems/frustrations/difficulties with these types of eating situations?

m. What were you doing while eating that? PROBES: tv, phone, reading, computer, cooking etc.

n. Was this eating situation typical for you? Is it usually this way?

OPTIONAL PROBES:

1. Who would you usually eat with at this time?

2. Who else would you like to eat with?

3. Who usually decides how/ what you will eat?

REPEAT PASS 2 FOR EATING SITUATION PRESENTED UNTIL THE ENTIRE DAY IS COVERED.

COMMENSALITY

Were there times yesterday when you were sitting/ talking with other people who were eating but did not eat with them? Why didn't you eat?

LIKES/DISLIKES

Can you tell about foods that you like? Can you tell me about the foods that you dislike?

What do you consider to be your ideal meal? Can you give a complete description of the foods, the people who are there, the time, the place, the feelings that make this situation special for you? What, where, when, who, how, and why?

WORK

Sometimes meals or eating get disrupted by daily activities and events at home or at work. Were any of your meals or snacks affected yesterday because of something like this? What caused the disruption? How was your eating disrupted?

IF NOT ANSWERED:

Where there times yesterday when you would have eaten or planned to eat and were not able to because something came up to prevent it?

How did the way you ate yesterday work from your perspective? Did the way you ate yesterday go as planned or as you expected?

RULES AND ROUTINES

Can you tell me how you usually get the foods that you use at home? at work? away from home?

PROBES:

Where do you usually get these foods/meals?

What is it about these places that causes you to go there?

Is there any way you simplify food and eating for yourself?

Do you have any guidelines or rules about food and eating?

Do you like getting food/meals from these places?

How do you feel about the time and effort that it takes to get the foods/meals?

What are the food basics or necessities that you see as important?

Is there anything else that you'd like to tell me that I did not ask that would help me understand your eating yesterday?

INTERVIEWS TWO THROUGH SIX:

QUALITATIVE 24-HOUR SITUATIONAL RECALL VIA PHONE

Participant #:

Interviewer:

Date range:

Time:

PASS 1: I'd like you to tell me everything you had to eat and drink all day yesterday from midnight to midnight. Include everything you ate and drank at home and away. PROBES: Anything else? And after that? Did you have anything to drink with that?]

PASS 2: Now I'm going to ask you for more detail about the foods and beverages you just listed. When you remember anything else you at or drank as we go along, please tell me.

EATING SITUATION DETAILS

1. Can you give me as much detail as possible about [EATING EVENT IN PARTIICIPANTS WORDS]?

a. At what time did you begin to (eat/drink) the (FOOD)?

b. How much time did you have to eat?

c. Where did you eat this food?

d. Who was there? Anyone else?

e. What were these other people doing? Where they eating? IF YES: Where they eating the same food?

f. How did you decide to eat that?

g. Where did the food come from? [SKIP THIS QUESTION FOR FOODS EATEN IN A RESTAURANT]

h. Who made the decision to buy it? Or Who made the decision to go to this restaurant?

i. Who prepared the food? [SKIP THIS QUESTION FOR RESTAURANT FOODS]

j. How were you feeling at that time?

k. What is most important to you in this situation? What are your priorities in this situation? PROBE: What about the food was important?

l. Are there ever any problems/frustrations/difficulties with these types of eating situations?

m. What were you doing while eating that? PROBES: tv, phone, reading, computer, cooking etc.

n. Was this eating situation typical for you? Is it usually this way?

OPTIONAL PROBES:

1. Who would you usually eat with at this time?

2. Who else would you like to eat with?

3. Who usually decides how/ what you will eat?

REPEAT PASS 2 FOR EATING SITUATION PRESENTED UNTIL THE ENTIRE DAY IS COVERED.

Were there times yesterday when you were sitting/ talking with other people who were eating but did not eat with them?

Sometimes meals or eating get disrupted by daily activities and events at home or at work. Were any of your meals or snacks affected yesterday because of something like this? What caused the disruption? How was your eating disrupted?

How did the way you ate yesterday work from your perspective? Did the way you ate yesterday go as planned or as you expected?

Is there anything else that I should know that I did not ask that would help me understand your eating yesterday?

APPENDIX D

FOOD CARD LIST

1. Alcohol-Beer, wine, liquor
2. Bacon or Sausage
3. Bagel or English Muffin
4. Beans-Baked, refried, kidney, chili etc
5. Bread-Whole grain, rolls, sticks
6. Brownies, cookies, desert bars
7. Butter or Margarine
8. Cake or Pie
9. Candy Chocolate
10. Candy non-Chocolate
11. Casserole-Tuna, macaroni and cheese etc
12. Cereal, Energy bars, Granola bars etc.
13. Cereal Cold
14. Cereal Hot
15. Cheese
16. Chicken or Turkey
17. Chinese Food
18. Coffee or Tea
19. Crackers
20. Donut, Danish, Sweet Roll, Muffin
21. Dried Fruit-Raisins, prunes, banana etc.
22. Egg
23. Entrée Salad-Taco, pasta, chicken etc.
24. Fast Food-Hamburger, chicken, tacos etc.
25. Fish Canned- Tuna, Salmon etc.
26. Fish-Fried, baked, grilled poached
27. French Fries
28. French Toast, Waffles or Pancakes
29. Fruit Canned
30. Fruit Fresh-whole piece of salad

31. Fruit Juice-orange, apple, grape etc
32. Ice cream, Frozen Yogurt, or Sherbet
33. Iced Tea
34. Jelly, Jam, Honey or Syrup
35. Meat-Beef, pork, lamb, hot dogs etc.
36. Milk-Skim, 1%, or 2%
37. Milk-Whole
38. Nuts
39. Pasta and sauce-Spaghetti, lasagna etc.
40. Peanut Butter
41. Pizza
42. Popcorn
43. Potato-mashed, baked, salt etc.
44. Potato Chips, Pretzels or Corn Chips
45. Rice
46. Salads-Pasta, potato, coleslaw, macaroni etc.
47. Sandwich or Sub
48 Seafood-Shrimp, scallops, lobster etc.
49. Soda Diet
50. Soda Regular
51. Soup or Chili
52. Tofu
53. Tossed Salad
54. TV dinners
55. Vegetable-cooked
56. Vegetable-juice
57. Vegetable-raw
58. Water
59. Yogurt

FOOD CHOICE SCHEMA INTERVIEW GUIDE

Participant #:   **Equipment:**

Interviewer: White Food Situation Cards

Day/Date: Blue Person Cards

Time: Yellow Food Cards

Location: Rubber bands

                                                      Small post-it notes

                                                      Tape recorder

                                                      Extra tape

                                                      Extra batteries

1. OPEN PILE SORT – YELLOW FOOD CARDS (10-15 minutes)

STEP 1. GIVE THE PARTICIPANT THE YELLOW FOOD CARDS

Can you arrange these cards into piles that make sense to you? There are no right or wrong answers. While you are making piles can you say out loud what you are doing? Let me know if any important foods are missing or if you find any of the cards confusing.

STEP 2. AFTER THE PARTICIPANT FINISHES SORTING

Why did you arrange them this way?

PROBES: What were you thinking when you arranged them this way?

STEP 3. PICK UP ONE PILE

What would you call this pile? Why do these foods go together?

PROBES: What makes them similar to one another?

Can this pile be split into smaller piles? Why did you split them this way? What are the names of these new piles?

USE POST-IT NOTES TO LABEL EACH PILE AND SUBPILE. FOR EXAMPLE:
A "Dairy" PILE THAT IS SPLIT INTO "Desserts" AND "Drinks" WOULD BE
LABELED "Dairy – desserts" and "Dairy- drinks".

STEP 4. PICK UP ANOTEHR PILE AND REPEAT STEP 3. CONTINUE WITH
EACH PILE UNTIL ALL PILES HAVE BEEN LABELED.

STEP 5. QUESTIONS

Are there other ways that you could arrange these cards? What ways? You don't need
to resort the cards but only tell me how else you might arrange these cards if you were
to start over again.

PROBES: What other piles could you make if you started over? What other categories
could you make out of these cards?

STACK THESE PILES AND SECURE THEM WITH A RUBBER BAND FOR
LATER RECORDING.

2. CONTEXT SPECIFIC PILE SORTS- three most common situations with people
and foods

STEP 1.   Context schema – WHITE CARDS

PLACE THREE WHITE CARDS IDENTIFIED IN THE INITIAL INTERVIEW IN
FRONT OF PARTICIPANT

At our last interview you sorted these white situation cards and picked out three, one for
the time and place you most often eat with others away from work, one for the time and
place you eat alone most often, and one for the time and place you eat most often during
work.

STEP 2. Strategy schema (1 minutes) USING ONE WHITE SITUATION CARD

PULL ONE CARD FORWARD FOR EACH PASS THROUGH THE FOLLOWING

QUESTIONS. YOU WILL COMPLETE A TOTAL OF THREE PASSES.

USE THE THREE WHITE SITUATION CARDS IN THE FOLLOWING ORDER;

NON-WORK SITUATION CARD

WORK SITUATION CARD

ALONE SITUATION CARD

What is your main goal (what is most important to you) in this situation? How do you

try to make things work out the way that you want in this situation?

STEP 3. Person schema/ Role/ Procedure/Self (12-15 minutes)

BLUE PERSON CARDS AND ONE WHITE SITUATION CARD

I have a list of people that might possibly eat with you. Starting with this eating

situation (REFER TO SITUATION CARD). Can you sort these people into five piles

according to who is there…

Usual – Sometimes- Rarely –Never – Does not apply

Was there anyone missing? IF YES – USE "OTHER" CARD

Who would you like to be there?

Who would you prefer is not there?

You said that your _____ is usually there. What is happening if this person is there?

PROBES: What types of things are you doing if this person is there? What does the

other person/persons do?

You said that your _____ sometimes there? What is happening when this person is

there? PROBES: What types of things do you do if this person is there? What does the

other person/persons do?

You said that you prefer if your _____ is not there? How would things be different if this person is there?

You said that you would like _____ to be there? How would things be different if this person is there?

How do you see yourself in this situation, that is, how would you describe yourself?

How would others describe you in this situation? How would you compare yourself to others in this setting?

STEP 4. Emotion schema (2-3 minutes)

How do you feel in this eating situation?   For example, Sad, angry, happy, nervous? What makes you feel this way? PROBES: Do you feel this way because of the eating situation or because of something else? If the situation changes do your feelings change? Can you tell me how the situation changes? How your feelings change?

LEAVE BLUE USUAL PILE AND PULL ALL OTHERS AWAY

STEP 5. Food Fact Schema (10-15 minutes) YELLOW FOOD CARDS

STEP 6. GIVE THE PARTICIPANT THE YELLOW FOOD CARDS

Based on this situation that we have been talking about can you arrange these cards into piles that make sense to you? There are no right or wrong answers. While you are making piles can you say out loud what you are doing?

STEP 7. AFTER THE PARTICIPANT FINISHES SORTING

Why did you arrange them this way?

PROBES: What were you thinking when you arranged them this way?

STEP 8. PICK UP ONE PILE

What would you call this pile? Why do these foods go together? PROBES: What makes them similar to one another?

Can this pile be split into smaller piles? Why did you split them this way? What are the names of these new piles?

USE POST-IT NOTES TO LABEL EACH PILE AND SUBPILE. FOR EXAMPLE: A "Dairy" PILE THAT IS SPLIT INTO "Desserts" AND "Drinks" WOULD BE LABELED "Dairy – desserts" and "Dairy- drinks".

STEP 9. PICK UP ANOTEHR PILE AND REPEAT STEP 3. CONTINUE WITH EACH PILE UNTIL ALL PILES HAVE BEEN LABELED.

STEP 10.

Are there other ways that you could arrange these cards? What ways? You don't need to resort the cards but only tell me how else you might arrange these cards if you were to start over again. PROBES: What other piles could you make if you started over? What other categories could you make out of these cards?

STACK THESE PILES AND SECURE THEM WITH A RUBBER BAND FOR LATER RECORDING. BE SURE THAT YELLOW FOOD CARD STACK IS LABELED WITH THE SITUATION THAT IT WAS SORTED IN.

PULL FORWARD THE NEXT WHITE SITUATION CARD

APPENDIX F

FINAL INTERVIEW

Final interview is designed as a member check and is tailored depending on the depth of information provided in prior interviews

To prepare for final interview:

1. Review data to create an individualized commensality map that shows place, meal, and people.

2. Review FFQ. Look for discrepancies or things that you would like clarified.

3. Review card sorts. Look for any discrepancies or things that you would like clarified.

4. Review initial interview and schema interview guides to verify that all questions were asked and all card sorts were completed.

5. Use detailed final interview checklist. If not asked, add these unasked questions to final interview.

6. Add your own additional questions to final interview.

DETAILED FINAL INTERVIEW CHECKLIST

ID#: _____

Interview Date: _____

TOPIC	QUESTION	LIKELY IN PRIOR INTERVIEW	SPECIFIC QUESTION ASKED	Y/N
1. COMMENSALITY MAP	• I made this map of your eating from the things you told me in our earlier interviews. EXPLAIN MAP. • Does this map make sense to you? • Is there anything missing? Are there other times or places that you eat? Can you tell me about these? (ask 24-hour situation recall questions from initial interview for new situations)	No	No	
2. LIFE COURSE				
a. Changes in adult life	• How do your current food and eating practices compare with other periods of your adult life?	No	No	
b. Stability of eating practices	• At this point in time, are you trying to change the way you eat in any way? • (If yes) What are the things you would like to change? What is on your mind when you are trying to make these changes?	Yes	No	
3. IDEALS				
a. Satisfaction	• How do you feel about the way you eat now? Are you happy? Comfortable? Disappointed?	Yes	No	
b. Wishes	• What do you consider to be your ideal meal? Can you give a complete description of the foods, the people who are there, the time, place, and feelings that make	Yes	Yes – initial interview	

	this situation special for you? What, where, when, who, how, and why?		
4. PERSONAL FACTORS			
a. Age influences	• How does your age influence what you eat?	No	No
b. Gender influences	• Does being a man/woman affect how you eat?	No	No
c. Health status	• Do you have any health concerns that influence how you eat? Allergies?	Yes	No
d. Emotional influences	• How does your eating relate to your mood or how you are feeling emotionally? • When you are sad or upset, do you tend to eat or stop eating?	Yes	No
	• How do you feel in this eating situation? What makes you feel this way? Do you feel this way because of the eating situation or because of something else? If the situation changes how do your feelings change? Can you tell me how the situation changes? How your feelings change?	Yes	Yes – schema card sort
e. Identities - **Personal Identity**	• What kind of an eater would you say you are? o I am a _____ eater? I am not a _____ eater?	No	No
- **Situational Identity**	• How do you see yourself in this situation? How would you describe yourself? How would others describe you in this situation? How would you compare yourself to others in this situation?	Yes	Yes – schema card sort
5. RESOURCES			
a. Financial	• How does money influence where and what you eat?	Yes	No

b. Facilities	• Are there things about your living situation that influence where/what you eat?	Yes	No
6. SOCIAL CONTEXT			
a. Home ○ **Household food responsibilities** ○ **Influence of others**	• How is food and eating managed in your household? • What do you expect of yourself? • What do others expect of you? • What do you expect others to do? • How do the other people in your house influence what you eat? • How do the people in your home help or hinder how you eat or cook?	Yes	No
b. Work	• How does you job influence the way that you eat? • How do the people at work influence what you eat? • Do you have any roles at work related to food and eating?	Yes	No
	• Sometimes meals or eating get disrupted by daily activities and events at home or at work. Were any of your meals or snacks affected yesterday because of something like this? What caused the disruption? How was your eating disrupted? • IF NOT ANSWERED – Where there times yesterday when you would have eaten or planned to eat and were not able to because something came up to prevent it?	Yes	Yes – Initial interview and phone
	• How did the way you ate yesterday work from your perspective? Did the way you ate yesterday go as planned or as you expected?	Yes	Yes – Initial interview and phone
c. Community	• Other than home or work, do you spend time in other activities that involve food or eating such as clubs, organizations?	Yes	No

	• How does food and eating work in these situations? • How do the people in these settings influence how you eat?		
d. Relationships	• Were there times yesterday when you were sitting/talking with other people who were eating but did not eat with them? Why didn't you eat?	Yes	Yes – Initial interview
	• Who do you prefer is there (specific situation)? How does the eating situation change if this person is there? Not there? • Who do you prefer is not there (specific situation)? How is the eating situation different if this person is there? Not there?	Yes	Yes – schema interview
e. Roles	• You said _____ is usually there (specific situation)? What is happening if this person is there? What types of things are you doing? What is the other person/persons doing?	Yes	Yes – Schema interview
7. FOOD CONTEXT			
a. Food prepared at home - **Shopping/food pantries** - **cooking**	• Where do you usually get the foods you use for cooking at home? • How do feel about the time and effort it takes to get groceries? • How do you feel about cooking	Yes	No
b. Food prepared away from home **- Eating out**	• When you eat out where do you usually go? • What do you like /not like about these places? • Where are places you would never go? Why?	Yes	No

		Yes	No
- Take out	• When you get take-out, where do you usually go? • What do you like/not like about these places? The food?	Yes	No
8. FOOD CHOICE VALUES			
a. Taste **Appeal** **Odor/aroma** **Flavor** **Food enjoyment**	• Are there certain food flavors, textures, odors, or appearances that you really like / or dislike? • In the different situations that you eat, can you find foods you enjoy?	Yes	No
b. Convenience **Time/Effort/Energy**	• How does your daily schedule influence what you eat? • Is time an issue for you? If yes, how do you deal with this? • Do you enjoy sitting down for a meal?	Yes	No
c. Monetary considerations	• Do you do anything special to save money on food?	Yes	No
d. Relationships	• How do the people in your life help or hinder your food choices? • Are there any situations where eating is difficult because of other people?	Yes	No
e. Physical well-being	• QUESTIONS MOVED TO END		
f. Food involvement	• How much interest do you have in foods and eating?	Yes	No
9. FOOD RULES			
	• Can you tell me how you usually get the foods that you use at home? at work? away from home? Where do you usually get these foods/ meals? What is it about these	Yes	Yes – Initial interview

places that causes you to go there? Is there any way you simplify food and eating for yourself? Do you have any guidelines or rules about food and eating? Do you like getting food/ meals from these places? How do you feel about the time and effort that it takes to get the foods/ meals?		
• Do you have any particular ways of balancing what you eat to be sure that you do what you need to do?	Yes	No
• What food basics or necessities do you see as important?	Yes	Yes – initial interview
10. FOOD CLASSIFICATION		
a. Food preferences • Can you tell me about the foods you like? The foods you dislike?	Yes	Yes – Initial interview
b. Eating Situation Preferences • What places do you like to eat? What is it about these places that you like? • What places do you dislike eating? What is it about these places that you dislike?	Yes	No
c. Health classifications • QUESTIONS MOVED TO END		
11. LAST CALL FOR OTHER		

• Can you add anything else to help me understand how you eat and the reasons that you do things the way you do?
   o Important meanings?
   o Rules		

			Yes	No
		○ Reasons ○ People ○ Settings ○ Past experiences		
12. HEALTH RELATED QUESTIONS				
a. Physical well-being **Health** **Fitness** **Weight** **Digestibility** **Performance** **Safety**	• Do you eat in any particular way to feel good physically? • What does healthy eating mean to you? • What would you change on this map to eat healthier? • Do you do anything special to ensure that the food you eat is safe?		Yes	No
b. Health classifications	• What types of foods do you consider to be good for you? Bad for you? Specific foods? Why?		Yes	No
13. STUDY EFFECT	• How do you think that doing these interviews has affected the way that you eat or think about food? How? Have you changed anything since we started these interviews? What?		No	No

FINAL INTERVIEW: SELECTED INFORMATION

ID #: _____   Date: _____

Distance to Work:

How do you usually get to work?

_____

How far do you have to travel to get to work?   _____ miles

How long does it take you to get there?   _____

Distance to food:

How do you usually get to the main place where you buy food?

_____

How far do you travel to get most of the food you use at home?   _____ miles

How long does it take you to get there?   _____

3. How long have you been with your current employer?

_____

4. Do you or your family currently participate in any of the following programs?

Food stamps   yes/no

WIC   yes/no

TANF   yes/no

Free or reduced price lunch   yes/no

Food pantries   yes/no

EFNEP/Eat Smart NY   yes/no

Other:_____   yes/no

5. How much do you currently weigh? _____ pounds

6. What is your current height? ____ ft ____ in

7. Place an X next to the category that best fits your current smoking status.

_____ current smoker

_____ nonsmoker (former smoker)

_____ nonsmoker (never smoked)

8. Place an X next to the category of your total household income.

_____ Less than $10,000

_____ $10,000 to $19,000

_____ $20,000 to $29,000

_____ $30,000 to $39,000

_____ $40,000 to $49,000

_____ $50,000 to $59,000

_____ $60,000 to $69,000

_____ More than $70,000

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