8-1990

Determining the Effect of Television, Parents, and Peers on the Food Choices of Pregnant Adolescents

Dena Leah Goldberg
University of Tennessee, Knoxville

To the Graduate Council:

I am submitting herewith a dissertation written by Dena Leah Goldberg entitled "Determining the Effect of Television, Parents, and Peers on the Food Choices of Pregnant Adolescents." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Human Ecology.

Betty Ruth Carruth, Major Professor

We have read this dissertation and recommend its acceptance:

Jean Skinner, Ronald Taylor, Priscilla White Blanton

Accepted for the Council:

Carolyn R. Hodges

Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

To the Graduate Council:

I am submitting herewith a dissertation written by Dena Leah Goldberg entitled "Determining the Effect of Television, Parents, and Peers on the Food Choices of Pregnant Adolescents." I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Human Ecology.

Betty Ruth Carruth

Betty Ruth Carruth, Major Professor

We have read this dissertation
and recommend its acceptance:

Jean O. Keane

Ronald E. Taylor

Priscilla White Blanton

Accepted for the Council:

Vice Provost
and Dean of The Graduate School

114

DETERMINING THE EFFECT OF TELEVISION, PARENTS, AND PEERS ON THE FOOD CHOICES OF PREGNANT ADOLESCENTS

A Dissertation

Presented for the

Doctor of Philosophy

Degree

The University of Tennessee, Knoxville

Dena Leah Goldberg

August 1990

ACKNOWLEDGEMENTS

I would like to express my sincere gratitude and appreciation to the many individuals who guided and supported my academic endeavors. I would especially like to thank:

Dr. Betty Ruth Carruth, my advisor, for her time and effort in making sure I received the best possible academic experience, her words of encouragement, and her patience in working with me even when things were rough.

Dr. Jean Skinner, Dr. Ronald Taylor, and Dr. Priscilla White Blanton for giving their time and expertise as members of my dissertation committee.

Janet Pope for being more than a collaborator in this study. She was always there to share the rewards and frustrations of graduate study.

John Schneider and Dr. William Sanders for assistance in data analysis.

J. J. Johnson for assistance with the audiovisual portion of this project.

The Department of Nutrition and Food Science support staff for word processing assistance, typing letters and forms, taking phone messages, and other activities.

The Department of Nutrition and Food Science and the Agricultural Experiment Station for financial support in the form of a graduate teaching assistantship and graduate research assistantship.

The many friends who were always there with a sympathetic ear and words of encouragement especially Jan, Maddy, Mimi, and Marcy.

My parents for moral and financial support.

My grandparents, Herbert and Mollie Harvey, in whose memory this dissertation is dedicated.

ABSTRACT

The influence of television, parents, and peers on the food choices of 79 pregnant adolescents, aged 14 to 18, was studied. Two 24-hour diet recalls and a two-day food record, questionnaires about television viewing habits and communication with parents and peers relating to food selection and food purchasing, and a semi-structured interview regarding television commercials were administered in the last trimester of pregnancy.

Adolescents consumed 38% of their calories and 36% to 41% of total vitamin and mineral intake per day while watching television. Foods consumed while watching television were significantly lower (P=0.03) in fat than foods consumed while not watching television. Popular snacks consumed while watching television included sweets/desserts, potato and corn chips, popcorn, carbonated beverages, fruits and vegetables, and breads and cereals.

Television viewing was not significantly related to caloric intake, weight gain during pregnancy, or nutrient density of the diet. A preference for name brands over generics was reported, although the heavily advertised brand was not perceived as more nutritious, of better quality, and a better value than the generic brand. The most frequently advertised snack foods were not necessarily the snacks chosen. The lack of television advertising effect on nutrient density of the diet and the preference for name brands suggest that advertising may influence brand preference specifically.

One-half of the adolescents discussed food purchasing and advertisements with parents and 80% helped parents with food selection at least sometimes. Results also indicated that parents do not recommend or control food purchases adolescents make for themselves. The frequency of communication with parents was not associated with the consumption of heavily advertised foods.

Communication with peers about food selection and food advertisements was generally infrequent. Fifty-seven percent to 73% responded rarely or never and 27% to 43% reported at least sometimes talking with peers about buying food, foods to buy at fast food restaurants, food advertisements, and asking for or receiving advice from friends about snack choices.

The lack of a statistically significant advertising effect on food-related behaviors does not mean that television advertising does not have indirect effects. Television commercials may promote purchase of the advertised by increasing product awareness and emphasizing product attractiveness.

TABLE OF CONTENTS

LIST OF TABLES

TABLE PAGE

LIST OF FIGURES

CHAPTER I

INTRODUCTION

The Problem

Television is a major leisure time activity of youth. Despite the fact that television viewing decreases in adolescence, the typical adolescent spends about 22 hours per week watching television (1). Upon completion of high school the typical graduate will have spent 18,000 hours watching television, more time than in school or any other activity except sleep (2,3). The growth of cable television, home video recording, and video games indicates that time spent viewing television is likely to increase (4).

Television and Health and Nutrition Related Practices

Due to the widespread accessibility and utilization of television, it plays a major role in the socialization of youth. Few forces are endowed with the power of television to shape the attitudes, beliefs, and behaviors of youth, including those pertaining to health and lifestyle (4,5).

For Americans, television is an important source of health-related information, ranking second to doctors and dentists (6). However, health information conveyed by television is often distorted, unrealistic, and deceiving, especially regarding food, nutrition, and obesity (4,5,6).

For example, prime time television characters practice eating habits (such as snacking frequently, not consuming well balanced meals, or not attending to what they eat) that are inconsistent with weight management, yet the characters are seldom overweight (7). Food commercials use healthy-looking, enthusiastic, and slim individuals to promote food products high in fat and sugar (8). Thus, television sends contradictory messages. One is that individuals should be trim and full of energy, whereas the other message implies that people eat in ways that do not promote health or weight management (7,8).

Advertisers appeal to adolescents' concerns about health and appearance and their desire to be popular, attractive (especially to the opposite sex), and accepted by peers (8). Television commercials attempt to link a product with a particular image or lifestyle, and "that image sells the product" (8).

Thus, television exposes adolescents to many direct and indirect messages regarding food and eating habits (8). These messages may in turn influence food preferences and eating behavior. Several studies of adolescents' food preferences have reported that teenagers' favorite foods are soda, milk, chicken, french fries, spaghetti, ice cream, cookies, cake, pizza, apple pie, and orange juice (9-12). Story (8) noted that food preferences are similar among adolescents from different regions, racial and ethnic groups, and rural or urban residence, and she concluded that the mass media substantially contributes to this uniformity. In fact, surveys of high school students have revealed that between 70% and 92% cited television as a source of nutrition information (13-15). In regard to eating behavior, a primary concern is

the impact of television viewing on adolescents' snack choices. Adolescents snack frequently, and snacking while watching television is very common (16-19).

Parents and peers also play a significant role in the lives of adolescents and have been identified as influencing food-related behaviors (8). The family is a source of nutrition information and food-related attitudes and behaviors that may continue throughout the lifespan (8,15). Adolescents spend a significant amount of time with peers and may eat what is acceptable and approved by their peer group (8).

Adolescent Pregnancy

The impact of television may be more significant for those groups identified as at risk nutritionally such as pregnant adolescents. Solderman and coworkers (20) reported that pregnancy increased the amount of time adolescents spend watching television. The effect, however, of television on food-related behaviors of pregnant adolescents has not been studied.

Adolescent pregnancy has been identified as a significant social and medical concern of youth (21). The teen pregnancy rate in the United States ranks among the highest of any developed nation and crosses all geographic, socioeconomic, and ethnic boundaries (21,22). In 1983 slightly more than 1 million or 10% of all female adolescents became pregnant (21). Although the teen pregnancy rate has decreased over the past five years, the decline was less than that for older

women. If present trends continue, 40% of all young females will experience a pregnancy during their teenage years (23).

Compared to adult women, medical complications during pregnancy and delivery occur more frequently among adolescents, especially the very young adolescent. Pregnant adolescents have a higher incidence of anemia, premature delivery, abruptio placenta, cephalopelvic disproportion, gynecological infections, toxemia, and maternal mortality than older women (21,24-30). The incidence of low birth weight and fetal and neonatal deaths among their infants also is greater than adult women (24,25,27-30). Maternal weight gain is a more significant determinant of infant birth weight in pregnant adolescents than in older women (26,28,31). Although the complications of teenage pregnancy may be partially explained by the social and economic environment of the young mother, many of their health-related behaviors, including poor food choices, contribute to their high risk obstetrical status (27,29,32).

Pregnant adolescents are considered to be at high nutritional risk because of (a) nutrient requirements that according to the 1989 Recommended Dietary Allowances (33) are among the highest of any age and sex category, and (b) inadequate nutrient intake both before and during pregnancy (27,32). In addition, the young pregnant adolescent has the increased needs of pregnancy superimposed on those of her own maturation (28).

Several studies have found inadequate dietary intake and/or biochemical signs of deficiency of vitamin A, iron, calcium, vitamin B_6,

folic acid, and zinc (34-43). Biochemical signs of deficiency indicate long-term dietary inadequacy.

Nutritional status influences pregnancy outcome (44). For example, poor zinc status was related to toxemia and labor abnormalities (35,45,46) and prematurity in normal weight and underweight multipara adolescents (47).

Improving the nutritional status of pregnant adolescents requires an understanding of the various factors influencing food practices. Despite evidence that television may impact the food-related beliefs and behaviors of adolescents, few investigators have examined the impact of television on the dietary habits of adolescents (6,48) and none have examined conjointly the influence of parents, peers, and television on the food-related behaviors of pregnant adolescents.

Overview of Study

This study is part of a larger Agricultural Experiment Station project, TN 860, examining the influence of a number of factors on pregnant adolescents' food choices, including television, peers, food cravings and aversions, and changes in taste perception. The objectives of this part of the study were to (a) test the applicability of Moschis' (49) and Moschis and Churchill's (50) model of consumer socialization to food purchasing and consumption in particular, (b) investigate the impact of television viewing on pregnant adolescents' snack choices and dietary adequacy, (c) examine pregnant adolescents' responses to television commercials, types of advertising claims salient to them, and

their attitudes toward name brand and generic products, and (d) determine whether self-reported communication with family and friends mediated the consumption of heavily advertised foods.

Data collection included the completion of a questionnaire about television viewing habits, the extent to which the respondent discusses food advertisements and food purchases with parents and friends, and the importance of consuming a particular snack food because it is associated with a particular lifestyle or image. An interview provided information on the subjects' responses to television commercials, their perception of heavily advertised foods, the relative salience of different advertising claims, and the frequency and types of foods they consume while viewing television.

Hypotheses

Hypothesis I pertains to the pregnant adolescent's perception and consumption of heavily advertised foods. Hypothesis II relates to the quantity and pattern of communication with family and peers about food advertisements and food purchasing.

I. Television viewing will influence the pregnant adolescent's perception and consumption of heavily advertised foods that are high in total fat and cholesterol and of low nutrient density.
   A. Pregnant adolescents who are heavy television viewers will perceive heavily advertised name brands and products as more nutritious, of better quality, and a better value than generics compared to pregnant adolescents watching less television.

B. Pregnant adolescents who are heavy television viewers will be more likely to consume a diet low in nutrient density and high in total fat and cholesterol than pregnant adolescents watching less television.

C. Television viewing by the pregnant adolescent will be associated with snacking.

D. The frequency of television viewing will be associated with the consumption of heavily advertised snack foods.

II. As agents of socialization, family and peers mediate the influence of television on pregnant adolescents' food choices.

A. The frequency of communication with parents about food advertisements seen on television will affect the pregnant adolescent's consumption of heavily advertised snack foods.

B. The pattern of family communication, as expressed by a socio-oriented family communication style, will increase the likelihood of consumption by the pregnant adolescent of a food product advertised as promoting a particular image or lifestyle.

C. The pattern of family communication, as expressed by a concept-oriented family communication style, will increase the likelihood of the pregnant adolescent consuming a food product advertised as nutritious or healthy.

D. The frequency of communication with peers about food advertisements seen on television will affect the pregnant adolescent's consumption of heavily advertised snack foods.

CHAPTER II

LITERATURE REVIEW

Because the impact of television on adolescents' food choices has been the subject of little research, the scope of this literature review was enlarged to include the more general topic of adolescent consumer socialization. The selection and consumption of food may be considered one component of the consumer role. Specifically, this literature review covers seven different topics: (a) television viewing practices of adolescents, (b) adolescents' food purchasing power, (c) messages regarding food and nutrition on television, (d) television viewing and adolescents' snacking patterns, (e) consumer socialization, (f) the impact of advertising on adolescents, and (g) interpersonal communication as a mediating influence on advertising effects.

Television Viewing Practices of Adolescents

Viewing Frequency

According to the Nielsen Ratings (1) the average teenage female and the average teenage male watch television about 21.25 hours and 22.5 hours per week, respectively. East Tennessee adolescents reported watching television about four hours per day or 28 hours a week (19). Solderman, Greenberg, and Linsangan, (20) examined the television habits of 146 pregnant and 649 non-pregnant Midwestern female adolescents and reported that they watched television 4.8 and 6.8 hours per day or 33.6

and 47.6 hours per week, respectively. Thus, the pregnant adolescents spent an average of two hours more per day viewing television than their non-pregnant counterparts.

Reasons for Viewing

Adolescents view television primarily for entertainment, to pass the time, or as a habit. Additional reasons include to escape or forget, to learn about themselves and their world, for arousal, for relaxation, and for companionship (51-53). Engaging in other activities while watching television is not uncommon. Forty-eight adolescents from Southern Louisiana reported that participation in other activities, primarily social or recreational, occurred during 26% of the viewing time (54). Among a sample of tenth graders in the Los Angeles area, 39% of the males and 54% of the females reported usually or sometimes studying while watching television (51). With adolescents, visual attention to television occurs about 70% of the time if an individual is in a room with a television set that is turned on (55).

Factors Influencing Television Viewing Practices

Demographic characteristics influence television viewing habits. An examination of data from the A.C. Nielsen Company revealed that adolescents from families that are poorer, less educated, and smaller view more television (51,56). In contrast, Lawrence and coworkers (54) reported that family income and education did not influence television viewing time. Moore and Moschis (57) found that socioeconomic status influenced whether or not adolescents watched television to gather

information for purchasing decisions and about lifestyles and behaviors associated with consumer goods.

Other demographic characteristics have been found to influence television viewing frequency. Employment of the mother decreases the time teenage children spend viewing television (54). Neither the adolescent's employment nor the amount of participation in leisure and social activities correlated with the amount of time the adolescent spent watching television (51). In contrast, a more recent study reported that availability of television resulted in a decreased participation in community activities and sports by youth (58).

In addition to demographic characteristics, psychosocial factors influence the amount of time spent watching television. Poor peer relations and parent-child conflict increased the time spent viewing television (51,56).

Network Programming, Cable, and Music Videos

Most television viewing by adolescents occurs during prime time, late afternoon, and early evening (1). They most frequently view situation comedies, feature films, and adventure programs.

Although most viewing by adolescents is network programming, both non-pay and pay cable are increasing their share of the television viewing audience (1). Families subscribing to pay cable tend to view more television than non-cable viewers. Subscribers to cable television tend to live in areas of the country where poor reception of network programming combined with sufficient people makes provision of cable services economically feasible (59). Households with children are more

likely to subscribe to cable television than those without children (59). In the Knox County, Tennessee area, with a population of approximately 319,000, about 60,000 homes have pay cable television service (60).

Music videos are an important constituent of the adolescent's pattern of television use (2,61,62). Approximately 80% of a sample of 1,209 adolescents, aged 12-to 14-years, in the South Central and South Atlantic regions of the United States reported watching music videos; over one-third watched music videos daily. Approximately 50% received MTV, the cable rock video station that focuses their programming at 12-to 34-year olds (61). MTV's popularity was revealed in another study of 64 seventh and tenth graders; 90% of the participants indicated that they like MTV or would like to have it in their home (2). In a study of 603 high school students in San Jose, California, 80% watched MTV averaging just over two hours per day, 124 minutes on weekdays, and 132 minutes on weekends (62).

Watching music videos entertains, diverts attention, contributes to social interaction, provides information about the social world, and gives the viewer something to do (61,62). While non-cable television aims at the broadest possible audience and transmits traditional middle class values, music videos convey the themes and concerns of the youth culture (2,63). Popular music not only plays an important role in the adolescent subculture, but also influences subsequent socialization to the mainstream culture (61). Music videos provide instruction in dancing and in dressing fashionably, and they stimulate and support interactions with peers (61).

Television as a Socializing Agent

Due to the amount of time spent viewing television, television competes with parents and teachers as a significant socializing agent that models beliefs, values, and expectations (63,64). A high degree of television involvement by adolescents may result in attitudes, beliefs, and behaviors that conform to established norms and traditional expectations (65). The major role television plays in the socialization of youth is substantiated by the extensive research into the impact of television on sex role socialization, values and beliefs regarding sexual behavior, and aggressive and antisocial behavior (66-68).

Television images are not always perceived directly as real due to interrelationships with other socializing agents (69). Whether the events, situations, and persons viewed on television are perceived as reality by adolescents is influenced by their interaction with peers, their view of the world as influenced by important developmental issues, their attention to and evaluation of television images, and their beliefs and previous experiences. The peer group can confirm or negate television images and provide an environment for adolescents to experiment with behaviors observed on television. Thus, television is an important mechanism by which the expectations, status relationships, and lifestyle values of the youth culture and its view of reality are transmitted (69).

The role of television as a socializing agent includes health-related attitudes and behavior. As Tucker and Friedman (4) state, "the impact of television on the lifestyles and health of Americans cannot be ignored." A study of the impact of television on the health of

adolescents reported that light viewers are more apt to be more physically active, creative, intelligent, moralistic, and more outgoing than heavy viewers. In contrast, heavy viewers expressed greater unhappiness and frustration, less self-confidence, and a greater dependence on drugs (5).

In summary, the substantial amount of time spent by youth in viewing television makes it an important socialization agent for beliefs, attitudes, and expectations. In addition to prime time network programs, cable television and music videos comprise important components of adolescents' television usage.

Adolescents' Purchasing Power for Food

According to Way (70), television, as an important socializing agent, may significantly influence nutrition socialization or the acquisition of food-related beliefs, attitudes, and behaviors. The substantial food buying power of teenagers may enhance television's role as an agent of nutrition socialization. The economic power of the American teenager continues to increase despite a decline in the teenage population (71). Freeman (72) states that "the current teenage population could go down in history as the generation with the most spending power and influence over family buying behavior."

Adolescent Buying Habits

In 1986, Teenage Research Unlimited interviewed a nationally representative sample of 5,000 adolescents, aged 12-to 19-years, about

their buying habits. Several trade journals and newspapers have published the results of this survey, which indicated adolescents spent a total of $70.5 billion in 1985. From this, 43% came from their own funds and 57% came from family funds (73). The amount of family funds spent by adolescents was primarily used to purchase food (73,74). With both parents working in about two-thirds of families with teenagers, adolescents often assume responsibility for all or part of family grocery shopping (71,72,74-77).

Adolescents reportedly spend approximately 45 minutes to two hours per week grocery shopping. During this time adolescents spend 40% of the family food dollar (72,75,77). In a Teenage Research Unlimited survey of 16-to 17-year olds, 55% of the females had purchased cookies, 42% frozen meals, 39% salad dressing, 42% cheese and yogurt, 51% cereal, and 28% rice over a three-month period (71). In addition to making shopping lists, choosing brands, and purchasing food, adolescents prepare about 13 meals per week for themselves and their families (71-73,75-77).

Targeting the Adolescent Market

In response to this teenage food buying power, many food manufacturers advertise specific brands or products to attract adolescent consumers and develop products specifically for them (71,72,76,77). In November, 1987, the National Dairy Promotion and Research Board launched a $9.3 million television advertising campaign targeted at 9-to 15-year olds to increase milk consumption (78). Also,

Borden developed a snack food, Spirals, with the 9-to 15-year old market in mind (76).

Food advertising appears not only on network programming but also on MTV (71,77). In 1984, MTV's advertising revenue was $54 million (79). MTV shows advertisements for Sara Lee cakes, Campbell's soups, and products by Nabisco, Quaker Oats, Kellogg's, and Procter and Gamble (71,77). Advertisers have found that adolescents are influenced by advertising, and they perceive the nationally advertised brands as more nutritious, of higher quality, and as a better value compared to generics (72,75).

Messages Regarding Food and Nutrition on Television

Because adolescents purchase food for themselves and their families, they may attend to food and nutrition messages on prime time television. Singleton and Rhoads (13) reported that two-thirds of 1,089 high school students cited advertisements as a source of nutrition information.

Commercials: Foods Advertised

In a 1980 review of prime time nutrition messages, 30% of prime time television commercials were for food products, 24% beverages, 33% fruits and vegetables, 11% cereals and grains, 8% desserts and other sweets, and 3% dairy products (7). According to a more recent review, 35% of all prime time television commercials were for food products, 25% fast food restaurants, 21% low nutrient beverages (soft drinks, coffee,

tea, and alcohol), 20% cereals (almost all highly sweetened), 13% desserts and other sweets, 5% convenience entrees, 4% dairy products, 3% fruit, and 2% salty snacks (80). Although there were only three commercials specifically for fruit and none for vegetables, 36% of the commercials showed fruits and vegetables in the commercial along with the advertised food.

Gerbner and coworkers (6) found that nutritional appeals are utilized in only 9% and are stressed in another 7% of all food commercials. Story and Faulkner (80) also noted that nutrition claims were utilized in only a few commercials, primarily cereals that were promoted as being low in fat and sodium, high in fiber, and nutritious.

Food Messages in Television Programming

Food-related messages and behaviors are seen not only in commercials but also in television programming. In fact, program content may refer to food as often as commercials refer to food (7,80). Eating, drinking, or talking about food occurs about nine times per hour on prime time network programming (80). The food selections made by program participants were neither nutritious nor well balanced. They consumed snacks as frequently or more often than they ate breakfast, lunch, and dinner combined (80). Forty-one percent of the prime time references were for low nutrient beverages and 18% for sweets (80). Sixty-nine percent of all snacks consumed were for sweet and salty items compared to only 9% for fruits and vegetables. According to Kaufman (7), prime time television programs showed four times more references to sweets and one-third fewer references to fruits and vegetables than

commercials (7). In fact, almost two-thirds of the references to non-nutritious foods were observed in program content. Foods actually consumed by major characters contained less nutrients than the foods they requested, purchased, prepared, served, or used in other food-related behaviors (70).

In addition to choosing foods of low nutritional quality and snacking more frequently than eating meals, television characters appear to eat not to fulfill physiological needs but to fulfill social and psychological needs. Characters may engage in another activity while eating or eat "on the run" (7).

All these food patterns are associated with obesity, yet few television characters are obese. Although about 22% of American teenagers have a weight problem (81), obese teenage characters are nonexistent and only 7% are overweight (7). The prime time message promotes the idea that what one eats does not affect one's health or nutritional status. In fact, heavy television viewers tend to express little concern about what they eat or drink and in general are more complacent about their health than light television viewers (6).

Television's Implicit Nutritional Messages

In addition to its previously discussed explicit messages, television also implicitly promotes certain food behaviors. According to Gussow (82) television's implicit messages may be more powerful than its explicit messages:

> The heavy advertising of beer and soft drinks, for example, delivers a message far more potent than the urging to buy any single product. In terms of this message it doesn't really matter whether someone going to the refrigerator gets out a Pepsi or a

> Coke, a 7-Up or a Budweiser. What matters is that a thirsty American goes to the refrigerator to open up a container rather than to the sink to open up the tap. That behavior has been sold to us.

Thus, both television programming and commercials send both implicit and explicit messages that could promote poor food habits.

Television Viewing and Adolescents' Snacking Patterns

Based on published literature, television encourages the consumption of low nutrient dense foods and unhealthy eating practices and, therefore, is believed to have a significant impact on adolescents' food choices (6,7,80). How television viewing may influence adolescents' food habits has been the subject of few studies; however, several researchers (6,19) have studied the prevalence of eating while watching television. In the study by Gerbner and coworkers (6), 83% of 649 sixth to ninth grade students in New Jersey reported usually eating while viewing television. The tendency to eat in front of the television increased with age from 74% of sixth graders, to 84% of eighth graders, and to 91% of ninth graders. Among a sample of 887 East Tennessee high school students, 24% reported snacking while watching television everyday, 34% several times a week, and 26% once or twice a week (19).

In general, the snacks consumed most frequently while watching television include snack foods chosen at other occasions. A survey of East Tennessee adolescents revealed that the most popular snacks consumed while watching television were potato and corn chips (55%), carbonated beverages (21%), popcorn (21%), cookies (19%), and sandwiches

(18%) (19). Burdine and coworkers (48) surveyed 2,695 young adolescents in Texas and found the amount of television viewing to be an important predictor of the consumption of sweets and salty snacks both at home and at school.

Snacking is an integral part of adolescents' food habits supplying about 17% to 33% of total caloric intake (16-18,83-86). Analysis of three-day food records from 670 female adolescents participating in the USDA 1977-1978 Nationwide Food Consumption Survey indicated that 80% consumed at least one snack per day (16). Approximately 78% of the 12-to 16-year old subjects in the Ten State Nutrition Survey consumed a snack on the day of the survey. Analysis of 24-hour diet recalls of 225, 15-to 18-year old, East Tennessee adolescents showed 89% consumed one or more snacks on the day of the recall (17). Another study that collected 24-hour diet recalls from 1,224 southern 12-to 16-year old females found similar results: 9% consumed a pre-breakfast snack, 56% a morning snack, 91% an afternoon snack, and 80% an evening snack (84). Other studies have also found that teenagers consume most snacks in the afternoon and evening (17,87). Thus, the most prevalent snacking times correspond to the time teenagers are most likely to be watching television. It is not known whether snacking that occurs while watching television also would occur if the adolescent was engaged in another activity.

Among southern adolescent females the most popular reasons for snacking included "hunger" (40%), "looks good" (32%), and "having something to do" (17%) (84). Whether the appetizing appearance of a food item on a commercial stimulates snacking has not been investigated.

Popular snack foods include carbonated beverages, milk, ice cream, sandwiches, cereal, cookies, cake, candy, crackers, and chips (17,83,88). Burdine and coworkers (48) reported that 30% of seventh and eighth graders consumed milk, 25% soft drinks, 25% ice cream, 25% cold cereal, 24% candy, 22% potato chips, 16% tortilla chips, 19% fruits and vegetables, and 17% cookies and cakes for snacks at home. Sixty percent of 35 Finish adolescents stated that food served at parties must be soft drinks, potato chips, popcorn, dips, sandwiches, and candy (89).

In a survey of East Tennessee adolescents, Ezell and coworkers (17) noted that the time of day the snack was consumed influenced the food selected. Milk, sandwiches, and desserts were more likely to be consumed in the afternoon or evening, and carbonated beverages, candy, and salty snacks were more likely to be consumed in the morning. These findings were attributed to the different foods available for morning snacks, which were more likely to be consumed at school, and evening snacks, which were more likely to be consumed at home. Crawford (90) and Hruban (91) found that high school students would select nutritious snacks from school vending machines if they were the only choices available. A more recent study by Olds (92) concluded that when given the choice, high school students more often selected snacks of low nutritional value rather than nutritious snacks.

Nutrient Contribution of Snacks to the Diet

Teenagers' frequent selection of salty snacks, soft drinks, and sweets reinforces the widespread notion that foods selected for snacks by adolescents contribute calories but are low in vitamins and minerals. However, snacks do contribute to nutrient intake. McCoy and coworkers

(84) reported that snacks consumed by adolescent females provided 15% to 20% of total mineral and 13% to 17% of total vitamin intake. Snacks provided 39%, 43%, and 52% of the RDA for thiamin, vitamin C, and riboflavin, respectively. Similarly, Thomas and Call (85) found that snacks met or exceeded the nutrient density allowance for riboflavin, vitamin C, and thiamin. In a survey of 248 female adolescents across the United States, snacks contributed 17% of the RDA for vitamin C, 14% for vitamin A, and 12% for calcium (86). Snacks of 11-to 14-year old females in the 1977-1978 Nationwide Food Consumption Survey (16) were as nutrient dense for calcium, magnesium, vitamin C, and vitamin A as meals. Similarly, for 15-to 18-year old females, snacks were as nutrient dense as meals for the same nutrients except vitamin A.

The typical adolescent diet, including snack contributions, exceeds the recommendations of the Committee on Diet and Health (93) and the American Heart Association (94) for intake of fat, saturated fat, and cholesterol. Using 24-hour diet recalls, the United States Department of Agriculture 1977 Nationwide Food Consumption Survey (95) reported that fat contributed 40.3% of kilocalories among the 309, 12-to 14-year old females, and 35% of kilocalories among the 402, 15-to 18-year old females. Using two 24-hour diet recalls, a study of 1,247 southern female adolescents, aged 12-to 16-years, revealed an intake of 39% of kilocalories as fat, 14% of kilocalories as saturated fat, and 148 mg cholesterol per 1,000 kilocalories (96). A study of 93 individuals, aged 6-to 16-years, in Rochester, Minnesota found an average intake of 38% of kilocalories as fat, 14% of kilocalories as saturated fat, and 147 milligrams of cholesterol per 1,000 kilocalories (97). In another

study, 890 Hawaiian adolescents consumed 36% of kilocalories as fat, 12% to 15% of kilocalories as saturated fat, and 148 milligrams cholesterol per 1,000 kilocalories (98). Using 24-hour diet recalls the Lipid Research Center Program reported the intakes of total fat, saturated fat, and cholesterol for 584, 10-to 19-year old females. Total fat was 38% of total kilocalories; 15% of kilocalories came from saturated fat; and 137 milligrams of cholesterol per 1,000 kilocalories was consumed (99). These studies indicate that female adolescents typically consume about 38% of kilocalories as fat, 14.5% of kilocalories as saturated fat, and 145 milligrams cholesterol per 1,000 kilocalories compared to current recommendation of less than 30% of kilocalories as fat, less than 10% of kilocalories as saturated fat and 100 milligrams of cholesterol per 1,000 calories or up to 300 milligrams per day (93,94).

Health Implications of Snacking and Television Viewing

The prevalence of snacking while watching television combined with the passivity of television viewing suggest that heavy television viewing might increase the risk of obesity. Dietz and Gortmaker (100) examined the National Health Examination Survey Cycle II and III data and found that the prevalence of obesity increased 2% for each additional hour spent watching television after controlling for several sociodemographic and family variables. This study indicated an association, not a cause and effect relationship, between obesity and television viewing. Furthermore, results of two other studies did not replicate these findings. In one study of 379 high school males, heavy

viewers were not more obese than light viewers; however, the heavy viewers were less physically fit (101). In another study of 986 high school students, underweight subjects more often rated themselves as regular or heavy television viewers than normal weight or obese subjects (102). No difference in time spent in extracurricular school sports and other active pursuits or passive leisure activities was noted among the underweight, normal weight, and obese students. This disparity in results presents important considerations in assessing the relationship between television viewing, obesity, and physical fitness. That is, (a) inactivity may be a consequence rather than a cause of obesity and (b) the relationship between the time spent viewing television and obesity may be mediated by other common factors (4).

To understand how television viewing may influence food choices, the next section will discuss research examining the factors influencing adolescent consumer behavior, the cognitive, affective, and behavioral effects of advertising, how adolescents process information in advertisements, and attributes of persuasive advertisements. This information will be used to develop a model to describe how television viewing may influence food-related habits. Adolescent consumer socialization research provides a theoretical framework for investigating the influence of television advertisements on a particular consumer behavior, i.e. food selection and consumption.

Consumer Socialization

Model of Consumer Socialization

In 1974, Ward (103) proposed taking a socialization approach to studying consumer behavior. Researchers have used the concept of consumer socialization to explain the development of consumption-related cognitions, attitudes, and behavior in children and adolescents (104). Ward (103) defined consumer socialization as "the processes by which young people acquire skills, knowledge, and attitudes relevant to their functioning as consumers in the market place".

The socialization perspective includes five different variables: (a) age or life cycle position, (b) social structural constraints, (c) socialization agents, (d) content or criterion behavior, and (e) the learning process (105). Moschis and Churchill (50) and Moschis (49,104) used these variables to develop a conceptual model of consumer socialization. Figure 1 illustrates this conceptual model.

a. Age or life cycle position of the individual acknowledges that they continue to learn throughout their lives and learn different things from various sources at each stage. For consumer socialization in particular, adolescence is a critical time because adolescents become more active marketplace participants in the process of making the transition to adulthood. Patterns of consumer behavior developed in adolescence may persist into adulthood (49).

b. Social structural constraints refer to the variables that define the social environment within which learning takes place; they include race, sex, and socioeconomic status. These variables determine

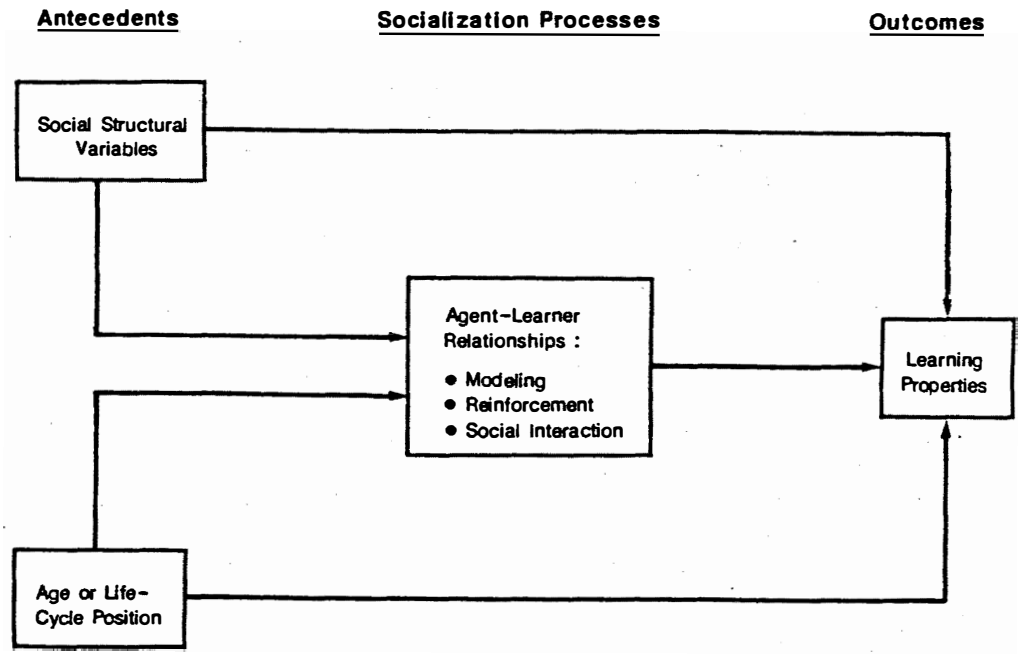

Figure 1. A Conceptual Model of Consumer Socialization.

Source: Moschis, G.P. & Churchill, G.A. (1978) Consumer socialization: A theoretical and empirical analysis. J. Marketing Res. 15: 599-609.

membership in relatively homogeneous subgroups. Each subgroup is likely to exhibit different patterns of consumer behavior. Social structural variables indirectly influence consumer socialization by altering interaction with socialization agents (105).

c. Socialization agents transmit norms, attitudes, motivations, and behaviors to the learner by communicating specific expectations and behavioral patterns (49,104). Socialization agents include individuals and organizations that influence the individual's socialization. According to Brim (106), this influence results from frequency of contact with the learner, primacy over the individual, and control over rewards and punishments. The mass media, peers, family, and school are important agents of consumer socialization for adolescents (104). These agents, combined with their behavioral expectations, are of extreme importance to the learner and continue to influence the learner's behavior throughout the entire life span. As a result of these interactions, the learner becomes oriented toward the evaluation of significant others and their expectations regarding the fulfillment of roles.

d. The content or criterion behavior, the cognitions and behaviors necessary to perform a given role, must be addressed in order to understand how an individual becomes socialized. The learner acquires specific beliefs and behaviors during interaction with socialization agents through the processes of modeling, reinforcement, and social interaction. In modeling, the learner imitates the agent due to a desire to emulate the agent or because that behavior is the best alternative (105). This observational learning is influenced by the

role model, the situation in which the behavior is observed and performed, and the individual's abilities. Reinforcement involves positively rewarding desired behavior and negatively reinforcing undesirable behavior. The social interaction process is less specific about the type of learning involved (105). It may include both modeling and reinforcement. According to this process, the social norms involved in a person's interaction with other people shape the individual's attitude and behavior, including communication style and preferences (105). What is learned is a complex series of interpersonal relationships, norms, and expectations involved in fulfilling a specific role (106). Examples in consumer socialization include parental norms regarding saving and spending and the skills needed to select and use consumer goods in a rational manner (104).

e. The learning process involves two types of consumer learning important in socialization research (103). One type of learning focuses on how adolescents acquire the ability to enact the consumer role and encompasses the skills, attitudes, and knowledge directly relevant to consumption behavior. Examples of this type of learning include budgeting, pricing, knowing brand attributes and shopping outlets, and acquiring feelings toward products, brands, and sales people. Culture, peers, and the mass media influence this type of consumer learning. The second type is comprised of relevant skills, attitudes, and knowledge which motivate purchases indirectly but are not directly useful in the purchase decision or transaction. Examples include the different motivations for consumption and beliefs about material goods, including materialistic attitudes.

The socialization perspective suggests that adolescents acquire consumer behaviors through interaction with the various agents in specific social settings. The net result is the acquisition of a specific set of individual and societal values, attitudes, beliefs, and behaviors essential to the acquisition of a specific role.

Learning Consumer Orientations from Television

Television is a significant source of information about fulfilling the consumer role. Television programming and advertising may contribute to the development of knowledge about and need for products in the consumer's "standard package" (104,107). While possession of these key items, such as radio, television, and specific brands of clothing and food, identifies one as a member of the middle class, variations identify one as possessing a specific lifestyle or belonging to a special peer group (107). Thus, the selection of a frequently advertised brand over a generic or store brand may reflect its association with a desired lifestyle in the advertisement or its acceptance by a salient peer group.

In a study of 806 adolescents in Wisconsin, the frequency of watching television was positively related to an orientation that emphasized television's role in learning about lifestyles and behaviors associated with users of consumer products (social motivations) ($P<0.001$) (50). Television watching was negatively related to the belief that price is an indication of quality and performance ($P<0.011$) and to an orientation that emphasizes the functional attributes and price of consumer goods (economic motivations) ($P<0.006$).

Social motivations for watching television also play a key role in consumer socialization as exposure alone may not be sufficient to explain the learning of some skills (50). Watching television to learn about lifestyles and behaviors associated with users of consumer products was positively associated with materialistic values ($P<0.001$), consumer affairs knowledge ($P<0.008$), and negatively related to economic motivations for consumption ($P<0.02$) (50,108). The link between social motivations for watching television and materialism suggest that the development of materialistic attitudes does not result solely from exposure, but also from the individual's motivations for watching television especially advertising (50).

Acknowledging that television programming influences consumer learning, television advertising appears to be even more influential in consumer learning (50). In fact, mere exposure to commercials for a specific brand can create a favorable attitude toward that brand (109,110). Favorable attitudes toward advertising develop when advertising satisfies social needs, such as a basis for communication with peers and family. According to Bandura (111), it is through observation and imitation of television commercials that individuals learn to attach social meaning to material goods.

Social motivations for viewing television commercials are predictive of materialistic attitudes, positive attitudes toward advertising, favorable attitudes toward brands, and social motivations for consumption but negatively related to economic motivations for consumption and ability to filter puffery (49,50,109). Long term effects of television advertising on consumer behavior depend on the

initial level of learning (112). Increased advertising exposure decreased the likelihood of performing socially desirable consumer behaviors among those who were least likely to perform them in the first place. Increased advertising exposure also contributed to the development of materialistic values among those who had not yet developed such predispositions.

Although teenagers learn the importance of conspicuous consumption from television, these skills may not be learned through imitation and observation alone as Bandura (111) proposes. Interpersonal communication with family and peers stimulates awareness and interest of youth toward goods and services, which in turn promotes increased attention to television to learn about the uses of products (50,108). According to Ward and Wackman (113) consumer behavior is definitely a social process involving interpersonal communication, not merely exposure to advertising.

In addition to finding a consistent relationship between exposure to television advertising and socially undesirable orientations, such as materialism and social motivations for consumption, consumer socialization research has identified other undesirable effects of television advertising. Exposure to television advertising appears to decrease the adolescent's ability to filter puffery and increase expectations about the performance of the advertised product, resulting in dissatisfaction with the marketplace (109,114).

The Impact of Advertising on Adolescents

Models of Advertising Effects

Results of research by Mendelsohn (115) and Macoby and Farquhar (116) indicate that a mass media education campaign can change health-related behaviors. Bandura (111) proposed that television directly influences behavior. According to his social learning theory, television viewers will model eating and drinking behaviors observed on television, thereby increasing the consumption of these products. Bandura also contends that this model also explains how products acquire social meaning through advertising. Advertising appeals use the principle that observed rewards increase and observed punishments decrease modeling behavior. For example, an advertiser might claim that a particular food product will make one feel good or provide one with lots of energy or athletic power. This may increase the likelihood the food will be consumed.

High involvement model. Traditionally, the effects of advertising have been viewed from a limited effects model (104). According to this model, individuals are so selective in their exposure to the mass media that a message tends to reinforce existing beliefs rather than change them.

In accordance with the limited effects model, Bauer's (117) high involvement model of advertising is based on the premise that advertising-initiated change occurs infrequently and with difficulty. This is because the consumer selects information congruent with existing

beliefs and avoids information inconsistent with current beliefs (118). According to the high involvement model, consumers actively seek information about products, and they critically evaluate this information. The consumer progresses through a sequence of steps leading to purchase. These steps involve awareness, comprehension, interest, evaluation, trial, and adoption (118). This model applies best when the consumer has strong feelings about the product or is highly involved in the decision making process (118,119).

Using the high involvement model, advertisers attempt to alter the consumer's beliefs regarding the association between the advertised product and specific attributes of the product that are relevant to the consumer. Individuals delivering advertising messages are chosen for their trustworthiness, competence, and dynamism (119). High levels of trustworthiness are attained by the use of characters viewed as similar to the target audience. For adolescents, this may mean using actors who are of the same age or slightly older. Portraying competence entails the use of characters who relate to the product with expertise or who convey general authoritativeness. For a food advertised as contributing to athletic prowess, this character may be a well-known athlete who has gained expertise and authority by virtue of his athletic accomplishments. For example, Olympic athlete Bruce Jenner advertises for Wheaties. To create dynamism, the advertisement might use a celebrity endorser, an attractive model, or a unique trade character.

Low involvement model. During the past two decades, several researchers have proposed that advertising effects occur more directly than in the high involvement model. Atkin (119), Robertson (118), and Krugman (120) hypothesized that the greatest proportion of consumer decisions are trivial and unimportant, and the low involvement theory of advertising applies. When commitment is low, and beliefs are not strong, cognitive defenses are limited since it is not worth the time and effort to process counterinformation (118).

Consumers rarely seek information and when they do, it is most likely based on trial use of the product. Under these conditions, advertising has great potential to persuade. As a result of repeated exposure to the advertisement, some parts of the message become a part of the viewer's long term memory. The net result is that the consumer becomes aware of the product but does not form a distinct attitude toward it (119,120). When shoppers encounter the product, they recognize and purchase the product on a trial basis.

According to the low involvement model, the response hierarchy is collapsed; awareness and trial are the only steps necessary for adoption to occur (118). In other words, after becoming aware of a new food product through a television advertisement, the consumer may respond by trying the product rather than taking the time and effort to seek out and evaluate information about it. Furthermore, interpersonal influences are not salient. Since different brands are not seen as having distinguishing characteristics, getting information or approval is not necessary.

In contrast to the work by Krugman (120) and Robertson (118), research by Petty and coworkers (121) indicated that under low involvement conditions behavior change did not precede attitude change. They proposed that the various persuasion theories basically emphasized two different routes to attitude change. One route, called the central route, views attitude change as resulting from the individual's active consideration of information believed to be relevant to the issue. Attitude changes resulting from the central route are long lasting and predictive of behavior.

The second route is peripheral. Change occurring through this route occurs through the association of the issue or object with another irrelevant positive or negative cue. For example, an advertisement claim may be accepted because the source is considered an expert rather than the consumer critically evaluating the claim. Peripheral cues are more salient than product relevant cues under low involvement conditions, while under high involvement conditions product relevant cues are more important (121). Under low involvement conditions, the consumer does not think about product relevant cues but instead may focus on the commercial's special effects or the endorser's credibility or prestige.

Agenda setting theory. According to agenda setting theory, advertising determines not what we think, but what we think about. Based on evidence from agenda setting research and top-of-mind and first-brand-awareness research, Sutherland and Galloway (122) propose that the major goal of advertising may be to focus the consumer's

attention on what products or brands to think about rather than persuading consumers what to think about them. Agenda setting theory also suggests that advertising may alter the relative importance of product attributes.

Not all attributes of products are evaluated when people do not have well developed attitudes toward the product. The attributes evaluated to determine whether or not to purchase the product in the supermarket are probably those that are most salient. Advertising does not influence the consumer's own opinions, rather it influences the consumer view of what others think. The opinions of others, not one's own opinion, determine the behavioral outcome for most individuals, especially when the individual does not have a well formed opinion or for those decisions that are not important to the individual.

An individual's behavior is significantly affected by what the person believes others think and do (122). Direct observation and inference based on what is seen, heard, or read form perceptions of what others buy. Advertising appears to play an important role in determining acceptable and popular products. Research indicates that advertising frequency is associated with product preference and popularity (104,122). Thus, advertising may influence adolescent food choices by providing information about what food products and brands are popular and appropriate to consume. Proper food choices may be important to peer group acceptance (8).

In general, communication theory provides the basis for three models of advertising effects. In high involvement model, the audience may be highly involved in critically examining advertisements while

developing thoughts and feelings about the product. According to the low involvement model, the individual is passively involved in the communication process when the information is not perceived as salient. Combining passivity with the repetitiveness of television advertising allows behavior change to occur. Agenda setting theory states that advertising exerts its influence by determining the salience of various product attributes and what products are popular.

Cognitive, Affective and Behavioral Effects of Advertising

Cognitive effects of advertising. It is apparent that advertising can have cognitive, affective, and behavioral effects. Agenda setting theory and the low involvement model of advertising effects suggest that advertising increases youth's awareness and knowledge of products in the market place as well as influencing their perceptions of products and the individuals who use them. However, research has yielded conflicting results. Moore and Stephens (123) and Moschis and Moore (124) found no relationship whereas Moore and Moschis (125) found a positive relationship between television exposure and ability to link brand name and specific product categories. Television viewing did not significantly influence ability to recall brand slogans (123,125) but was correlated with the belief that brand names are indicative of product quality and performance (109).

A study of 306 high school students investigated the relationship between brand preference, advertising recall, and the level of cigarette smoking. The researchers reported a correlation of 0.50 ($P<0.001$)

between the level of tobacco use and recognition of cigarette brands and cigarette advertising slogans (126). Students smoking more than one pack per week recognized almost twice as many advertisements as non-smokers.

In a sample of 1,227 young adults, aged 12-to 22-years, substantial knowledge about the attributes of different alcoholic beverages was acquired from magazine and television advertisements (127). They gained information about which brands are most popular, costly or impressive to others. Other information learned included the ingredients in alcoholic drinks, the caloric content of beer, and the availability of new mixed drinks. Approximately one-fourth learned about taste and cost. Subjects with the greatest exposure to advertising were more likely to know about liquor proof, beer ingredients, and the appropriate drink to have with a good meal. During the initial period of experimentation with alcohol, subjects reported acquiring information about brand attributes, mixing drinks, prices, and taste from advertising. In another study, exposure to a mass media campaign using television, radio, and brochures significantly increased ($P<0.03$) the scores on a nutrition knowledge test of 400 ninth graders (128).

Moore and Stephens (123) found a strong association between brand awareness and slogan recall. They concluded that advertisements are an important source of information about brands, and brand name is a significant attribute. Some products, such as toothpaste and school supplies, first may be purchased randomly with subsequent selective retention of information from commercials for those brands serving to reinforce a particular brand selection (123). Brand knowledge is

determined by exposure to advertising and recall of slogans as well as information seeking from personal and media sources. Brand awareness may motivate learning more about the product.

In the Moore and Stephens (123) study, scores on the slogan recall instrument were low and may reflect the fact that adolescents do not pay attention to advertisements. A survey of 12-to 19-year old adolescents by Teenage Research Unlimited revealed that 66% change channels during commercials and 89% fast forward through the commercials when they watch videotaped programs (129). Recall of advertising messages is dependent on motivations for exposure, an understanding of prices, and age (123).

Affective effects of advertising. The impact of advertising at the affective level has been examined in several studies that surveyed approximately 1,000 junior high and high school students in urban, suburban, semirural, and rural Wisconsin and Georgia (49,104,110). In this survey, brand preferences were measured by asking the participants to list their favorite brand next to twelve different products or leave the space blank if they had no preference. These studies revealed a positive association between frequency of television viewing and youth's brand preferences. Results suggested that mere exposure to specific brands in television commercials may be sufficient to create favorable attitudes towards them (49,110).

In a study by Moschis (104), adolescents' affective responses to brands of varying advertising intensity and involvement were studied. He found that brand preferences and loyalty were more likely to develop for heavily advertised and relevant products than for infrequently

advertised and less relevant products. Results also suggested that while brand preferences for salient products develop during childhood, advertising may play an important role in the establishment of preferences and loyalty for brands of less salient products during adolescence.

Advertising also may affect attitudes toward product use. Exposure to advertisements for alcoholic beverages was associated with favorable attitudes toward use of alcohol and the belief that one can consume a greater amount of alcohol before ability to drive is impaired (127). According to a literature review by Moschis (104), several researchers have investigated the effect of advertising exposure on youth and their perceptions of advertised products and the people who use them. For example, youth heavily exposed to advertisements for products, such as over-the-counter medications, alcohol, mouthwash, and deodorant, were more likely to think that people need or use these products, and that these products are effective. (119).

Based on survey results, teenagers are brand conscious (72,130). This consciousness may result from advertising, preferences associated with gender, parental influence, and other factors. Exposure to advertising can influence teenagers' food choices by increasing their awareness of brands. In fact, when asked to name their favorite foods, many teenagers list foods by brand names such as Kraft or Chef Boyardee (130). While females are more brand conscious than males, both tend not to purchase generics (71). However, the products and brands in favor change frequently, as often as every six months (72). Teenagers want to buy what they find acceptable to their peers, and thus may make

different brand choices than their parents (71,72,130). Television/Radio Age published the results of a survey of 6-to 15-year old youth by Yankelovich, Clancy, Shulman, Inc., MTV Networks' Nickelodeon, and Gannett's USA Today (131). This study revealed that 53% of 9-to 15-year olds do not always buy the same brand of groceries as their parents.

The formation of brand preferences and the degree of brand loyalty vary with the type of product (132). A study of 1,000 junior and senior high school students found that over a three-month period significant ($P<0.05$) formation of brand preferences occurred for toothpaste, camera, flash cubes, light bulbs, and typewriters but not for coffee, soft drinks, radio, jeans, furniture, tires, and insurance. Adolescents were more likely to change brands for soft drinks or toothpaste than for jeans over the three months of the study.

Brand preference may be acquired as the result of media exposure rather than experience in the marketplace. Television commercials showing social uses of products are more likely to have a higher impact on formation of favorable attitudes toward brands than commercials not showing social uses (109).

Behavioral effects of advertising. The behavioral effects of advertising on teenagers has not been as extensively investigated as in young children. Work by Atkin and coworkers (127,133) indicated that exposure to advertisements for beer, wine, and alcohol increased drinking or intention to begin drinking in the future and was associated with drinking and driving. In another study, high school males who were

heavy television viewers reported more frequent use of alcohol than light television viewers (134). No studies examining the behavioral effects of food advertising on food-related behaviors were found.

In summary, advertising appears to increase youths' knowledge and awareness of products in the marketplace, influence their perceptions of advertised products and the people who use them, and influence brand preference and loyalty. Although the behavioral effects of advertising are not as well documented, research indicates that exposure to advertising for beer, wine, and liquor increases drinking or intention to begin drinking and driving while intoxicated.

Adolescents' Reasoning About Advertisements

Despite their ubiquitous presence and their substantial impact on consumer behavior, little research has investigated how adolescents reason about or process advertisements. Factors which influence the persuasiveness of advertisements include (a) knowledge about how to process biased information, (b) knowledge about advertising, (c) knowledge about the product, and (d) degree of involvement. Since knowledge about the product and the degree of involvement has been previously discussed, this section will review the first two factors.

Knowledge about how to process biased information. Both the development of skills in formal reasoning and the use of specific formal reasoning strategies influence adolescents' reasoning about advertisements (135). In particular, by relying less on the concrete and observable aspects of a situation, abstract reasoning allows the

adolescent to consider possible ways a result could be obtained. For example, the television commercial for a candy bar states that its consumption will alleviate hunger and improve concentration and work performance. Although not mentioned in the commercial other foods, such as a peanut butter and jelly sandwich, also can alleviate hunger and improve concentration and work performance. Thus, the commercial may be misleading.

Formal reasoning also employs specific strategies, such as the controlling variable strategy. Use of this strategy involves designing experiments to manipulate one variable while holding others constant. Formal reasoning should determine how adolescents assess product claims. However, abstract reasoning ability provided 126 seventh and eighth graders no assistance in the appraisal of advertisements (135). Thus, formal reasoning strategies may not be fully utilized. Because of the effort involved, adolescents may abandon critical thought and accept the advertisement rather than critically evaluate it (135).

Interviews with adolescents in the study by Linn and coworkers (135) provided insight into another reason that adolescents may not use formal reasoning skills. These adolescents were skeptical of advertisers and the techniques they used in product tests for advertisements (135,136). In fact, only 18% of 88 seventh and eighth graders believed advertisers tested their advertising claims; the remaining 82% felt that advertisers only test their claims when they want to, other people ask them to, or they are asked to by the government (136). The adolescents' lack of trust in advertisers reflects an awareness of the persuasive intent of advertising. To avoid

being persuaded, adolescents may reject advertisements rather than critically evaluate them.

Results of the interviews also indicated that this sample of adolescents was strongly influenced by the results of product tests in advertisements (135). Thus, despite skepticism and the ability to recognize procedural flaws in the tests, they still believed the results of tests as claimed and were misled by the advertisement. Lack of contradictory information and alternative sources of information about the product being tested may explain the adolescent's failure to act on his/her critical evaluation of advertisements.

The adolescents' ability to develop tests to determine if a specific product meets their needs is poor. Left to their own devices, adolescents often designed tests to evaluate products that lacked relevance to the hypothesis they were testing (135). They lost track of the test's purpose and instead attempted to show a large difference between the products or to test the advertiser's claim. Adolescents designed experiments to evaluate product claims that were less than optimal in terms of the number of tests and the number of subjects. Adolescents failed to demonstrate an appreciation of the importance of repeated testing.

Instead of using formal reasoning strategies, "adolescents appear to make decisions based on limited information and seek only a limited amount of information when given the opportunity to gather evidence for a decision. Adolescents' reasoning about advertisements appears expedient rather than thoughtful and may result in acceptance of misleading claims" (135). Linn and coworkers (135,136) concluded from

their research that adolescents who believed the claims in an advertisement were more willing to purchase the product than those who were non-believers.

Advertisements can persuade by increasing the number of criteria used in decision making or by changing the viewer's criteria for decision making (136). Increasing the number of factors used in making a decision results in more information than the adolescent can process. The additional information can impair consistent and logical decision making (136,137). Under these circumstances, a capricious response may replace rational thought processes. Adolescents are especially vulnerable to advertisers' attempts to change their criteria for decision making.

Advertisements can impair rational decision making by encouraging the adoption of inappropriate criteria for product selection (such as "makes me feel good") or by building on or altering the consumer's needs and desires. For example, food advertisements might influence an adolescent's perceived desire for the advertised product by building on the adolescent's excessive concern with physical appearance. One might speculate that successful food advertisements alter the salience of attributes on which food-related decisions are made. Research by Eiser and coworkers (138) supports this idea. They state that in the process of food selection, consumers evaluate the different products based on the attributes that are salient to them. For example, to one individual red meat is good because it contains iron, and to another it is bad because it contains saturated fat. In order to decide if a particular food is "good or "bad," an attitudinal judgment regarding the relative

importance of the different attributes of a food must be made by the consumer. Making this judgment likely requires the selective attention to and processing of particular attributes at the expense of other attributes. Thus, attitudes can be changed by modifying the salience of attributes (138).

"Accentuation theory," developed by Eiser and coworkers (138), distinguishes between the focal attributes on which a judgment is based and the peripheral attributes of an item which may or may not affect judgement of the focal attribute. When focal and peripheral attributes are related, peripheral attributes can help predict judgement on focal attributes. For example, when one is evaluating foods on the focal dimension of whether "it's good for you," knowledge of various peripheral attributes (such as vitamin or mineral content) can help the individual make a decision about which food is better.

In a test of this theory, Eiser and coworkers (138) presented an experimental group of 211, 13-to 14-year olds, with information about the amount of iron, protein, carbohydrate, kilocalories, or fat in 21 different foods. Then, they compared their ratings of the pleasantness and goodness of the foods to a control group of 36, that did not receive the nutrition information. The information about the nutrient content of the foods positively affected the subjects' ratings of their "goodness." Eiser and coworkers (138) concluded that the foods were evaluated on the most important or available attribute at that time. The results suggest that advertising can enhance the salience or acceptibility of particular attributes (138). Knowledge of the nutrient

content of the food did not affect ratings of pleasantness, because this attribute was not related to goodness as defined in this study.

Food advertising can introduce bias by selectively emphasizing certain attributes of the food even when this selective information is correct. Television food advertisements commonly emphasize the more attractive aspects of a food product while avoiding any mention of the less positive aspects. This selective emphasis can reduce the amount of information used to evaluate the food advertisement, resulting in a simplified evaluation. Thus, advertising apparently builds on the desire of an individual to reduce complex decisions to simpler ones. Research indicates that young consumers have preferences regarding more attributes than they take into account in evaluating a product, and it is not until late adolescence that individuals integrate their preferences on two or more attributes (137). Therefore, although advertising can disseminate accurate information, it can still reduce the quality of adolescents' decision making.

Knowledge of advertising. Knowledge is an additional factor that may influence how adolescents process the information in commercials. Knowledge and understanding of the purpose of advertising influence the persuasiveness of the commercial and the retention of information in the commercial (139). Specifically, knowledge regarding the purpose of advertising affects the processing of the information in the commercial, which in turn influences the retention of both product and non-product related information in the commercial and the subsequent recognition of the product. This recall and recognition, then, are determinants of

preference for the advertised product. These relationships are depicted in Figure 2.

Based on a thorough review of relevant research, Siegler (140) identified three ways knowledge may influence information processing. First, previous knowledge can enhance the recall of newly presented information. Second, age related differences in information processing abilities and strategies may be due to changes in the knowledge base. In fact, children knowledgeable in a particular area can recall more information about their area of expertise than adults without this knowledge base. Third, recall can improve without learning new strategies when the knowledge base is increased.

In summary, advertisements may impair adolescents' ability to evaluate the claims critically by increasing or changing the salient attributes used to evaluate the products. Adolescents appear to be especially persuaded by advertisements that use comparison tests. Prior knowledge about the product, an understanding of the purpose of advertising, and degree of involvement are other factors that may influence how adolescents reason about advertisements.

Attributes of Persuasive Advertisements

Articles in trade journals have described ways to market products to teenagers (74-76,130). Adolescents respond to commercials that involve dance, beat music, adventure, and fast pace cutting. The actual words in the commercial may not be significant because teenagers respond to "allegiance advertising-this brand is who I am." (74). Food

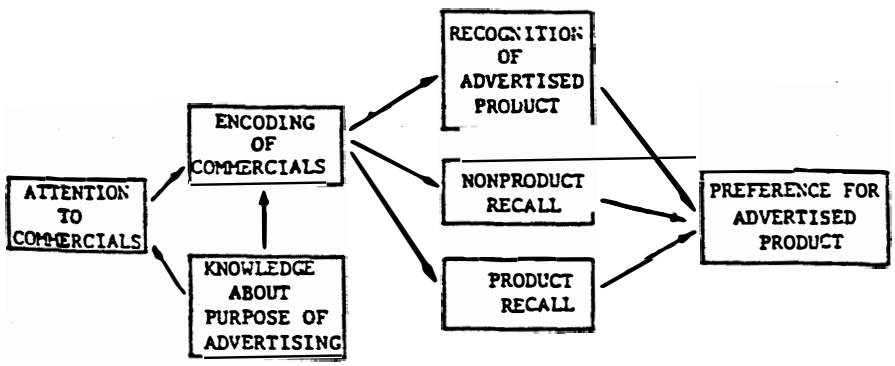

Figure 2. Model of the Role of Knowledge in the Effects of Television Advertising on Children.

Source: Sanft, H. (1986) The role of knowledge in the effects of television advertising on children. Adv. Consumer Res. 13: 147-152.

manufacturers design advertising campaigns for adolescents that build on their concern with physical appearance and interest in health and physical fitness. Results of two studies indicated that the perceived healthfulness of foods significantly influenced the food choices of both male and female adolescents (141,142). Adolescent females respond to advertisements that emphasize fitness and health and are very interested in "lower calorie natural advertising" (75). According to recent research by Contento and coworkers (143), health is an important factor determining food choices for three subgroups of adolescents. These adolescents consumed foods they believe are healthful and avoided foods that contain sugar, are fattening, and promote heart disease. American high school home economic students reported that price, nutritional value, ease of preparation, caloric content, and brand loyalty in descending order were the most important criteria for purchasing food (144).

Advertisers also plan promotional campaigns around other issues, such as family continuity and developing an identity, that are relevant to this age group (74). Moschis (109) has suggested that advertisements promoting the social uses of products were likely to impact the formation of favorable attitudes toward brands of advertised products.

However, adolescents' attitudes toward and responses to commercials are not all positive. Adolescents express a great deal of discontent and skepticism toward commercials. Approximately 90% of about 500 tenth graders studied by Lyle and Hoffman (51) felt there are too many commercials. Fifty-one percent rated commercials as annoying or in poor taste always or most of the time. The overwhelming majority felt that

television commercials never tell the truth or at best do so only some of the time.

A survey of 1,094 eighth to twelfth graders in Maryland assessed attitudes toward advertising by asking participants what commercials represented the best and the worst in television advertising and the reason they liked or disliked these commercials (145). Of all respondents, the two most frequently cited categories of commercials were cigarettes and drugs or patent medications mentioned by 17% and 15%, respectively. Soft drinks were cited by 7% and food and gum commercials by 6%. Soft drink commercials were well liked; 96% of those mentioning soft drinks ranked them as the best in television advertising, and 4% ranked them as the worst in television advertising. Fifty-three percent of those mentioning food and gum commercials felt they represented the best in television advertising, and 47% the worst in television advertising.

Many of the respondents in the Ward and Robertson (145) survey failed to specify both a commercial and a reason for liking or disliking it. Of the 705 respondents in this study who specified both a product category as representing the best and a reason for liking the commercial, 14% specified liking soft drink commercials and 6% food commercials. The primary reason for liking soft drink advertisements was good music. Interestingly, clever was a term most frequently cited as a reason for liking food and gum commercials. On the other hand, the primary reasons for disliking food and gum commercials were that they were stupid or fake.

Interestingly, attitudes toward commercials were not related to recall of commercial content or self-reported effects on buying. In fact, very few adolescents said they watch television commercials to learn how to solve problems, to make a good impression on others, or to be successful (social utility reasons); to have something to talk about with parents and friends (communication utility reasons); or to see things they'd like to have or let them dream of the good life (vicarious consumption reasons) (146).

Interpersonal Communication and Consumer Socialization

Interpersonal communication also plays an important role in consumer socialization and mediates the adolescent's response to advertising. This section of the review discusses the influence of family and peers on adolescents' food habits and the impact of interpersonal communication on consumer socialization.

Interpersonal Relationships and Adolescents' Food Habits

Family relationships and adolescents' food habits are interrelated. Family commensalism has been correlated with a preference for a greater variety of foods, improved dietary adequacy, and greater assistance from parents with decision making, homework, personal problems, and money problems (147). Family commensalism was also associated with the degree of affection between the adolescent and each parent, performance ratings in the fulfillment of the mother, father, son, or daughter role, and the mood level manifested by the parent-child dyad. Adolescents who shared

food-related activities with their family were more likely to report receiving praise, discipline, and encouragement, to share confidences and problems, or to agree on most matters with at least one adult in the household (148). Hinton and coworkers (87) noted that positive family relations were associated with less meal skipping and a more adequate diet. In this study, criticism regarding dietary intake increased meal skipping and decreased the adequacy of the diet.

Contento and coworkers (143) identified three subgroups of adolescents who were significantly influenced by significant others in their food choices. One subgroup's food choices were primarily determined by what parents serve and friends eat. A second subgroup believed both they and their friends ate healthful foods. A third subgroup's food choices correlated with what their parents serve and with concern about health.

Parents and peers are frequently cited as sources of nutrition information. Results of three studies indicated that between 80% and 91% of high school students received nutrition information from their parents (13-15). Peers were reported as a source of nutrition information by 31% (14) and 47% (15) of high school students. The next section of the literature review describes how communication with peers and family impacts consumer socialization and mediates the influence of television advertising.

Interpersonal Communication and Television Viewing

Television viewing often may be a shared leisure activity, and this social context determines what programs are watched (54,149). Eighty-

two percent of tenth graders reported usually or sometimes watching television with their parents, 75% with siblings, and 47% with friends (51). Of those who watched television with their families, 18% reported talking with other members quite a bit, and 60% sometimes. Sixteen percent talked about the television show, and over one-half reported talking about both the television show and other things. Television not only may serve as a social activity, but what is seen on television also can be a topic of conversation. Sixty-three percent of tenth graders discussed topics viewed on television with friends, and 37% of the males and 58% of the females discussed television with their parents (51).

Interpersonal communication can condition a youth's attention to and learning from television commercials, resulting in positive and negative socialization (50,112). Adolescents are more likely to retain advertising information when they expect to use it in interpersonal communication (150). Day-to-day consumption plans appear to be discussed with peers, while long term plans are discussed with family members (150). Ward and Wackman (113) have suggested that communication with parents plays an important mediating role between exposure and purchase, thus indicating that consumer behavior is not just a direct effect of advertising but a social process involving communication with others.

Peer Communication

Interaction with peers satisfies several psychological and social needs including reinforcement of values and status (104). Satisfaction of these needs might in turn lead to changes in an individual's attitudes and behaviors. Membership in and acceptance by a special peer group may require engaging in certain behaviors. For example, due to their symbolic connotation, certain foods may not be acceptable to consume in the company of friends (8).

Research indicates that reference groups can influence consumer behavior by determining what consumer goods are acceptable and popular (104). Adolescents who watch television to learn what others will think about the purchase of a particular product are more likely to buy an advertised product (113). Teenagers respond to peer opinions regarding topics about which they have similar interests, opinions, and attitudes such as choice of clothes or hairstyle (104,125). Additionally, peers can serve as a source of reinforcement or as a model.

According to social comparison theory, people desire to validate their beliefs and receive an accurate appraisal of their capabilities. (151). The behavioral outcome of this drive is that individuals will compare their opinions and abilities with others. One could speculate that adolescents will attempt to evaluate what they learn about food and nutrition from television by comparing it with others who are likely to have similar views. In other words, television advertising can have indirect effects by setting the agenda for communication about consumption with peers (110,125). Research indicates that adolescents do initiate discussions with peers about consumer information obtained

at home, and peer communication may be a second-order consequence of learning from parents rather than from television (50,108,152).

Learning consumer norms from peers. In the mid 1950's, Riesman and Roseborough (107) suggested that adolescents learn the symbolic meaning of goods from their peers. Research conducted during the last decade supports this view. Adolescents reported that their peers were a significant source of information in making decisions about the purchase of consumer goods that were important to social acceptance such as sunglasses and a wallet. This need for social approval may cause the adolescent to purchase such a product with friends (153).

Communication with peers increases awareness of consumer goods and services, and that in turn results in greater attention to television and commercials in order to learn about the social uses of products (49,50,150). The availability and demonstration of the social uses of products in advertisements contribute to the formation of materialistic attitudes and to social motivations for consumption. Therefore, it is not surprising that communication with peers about consumption has been correlated with the strength of materialistic attitudes in both cross sectional and longitudinal studies (50,108,112).

In addition to influencing orientations toward conspicuous consumption, peers appear to play a key role in the decision making process. For example, the frequency of peer communication about consumption and the trust placed in their advice about purchasing decisions were associated with the need to work to satisfy both immediate and future consumption motives (150). Frequency of

communication with peers about consumption also has been linked to preferences for information from peers and to reliance on peer product preferences (153). Peers, then, appear to be influential at the product evaluation stage.

While discussing consumption matters with their peers, adolescents learn a variety of information about the marketplace. Communication with peers results in an increased awareness of brands in the marketplace, the costs of these goods and services, and consumer rights and obligations (124). The increased awareness results in greater interaction with other socialization agents, such as the mass media and the family, and that in turn results in additional learning. According to Moschis (49), watching television programs and commercials to acquire information about lifestyles and behaviors associated with users of consumer goods and products was positively related with peer communication about consumption. Peers also play a key role in the development and maintenance of brand preferences (110). Moreover, favorability of attitudes toward advertising, ability to filter puffery in commercials, dissatisfaction with the marketplace, and information seeking are positively linked to peer communication (49,109,114).

Peer influences on interaction with other socialization agents. In addition to their influence on the development of attitudes toward conspicuous consumption and on the decision making process, peers can influence the interaction with other socialization agents. According to Chaffee and Tims (149), social relations influence adolescents' use of the mass media. As they spend more time interacting with peers, they

spend less time using the mass media. Additional support for this pattern is supplied by research reporting an inverse relationship between frequency of communication with peers regarding consumption and frequency of television viewing (150,154).

In the process of sharing with their parents what they learn from peers, adolescents may influence parental consumption. Riesman and Roseborough (107) call this process retroactive socialization. Several studies support the hypothesis that retroactive socialization occurs (125,154,155). Several studies have reported a positive relationship between the frequency of interaction with peers about consumption and the frequency of initiating discussions about consumption with parents (50,108,109,154). A study by Moschis and Mitchell (155) examined the degree of adolescents' participation in various stages of the decision making process concerning the purchase of a wide range of products. Some were specifically for adolescents' use (such as school supplies or clothing), and others were specifically for use by the family or just the parents (such as small appliances or car repairs). The study reported a statistically significant relationship between the adolescent's frequency of interaction with peers about consumption and the likelihood of the adolescent mentioning the need for these products and services, discussing their purchase, and playing a key role in the family purchase decision. The data, thus, suggest a tendency for peer influences to be carried into the family decision process and to impact family decisions.

The strength of peer influence on consumer behavior depends on gender and family relations. Females appear more likely to conform to

peer pressure than males (104). This may reflect the greater parental restrictiveness toward their daughters than their sons. In response to this more authoritarian parenting style, the adolescent female may substitute peer norms for parental support. One longitudinal study (112) found that the influence of peers was greater on adolescents from families who discussed consumption matters infrequently.

To summarize, research results provide evidence that communication with peers is associated with the development of the expressive or social aspects of consumption and, also, plays a role in the decision making process, especially at the information seeking and evaluation stages. Frequency of interaction with peers also is related to reliance on peer product preferences, especially for items where social acceptance is salient. Peer communication is also associated with the development of a variety of consumer skills, the development and maintenance of brand preferences, and the development of dissatisfaction with the marketplace. However, discussions about consumption with parents reportedly decrease the influence of peers. Peers can indirectly influence the family decision making process through retroactive socialization. Additionally, peer communication can influence the interaction with other sources of consumer information such as the family and the mass media. Finally, peers can influence the adolescent's attention to and processing of information from the mass media.

Family Communication

Because youth watch television at home, one would assume that social influences in the home shape the adolescent's use of and learning from the mass media. In fact, the family context of interpersonal communication appears to have the greatest impact on consumer socialization. The influence of intrafamilial communication on consumer learning results from sibling-sibling, parent-child, and child-parent communication (104).

Unfortunately, few studies have examined the effect of discussion with siblings about consumption on consumer socialization (104). Research on the impact of older siblings on clothing selection indicates that siblings may affect the development of materialistic attitudes and social motivations for consumption. Watching television with siblings influences what type of television program the children view (149). The importance of siblings as socialization agents is influenced by their gender and birth order position. Since research on sibling communication is sparse, the rest of this section will discuss the influence of parent-child communication on consumer socialization. The term "family" will refer solely to parent-child relations.

Learning consumer norms from parents. The effects of family communication on consumer socialization can be either direct, indirect, or it can mediate the impact of other sources of consumer socialization (104). Direct effects include the transmission of consumer knowledge and the subsequent formation of patterns of norms, beliefs, and behavior from one member to another. Indirect influences involve learning

patterns of interaction with other sources of consumer information such as peers and the mass media which in turn influence consumer learning. Finally, the family may mediate the effects of other sources of consumer information. For example, family communication can attenuate the influence of peers.

Riseman and Roseborough (107) proposed that youth learn the basic rational aspects of consumption from their family. Parents emphasize normative consumer skills in their interaction with their children. Moore and Moschis (57) reported that parental modeling is associated with consumer role perceptions. Family communication is positively related to the performance of socially desirable consumer behaviors (50,112,125,154). Family communication also increases the adolescent's knowledge of the price of selected products, economic motivations for consumption, and in the short term the likelihood of the adolescent preferring to buy sale items or heavily advertised products (49,50,123,154,156).

Parental influence appears to encompass more than the rational aspects of consumption. Moschis (114) conducted a study of 556 sixth to twelfth graders and found that family communication was positively linked ($P<0.05$) to the development of brand preference and the ability to filter puffery in advertisements during the 14-month study.

Parents not only teach their children the normative aspects of consumption, but also provide assistance in the selection of consumer goods. In fact, children prefer their parents as a source of consumer information (153). The effect of family interaction on the decision making process varies with the stage and the type of product (104,157).

This idea is supported by a study of the purchasing patterns of 607 adolescents (158). By themselves, adolescents were more likely to purchase products relevant to their own leisure activities, such as records and tapes, movie tickets, and sports equipment, but with their parents they tended to purchase items of higher price and social risk, such as shoes and clothes (158). Adolescents were more likely to purchase snack foods alone or with peers than with family members, while health care products were more likely to be purchased with other family members, alone, or by others. In a study by Belch and coworkers (157), teenagers had greater input regarding the decision for purchasing products and services they used or were affected by, such as breakfast cereal or the family vacation, than for those they were less involved with such as television, automobile, household appliances and household furniture. Similarly, Moschis and Moore (153) found that the desire for parental advice was greatest for products where price, social acceptance, and performance were salient. In other words, adolescents are most likely to purchase products which involve greater monetary and performance risk with parents and products of lower risk alone or with peers (152,153).

Mechanism of parental influence. The specific mechanism by which family communication influences the child's consumer learning is not well understood (104). It does appear that parents make limited attempts to teach their children consumer skills, such as brand knowledge, price accuracy, and consumer role perceptions (109,124,159). With these limited efforts, parents encourage their children's practice

of positive consumer behaviors without providing any explanation. Parents expect that the child will learn consumer norms by observation. In other words, parents attempt to act as role models to their children, and they expect them to learn these roles through observation. Although positive reinforcement appears to encourage the performance of socially desirable consumer behaviors, negative reinforcement does not restrain these behaviors, and it may interfere with adolescents' learning about consumer matters. For example, restrictive punishment, such as grounding, increases the amount of time the adolescent spends watching television (160).

Sociodemographic characteristics influence family interaction processes (152). Older teenagers discuss consumption with their parents less often and receive less positive reinforcement from them (159). Older adolescents are also less likely to take parental preferences into account in evaluating products and are more likely to buy heavily advertised products (156). Females are less dependent than males on other family members for the purchase of health care products, jeans, and shirts but not other products relevant to physical appearance, such as shoes and coats (158). Females interact more with parents about consumer matters and are more likely to receive negative reinforcement than males. The active involvement of female adolescents in food shopping suggests that parents might allow their daughters greater independence in making family decisions or encourage greater involvement in family decisions than their sons. In fact, females are more likely than their male counterparts to mention the need for products, discuss

the purchase, make product decisions, and actually purchase the product (155).

To summarize, adolescents learn consumer norms by observing their parents as they mature or through experience in the marketplace. Parental mediation efforts, such as reinforcement or purposive training, also play a role in the development of consumer norms. Age and gender of the adolescent influence the interaction with parents about consumer matters.

Family Communication Style

Consumer learning from the family is related not only to the frequency but also to the pattern of communication. Research has consistently shown that there are two styles of family communication: socio-oriented and concept-oriented. Newcomb's (161) A B X paradigm provides the framework for these two dimensions of parent-child communication (105). According to this model, interpersonal communication involves at least two persons, A and B, and an object of communication, X. The model assumes that A and B are positively or negatively oriented toward each other and are co-oriented toward X. Family communication patterns can be divided into A B stressed relationships (socio-oriented) and A X or B X emphasized relationships, (concept-oriented) (105). Socio-oriented families emphasize the importance of harmonious social relationships, while concept-oriented families encourage consideration of all alternatives before making a

decision, open expression of opinion, and exposure to controversy. These dimensions form the four-fold family communication typology shown in Figure 3.

Family communication style and television viewing. Television viewing practices vary with style of family communication. McLeod and O'Keefe (105) reported that adolescents from protective families watch the most television of any family communication pattern, especially entertainment programs. Television allows the child to escape from the strong emphasis on relationships. Consensual families have a greater than average interest in public affairs content on television. However, their knowledge of politics is well below average. The tendency of consensual families to view fantasy-oriented programs may be due to the conflicting messages these adolescents receive from their parents (exploring controversies but maintaining harmonious relations). These adolescents reportedly watch a large amount of violent programming and do not feel the real world is similar to that seen on television. Adolescents from both protective and consensual families are more apt to model parental viewing patterns (161). Adolescents from laissez faire families, like those from protective families, do not feel there is similarity between television and real life, although these adolescents become involved with characters and story or action shows. Adolescents from pluralistic families watch less television than other family types.

Family communication style and consumer decision making. Adolescents from socio-oriented families believe the source of

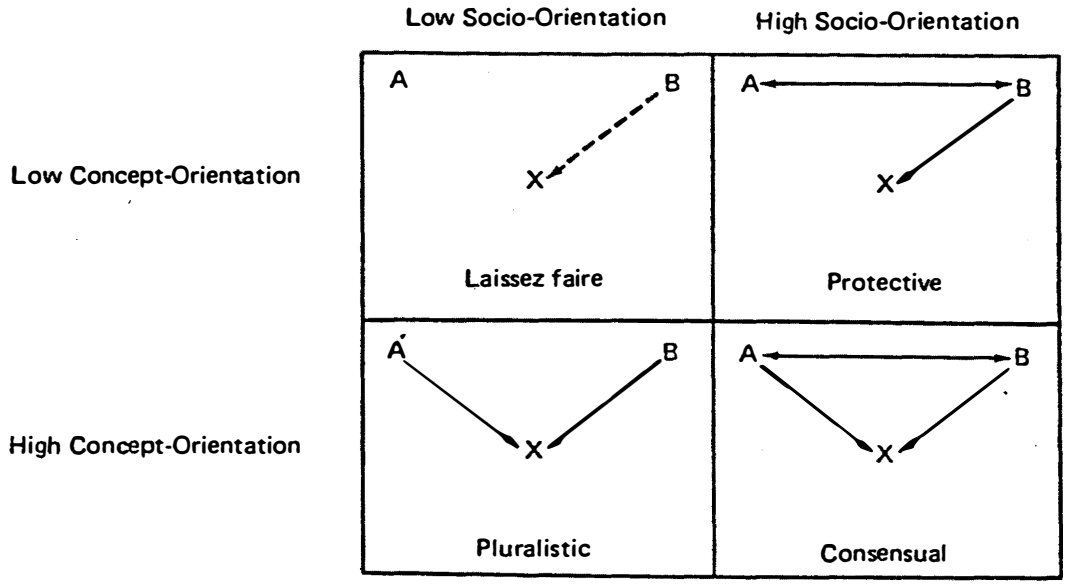

Figure 3. Family Communication Pattern Typology Interpreted by Relations From Newcomb's ABX Paradigm.

Key: A = the child, B = the parent, X = the topic, arrows indicate relations stressed in particular family type.

Laissez faire families lack emphasis on either type of relation. The adolescent is not prohibited from arguing with his/her parents, but neither is s/he exposed to conflicting sets of ideas.

Protective families stress the obedience and social harmony of socio-relations (A B) only, and there is little concern with conceptual matters. The child not only is prohibited from speaking up, but s/he is not likely to encounter controversial ideas that would make him/her speak out.

Pluralistic families emphasize the development of strong and varied concept relations (A X) without insisting on obedience to authority. The child is encouraged to explore new ideas and to express them without fear of retaliation.

Consensual families place stress on agreement through both types of orientations (A B and A X). The child is faced with a seemingly incompatible situation in that s/he is encouraged to explore controversy, but s/he is also constrained to develop and maintain ideas consonant with those of his parents.

Source: McLeod, J.M. & O'Keefe, G.J. (1972) The socialization perspective and communication behavior. In Kline, F. G., and Tichenor, P.J., eds.: Current Perspectives in Mass Communication Research, Beverly Hills, CA.: Sage Publications.

information in an advertising message is a more important attribute than their counterparts from concept-oriented families (Moschis, 1987). Socio-oriented subjects more readily changed their attitudes when the expertise of the message's source was manipulated.

According to a study of 161 adolescent families, a socio-oriented communication structure also appears to influence the family decision process. Adolescents from socio-oriented families were less likely to be influential in the decision of what to buy and the actual purchase of the product (155). Youth from a concept-oriented family did not play a significant role in mentioning the need for products, seeking information, deciding what to buy, and actually purchasing the product. Thus, a socio-oriented family communication pattern discourages the child's participation in consumer decisions, while a concept-oriented family communication pattern does not either discourage or encourage greater participation through independent decision making.

In addition, family communication patterns influence information seeking. Adolescents from pluralistic families that encourage self expression and lack of social constraints prefer functional types of information (109). Since pluralistic families promote the evaluation of choices, their children report an increased preference for sources of information, such as Consumer Reports, which contain many alternatives. They have a higher regard for their parent's opinion and prefer to use parents as a source of information. On the other hand, adolescents from laissez faire families rely less on parents or peers for information (152). Adolescents from protective families are more susceptible to outside influences, such as peers and television advertisements (152).

Vulnerability to these outside influences is probably limited to informal social influences rather than commercial influences in the market place (162).

Family communication style and consumer learning. Family communication patterns also influence the youth's consumer knowledge and behavior. Adolescents from pluralistic families are better able to filter puffery in advertising, manage a typical family budget, describe various consumer goods and their attributes, and more apt to perform socially desirable consumer behaviors (152,163,164). These adolescents tend to report negative attitudes toward the marketplace, preferences for brands, and greater purchasing independence than the other groups (162). Adolescents from pluralistic families are the most competent consumers. On the other hand, a consensual family communication pattern is associated with the most positive attitudes toward the market place and greater dissatisfaction with products purchased or consumed (162). Adolescents from laissez faire families are least likely to develop brand preferences and are the least competent consumers (162).

Family communication patterns also affect other parent-child interaction processes. Family communication patterns influence the degree of similarity of attitudes and behaviors between parents and children (104). Only in laissez faire families were parental and child attitudes toward the marketplace and dissatisfaction with the marketplace similar. Protective families reported the highest degree of similarity in attitudes toward money, whereas consensual families exhibited the greatest similarity in desirable consumer behaviors.

Family communication style and interaction with other socialization agents. In addition to influencing the rational aspects of consumption, the family communication style also shapes the child's consumer behavior by influencing interaction with other socialization agents. A survey of 377 families with children between the ages of 2-to 15-years revealed a link between family communication patterns and restrictions regarding the use of television (105). Although both socio- and concept-oriented families used television viewing privileges for reward and punishment, concept-oriented families provided guidance about the programs selected for viewing. However, protective families, which are high in social orientation and low in concept orientation, were most likely to use television viewing privileges for reward and punishment, while pluralistic families, which are low in social orientation and high in concept orientation, were the least likely to use television privileges for reward and punishment.

Ward (103) speculated that "families stressing conformity to others may implicitly encourage their children to learn to purchase and to derive satisfaction from their purchases on the basis of the perceived effects on others." This encouragement of respect for others and consideration of their beliefs may result in materialistic attitudes and social motivations for consumption. Two studies reported a positive association between a socio-oriented family communication pattern and materialism and social motivations for consumption (164,165). A concept-oriented family communication pattern was not significantly related to materialism, social motivations for consumption, or economic motivations for consumption. Moore and Moschis (165) have suggested

that the emphasis in socio-oriented families on evaluating consumer goods on the basis of their perceived effect on others may indirectly affect consumption related cognitions by influencing television viewing motives. These motives in turn affect the development of materialistic attitudes.

On the other hand, a concept-oriented family communication pattern increases exposure to public affairs programming. Exposure to this programming is positively linked to (a) economic motivations for consumption, (b) the propensity to buy and use consumer goods and services in a socially desirable way, (c) consumer affairs knowledge, (d) ability to filter puffery, (e) the ability to identify products that are claimed to be different on specific attributes, and (f) consumer financial management (163-165).

Based on the studies reviewed, family communication patterns influence the frequency and type of television programs viewed as well as television viewing motives. A socio oriented-family communication pattern discourages participation in consumer decisions, while a concept-oriented family communication pattern does not either discourage or encourage participation in the decision making process. Family communication patterns also influence information seeking, consumer knowledge and behaviors, and attitudes toward the marketplace. Family communication patterns indirectly impact consumer socialization by influencing interaction with other socialization agents, which subsequently affects consumer learning. Parents also mediate the effects of television and peers by influencing the processing and interpretation of messages received from these sources.

Overall, consumer socialization research indicates that parent-child communication directly influences the development of consumer skills, knowledge, and attitudes. By determining the frequency, type of, and motivations for use of the mass media and interaction with peers, family communication indirectly influences consumer socialization. Finally, parents also mediate the effects of other socialization agents by altering the interpretation of information from these sources.

Summary

Adolescents purchase a significant portion of the food consumed by themselves and their families. This fact combined with the extensive amount of time adolescents spend watching television has made adolescents a target audience for food advertisements. The large amount of money spent by food manufacturers on television advertising suggests that food commercials may be successful in influencing food choices. However, the impact of television viewing by adolescents on their dietary habits has been the subject of few studies. It is postulated that television promotes the consumption of foods high in fat and sugar, and this combined with the passivity of television may increase the risk of obesity.

The influence of television on adolescent consumer behavior has been extensively examined from a socialization perspective. According to this viewpoint, as an agent of socialization, television transmits attitudes, beliefs, and behaviors essential to the acquisition of the

consumer role. Mass communication theory provides the conceptual framework for three models of advertising effects. The high involvement model states that the audience may be highly involved in critically examining advertisements, while developing thoughts and feelings about the product. According to the low involvement model, individuals are passively involved in the communication process when they do not perceive the information as salient. This passivity combined with frequent exposure results in behavior change. The third model, agenda setting theory, proposes that the major goal of advertising may be to focus the consumer's attention on what products or brands to think about rather than persuading consumers what to think about them. Agenda setting theory also suggests that advertising may alter the relative importance of product attributes. These models suggest that advertising has cognitive, attitudinal, and behavioral effects. Advertising increases knowledge and awareness of products in the marketplace and influences the perception of advertised products and brand preferences.

Exposure to advertising increases expectations about the performance of advertised products and decreases the person's ability to filter puffery in advertisements. Advertisements also impair adolescents' ability to critically evaluate the claims by increasing the number or altering the salience of attributes that can be used to evaluate products. Knowledge about the product, knowledge about advertising, and the degree of involvement are also important factors which determine adolescents' responses to advertisements.

Information about how adolescents reason about the claims in advertisements is utilized to improve the persuasiveness of

advertisements. In fact, articles in trade journals describe ways of making advertising more effective. Adolescent females appear to be especially responsive to advertisements emphasizing fitness and health, are eager to try new products, and may perceive the nationally advertised brands as more nutritious, as a better value, and of a higher quality than store brands or generics.

Interpersonal communication plays a key role in determining the adolescent's response to advertising. Interaction with peers increases awareness of goods and services in the marketplace, which in turn influences learning from other sources of consumer information including the family and television. Communication with peers also appears to influence family consumer decisions, and peers are instrumental in the development and maintenance of brand preferences.

Parents are primary agents in the consumer socialization of their children. They serve as role models for appropriate behavior, and the child's communication with parents influences interactions with other sources of consumer information. For example, family communication influences the frequency of television viewing and the types of programs viewed. Parents also appear to mediate the influence of the mass media and peers. Apparently the influence of parents depends more on the pattern of interaction than on the frequency of interaction.

The literature reviewed suggests that television advertising may have direct effects on pregnant adolescents' food choices and that communication with family and peers may mediate these effects. The hypothesized direct effects of television advertising are diagrammed in Figure 4. According to this proposed model, television advertising

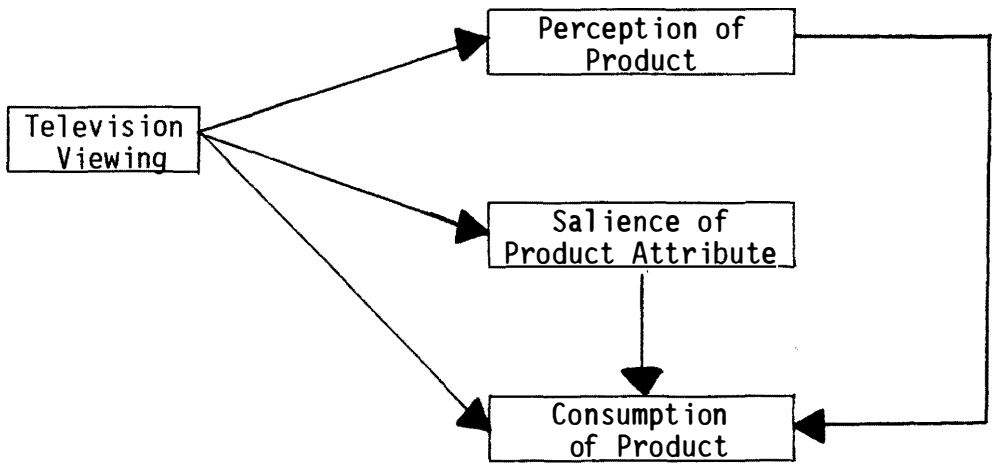

Figure 4. Proposed Model to Describe the Direct Effects of Television on the Food Consumption of Pregnant Adolescents.

influences the relative importance of the various attributes of the product, the individual's perception of the advertised product, and consumption of the advertised product. In addition, perception of the advertised product may influence consumption of the product. Figure 5 shows that the frequency of communication with family and peers and the pattern of family communication may mediate the influence of television advertising.

No studies were found in which the influences of parents, peers, and television viewing were studied conjointly and associated with actual food consumption of adolescents. Furthermore, no studies were found that examined the relationship among these variables, although there is a theoretical and empirical basis for such a study. A systematic study of these factors could prove or disprove the purported effect of television, given that the influence of parents and peers is also determined.

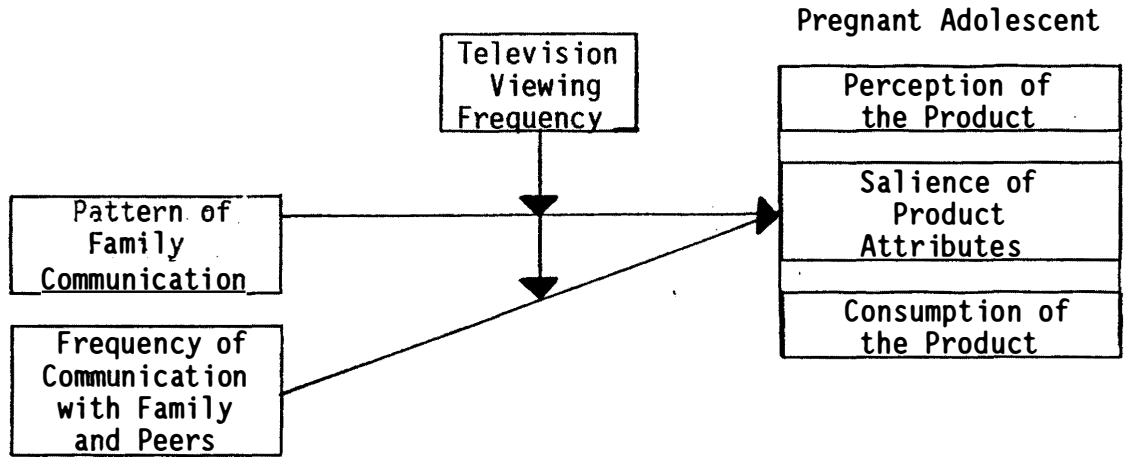

Figure 5. Proposed Model to Describe How Family and Peer Communication Mediate the Impact of Television on the Food Consumption of Pregnant Adolescents.

CHAPTER III

METHODOLOGY

Sample Selection

Pregnant adolescents, ages 11 to 17 at conception, were recruited from private and public medical clinics, government assistance programs, public schools, and special programs for pregnant adolescents within approximately 100 miles of Knoxville, Tennessee. Pregnant adolescents identified to participate in the study were from 28 to 35 weeks of gestational age according to self-reported expected dates of delivery. Staff from cooperating agencies approached potential subjects about their willingness to participate and obtained permission to release their name, address, and phone number to researchers involved in TN 860.

In addition, posters advertising the study were posted in cooperating agencies and Department of Human Services offices in the target area. The poster included postcards which pregnant adolescents who were interested in receiving additional information about the study could complete and mail to the TN 860 researchers.

Upon receipt of the pregnant adolescent's name from either the cooperating agency or the postcard, one of three graduate research assistants contacted the potential subject by telephone. The research assistant explained the purpose of the study and invited the pregnant adolescent to participate in the study. The prospective subject was informed that information about her television viewing habits, reaction

to food commercials, and food purchasing and consumption practices would be collected through written questionnaires and individual interviews. The potential subject also was told that participation was voluntary and that she could withdraw at any time. Additionally, the research assistant stressed that all information provided would carry a code number and would be kept confidential, and no one could be identified as a participant in the study. All results of the study would be reported as group data. If the adolescent agreed to participate, an appointment for the first interview was made to begin data collection.

If the potential subject did not have a telephone, a letter was sent to the adolescent that included information about the study and asked the person to call the researchers collect. A second letter was sent if the potential subject did not respond to the first inquiry. No further effort was made to enroll the adolescent in the study.

Human Subjects

The TN 860 project was approved by the Committee on Research Participation involving Human Subjects at the University of Tennessee, Knoxville. According to Tennessee laws regarding confidentiality and rights of minors, parental consent to participate in research is not required for pregnant adolescents. This study involved no invasive laboratory techniques and no known risk to the participants.

Data Collection

Three research assistants in the Department of Nutrition and Food Sciences collected all data, with the author acting as the primary investigator for the portion of the project that involved television. All research assistants were Registered Dietitians with Master of Science degrees in nutrition or a related field and had clinical practice experience. Data collection involved two different interviews scheduled no more than two weeks apart. These interviews were conducted during April through June and July through October, 1989. All interviews were conducted in a mobile home at a location and time convenient to the participant. Transporting pregnant adolescents in the third trimester was not considered safe, and the mobile home served as a laboratory which provided a consistent environment for data collection. All subjects who missed any appointment were contacted about their willingness to reschedule their appointment.

Initial Interview

During the first interview, a research assistant reviewed the purpose of the study, responsibilities of the participant, and activities that research assistants would be doing during data collection. The research assistant reiterated that participation in the study was voluntary and that the participant could withdraw at any time with no penalty. She also explained that all information would be kept confidential by the use of code numbers and that results could help professionals working with pregnant adolescents. All subjects were

required to sign an informed consent form (Appendix A), indicating their understanding of the study and their agreement to participate.

At this time, a research assistant interviewed the subject to collect demographic and background information. Specifically, information was collected about the last grade completed in school, age, marital status, living arrangement, and occupation of the individual or individuals providing financial support. This information was recorded on the Demographic and Background Information sheet (Appendix B) and used to calculate the Hollingshead Four Factor Index of Social Status Score (166).

During the first interview, a 24-hour diet recall was completed and subjects received instructions and forms for completing a two-day food record (Appendix C) to be returned at the second interview. Subjects were asked to keep records for one weekday and one weekend day. Information on the time and location of each eating occasion, the individuals with whom the subject ate, and whether or not the subject was watching television while eating was recorded on all dietary forms for both food recalls and food records. The primary investigator also administered the Television Viewing Questionnaire (Appendix D) and Parent/Peer Communication Questionnaire (Appendix E) at the first interview.

Second Interview

To provide continuity and consistency from the first to the second interview, the same research assistant who completed the first 24-hour diet recall repeated this process in the second interview. The primary

investigator reviewed the food records for completeness and accuracy and showed the subject a six minute videotape of television commercials. Then the subject was interviewed regarding (a) her reaction to the food commercials and advertising claims most salient to purchasing the product, (b) her attitudes toward heavily advertised foods and the generic food counterpart, and (c) the frequency and types of foods she consumes while watching television. Appendix F contains the interview protocol used to elicit this information. After completion of this portion of the second interview, the Important Qualities of Snack Foods Questionnaire (Appendix G) was completed by the participant.

Participants were paid $5 upon completion of each interview. Payment for the second interview was contingent upon receipt of the completed food records.

Measurement of Variables

In order to test the hypotheses, information on several different variables were collected. Table 1 provides a list of the variables, the measurement tool, and the purpose for measuring the variable. The following paragraphs describe the development of the questionnaires and how they were scored.

Socioeconomic Status

The Hollingshead Four Factor Index of Social Status (166) was utilized to determine socioeconomic status. This index uses education,

Table 1. Description of the Variables, Indices for Measuring the Variables, and Purposes/Related Hypotheses Used in a Study of the Influence of Television, Parents, and Peers on Food-Related Behaviors of Pregnant Adolescents.

Variable	Instrument	Purpose/Hypotheses Tested
Socioeconomic Status	Hollingshead Four Factor Index of Social Status	To determine whether family income and education influence television viewing habits.
Television Viewing Score	Television Viewing Questionnaire (Appendix D) used to calculate a television viewing score.	To determine the type and frequency of television viewing and to relate television viewing frequency to perception of heavily advertised foods, nutrient density of diet or snacks, and heavily advertised food score (Hypotheses IA, IB, ID).
Parent Communication Score	Parent/Peer Communication Questionnaire (Appendix E) used to calculate a parent communication score.	To determine whether the quantity of family communication about food advertisements and food selection mediates the frequency of consumption of heavily advertised foods or the nutrient density of the diet (Hypothesis IIA).
Socio-Oriented Family Communication Score	Parent/Peer Communication Questionnaire (Appendix E) used to calculate a socio-oriented family communication score.	To determine whether the pattern of family communication as expressed by a socio-oriented family communication score influences the likelihood of purchasing a food advertised as promoting a particular lifestyle (Hypothesis IIB).
Concept-Oriented Family Communication Score	Parent/Peer Communication Questionnaire (Appendix E) used to calculate a concept-oriented family communication score.	To determine whether the pattern of family communication as expressed by a concept-oriented family communication score influences the likelihood of purchasing a food advertised as nutritious and healthy (Hypothesis IIC).
Peer Communication	Parent/Peer Communication Questionnaire (Appendix E) used to calculate a peer communication score.	To determine whether communication with peers about food advertisements and food selection mediates the consumption of heavily advertised foods (Hypothesis IID).
Nutrient Analysis: Total Intake	Using food recalls and food records, computer calculate the nutrient content and nutrient density of the diet.	To determine whether foods consumed while watching television differ in nutrient density from those consumed while not watching television (Hypothesis IB).
Number of Meals and Snacks Consumed	Using food recalls and food records, classify all eating occasions as meals and snacks.	To determine the proportion of meals and snacks consumed while watching television (Hypothesis IC).
Nutrient Analysis: Snacks	Using food recalls and food records, computer calculate the nutrient content and nutrient density of (a) all snacks, (b) snacks consumed while watching television, and (c) snacks consumed while not watching television.	To determine whether snacks consumed while watching television differ in nutrient density from those consumed while not watching television (Hypothesis IB).

Table 1. Continued

Variable	Instrument	Purpose/Hypotheses Tested
Nutrient Analysis: Foods Consumed While Watching Television and Foods Consumed While Not Watching Television	Using food recalls and food records, computer calculate the nutrient content and nutrient density of foods consumed while watching television and foods consumed while not watching television.	To determine whether foods consumed while watching television differ in nutrient density from those consumed while not watching television (Hypothesis IB).
Heavily Advertised Food Score	Using food recalls and food records, determine the frequency of consumption of several heavily advertised snacks foods.	To determine whether there is an association between the heavily advertised food score and the television viewing score (Hypothesis ID).
Frequency of Snacking While Watching Television	Information collected during a semi-structured interview. See Appendix F Food Commercials: What Sells the Product, Section 4, Snacking Patterns While Watching Television, for a list of interview questions.	To determine the frequency of snacking while watching television (Hypothesis IC).
Weight Gain During Pregnancy	Information on self reported weight gain during pregnancy collected three to six months post partum.	To determine whether there is an association between the television viewing score and weight gain during pregnancy.
Comparing Attributes of Name Brands Versus Generics	Information collected during a semi-structured interview. See Appendix F Food Commercials: What Sells the Product, Section 3, Comparison of the Attributes of Name Brands and Generics for a list of interview questions.	To determine whether frequently advertised foods are perceived as more nutritious, of better quality, and a better value than their generic counterparts (Hypothesis IA).
Advertising Claims Most Likely to Promote Purchase of the Product	Information collected during a semi-structured interview. See Appendix F Food Commercials: What Sells the Product, Section 2, Advertising Claims Most Likely to Promote Purchase of the Product for a list of interview questions.	To determine whether a concept-oriented family communication style increases the likelihood of consuming a food product advertised as healthy or nutritious (Hypothesis IIC).
Importance of Associating a Food with a Particular Lifestyle	Importance Qualities of Snack Food Questionnaire (Appendix G) used to calculate a score indicating the importance of selecting a snack food because it is associated with a particular image or lifestyle.	To determine whether a socio-oriented family communication style measures the likelihood of consuming a food product advertised as promoting a particular image or lifestyle (Hypothesis IIB).

occupation, sex, and marital status to estimate social status. Educational attainment is given a score of one to seven with one = less than seventh grade education, two = completion of junior high school (ninth grade), three = some high school, four = high school graduate, five = some college or specialized training, six = college graduate, and seven = graduate school or professional training.

Occupations are grouped into nine levels with the occupational titles derived from the 1970 United States Census. The occupational levels are as follows: nine = high level executives; eight = administrators, lesser professionals; seven = managers, minor professionals; six = technicians, semi professionals; five = clerical and sales workers; four = skilled manual workers, craftsmen, and tenant farmers; three = machine operators and semiskilled workers; two = unskilled workers, and one = farm laborers, menial service workers. The occupational score of individuals owning a business or a farm is based on the size and value of the business or farm. The occupational score was validated by correlating the occupational score on the Hollingshead Four Factor Index of Social Status with the National Opinion Research Center (NORC) which had a thirty year history of studying occupations and occupational groups (166). The Pearson correlation coefficient between the Hollingshead Four Factor Index of Social Status occupational score and the NORC score was 0.93.

In the case of a married couple, the Hollingshead Four Factor Index of Social Status Score is based on the average score if both are working, or the score of the one individual who is working (166). For this study, the Hollingshead Four Factor Index of Social Status Score

was based on education and occupation of the individual or individuals providing financial support for the pregnant adolescent and included her parents or other relatives, spouse, spouse's family, and the pregnant adolescent herself. The scores assigned for subjects in foster care or living in a group home with plans to go to foster home were based on their educational attainment and their dependency on social services for financial support.

The Hollingshead Four Factor Index of Social Status Score of an individual is calculated by multiplying the educational level score by three and the occupational score by five and summing the two numbers. Possible scores on the Hollingshead Four Factor Index of Social Status range from 8 to 66 (166).

Television Viewing Frequency

Television viewing frequency was measured by asking participants to complete a questionnaire regarding how often they watch national and local news, sports events, movies, game shows, soap operas, police and adventure shows, and comedy shows (Appendix D). Responses were given on a five point "every day-never" scale and summed to form a television viewing index. Possible scores on this index ranged from 0 to 32, when never = 0, less than once a week = 1, once or twice a week = 2, several times a week = 3, and every day = 4. This approach is a modification of a methodology used to measure television viewing of junior and senior high school students in rural, semi-rural, suburban, and urban Wisconsin and Georgia (49,50,105). The instrument used in this study was modified slightly from the form used in the aforementioned studies to reflect

television programs now commonly viewed by adolescents. Game shows replaced variety shows because few variety shows are currently aired. Soap operas replaced cartoons because cartoons are primarily aired on Saturday morning, and Saturday morning occupies only seven percent of adolescents' television viewing time (1). MTV was added because of studies that indicated its popularity among adolescents (2,61,62). As an additional indicator of television viewing habits, participants also were asked the number of hours per day they usually watch television, and if their family subscribes to cable television.

Parent Communication

Communication with parents was defined as any exchange between the pregnant adolescent and her parents concerning the purchase of food eaten at home or away from home. The family communication items used in this study were adapted from 12 items developed by Moschis (49) to measure "overt interaction between parent and adolescent concerning goods and services." In this study the items were adapted to reflect food products in particular. For example, "my parents tell me what things I should or should not buy" was changed to "my parents tell me what foods I should or should not buy." Three of the twelve items developed by Moschis did not seem to apply to food purchasing and were omitted: "my parents ask me what I think about things they buy for themselves," "my parents tell me why they buy some things for themselves," and "my parents tell me what they do with their money."

The pregnant adolescent's communication with parents was measured by responses given to the following items on a five point "very often-

never scale" with very often = 4, often = 3, sometimes = 2, rarely = 1, and never = 0:

1. My parents complain when they do not like the types of foods I buy for myself.
2. My parents and I talk about buying food.
3. My parents and I talk about the food advertisements we see on television.
4. I help my parents decide what foods to buy.
5. My parents want to know what foods I purchase with my money.
6. My parents tell me I should decide about the foods I should or should not buy.
7. My parents tell me what kinds of food I should or should not buy.
8. I ask my parents for advice about buying food.
9. I go grocery shopping with my parents.

Responses to these items were summed to obtain a score between 0 and 36.

Family Communication Style

Family communication style was assessed by the adolescents indicating on a questionnaire how often certain types of parent-adolescent communication occurred. The items used to measure family communication style replicated those adapted by Moschis, Moore, and Smith (159) from items traditionally used to measure the two general family communication patterns. Moore and Moschis (165) reported the Cronbach alpha reliability coefficients of these scales to be 0.71 and 0.54 for socio- and concept-oriented family communication styles,

respectively. This scale has been used in studies of adolescents in rural, semi-rural, suburban, and urban Georgia (155,159,165).

Socio-oriented Family Communication Style. The following six items measured a socio-oriented family communication style:

Your parents . . .

1. tell you what things you should or shouldn't buy.
2. want to know what you do with your money.
3. complain when they don't like something you bought for yourself.
4. say that they know what is best for you and you shouldn't question them.
5. say you shouldn't ask questions about things that teenagers like you don't normally buy.
6. say you may not buy certain things.

Concept-oriented Family Communication Style

The following six items measured a concept-oriented family communication style:

Your parents . . .

1. ask you to help them buy things for the family.
2. ask you what you think about things they buy for themselves.
3. ask you for advice about buying things.
4. say you should decide what things you should or shouldn't buy.
5. say that buying things you like is important even if others do not like them.

6. say you should decide for yourself how to spend your money.

Responses to these items were measured on a five point "very often-never" scale. The results were summed across the six items used to measure each dimension of family communication style and the scores for each scale ranged from 0 to 24.

Peer Communication

Communication with peers was defined as any exchange between the adolescent and peer concerning the purchase of food at home and away from home. The six items used to measure peer communication were adapted in a similar manner as the parent communication items from six items developed by Moschis (49) to measure overt interaction between the adolescent and peer concerning consumer goods and services. In pretesting, three adapted items received negative responses; that is, they were not viewed as relevant and were modified to be more relevant. "I ask my friends for advice about what food products to buy," and, "My friends ask me for advice about what food products to buy," were modified to specify snacks. The item, "I go grocery shopping with friends," was dropped due to the overwhelming negative response and replaced with the item, "I talk with friends about what food to buy at fast food places (McDonalds, Wendy's, Burger King)." This peer communication item was selected because fast food places are popular with adolescents, and these businesses advertise heavily on Capital Cities/ABC, Incorporated (ABC), Columbia Broadcasting System, Incorporated (CBS), and National Broadcasting Company, Incorporated (NBC).

The adolescents responded to the following six items on a five point, "very often-never" scale.

1. My friends and I talk about buying food.
2. My friends tell me what foods I should or should not buy.
3. I ask my friends for advice about what food products to buy for snacks.
4. My friends ask me for advice about what food products to buy for snacks.
5. I talk with friends about what foods to buy at fast food places (McDonalds, Wendy's, Burger King).
6. My friends and I talk about the food advertisements we see on television.

Responses to these six items were summed to obtain a score between 0 to 24.

Dietary Data Preparation

Each participant completed four days of food records, two 24-hour diet recalls and a two-day food record. Using Nutritionist III, Version 5.0 data base (167), one research assistant coded each subject's dietary information for entry into the computer, making appropriate substitutions as needed for foods eaten but not in the Nutritionist III data base. Another research assistant entered the information into the computer, and the third research assistant checked the computer printout against food records for accuracy and appropriateness of substitutions. These tasks were rotated among the three research assistants. Thus, each research assistant participated in the dietary preparation/analysis

by either coding, entering the data in the computer, or checking for accuracy. One research assistant checked the computer printout against the original record a second time to ensure consistency and accuracy.

Classifying Eating Occasions

All eating occasions were classified as a meal or a snack. An eating occasion was defined as all food and beverages except water consumed in 30 minutes or less in the same place with the same person. In classifying eating occasions as meals or snacks, consideration was given to the special needs of pregnancy. During the last months of pregnancy, the consumption of small frequent meals is recommended to alleviate some of the discomforts of pregnancy (168). Therefore, the number of eating occasions per day classified as meals was not limited to three. A meal was defined as an eating occasion where foods from at least two of the Basic Four Food Groups (dairy products, meat and meat substitutes, fruits and vegetables, and bread and cereals) were consumed, and the occasion occurred within a time lapse of at least two hours from the previous meal. Foods high in fat and sugar and low in complex carbohydrates, such as toaster pastries, donuts, and cakes, were not considered part of the Basic Four Food Groups. Any eating occasion that did not meet the criteria for a meal was considered a snack.

Snacking Patterns

Snacking patterns while watching television were examined in two ways. During the second interview, the subject was asked how often she snacks while watching television, the specific snack foods she consumes, and whether seeing a television commercial prompts her to get something to eat. The frequency of snacking was obtained on a five point "everyday-never" scale. See Appendix F, Section 4, Snacking Patterns While Watching Television, for a list of interview questions.

Using the 24-hour diet recalls and two-day food records, the proportion of snacks consumed while watching television was calculated using the following formula:

$$\frac{\text{Total Number of Snacks Consumed While Watching Television}}{\text{Total Number of Snacks Consumed}} \times 100$$

Thus, self reports during the interview and analysis of dietary data provided two ways of examining snacking patterns while viewing television. The proportion of eating occasions that occurred while watching television also was determined, using the same formula but substituting eating occasions for snacks.

It has been reported that there is a direct relationship between television viewing and obesity (100). Therefore, information on self-reported weight gain during pregnancy was collected to determine if there was a relationship between weight gain and the television viewing score. This information was collected either from a questionnaire

mailed three months post partum or at a six month post partum interview, if the questionnaire was not returned.

Heavily Advertised Food Score

Determining heavily advertised foods. To determine foods heavily advertised during prime time television, the following days of the week and hours were videotaped: Sunday 7:00 P.M. to 11:00 P.M and Monday through Saturday 8:00 P.M. to 11:00 P.M. on the three major networks, ABC, CBS, and NBC during the weeks of March 2 through March 9, 1989 and July 5 to July 12, 1989. Music Television (MTV) was also taped during the same time period. Due to problems with video equipment and individuals who were not able to tape the three or four hour time slots, videotapes for 12 to 13 of the total 14 days from each station were available for analysis. Thus, a total of 163 hours of prime time programming was reviewed by the primary investigator. All food and beverage commercials on the videotapes, except those for alcoholic beverages and grocery stores, were grouped into general categories such as restaurants, beverages, cereals, candy and gum, and meat and meat substitutes. The term "restaurant" refers to commercials promoting specific restaurants and not a particular food. Appendix H lists categories of foods, specific food items in each category, number of times and the broadcaster (ABC, CBS, NBC, MTV) that aired the food commercial, and those foods classified by the primary investigator as heavily advertised foods.

The following categories were selected as frequently advertised: restaurants, beverages, cereals, candy and gum, dairy products, salty snacks, fruits and vegetables, weight control products, and sweets. These categories were selected because they contained frequently advertised foods typically considered snack foods. In each category the two most frequently advertised foods were selected as heavily advertised foods, or if a natural break occurred in the frequency, this was used as a cut off point. The heavily advertised restaurants for this study included McDonalds and Burger King. The most frequently advertised beverages were Coca Cola and Pepsi. The cereal category included Frosted Mini Wheats, Nutri-grain, Cheerios, Quaker Oat Squares, Raisin Bran, Just Right, Grape Nuts, and Oat Flakes. Other heavily advertised foods were gum, chocolate candy, yogurt, ice cream, cheese, potato chips, Ritz crackers, orange juice, Slim Fast, and foods containing Nutrasweet.

Determining heavily advertised food score. The food recalls and food records were reviewed to calculate how many times each subject consumed each one of the heavily advertised foods over the four days. Serving size was not considered, just the number of different times the food was consumed. The score for each food was summed to form a heavily advertised food score for each participant.

Measuring the Participants' Reactions to Commercials

Developing videotape of commercials. To facilitate discussion about food commercials, subjects viewed a videotape of 13 food commercials aired during the week of March 2 to March 9, 1989. The primary investigator viewed videotapes of six days of prime time programming (Sunday 7:00 P.M. to 11:00 P.M., Monday to Saturday 8:00 P.M. to 11:00 P.M.) on ABC, CBS, NBC, and MTV to choose the commercials. The commercials selected were frequently aired commercials for foods popular with adolescents. They utilized a variety of techniques, such as humor or animation, and made a variety of claims for their product. This 13 commercial, six and one-quarter minute videotape was shown to the pregnant adolescents during data collection in April through June, 1989.

To keep the videotape of food commercials current throughout the study, a second videotape was made following the same procedure using commercials aired during the week of July 5 to July 12, 1989. This 12 commercial, five and one-half minute videotape was viewed during interviews conducted from August through October, 1989. Appendix I contains a description of the food commercials selected for the videotapes and major claims made in these commercials.

Appendix F, Food Commercials: What Sells the Product, Section 1 Advertising Appeals, contains a list of the questions used in a semi-structured interview to discuss the subject's reactions to commercials shown on the videotapes. To ensure completeness and accuracy of data collected from the interview, permission was requested to tape the

interview. See Appendix J for the Consent To Tape Interview Form. For the remaining discussion of methodology, all information was collected in the semi-structured interview completed with the participants.

Comparing Attributes of Name Brands Versus Generics

The interview also included a discussion of the pregnant adolescent's perception of heavily advertised foods. Samples of a heavily advertised snack item shown on the two videotapes and its generic counterpart were used to facilitate discussion. For purposes of this study the term generic included store brands and regional brands. Name brands included products advertised nationally on the major networks and available locally. See Appendix F, Section 3, Comparison of the Attributes of Name Brands and Generics, for a list of interview questions.

Three attributes of the products identified in the interviews involved quality, value, and being nutritious. The following responses were coded as they related to quality: "use better quality ingredients," "tastes better," "higher quality," "fresher," "made better," and "better flavor." Responses considered as pertaining to value included "not skimping on ingredients," "have more air than chips," and "put more stuff in them" (i.e. ingredients such as sour cream and onion flavor in potato chips). The attribute of being nutritious was identified by phrases such as "good for you," "low in fat," "low in calories," "lists the ingredients," "healthy," "low in cholesterol," "low in sugar," "nutritious," and "contains vitamins and minerals." Each attribute (quality, value, and nutritious) was coded separately with one assigned

when the subject did perceive the name brand as having that attribute and zero if the subject did not perceive the name brand as having that attribute. The value assigned for each attribute was summed to form an attribute score.

Identifying Advertising Claims Most Likely to Promote Purchase of the Product

Identifying advertising claims most salient to the subject was also a part of the television commercial interview. Appendix F, Section 2, Advertising Claims Most Likely to Promote Purchase of the Product, contains a list of interview questions asked of the participants. This information was used to test Hypothesis IIC regarding the relationship between a concept-oriented family communication style and the importance of health and nutrition claims. The type of advertising claims reported as being salient to the participant were coded as to whether or not they were nutrition and health oriented (one = health and nutrition oriented, zero = not health and nutrition oriented). Advertising claims considered as desirable nutrition practices or health oriented included comments of the participants such as "good for you," "low in fat," "low in calories," "lists the ingredients," "healthy," "low in cholesterol," "low in sugar," "nutritious," and "contains vitamins and minerals."

Associating a Food with a Particular Lifestyle

The Important Qualities of Snack Foods Questionnaire (Appendix G) measured whether the respondent selected soft drinks, corn chips, a chocolate candy bar, cookies, or crackers as snack foods, because those

foods are associated on television with a particular image or lifestyle. The items used in this scale replicated those developed by Moschis (49) to determine the importance of social visibility in the selection of a bicycle, a watch, a camera, a pocket calculator, and a hair dryer with one modification; popular, frequently advertised snack foods replaced the consumer goods used by Moschis. The respondent was asked to indicate whether or not she thinks it is important to know (a) what friends think of the food, (b) what type of people eat this food, (c) what others think of people who eat this food, and (d) whether eating this food will make a good impression on others before purchasing and consuming soft drinks, corn chips, a chocolate candy bar, cookies, or crackers. The number of positive responses for each food item and the importance attached to a particular image or life style statement were summed to yield a score of 0-20. That is, four lifestyle statements multiplied by five snack items equal a score of 20.

Pretesting of Instruments

The Television Viewing Questionnaire, Parent/Peer Communication Questionnaire, and the Important Qualities of Snack Foods Questionnaire were pilot tested with 34 pregnant adolescents, residing at a group home or attending a public health clinic, and seven non-pregnant female adolescents, ages 11-to 17-years. The format for the Important Qualities of Snack Foods Questionnaire was revised to make the instructions for completing it clearer. The Food Commercials: What Sells the Product Interview Protocol was pretested with one pregnant

adolescent and two non-pregnant female adolescents, ages 11-to 17-years. None of these adolescents participated in the subsequent study reported here.

Analysis of Data

Coding/Transcribing/Analysis of Interview Tapes

The TV interview tapes were transcribed by a professional secretary and reviewed twice by the primary investigator for completeness and accuracy. Due to the background noise of the generator and air conditioning in the mobile home, parts of the interviews with a few subjects could not be understood. The transcriptions of each interview were reviewed to determine (a) if health and nutrition claims were salient to the participant and (b) whether she perceived heavily advertised brands as more nutritious, of better quality, and a better value than their generic counterparts. Each recorded interview was reviewed twice to ensure accuracy and consistency of coding.

Statistical Analysis

All statistical procedures were carried out using the Statistical Analysis System (SAS) (169). A P value $\leq$ 0.05 was used as the level of significance for all analyses.

Descriptive statistics. Means and/or frequency distributions as appropriate were calculated using Proc Means and Proc Freq for all variables. Means were calculated for last grade in school completed,

the Hollingshead Four Factor Index of Social Status, age, and all dietary variables. Frequency distributions were tabulated for age, grade, marital status, and living arrangements. The Important Quality of Snack Food Questionnaire responses were tabulated using frequency counts for each food item and the importance attached to a particular image or life style statement. The number and percentage of individuals who selected the name brand product or its generic counterpart, who perceived heavily advertised foods as either more nutritious, of better quality, and a better value than their generic counterparts, and for whom health and nutrition claims were salient were tabulated also. Responses to the Television Viewing Questionnaire and Parent/Peer Communication Questionnaire were analyzed using both means and frequency counts.

Analyzing the effect of socioeconomic status, access to cable, and age on television viewing score. Research has shown that socioeconomic status influences (a) television viewing practices (56,104,155), (b) consumer competencies and susceptibility to marketing stimuli (50,104,114,125,170), (c) the frequency of interaction with parents concerning consumer goods and services (104), and (d) food habits (171). Thus, socioeconomic status could influence the television viewing score, parent communication score, heavily advertised food score, and dietary intake.

Access to cable, which is needed to receive MTV, increases the number of programs available to watch, as well as the amount of time spent watching television (59). Several investigators have noted that

television viewing declines with age during adolescence (51,56,172). Therefore, access to cable and age could influence the television viewing score.

Thus, the chi-square statistic was used to determine whether television program viewing frequency was influenced by socioeconomic status, access to cable television in the home, and age of the pregnant adolescent. For this analysis frequency scores for each type of television programs were divided into two groups, i.e. a low frequency group (never to once or twice a week) and a high frequency group (several times a week or every day). For the analysis of socioeconomic status effects, two subgroups were formed, a group with a Hollingshead Four Factor Index of Social Status Score (166) less than the median and a group with a Hollingshead Four Factor Index of Social Status Score greater than the median. To test for age effects the subjects were divided into two subgroups, younger adolescents (14 to 16) and older adolescents (17 to 18).

Analyzing dietary data.

Determining total dietary intake. Using Nutritionist III, Version 5.0 (167), the mean intake of kilocalories, fat, cholesterol, thiamin, niacin, riboflavin, vitamin A, vitamin C, vitamin B_6, folacin, zinc, calcium, magnesium, and iron from the two 24-hour diet recalls and two-day food records was calculated. The nutrient density, or intake per 1,000 kilocalories, of each vitamin and mineral was calculated to control for varying caloric intakes.

The nutrient density scores were compared also to recommended nutrient allowances (RDAs) per 1,000 calories, calculated according to the methodology of Hansen and Wyse (173) who used this method for analyzing diets of non-pregnant females. The following formula was used to determine the recommended nutrient density per 1,000 kilocalories for each nutrient:

$$\frac{\text{RDA for nutrient}}{\text{2,500 Kilocalories}} \times \text{1,000 kilocalories}$$

RDA = Recommended Dietary Allowances, 10th edition (33)

2,500 = recommended energy intake for pregnant adolescents

1,000 = ratio of standard for nutrient per 1,000 kilocalories

The recommended energy intake was determined by adding 300 kilocalories, the recommended increment in caloric intake during the second and third trimester of pregnancy, to 2,200 kilocalories, the average energy allowance for females, 15-to 18-years of age (33).

Determining nutrient content of snacks. The nutrient content of all snacks and snacks consumed while watching television was computer analyzed using Nutritionist III, Version 5.0 (167). Using this information, the nutrient content of snacks consumed while not watching television was calculated by subtracting the nutrient content of all snacks from snacks consumed while watching television. Nutrient densities for all snacks, snacks consumed while watching television, and

snacks consumed while not watching television were calculated and compared to the standard previously described (173).

Determining nutrient content of foods consumed while watching television and foods consumed while not watching television. The nutrient content of all foods eaten while watching television was analyzed using Nutritionist III, Version 5.0 (167). The nutrient content of foods eaten away from television was calculated using the following formula: Non-television nutrient intake equals overall nutrient intake minus television nutrient intake. Nutrient density scores for foods consumed while watching television and foods consumed while not watching television were compared to the nutrient density standard (173) and used to compare the nutrient density of all foods consumed while watching television and those consumed while not watching television.

Hypothesis Testing

All hypotheses were tested using Analysis of Covariance with the Hollingshead Four Factor Index of Social Status Score (166), television viewing score, and total caloric intake serving as covariates if appropriate. Table 2 describes the statistical models used to test the hypotheses. All models except Model 6 were analyzed using Proc Reg. Due to the categorical variable indicating whether health or nutrition related claims were important, Model 6 was analyzed using Proc GLM. Proc Reg also was used to test the relationship between the television viewing score and weight gain during pregnancy.

Table 2. Statistical Models Used to Test Hypotheses.

	Hypothesis[a]	Independent Variable	Dependent Variable	Covariates
Model 1	IA, IB, ID	TV viewing Score	1. Mean total intake of iron, Vitamin A, folate, fat, cholesterol, magnesium, zinc, Vitamin B_6, calcium 2. Heavily advertised food score 3. Attribute score	1. Hollingshead Four Factor Index of Social Status Score. 2. Mean total caloric intake
Model 2	ID	TV viewing score	Mean total intake from snacks of iron, Vitamin A, folate, fat, cholesterol, magnesium, zinc, Vitamin B_6, calcium	1. Hollingshead Four Factor Index of Social Status Score 2. Mean total snack calories
Model 3	IID	Parent Communication Score	Heavily advertised food score	1. Hollingshead Four Factor Index of Social Status Score 2. TV viewing score 3. Mean total caloric intake
Model 4	IIA	Parent Communication Score	Mean total intake of iron, Vitamin A, folate, fat, cholesterol, magnesium, zinc, Vitamin B_6, calcium	1. Hollingshead Four Factor Index of Social Status Score 2. Mean total caloric intake 3. TV viewing score
Model 5	IIB	Socio-oriented family communication score	Important qualities of snack food score	1. Hollingshead Four Factor Index of Social Status Score 2. TV viewing score
Model 6	IIC	Concept-oriented family communication score	Whether nutrition/health claims are salient	1. Hollingshead Four Factor Index of Social Status Score 2. TV viewing score
Model 7	IID	Peer Communication Score	Heavily advertised food score	1. Hollingshead Four Factor Index of Social Status Score 2. TV viewing score 3. Mean total caloric intake

Table 2. Continued

[a]Hypothesis IA: Pregnant adolescents who are heavy television viewers will perceive heavily advertised name brands and products as more nutritious, of better quality, and a better value than generics compared to pregnant adolescents watching less television.

Hypothesis IB: Pregnant adolescents who are heavy television viewers will be more likely to consume a diet low in nutrient density and high in total fat and cholesterol than pregnant adolescents watching less television.

Hypothesis IC: Television viewing by the pregnant adolescent will be associated with snacking.

Hypothesis ID: The frequency of television viewing will be associated with the consumption of heavily advertised snack foods.

Hypothesis IIA: The frequency of communication with parents about food advertisements seen on television will affect the pregnant adolescent's consumption of heavily advertised snack foods.

Hypothesis IIB: The pattern of family communication, as expressed by a socio-oriented family communication style, will increase the likelihood of consumption by the pregnant adolescent of a food product advertised as promoting a particular image or lifestyle.

Hypothesis IIC: The pattern of family communication, as expressed by a concept-oriented family communication style, will increase the likelihood of the pregnant adolescent consuming a food product advertised as nutritious or healthy.

Hypothesis IID: The frequency of communication with peers about food advertisements seen on television will affect the pregnant adolescent's consumption of heavily advertised snack foods.

Testing for differences in the nutrient densities of television and non-television foods for vitamin B_6, zinc, folate, magnesium, iron, calcium, fat, vitamin A, and cholesterol was done using a separate Analysis of Variance (Proc GLM) for each nutrient. The nutrient densities for the same nutrients from television and non-television snacks were compared using the Student's t-test. These nutrients were selected because iron, vitamin B_6, zinc, folate, vitamin A, magnesium, and calcium are often found to be consumed in inadequate amounts and fat and cholesterol in excessive amounts by adolescents based on current recommendations (33,93). Comparisons of (a) mean television program viewing frequencies, (b) hours per day spent watching television, (c) frequency of snacking while watching television, (d) frequency of eating in response to a commercial, (e) and mean responses to the parent and peer communication items for the pregnant adolescents in this study and the white adolescent females in the study by Carruth and coworkers (19) were done using Least Squares Analysis of Variance (Proc GLM).

The Committee on Diet and Health of the Food and Nutrition Board, National Research Council recommends that the diets of Americans contain 30% or less of calories from fat and less than 300 milligrams of cholesterol per day for prevention of heart disease (93). However, adolescents' diets tend to be higher in fat and cholesterol than recommended. No specific recommendations are made for fat or cholesterol intake during pregnancy. Foods frequently advertised on television are high in fat and cholesterol and of low nutrient density. Thus testing for differences in the nutrient density between television foods and non-television foods for fat and cholesterol was done to test

the hypothesis that foods consumed while watching television contain greater amount of fat and cholesterol and lesser amounts of vitamins and minerals than foods consumed while not watching television.

CHAPTER IV

RESULTS

Sample Description

Determination of Inclusion Criteria for Data Analysis

In this study, 98 pregnant adolescents completed the Television Viewing Questionnaire and Parent/Peer Communication Questionnaire; 76 completed the Important Qualities of Snack Foods Questionnaire; 66 completed the television commercial interview conducted by the investigator. Four-day food recalls/records were available for 93 of the 98 participants in this study. Two subjects completed three-day food recalls/records and three completed two-day food recalls/records. Of the 98 subjects, 12 were black, leaving 86 white participants.

TN 860 was designed to examine the food habits of white pregnant teenagers, because it was anticipated that race would influence the results. Thus, black pregnant adolescents were neither actively recruited nor were any special efforts made to retain them in the study. Furthermore, research results have shown that black East Tennessee male and female adolescents (19) and pregnant black adolescents (20) watched more television than their white counterparts. Therefore, the black subjects were omitted from data analysis.

Of the 86 white participants remaining, seven subjects completed only the Television Viewing Questionnaire and the Parent/Peer Communication Questionnaire and were omitted from further analysis.

These subjects either chose not to complete the study or delivered their baby before completing the study. Information comparing the demographic and background characteristics and the television habits of these seven subjects and the remaining 79 subjects who completed the study is provided in Appendix K.

Demographic and Background Characteristics

Table 3 describes the demographic and background characteristics of the 79 participants. The mean age for the sample was 16.4, with a range from 14-to 18-years of age. The mean last grade in school completed was 10.1 with a range from seventh to twelfth grade. Thirty percent reported seventh to ninth grade as the last grade in school they had completed. The remaining 70% had completed some high school, graduated from high school, or earned a general equivalency diploma. The mean Hollingshead Four Factor Index of Social Status Score was 25.7 (166) compared to the maximum score of 66, indicating the low socioeconomic status of this sample. Scores ranged from 11 to 53.

Information on marital status and living arrangements is also presented in Table 3. About 65% of the participants were single; 35% were married. In regard to living arrangements, 48.2% lived with one parent or both parents, 17.7% with spouse, 10.1% with spouse and parents, and 7.6% with other relatives (four with grandparents, one with an aunt, and one with a cousin). Five adolescents (6.3%) lived in a group home, and eight (10.1%) lived with other individuals including foster parents, boyfriend, and boyfriend/spouse and his parents.

Table 3. Demographic and Background Characteristics of Pregnant Adolescents.[a]

Characteristic[b]	N	% of Participants	Mean±SEM
AGE			
14	5	6.3	16.4±0.1
15	8	10.1	
16	27	34.2	
17	27	34.2	
18	12	15.2	
GRADE			
7	3	3.8	10.1±0.2
8	5	6.3	
9	16	20.3	
10	24	30.4	
11	15	19.0	
12	16	20.3	
SES			
Hollingshead Four Factor Index of Social Status[c,d]			25.7±1.0
MARITAL STATUS			
Single	51	64.6	
Married	28	35.4	
LIVING ARRANGEMENT			
With one parent	19	24.1	
With both parents	19	24.1	
With spouse	14	17.7	
With parents and spouse	8	10.1	
With other relative	6	7.6	
In a group home	5	6.3	
Other	8	10.1	

[a]N=79.

[b]Information collected using personal interviews.

[c]Hollingshead, A. (1976) Four Factor Index of Social Status, Hollingshead, New Haven, CT.

[d]Scores on the Hollingshead Four Factor Index of Social Status range from 8 to 66.

Television Viewing Habits

Information gathered on television viewing habits is summarized in Table 4. The pregnant adolescents reported spending a mean ±SEM of 5.3±0.8 hours per day watching television with approximately one-fourth watching television 7 to 14.5 hours per day. This average does not include two subjects who reported watching television 24 hours a day. Soap operas, comedy shows, and movies were the most popular programs with two-thirds or more reportedly viewing them everyday or several times a week. Sports and MTV were the least popular shows with 40% and 54%, respectively, reporting never watching these programs. Fifty-two percent had access to cable television in their home.

Access to cable influenced the viewing frequency for game shows, but had no effect on the frequency of watching news, soap operas, movies, police and adventure shows, and comedy programs. Those with access to cable watched game shows less frequently than expected, whereas those without access to cable watched game shows more frequently than expected (Chi-square=6.649, P=0.01). The frequency of viewing MTV was greater among those with access to cable than those without access to cable (Chi-square=6.924, P=0.01).

Socioeconomic status and age influenced only the viewing frequency for MTV. Participants who had a score of less than the median of 26 on the Hollingshead Four Factor Index of Social Status (166), watched less TV than those above the median (Chi-square=3.870, P=0.05). MTV was more popular among the younger adolescents, 14-to 16-years of age, than older adolescents, 17-to 18-years of age (Chi-square=4.766, P=0.03).

Table 4. TV Viewing Practices of 79 Pregnant Adolescents.

TV Programs Viewed	% Subjects					Mean±SEM[a]
	Every Day	Several Times a Week	Once or Twice a Week	Less Than Once a Week	Never	
News	24.1	25.3	24.1	17.7	8.9	2.38±0.14
Sports Events	1.3	6.3	12.7	39.2	40.5	0.89±0.11
Movies	19.2	52.6	21.8	5.1	1.3	2.83±0.10
Game Shows	29.1	19.0	16.5	19.0	16.5	2.25±0.17
Soap Operas	54.4	17.7	11.4	7.6	8.9	3.01±0.15
Police and Adventure Shows	8.9	25.3	36.7	24.1	5.1	2.09±0.12
Comedy Shows	25.3	41.8	19.0	8.9	5.1	2.73±0.12
MTV	11.4	8.9	8.9	16.5	54.4	1.06±0.16

[a]Means ± standard errors were derived from responses to a frequency scale for television viewing: 4=every day, 3=several times a week, 2=once or twice a week, 1=less than once a week, and 0=never.

Hypothesis Testing

Hypothesis IA

It was hypothesized that adolescents who are heavy television viewers and, therefore, exposed more frequently to television commercials would perceive heavily advertised foods as more nutritious, of better quality, and as a better value than their generic or store brand counterparts. In response to the question regarding whether they would buy a heavily advertised snack food or its generic counterpart, 64% expressed a preference for the name brand item, 24% did not express a preference (either it did not matter or they would buy whichever one was cheapest), and 12% expressed a preference for the generic item. The primary reasons for selecting the name brand were (a) it is a name brand and thus familiar, (b) it is better tasting, (c) it is made with better ingredients, (d) it is a better quality product, and (e) it has a more attractive package. Reasons for preferring the generic item included it is (a) cheaper, (b) a better product, and (c) what I eat. Interestingly, several participants stated they would buy the name brand, even though they did not believe there was any difference between the heavily advertised product and its generic counterpart.

No participant felt that the heavily advertised product was more nutritious, and only two felt the name brand was a better value. Thirty-nine percent stated that the name brand was of better quality.

Hypothesis testing. Heavy television viewers did not perceive heavily advertised brands and products as more nutritious, of better

quality, and as a better value than did light television viewers (t=1.396, P=0.17). Thus, hypothesis IA was rejected.

Hypothesis IB

According to Kaufman (7) and Story and Faulkner (80), television promotes the consumption of foods high in fat and sugar and of low nutrient density. Thus, it was hypothesized that heavy television viewers would consume diets higher in fat and cholesterol and lower in nutrient density than light television viewers. Four different analysis were done on the dietary information to test this hypothesis: (a) the mean nutrient content and nutrient density of the total diet, (b) the nutrient content and nutrient density of snacks, (c) the nutrient content and nutrient density of snacks consumed while watching television and snacks consumed while not watching television, and (d) the nutrient content and nutrient density of all foods consumed while watching television and all foods consumed while not watching television.

Nutrient content and nutrient density of the total diet. The nutrient intake and nutrient density of the pregnant adolescents' diets in comparison to the RDA (33) for pregnant women and the nutrient density standard are shown in Table 5. Mean caloric intake was approximately the same as the RDA. Intakes of protein, thiamin, niacin, riboflavin, vitamin A, vitamin C, and calcium all exceeded the RDA ranging from 110% to 165% of the RDA. Intakes of folate, vitamin B_6, iron, zinc, and magnesium were below the recommended allowances meeting

Table 5. Mean Nutrient Intake, Percent of RDA, and Nutrient Density of Diet for 79 Pregnant Adolescents.

	Mean ± SEM[a]	Range	% RDA[b]	Nutrient Density[c,d]	Suggested Nutrient Density[d]
Energy (kcal)	2490.1± 81.1	1174.0- 4717.0	99.6	--	--
Protein (gm)	90.1± 3.3	37.0- 222.4	150.1	36.5	24.0
Fat (gm)	100.1± 3.8	48.3- 216.4	--	40.0	--
Cholesterol (mg)	340.9± 16.1	74.5- 798.7	--	136.8	--
Vitamin A (IU)	5028.8±302.6	1216.0-15055.0	126.0	2089.3	1600.0
Thiamin (mg)	1.9± 0.0	0.6- 4.3	124.0	0.7	0.6
Niacin (mg)	22.0± 0.8	8.7- 58.4	129.9	9.0	6.8
Riboflavin (mg)	2.6± 0.1	0.8- 7.3	165.0	1.1	0.6
Folate (μg)	277.8± 17.1	78.8- 957.0	69.4	114.4	160.0
Vitamin B_6 (mg)	1.7± 0.1	0.4- 4.7	78.6	0.7	0.9
Vitamin C (mg)	99.5± 7.3	13.2- 281.2	142.1	40.7	28.0
Calcium (mg)	1330.9± 80.2	348.3- 4764.0	110.9	531.7	480.0
Iron (mg)	14.9± 0.7	5.8- 47.4	49.8	6.1	12.0
Zinc (mg)	11.1± 0.5	2.9- 31.1	74.1	4.5	6.0
Magnesium (mg)	264.6± 11.8	87.2- 721.1	82.7	106.0	128.0

[a]Mean derived from two 24-hour diet recalls and two-day food records.

[b]Recommended Dietary Allowance, 10th Edition, 1989.

[c]Formula for Nutrient Density = $\frac{\text{Intake of Nutrient}}{\text{2500 kilocalories}}$ x 1,000 kilocalories

[d]Adapted from Hansen, R.C. & Wyse, B.W. (1980) Expression of nutrient allowances per 1,000 kilocalories. J. Am. Diet Assoc. 76: 223-227.

69%, 79%, 50%, 74% and 83% of the RDA, respectively. The range of intakes for folate, calcium, and vitamin A were more than ten fold increases from least to most. Nutrient density in comparison to the standard followed the same pattern as the RDAs. Intakes of protein, vitamin A, thiamin, niacin, riboflavin, vitamin C, and calcium were above the standard and intakes of folate, vitamin B_6, iron, magnesium, and zinc were less than the standard. The pregnant adolescents consumed 136.8 milligrams of cholesterol per 1,000 kilocalories. Although not shown in Table 5, fat supplied 36% of kilocalories.

Nutrient content and nutrient density of snacks. Information on mean intake and nutrient density of snacks is presented in Table 6. Snacks provided 21% of total caloric intake and 10% to 22% of vitamin/mineral intake. Fat in snack foods supplied 31% of snack kilocalories. Although not shown in Table 6, snacks supplied 20% of the RDA (33) for calcium, 26% of the RDA for riboflavin, and 31% of the RDA for vitamin C.

Nutrient density of snacks for protein, vitamin A, thiamin, niacin, folate, vitamin B_6, iron, zinc, and magnesium were less than the suggested nutrient density. Snacks were especially poor sources of iron, zinc, folate, and vitamin B_6 meeting only 29%, 44%, 50%, and 52%, respectively of the nutrient density standard. In contrast, calcium, riboflavin, and vitamin C nutrient densities were almost equal to or exceeded the standard. Cholesterol intake from snacks averaged 67.4 milligrams per 1,000 kilocalories.

Table 6. Mean Nutrient Intake, Nutrient Density, and Percent of Total Nutrient and Energy Intake from Snacks Consumed by 79 Pregnant Adolescents.

	Mean ± SEM[a]	Range[b]	Nutrient Density[c,d]	Suggested Nutrient Density[c]	% of Total Intake from Snacks
Energy (kcal)	527.8±38.82	0-1,658.0	--	--	21
Protein (gm)	10.7± 0.98	0- 35.2	19.4	24.0	12
Fat (gm)	18.1± 1.48	0- 63.9	34.2	--	18
Cholesterol (mg)	38.8± 4.34	0- 159.3	67.4	--	11
Vitamin A (IU)	647.5±97.57	0-5,224.0	1163.9	1600.0	13
Thiamin (mg)	0.2± 0.03	0- 1.3	0.4	0.6	13
Niacin (mg)	2.1± 0.24	0- 11.3	3.8	6.8	10
Riboflavin (mg)	0.4± 0.04	0- 1.4	0.8	0.6	15
Folate (μg)	40.1± 5.91	0- 311.5	79.9	160.0	14
Vitamin B_6 (mg)	0.2± 0.03	0- 1.4	0.5	0.9	14
Vitamin C (mg)	21.9± 2.94	0- 114.1	50.6	28.0	22
Calcium (mg)	244.9±24.05	0- 991.3	465.7	480.0	18
Iron (mg)	1.8± 0.20	0- 10.9	3.5	12.0	12
Zinc (mg)	1.5± 0.16	0- 5.6	2.7	6.0	13
Magnesium (mg)	49.4± 4.58	0- 237.8	93.7	128.0	18

[a]Mean derived from two 24-hour diet recalls and two-day food records.

[b]One subject did not consume any snacks during the four days.

[c]Formula for Nutrient Density = $\frac{\text{Intake of Nutrient}}{\text{2,500 kilocalories}} \times 1{,}000$ kilocalories

[d]Adapted from Hansen, R.C. & Wyse, B.W. (1980) Expression of nutrient allowances per 1,000 kilocalories. J. Am. Diet Assoc. 76: 223-227.

Nutrient content and nutrient density of snacks consumed while watching television and snacks consumed while not watching television. Table 7 provides information on the mean nutrient intake from snacks consumed while watching television and snacks consumed while not watching television. Television snacks supplied 46% of snack calories and 46% to 52% of all nutrients from snacks with the exception of vitamin B_6. Television snacks supplied 88% of the total vitamin B_6 intake from total daily snacks. Non-television snacks provided 54% of total snack calories and 48% to 54% of the intake of protein, vitamins and minerals from snacks with the exception of vitamin B_6. Non-television snacks provided 22% of total vitamin B_6 intake from snacks. Approximately 31% of both television and non-television snack calories were supplied by fat.

As shown in Table 8, nutrient density of non-television snacks compared to television snacks was greater for protein, fat, cholesterol, thiamin, calcium, and iron, less for vitamin A, folate, vitamin B_6, vitamin C, and about the same for niacin, riboflavin, zinc, and magnesium. However, none of these differences was statistically significant. Cholesterol intake was 57 milligrams per 1,000 kilocalories from television snacks compared to 76 milligrams per 1,000 kilocalories from non-television snacks.

In regard to suggested nutrient densities, television snack vitamin B_6, riboflavin, vitamin C, and non-television snack thiamin, calcium, ribolfavin, and vitamin C nutrient densities were greater than the standard. All other nutrient densities relating to television and

Table 7. Mean Nutrient Intake and Percent of Total Intake of Snacks Consumed While Watching Television and Snacks Consumed While Not Watching Television for 79 Pregnant Adolescents.

	TV Snacks			Non-TV Snacks		
	Mean±SEM[a]	Range[b]	% of Total Intake from Snacks	Mean±SEM	Range[b]	% of Total Intake from Snacks
Energy (kcal)	243.0±29.8	0-1520.0	46	286.3±26.7	0- 898.3	54
Protein (gm)	4.9± 0.8	0- 38.1	46	5.9± 0.7	0- 31.0	54
Fat (gm)	8.5± 1.2	0- 69.5	47	9.7± 1.0	0- 35.8	53
Cholesterol (mg)	17.3± 3.2	0- 128.2	45	22.0± 3.2	0- 108.5	55
Vitamin A (IU)	333.2±80.5	0-5398.0	51	320.2±57.9	0-3436.5	49
Thiamin (mg)	0.1± 0.0	0- 0.9	46	0.1± 0.0	0- 0.8	54
Niacin (mg)	1.0± 0.2	0- 9.8	49	1.1± 0.0	0- 7.9	51
Riboflavin (mg)	0.2± 0.0	0- 1.5	51	0.2± 0.0	0- 1.1	49
Folate (μg)	20.9± 4.4	0- 264.0	52	19.7± 4.2	0- 308.1	48
Vitamin B_6 (mg)	0.2± 0.1	0- 6.9	88	0.1± 0.0	0- 1.1	22
Vitamin C (mg)	10.1± 2.3	0- 102.5	50	11.1± 1.9	0- 88.6	50
Calcium (mg)	121.4±19.8	0- 817.4	49	129.3±17.3	0- 723.6	51
Iron (mg)	0.9± 0.2	0- 10.9	48	1.0± 0.1	0- 9.3	52
Zinc (mg)	0.8± 0.1	0- 5.0	51	0.7± 0.1	0- 5.6	49
Magnesium (mg)	25.6± 4.0	0- 243.0	52	24.5± 2.8	0- 96.9	48

[a]Mean derived from two 24-hour diet recalls and two-day food records.

[b]Eighteen subjects did not consume any snacks while watching television during the four-day period.

[c]One subject did not consume any snacks during the four-day period.

Table 8. Nutrient Density of Snacks Consumed While Watching Television and Snacks Consumed While Not Watching Television for 79 Pregnant Adolescents.

	TV Snacks Nutrient Density[a]	Non TV Snacks Nutrient Density[a]	Suggested Nutrient Density[b]
Protein (gm)	18.7	21.4	24.0
Fat (gm)	32.8	40.7	--
Cholesterol (mg)	57.0	75.7	--
Vitamin A (IU)	1128.6	1029.7	1600.0
Thiamin (mg)	0.4	1.0	0.6
Niacin (mg)	4.2	4.0	6.8
Riboflavin (mg)	0.8	0.7	0.6
Folate (µg)	90.6	69.5	160.0
Vitamin B_6 (mg)	2.1	0.3	0.9
Vitamin C (mg)	69.1	41.9	28.0
Calcium (mg)	468.3	531.3	480.0
Iron (mg)	3.7	5.3	12.0
Zinc (mg)	2.8	3.0	6.0
Magnesium (mg)	103.8	101.3	128.0

[a]Formula for nutrient density = $\frac{\text{intake of nutrient}}{\text{2500 kilocalories}}$ x 1,000 kilocalories

[b]Adapted from Hansen, R.C. & Wyse, W.B. (1980). Expression of nutrient allowances per 1,000 kilocalories. J. Am. Diet Assoc. 76: 223-227.

non-television snacks were less than the standard. Nutrient densities for both television snack and non-television snack niacin, folate, zinc, and iron as well as non-television vitamin B_6 were especially low meeting less than two-thirds of the standard.

Nutrient content and nutrient density of all foods consumed while watching television and all foods consumed while not watching television. Table 9 contains information on the nutrient content of all foods consumed while watching television and all foods consumed while not watching television. Foods consumed while watching television provided 38% of total caloric intake and 36% to 41% of total protein and vitamin and mineral intake. Foods consumed while not watching television provided 62% of total caloric intake and 59% to 65% of protein and vitamin and mineral intake. Thus, foods eaten while not watching television compared to foods eaten while watching television provided almost twice the calories and from 15% to 24% more protein and vitamins and minerals. Fat supplied 31% of television food calories and 37% of non-television food calories.

The nutrient densities of television foods and non-television foods are shown in Table 10. The nutrient densities exceeded the standard for protein, thiamin, niacin, riboflavin, vitamin C, and calcium and were below the standard for folate, vitamin B_6, zinc, iron, and magnesium. Television foods provided 122.2 milligrams of cholesterol and non-television foods 137.4 milligrams of cholesterol per 1,000 calories.

Table 9. Mean Nutrient Intake and Percent of Total Intake of Foods Consumed While Watching Television and Foods Consumed While Not Watching Television for 79 Pregnant Adolescents.

	Television Foods			Non Television Foods		
	Mean±SEM[a]	Range[b,c]	% of Total Intake	Mean±SEM[a]	Range[c]	% of Total Intake
Energy (kcal)	943.2± 79.6	0-3184.0	38	1546.9± 84.7	0- 3524.0	62
Protein (gm)	32.5± 2.8	0- 122.1	36	57.6± 3.8	0- 170.1	64
Fat (gm)	36.3± 3.3	0- 140.8	36	63.8± 3.9	0- 161.7	64
Cholesterol (mg)	122.0± 13.0	0- 518.5	36	218.9± 16.9	0- 634.3.	64
Vitamin A (IU)	1754.7±197.5	0-9004.0	35	3274.1±300.9	0-13820.0	65
Thiamin (mg)	0.7± 0.1	0- 3.2	38	1.2± 0.1	0- 2.7	62
Niacin (mg)	7.9± 0.7	0- 28.7	36	14.2± 0.8	0- 31.2	64
Riboflavin (mg)	1.0± 0.1	0- 3.9	36	1.7± 0.1	0- 5.6	64
Folate (µg)	100.8± 10.5	0- 451.5	36	177.0± 15.0	0- 667.2	64
Vitamin B_6 (mg)	0.6± 0.1	0- 3.1	36	1.1± 0.1	0- 3.0	64
Vitamin C (mg)	40.9± 5.2	0- 235.7	41	59.4± 5.3	0- 221.9	59
Calcim (mg)	484.9± 45.1	0-1854.0	36	845.9± 81.3	0- 3865.9	62
Iron (mg)	5.6± 0.5	0- 20.4	37	9.4± 0.6	0- 34.6	63
Zinc (mg)	4.0± 0.4	0- 17.8	36	7.1± 0.5	0- 25.4	65
Magnesium (mg)	100.3± 9.1	0- 391.5	38	164.4± 12.3	0- 566.6	63

[a]Mean derived from two 24-hour diet recalls and two-day food records.

[b]Five subjects did not consume any meals or snacks while watching television.

[c]One subject consumed all meals and snacks while watching television.

Table 10. Nutrient Density of Foods Consumed While Watching Television and Foods Consumed While Not Watching Television for 79 Pregnant Adolescents.

	TV Foods Nutrient Density[a]	Non TV Foods Nutrient Density[b]	Suggested Nutrient Density[b]
Protein (gm)	33.8	35.6	24.0
Fat (gm)	37.2	40.4	--
Cholesterol (mg)	122.2	137.4	--
Vitamin A (IU)	1888.1	2090.8	1600.0
Thiamin (mg)	0.7	0.7	0.6
Niacin (mg)	8.5	9.0	6.8
Riboflavin (mg)	1.0	1.0	0.6
Folate (μg)	111.9	111.1	160.0
Vitamin B_6 (mg)	0.7	0.7	0.9
Vitamin C (mg)	43.7	39.5	28.0
Calcium (mg)	534.5	501.3	480.0
Iron (mg)	5.9	6.1	12.0
Zinc (mg)	4.3	4.4	6.0
Magnesium (mg)	113.0	99.5	128.0

[a]Formula for Nutrient Density = $\frac{\text{Intake of Nutrient}}{\text{2,500 kilocalories}} \times$ 1,000 kilocalories

[b]Adapted from Hansen, R.C. & Wyse, B.W. (1980) Expression of nutrient allowances per 1,000 kilocalories. J. Am. Diet Assoc. 76: 223-227.

Hypothesis testing. Results of the analysis indicate that heavy television viewers did not consume a diet higher in fat and lower in nutrient density than light television viewers as total dietary iron, vitamin B_6, zinc, folate, vitamin A, magnesium, calcium, fat, cholesterol, and magnesium were not related to the television viewing score. The t values ranged from -0.067 to 1.290 and P values from 0.20 to 0.95.

Table 11 shows the results of the Student's t-test comparing the nutrient density of television and non-television snacks. No significant differences were found.

Results of the ANOVA comparing the nutrient density of foods consumed while watching television and those consumed while not watching television for the same nutrients are presented in Table 12. No significant differences were found except for fat. The nutrient density for fat from foods consumed while watching television was less than that for foods consumed while not watching television (F=0.58; P=0.03). The results are contrary to the purported high fat intake associated with snacking before the television.

Hypothesis IC.

Hypothesis IC states that television viewing will be associated with snacking. This hypothesis was examined in four different ways: (a) calculating the proportion of eating occasions and snacks consumed while watching television, (b) determining the frequency of snacking while watching television on a five point "every day-never" scale, (c) examining how often the subjects ate in response to a commercial and

Table 11. Results of Student's t-Test Comparing the Nutrient Density for Nine Nutrients from Snacks Consumed While Watching Television and Snacks Consumed While Not Watching Television.[a]

	Mean TV Nutrient Density	Mean Non-TV Nutrient Density	t-value	P-value
Iron (mg)	3.7	5.3	0.89	0.38
Vitamin B_6 (mg)	2.1	0.3	-1.105	0.27
Zinc (mg)	2.8	3.0	0.41	0.68
Folate (µg)	90.6	69.5	-0.75	0.45
Vitamin A (IU)	1128.6	1029.7	-0.21	0.83
Magnesium (mg)	103.8	101.3	0.06	0.95
Calcium (mg)	468.3	531.3	0.65	0.52
Fat (gm)	32.8	40.7	0.75	0.46
Cholesterol (mg)	57.0	75.7	0.85	0.39

[a]N = 79.

Table 12. Results of ANOVA Comparing the Nutrient Densities for Nine Nutrients from Foods Consumed While Watching Television and Foods Consumed While Not Watching Television.[a]

	Mean TV Nutrient Density[b]	Mean Non TV Nutrient Density[c]	F-Value	P-Value
Iron (mg)	5.9	6.1	0.14	0.71
Vitamin B_6 (mg)	0.7	0.7	0.10	0.75
Zinc (mg)	4.3	4.4	0.18	0.68
Folate (µg)	111.9	111.1	0.00	0.95
Vitamin A (IU)	1888.1	2090.8	0.76	0.38
Magnesium (mg)	113.0	99.5	1.96	0.16
Calcium (mg)	534.5	501.3	0.71	0.40
Fat (gm)	37.2	40.4	4.58	0.03*
Cholesterol (mg)	122.2	137.4	1.86	0.17

[a]N = 79.

[b]Formula for nutrient density = $\frac{\text{intake of nutrient}}{\text{2,500 calories}}$ x 1,000 kilocalories

*P<0.05.

what prompted them to eat, and (d) determining whether there was a relationship between the television viewing score and caloric intake and weight gain.

Eating occasions. The total number of eating occasions over the four days averaged 17 (4.25 per day) and ranged from 10 (2.5 per day) to 28 (7 per day). Participants consumed an average of 1.5 snacks per day, which accounted for 36% of all eating occasions. Only one subject did not consume at least one snack during the four-day period. Just over three-fourths of the participants consumed at least one snack while watching television during the four day period.

An average of 6.64 eating occasions (range 0-21) or 1.67 per day occurred while watching television. An average of 0.7 of these eating occasions met the criteria for a snack. Thus 39% of all eating occasions occurred while watching television; 47% of all snacks and 35% of all meals. Five subjects consumed no meals or snacks while watching television, and 18 reported consuming no snacks in front of the television. One subject lived in a group home which did not allow eating while watching television, and one reported that she doesn't like television and never watches it. At the other extreme, one participant consumed all meals and snacks while watching television, and eight participants consumed all snacks while watching television.

Snacking frequency. Fifty-two percent of the adolescents reported snacking in front of the television daily and 19% several times a week. When asked what they like to eat while watching television, several

subjects indicated that they snacked on what was available as reflected by comments such as "depends on what we have in the house," "anything I can get my hands on, and "whatever is available." This snacking was to some extent in response to seeing a commercial; 56% reported eating in response to a commercial at least once or twice a week (17% every day, 13% several times a week, and 25% once or twice a week). Only 10% indicated that seeing a commercial never made them want to get something to eat. When asked to describe what aspects of the commercial prompted them to get something to eat, the most common themes were it looked good or appetizing, it was for a food or beverage I had been craving or the commercial made me crave it, and I was hungry or thirsty.

Eating in response to a commercial. For many subjects seeing the videotape of commercials sparked their interest in the foods. One-half of the respondents stated that they wanted to buy one or more of the foods they saw on the videotape of television commercials. The most frequently cited reasons for wanting to purchase the advertised foods were (a) it looked good, (b) something about the commercial itself, (c) it was for a well liked or familiar food, and (d) it was a food she had been craving. Those not wanting to buy the advertised foods cited I'm not hungry or thirsty, the foods were not appealing, the foods were ones I don't like or don't buy, and I don't know.

Snacking while watching television and caloric intake and weight gain. Mean weight gain for a subsample of 52 participants was 34 pounds and ranged from 0 to 77 pounds. Fifty percent gained between 25 and 40

pounds. Concern has been expressed that snacking while watching television results in excessive caloric intake. However, in this study heavy television viewers did not consume more calories than light viewers (F=0.01; P=0.92). In addition, the television viewing score was not related to weight gain during pregnancy (F=0.748, P=0.39). Thus, television watching was not associated with excessive caloric intake or weight gain.

Hypothesis ID

Television commercials are designed to encourage the purchase and consumption of the advertised foods (71,75). Thus, it was hypothesized that television viewing would be associated with the consumption of heavily advertised foods.

Heavily advertised foods. Appendix H contains the results of the analysis of prime time television commercials. Commercials for restaurants (primarily fast food establishments) were by far the most frequently aired food commercials with 325 commercials during the 163-hour period. Most of these commercials were on the major networks with 18 (primarily Burger King) aired on MTV. The next most frequently advertised category was beverages with a total of 133 commercials. Seventy-eight percent of the beverage commercials were for soft drinks. Over the 163-hour period, MTV aired 50 commercials for soft drinks accounting for 48% of all soft drink commercials. Cereals, with a total of 101 commercials, were the next most frequently advertised food with 29 different cereals advertised at least once. The seven cereals

considered the most frequently advertised cereals were advertised six or seven times during the 163 hours. Most of the cereals were advertised on CBS and NBC and none were advertised on MTV. Candy and gum advertisements (N=77) appeared primarily on MTV and ABC. In fact 39% of the candy, 42% of the gum, and 64% of the breath mint commercials were shown on MTV.

Meat and meat substitutes, fats, dairy products, and salty snacks were the next most frequently advertised foods. These foods were promoted solely on the major networks (ABC, CBS, NBC). Other categories advertised on the major networks included spices, condiments, and sauces, fruits and vegetables, pasta dishes, grains, sweets, and main dish items. Most of the fruit and vegetable commercials were for orange juice and frozen vegetables. Interestingly, fruits and vegetables were advertised slightly more often than sweets, 20 compared to 16 times.

Food commercials on MTV are limited to a few types of foods. During March 2 to 8, 1989, candy, gum, breath mints, and fast food restaurants were the only food commercials. During July 10 to 16, 1989 commercials for alcoholic beverages and fast food restaurants were the only food commercials aired.

In Appendix L heavily advertised foods consumed by the subjects are described. Twenty-seven (34%) ate foods from the two most frequently advertised fast food restaurants, McDonalds and Burger King. These data are limited by the fact that no information was collected on the availability of fast food restaurants where the subject lived. The most frequently consumed of the heavily advertised foods were cheese, coke, ice cream, orange juice, potato chips, and Pepsi with 78%, 70%, 46%,

43%, 41%, and 35%, respectively, of participants consuming these foods and beverages at least once over a four-day period. Sweets were the next most frequently consumed heavily advertised food by the pregnant adolescents; 25% consumed chocolate candy, 23% chocolate cookies, and 13% brownies. Nine (11%) drank diet beverages at least once. The following heavily advertised foods were consumed by only one or two subjects: gum, yogurt, and Ritz crackers.

The seven cereals meeting the criteria for the most heavily advertised cereals were not the most frequently consumed cereals. Eighteen subjects (22%) consumed one, and one person (1.3%) consumed two of the heavily advertised cereals, whereas 56 (71%) consumed one or more of 35 other cereals not meeting the criteria for a heavily advertised food. Of these 35 cereals only about one-fourth were advertised at least once during the 163-hour period of analysis, indicating that advertising did not significantly influence the brand of cereal consumed by the pregnant adolescent.

Hypothesis testing. The frequency of television viewing was not related to the consumption of heavily advertised foods (t=1.375, P=0.1750).

Hypothesis IIA

The family is a significant influence on the food behavior of youth (8). Food-related attitudes and behaviors are learned in the home. Parents also play a significant role in the consumer socialization of their children (104). Thus, it was hypothesized that communication with parents about food advertisements and food purchasing and selection would influence the consumption of heavily advertised snack foods.

Results of responses to the parent communication items are presented in Table 13. Evidently parents do not often express concern about how money is spent on food and the types of foods purchased. In fact, over half the pregnant adolescents reported that their parents tell them they should decide what foods to buy at least sometimes. However, about 50% of the pregnant adolescents asked their parents for advice about buying foods, 56% discussed the food advertisements with their parents, 63% talked about buying food with their parents, and 80% helped their parents decide what foods to buy at least sometimes. In line with this communication about food selection, these adolescents frequently went grocery shopping with their parents, 38% very often, 24% often, and 23% sometimes. It is interesting to note that these adolescents talked about food advertisements and buying food with their parents less regularly than they went grocery shopping together. The

Table 13. Response Frequencies for 79 Pregnant Adolescents to Statements that Measure Communication with Family about Food Advertisements and Food Purchasing.[a]

Family Communication Statements	Response Frequencies					Mean[b] ± SEM
	Very Often	Often	Some-times	Rarely	Never	
My parents complain when they do not like the types of food I buy for myself.	2.5	10.1	38.0	21.5	27.8	1.38 ± 0.12
My parents and I talk about buying food.	7.7	26.9	39.7	16.7	9.0	2.08 ± 0.12
My parents and I talk about the food advertisements we see on television.	10.1	8.9	36.7	34.2	10.1	1.75 ± 0.12
I help my parents decide what foods to buy.	26.6	27.8	25.3	10.1	10.1	2.51 ± 0.14
My parents want to know what foods I purchase with my money.	3.8	3.8	26.6	32.9	32.9	1.13 ± 0.12
My parents tell me I should decide about the foods I should or should not buy.	11.4	15.2	29.1	24.1	20.3	1.73 ± 0.14
My parents tell me what kinds of food I should or should not buy.	2.5	10.1	17.7	34.2	35.4	1.10 ± 0.12
I ask my parents for advice about buying food.	7.6	7.6	35.4	26.6	22.8	1.50 ± 0.13
I go grocery shopping with my parents.	38.0	24.1	22.8	7.6	7.6	2.77 ± 0.14

[a]Adapted from Moschis, G.P. (1978), Acquisition of the Consumer Role by Adolescents. Publishing Services Division, College of Business Administration, Georgia State University, Atlanta, Georgia.

[b]Means ± standard error were derived from responses to a frequency scale: 4=very often, 3=often, 2=sometimes, 1=rarely, and 0=never.

frequency of helping parents decide what foods to buy was similar to the frequency of grocery shopping with parents.

Hypothesis testing. The relationship bewteen the parent communication score and the heavily advertised food score was not statistically significant (t=-0.071, P=0.94). The frequency of communication with parents did not influence the intake of iron, vitamin A, folate, fat, cholesterol, magnesium, zinc, vitamin B_6, and calcium. The t values ranged from -0.388 to 1.074 and P values from 0.29 to 0.89.

Hypothesis IIB

A socio-oriented family communication pattern emphasizes the importance of harmonious relationships and conformity to others as well as the withholding of feelings. This in turn may implicitly encourage the child to select consumer goods on the basis of what significant others may think (103). Therefore, it was hypothesized that a socio-oriented family communication pattern would encourage the consumption of food products advertised as promoting a particular image or lifestyle.

The responses to the items forming the socio-oriented family communication scale are presented in Table 14. The mean score on a scale of 0 to 24 was 6.74, with from 53% to 81% of the subjects responding rarely or never to the socio-oriented family communication pattern statements.

Results of responses to the Important Qualities of Snack Food Questionnaire are shown in Table 15. None of the descriptors in columns A through D were important considerations in the selection of snack

Table 14. Response Frequencies for 79 Pregnant Adolescents to Statements that Measure Socio-oriented Family Communication Style.[a]

Communication Style Statements Your Parents	Response Frequencies					Mean ± SEM[b]
	Very Often	Often	Some-times	Rarely	Never	
Say you may not buy certain things	1.3	8.9	26.6	29.1	34.2	1.14 ± 0.12
Want to know what you do with your money	11.4	10.1	25.3	24.1	29.1	1.51 ± 0.15
Tell you what things you should or should not buy	5.1	3.8	27.8	31.6	31.6	1.19 ± 0.12
Say that they know what is best for you and you should not question them	11.4	8.9	19.0	21.5	39.2	1.32 ± 0.16
Say you should not ask questions about things that teenagers like you do not normally buy	2.5	2.5	13.9	26.6	54.4	0.72 ± 0.11
Complain when they do not like something you bought for yourself	5.1	7.7	20.5	30.8	35.9	1.15 ± 0.13

[a]Adapted from Moschis, G.P., Moore, R.L. & Smith, R.B. (1984), The impact of family communication on adolescent consumer socialization. Adv. Consumer Res. 11: 314-319.

[b]Means ± standard error were derived from responses to a frequency scale: 4=very often, 3=often, 2=sometimes, 1=rarely, and 0=never.

Table 15. Responses of 76 Pregnant Adolescents to the Important Qualities of Snack Foods Questionnaire.[a,b,c]

	A	B	C	D
	What friends think of the food.	What type of people eat this food.	What others think of people who eat this food.	Whether eating this food will make a good impression on others.
Soft Drink	16[c]	9	4	6
Corn Chips	14	9	3	2
Chocolate Candy Bar	12	9	9	3
Cookie	10	9	6	5
Crackers	9	12	1	6
Totals[d]	61	48	23	22

[a]Adapted from Moschis, G.P. (1978) Acquisition of the Consumer Role by Adolescents, Publishing Services Division, College of Business Administration, Georgia State University, Atlanta, Georgia.

[b]Instructions for completing the questionnaire were as follows: Five common snack foods are listed below. There are four things (listed across from the food items) which you might think about before buying and eating these foods. Please check all that apply.

[c]Number of positive responses for categories A through D as applied to the foods. Respondents could also check that none of the categories applied.

[d]42 indicated that none of the categories A-D were important considerations in the selection of the listed snack foods.

foods for these pregnant adolescents. Only 34 responded positively to at least one of the 20 statements. Most of the positive responses were to what friends think about the food and what type of people eat this food.

Hypothesis Testing. A socio-oriented family communication pattern was not related to considering the lifestyle or image associated with a snack item before buying the food (t=0.734, P=0.47).

Hypothesis IIC

A concept-oriented family communication style encourages consideration of all alternatives before making a decision, open expression of opinion, and exposure to controversy. Hypothesis IIC postulates that a concept-oriented family communication pattern will increase the likelihood of the pregnant adolescent consuming a food product advertised as nutritious or healthy.

Concept-oriented family communication score. Responses to the concept-oriented family communication items are shown in Table 16. The mean response on the concept-oriented family communication scale was 13.39 out of a possible score of 24. A concept-oriented family communication style was more descriptive of the communication style in these pregnant adolescents' families than the socio-oriented family communication style. The responses indicate that a majority of subjects have parents who (a) let them decide how to spend their money, (b) allow them to make decisions about what they buy, (c) ask their children what

Table 16. Response Frequencies for 79 Pregnant Adolescents to Statements that Measure Concept-Oriented Family Communication Style.[a]

Communication Style Statements Your Parents	Response Frequencies					Mean ± SEM[b]
	Very Often	Often	Some-times	Rarely	Never	
Ask you to help them buy things for the family	7.6	8.9	25.3	24.1	34.2	1.32 ± 0.14
Say you should decide for yourself how to spend your money	29.1	30.4	24.1	10.1	6.3	2.66 ± 0.13
Say you should decide what things you should or should not buy	24.1	27.8	30.4	10.1	7.6	2.51 ± 0.13
Ask you what you think about things they buy for themselves	28.2	30.8	21.8	10.3	9.0	2.59 ± 0.14
Ask you for advice about buying things	13.9	26.6	29.1	13.9	16.5	2.08 ± 0.14
Say that buying things you like is important even if others do not like them	19.0	24.1	32.9	10.1	13.9	2.24 ± 0.14

[a]Adapted from Moschis, G.P., Moore, R.L. & Smith, R.B. (1984) The impact of family communication on adolescent consumer socialization. Adv. Consumer Res. 11: 314-319.

[b]Means ± standard error were derived from responses to a frequency scale: 4=very often, 3=often, 2=sometimes, 1=rarely, and 0=never.

they think about things they buy for themselves, (d) tell their children they should buy what they like, not what others like, and (e) ask advice about buying things. However 58% reported that their parents rarely or never asked them for assistance in buying things. Apparently communication centers on information and approval seeking, not the actual selection.

Advertising claims most likely to promote the purchase of the product. When the pregnant adolescents were asked what would entice other teens and themselves to try a new food product the most popular responses were (a) it is good tasting, (b) it is not fattening, and (c) it is nutritious (contains vitamins and minerals, low in cholesterol). Additional suggestions included having lots of action or music and dancing in the commercial, showing other people of all ages (especially teens) enjoying the food, making the food look good, and pointing out that the food doesn't cost a lot. For half the participants nutrition and health related claims were important considerations that might entice the adolescents to buy an advertised product.

Hypothesis testing. The effect of the concept-oriented family communication score on the pregnant adolescents' receptiveness to health and nutrition claims was not statistically significant ($t=0.896$, $P=0.37$).

Hypothesis IID

During adolescence more time is spent with peers and less with family (8). Therefore, it was hypothesized that communication with peers about food selection and purchasing would increase the consumption of heavily advertised snack foods.

Peer communication score. Response frequencies to the peer communication items are tabulated in Table 17. Communication with friends about food selection and purchasing was infrequent. From 68% to 73% rarely or never talked about buying food with friends or received or asked for advice in snack selection. Approximately 57% rarely or never discussed food selection at fast food restaurants or food advertisements with friends. However, 27% to 43% sometimes did discuss all the aforementioned items with their peers. Thus, although most subjects reported minimal communication with peers about food advertisements and food selection, a subgroup reported some communication with their friends regarding food-related behaviors.

Hypothesis testing. The result of testing the hypothesis that peer communication would increase the consumption of heavily advertised foods was not statistically significant ($t=-0.506$, $P=0.61$). Therefore, the hypothesis that the frequency of communication with peers regarding food selection and consumption would influence the frequency of consuming heavily advertised foods was rejected. Thus, television commercials did not have an indirect influence on food selection by setting the agenda for communication with peers.

Table 17. Response Frequencies for 79 Pregnant Adolescents to Statements that Measure Communication with Peers about Food Advertisements and Food Purchasing.[a]

Peer Communication Statements	Response Frequencies					Mean[b] ± SEM
	Very Often	Often	Some-times	Rarely	Never	
My friends and I talk about buying food.	0.0	3.8	24.1	41.8	30.4	1.01 ± 0.09
My friends tell me what foods I should or should not buy.	0.0	2.6	7.9	26.3	63.2	0.50 ± 0.09
I ask my friends for advice about what food products to buy for snacks.	0.0	1.3	25.6	23.1	50.0	0.80 ± 0.10
My friends ask me for advice about what food products to buy for snacks.	1.3	3.8	26.6	29.1	39.2	0.99 ± 0.11
I talk with friends about what foods to buy at fast food places (McDonalds, Wendy's, Burger King).	2.5	8.9	31.6	32.9	24.1	1.33 ± 0.11
My friends and I talk about the food advertisements we see on television.	3.8	10.1	27.8	32.9	25.3	1.34 ± 0.12

[a]Adapted from Moschis, G.P. (1978), Acquisition of the Consumer Role by Adolescents. Publishing Services Division, College of Business Administration, Georgia State University, Atlanta, Georgia.

[b]Means ± standard error were derived from responses to a frequency scale: 4=very often, 3=often, 2=sometimes, 1=rarely, and 0=never.

Summary

The amount of time spent watching television did not influence caloric intake, nutrient density of the diet, or consumption of heavily advertised foods as defined in this study. However, foods consumed while watching television were lower in fat than foods consumed while not watching television, and the television viewing score was significantly related to fat intake from snacks. Heavy television viewers did not perceive name brand items as more nutritious, of better quality, and a better value than light television viewers. Communication with parents about food selection and food purchasing influenced neither the consumption of heavily advertised foods nor individual nutrient intakes. A socio-oriented family communication style was not related to the selection of a snack food because it was associated with a particular image or lifestyle. A concept-oriented family communication did not increase the likelihood of consuming a food product advertised as nutritious or healthy. Communication with peers about food advertisements and food purchasing was not associated with the consumption of heavily advertised foods.

CHAPTER V

DISCUSSION

Sample

This sample of pregnant adolescents was of low socioeconomic status as measured by the Hollingshead Four Factor Index of Social Status (166). As shown in Table 3 (page 111) over half (58%) lived with one or both parents and about one-third were married. The mean age ± SEM was 16.4 ± 0.1. In comparison, about 68% of the 34 East Tennessee pregnant adolescents studied by Valdrighi (174) lived with one or both parents and approximately 26% were married. The educational attainment of parents and guardians of the pregnant adolescents in Valdrighi's study was low (38% to 47% had completed high school) indicating low socioeconomic status. The educational attainment of the participants in Valdrighi's study was lower than that of the pregnant adolescents in this study; only 47% had completed tenth through twelfth grade compared to 70% in this study.

The mean age of participants in other studies of the dietary intake of pregnant adolescents was between 16 and 17 (37,38,41,43,173-175). Most of these studies did not provide information on other demographic characteristics so no comparisons can be made. Subjects in the two studies by Endres and coworkers (37,38) were in the process of applying for or enrolled in the Supplemental Food Program for Women, Infants, and Children and, thus, of low socioeconomic status.

Television Viewing Habits

The pregnant adolescents reported watching approximately five hours of television per day, significantly ($F=56.56$, $P<0.001$) greater than the four hours per day reported by 494 non-pregnant female adolescents in East Tennessee (19). Solderman and coworkers (20) surveyed 358 white ninth to twelfth grade females and 54 white pregnant adolescents in the Midwest, and also found that the pregnant adolescents spent more time watching television than non-pregnant adolescents, 5.6 hours per day compared to 4.6 hours. The pregnant adolescents in this study and the study by Solderman and coworkers (20) both reported watching television over 5 hours per day or 35 hours per week compared to about 21.25 hours per week for the typical female adolescent reported by the Nielsen Ratings (1). Thus, pregnant adolescents reported they spend a substantial amount of time watching television, about one hour more per day than their non-pregnant peers.

The substantial amount of time spent watching television is consistent with research indicating that adolescents from families that are poorer and less educated watch more television (51,56). The high television viewing frequency may also reflect the increased time available for watching television. Some participants were not in school or were on home bound instruction. Perhaps those pregnant adolescents who continued in school were less active in extracurricular activities. No data were collected about other leisure time activities.

In accord with the Nielsen ratings (1), comedy shows and movies were popular programs. As shown in Table 18, pregnant adolescents in

Table 18. The Television Program Viewing Frequency of 79 Pregnant and 463 Non-Pregnant Female East Tennessee Adolescents.

	LSM±SEM[a]	
TV Program	Non-Pregnant Adolescents[b]	Pregnant Adolescents[c]
News	2.06±0.06	2.38±0.13
Sports Events	1.16±0.04	0.89±0.11*
Movies	2.20±0.04	2.83±0.11***
Game Shows	1.42±0.06	2.25±0.14***
Soap Operas	1.81±0.07	3.01±0.16***
Police and Adventure Shows	1.62±0.05	2.09±0.12***
Comedy Shows	2.56±0.04	2.73±0.11
MTV	2.02±0.02	1.06±0.17***

[a]Least squares means derived from responses to a frequency scale for viewing television programs: 4=every day, 3=several times a week, 2=once or twice a week, 1=less than once a week, 0=never.

[b]Data from Carruth, B.R., Goldberg, D.L. & Skinner, J.D. (submitted) Adolescents' TV viewing habits, snack choices, and communication with parents and peers about food related purchases. J. Adolesc. Res.

[c]Data from current study.

*$P \leq 0.05$

***$P \leq 0.001$

this study indicated they watched soap operas, news, sports events, movies, game shows, police and adventure shows, and MTV more frequently than the white non-pregnant East Tennessee female adolescents in the study by Carruth and coworkers (19). The higher frequency of watching sports events may reflect the fact that pregnant adolescents are more likely than non-pregnant adolescents to watch television with a steady boyfriend (20). Male adolescents watch sports events more frequently than female adolescents (19).

Pregnant adolescents with access to cable did not report more frequent viewing of news, sports events, soap operas, movies, police and adventure programs than those without access to cable. However, game show viewing frequency was lower and MTV was greater suggesting that subjects were watching cable programming in place of game shows.

Socioeconomic status did not influence the viewing frequency of news, soap operas, movies, sports events, police and adventure programs, and game shows and may be explained by the low variability in socioeconomic status. Churchill and Moschis (154) also found that socioeconomic status did not influence television program viewing frequencies. MTV viewing frequency was greater among those with a Hollingshead Four Factor Index of Social Status Score above the median, probably reflective of having money to pay for cable. MTV was more popular among the younger adolescents and may be explained by the fact that younger adolescents do not have drivers' licenses and are probably less able to get away from home. However, the majority of adolescents in this study rarely watched MTV. In contrast, 80% of a sample of 603 high school students watched MTV everyday (62). This discrepancy may be

explained by the fact that only about one-half of the pregnant adolescents in this study had access to cable television in their home.

Television Viewing and Brand Preference

Approximately two-thirds of the subjects reported a preference for purchasing the name brand snack item over its generic counterpart. This is in agreement with other studies reporting that teenagers prefer brand name items (72,130,153). Moschis and Moore (153) surveyed 734 adolescents regarding the evaluative criteria they use in selecting each of the following items: wristwatch, dress shoes, pocket calculator, hair dryer, sunglasses, wallet, flash cubes, and household batteries. When responses were averaged for all eight items, 43% (range 30% to 60%) reported they would buy a well-known brand name, and 15% (range 8% to 19%) indicated they would buy one advertised a lot.

The pregnant adolescents' preference for the name brand product was not necessarily related to perceiving it as a better product. Only 40% felt the name brand was of better quality or of better value and none believed the name brand was more nutritious. This is in disagreement with surveys by Seventeen magazine which have revealed that female adolescents perceive name brands as more nutritious, of better quality and of better value than store brands or generics (75). Perhaps these other surveys included a higher socioeconomic status population than the 79 adolescents in this study.

Apparently, familiarity, appearance, and positive experiences with the product were explanations for choosing the name brand as indicated

by the following statements by participants: (a) "Really I've tried the difference and it don't (i.e. no perceived difference between the name brand and its generic counterpart), but the price is different. That's what it is. A lot different," (b) "I wouldn't say that it (the name brand) would probably be better. It might, but the fact that it's been advertised more, people are going to notice this one more (the name brand) than this one (the generic product). Because my mom, she buys things that have, you know, no name brands and they're just as good, you know, but it's kind of dull looking, you know, not as colorful as the name brand," and (c) "I guess just because Lay's (the name brand) is more known than the Golden Flake (the generic brand)." Interviewer: "Do you think there's a difference in quality between the two?" Subject: "Probably not." This is in agreement with research by Moschis (109) and Moschis, Moore, and Stanley (110) which indicated that mere exposure to television advertisements for a specific brand can result in a favorable attitude toward that brand.

Television Viewing and Diet Adequacy

Intakes of protein, thiamin, riboflavin, niacin, vitamin C, and calcium exceeded the RDA (133) for pregnancy but were less than the RDA for folate, iron, zinc, vitamin B_6, and magnesium. The low intake of folate, zinc, and magnesium are indicative of the infrequent consumption of foods high in these nutrients such as whole grains, beans and legumes, and dark green leafy vegetables. The low intake of iron in comparison to the RDA reflects the fact that the RDA of 30 milligrams is

very difficult to meet with food when the typical iron intake of American female teenagers is about six milligrams per 1,000 kilocalories (177). Thus, the typical diet containing the recommended energy intake of 2,500 kilocalories would supply 15 milligrams of iron compared to the RDA of 30 milligrams.

Table 19 compares the nutrient intake of the pregnant adolescents in the current study to seven other studies of the nutrient intake of pregnant adolescents. In this study, the nutrient intake did not differ greatly from that in the other studies. All values from these studies were compared to the 1989 RDAs (33). Average caloric intake ranged from 71% to 112% of the RDAs (33) compared to the mean of 100% in this study. Protein intake ranged from 110% to 183% compared to the mean of 150% in the current study. Vitamin A intake ranged from 99% to 180% compared to the mean of 126% in the current study. Mean niacin intake ranged from 78% to 126% compared to 130% in the current study. Mean intake of riboflavin intake ranged from 100% to 200% of the 1989 RDAs compared to 162% in the current study. Average thiamin intake ranged from 67% to 127% of the 1989 RDAs compared to 120% in the current study. Intakes of folacin, iron, and vitamin B_6 were below the 1989 RDA in all studies that examined intakes of these nutrients.

Several studies have reported that non-pregnant adolescent females typically consume about 38% of kilocalories as fat and 145 milligrams cholesterol per 1,000 kilocalories (95-99). Results of this study (36% of kilocalories as fat, 136.8 milligrams cholesterol per 1,000 kilocalories) are in agreement with the previously cited studies. The percent calories from fat and total cholesterol intake were greater than

Table 19. Average Daily Nutrient Intakes in Current Study Compared to Other Studies of Pregnant Adolescents.[a,b]

	Mean Gestational Age (Weeks)	Number of Subjects	Dietary Record Recall	Energy (kcal)	Protein (gm)	Vit. A (IU)	Thiamin (mg)	Niacin (mg)	Riboflavin (mg)	Folacin (mg)	Vit. B_6 (mg)	Vit. C (mg)	Iron (mg)	Calcium (mg)
Current study	28+	79	2-day food record 2-24-hour diet recalls	2490	90	5029	1.8	22.1	2.6	278	1.7	99	14.9	1351
Endres et al., 1987 (38)	23+	526	24-hour diet recall	1876	74	4859	1.5	19.0	2.2	--	--	123	13.8	796
Valdrighi, 1986 (174)	28+	34	3-day record 24-hour recall	2249	88	6292	1.63	19.4	2.5	--	--	121	13.6	1263
Endres et al., 1985:[c] (37)														
Pre-WIC	20	91	24-hour diet recall	1927	77	5843	1.5	19.3	2.3	243	1.0	99	15.1	934
WIC	26	46	24-hour diet recall	1908	80	5846	1.6	18.5	2.4	243	1.1	85	16.0	982
Loris et al. 1985 (175)	26+	54	24-hour diet recall	2822	110	7199	1.9	21.5	3.2	--	--	133	16.6	1670
Hansen et al., 1976[d] (42)	13+	29	24-hour diet recall	2438	92	6712	1.4	17.0	2.5	--	--	187	13.6	1315
King et al., 1972 (43)	26+	17	1 or 2 sets of 3-day food records	1871	77	4208	1.0	15.0	1.8	--	--	82.0	10.0	800
Osofsky et al., 1971 (41)	--	88	3-day food record	1782	66	3967	1.0	13.3	1.6	--	--	79	9.0	760

[a] Intakes for all studies do not include vitamin/mineral supplements.

[b] Presentation style adapted from Endres, J.M., Poell-Odenwald, K., Sawicki, M. & Welch, P. (1985), Dietary assessment of pregnant adolescents participating in a supplemental food program. J. Reprod. Med. 30: 10-17.

[c] This study examined dietary intake of a group of subjects before and another group after enrollment in the Special Supplemental Food Program for Women, Infants, and Children.

[d] These subjects were enrolled in school and provided with lunch and snacks which provided 35% to 40% of kilocalories and vitamins and minerals.

the current recommendations for Americans of less than 30% of kilocalories as fat and less than 300 milligrams of cholesterol per day (93). The applicability of these recommendations to the pregnant adolescent has not been examined.

Nutrient Content of Snacks

The frequency of snacking and nutrient content of the snacks of the pregnant adolescents are in agreement with other studies of non-pregnant adolescents' snacking patterns (16,17,84,85). The most frequently consumed snacks were (a) soft drinks and other sugar containing beverages; (b) sweets such as cookies, cake, pastry, candy, ice cream, and doughnuts; (c) milk; (d) sandwiches and main dish items; (e) fruit; (f) bread, muffins, crackers and cereal; and (g) salty snacks such as pretzels, potato chips, and popcorn. The most popular television snacks included sweets/desserts, carbonated beverages, fruits and vegetables, and breads and cereals. This is in agreement with other studies of adolescents' snacking patterns which have reported that carbonated beverages, milk, ice cream, sandwiches, cereal, cookies, cake, candy, crackers, and chips are popular snacks (17,83,88).

Snacks accounted for 21% of total kilocalories and 10% to 22% of total vitamin and mineral intake in comparison to 17% to 33% of total kilocalories and 13% to 20% of total vitamin and mineral intake from other studies (18,84-86). Snacks provided one-fifth or more of the RDA for calcium, riboflavin, and vitamin C. Other researchers have also found that adolescents' snacks are good sources of vitamin C and

riboflavin (84,85). Contrary to these studies, snacks consumed by adolescents in this study were not good sources of thiamin.

The percent kilocalories from fat in snacks was less than the percent kilocalories from the overall diet and approximated current recommendations of 30% or less of calories from fat (93,94). This reflects the frequent consumption of foods not high in fat but high in sugar, such as sugar containing beverages and fruit.

Overall, the nutrient density of television and non-television snacks were below the standard. No significant differences were found in the nutrient density of television and non-television snacks except for fat. Television snacks were lower in fat than non-television snacks, again reflecting the consumption of foods high in sugar but not high in fat, such as carbonated beverages and fruit.

Nutrient Content of Television and Non-Television Foods

Participants consumed 38% of total caloric intake while watching television. This result is not surprising considering that the pregnant adolescents spent close to one-third of their waking hours watching television (assuming eight hours of sleep per day). Foods consumed while not watching television were higher in fat than foods consumed while watching television. The nutrient densities for all other nutrients were similar.

Burdine and coworkers (48) are the only other researchers to examine the relationship between the amount of time spent watching television and food choices. In this survey of 2,695 seventh and eighth

graders, the amount of television watching was associated with the reported frequency of consumption of sweets (soft drinks, cookies, ice cream, and candy) and salty foods (potato chips, corn chips, nuts, and tortilla chips). In this study the consumption of heavily advertised foods, which included the aforementioned foods, was not related to the frequency of television viewing. Methodological differences may account for the disparate findings. The current study used actual records of food consumption rather than estimated frequency of consumption. Since one goal of this study was to examine whether television advertising influenced food choices, dietary records were reviewed specifically for consumption of advertised foods. For example, dietary records were reviewed for the frequency of consumption of Coca Cola and Pepsi rather than soft drinks, Ritz crackers rather than any kind of crackers, and chocolate cookies rather than any kind of cookies. Another consideration is that the subjects in the study by Burdine and coworkers were younger than the participants in this study.

Snacking Patterns

In this study 71% of the pregnant adolescents reported snacking every day or several times week compared to 58% of a sample of non-pregnant East Tennessee high school students (19). The mean frequency of snacking while watching television was greater ($F=7.73$, $P=.01$) among pregnant East Tennessee adolescents than among non-pregnant East Tennessee adolescents. Gerbner and coworkers (6) reported that 91%

of the tenth graders they surveyed usually ate while watching television.

Seeing a commercial was a stimulus for getting something to eat at least sometimes for some participants. In the current study 58% of the pregnant adolescents reported snacking at least once or twice a week in response to seeing a commercial, and only 10% reported never snacking in response to a commercial. Carruth, Goldberg, and Skinner (19) found that among East Tennessee adolescents 49% reported snacking at least one or twice a week in response to seeing a commercial, and 27% reported never snacking in response to seeing a commercial. The mean frequency of snacking in response to seeing a commercial reported by the non-pregnant adolescents was less ($F=4.05$, $P=0.04$) than the frequency reported by the pregnant adolescents. In the study by Carruth and coworkers the question about snacking in response to a commercial was asked as part of a written survey, while in the current study the question was asked during a semi-structured interview after the participant was shown a videotape of commercials. Another explanation is that the increased caloric needs of the pregnant adolescent may increase her frequency of snacking or susceptibility to commercials. Furthermore, as previously discussed, the pregnant teens watched television more frequently than the non-pregnant teens.

However, the cue encouraging the adolescent to get something to eat was not always related to the commercial; hunger and thirst were also significant determinants of snacking patterns. One participant stated in the interview that how long it had been since she last ate was a significant determinant of whether she ate in response to a commercial.

Or in the words of another participant, "Commercials never make me want to snack. I just snack anyway." Furthermore, the fact that television viewing was not associated with greater caloric intake or weight gain supports the idea that the snacking while watching television was in response to a perceived physiological need.

Interestingly, prompts for eating in front of the television reported by these pregnant adolescents were similar to reasons for snacking given by other southern adolescent females (84). The primary reasons for snacking in response to seeing a commercial given by the pregnant adolescents in this study could be categorized as follows: (a) it looked good or appetizing, (b) it was for a food or beverage I had been craving or the commercial made me crave it, and (c) hunger or thirst. The most popular reasons cited by non-pregnant adolescents were hunger, looks good, and having nothing to do.

Despite the fact that these pregnant adolescents did sometimes eat in response to a commercial and consumed 38% of their total caloric intake while watching television, the time spent watching television did not substantially influence food selection and dietary adequacy. Apparently the foods consumed while watching television were well liked, easily available, similar in nutrient content to foods consumed while not watching television, and not particularly the foods advertised on television.

Mean weight gain was 34 pounds with half gaining between 25 and 40 pounds. The current recommended weight gain range for adult women is 22 to 32 pounds (44). For adolescents, expected weight gain due to

maturation during the nine months of pregnancy should be added to the recommendations for adult women (44).

Heavily Advertised Foods

The results of analyzing television commercials are similar to the results of Story and Faulkner (80). Salty snacks and fruit commercials accounted for two to three percent and soft drinks 11% to 12% of all food commercials in both studies. The percentage of cereal commercials (11% versus 20%) and sweet/desserts (9% versus 13%) was less and the percentage of restaurant commercials was greater (36% versus 26%) in the current study compared to the study by Story and Faulkner (80). These small differences may reflect the difference in methodology used to select the programs for analysis. In the current study, all commercials aired during prime time on the major networks and MTV were reviewed whereas Story and Faulkner (80) analyzed the commercials on 11 dramatic and situational comedies aired during prime time on the major networks. As previously mentioned, food commercials aired on MTV included a limited variety of foods. Furthermore, the study by Story and Faulkner was completed during the summer of 1988 while the analysis for this study was completed in the spring and summer of 1989.

In regard to the consumption of heavily advertised foods, pregnant adolescents in this study did not choose the most heavily advertised brands even for a frequently consumed food such as cereal, which was consumed at least once during the four days of records/recalls by approximately 80% of the participants. Only 30% consumed a cereal that

was advertised at least once during the 163-hour period of analysis. Although this finding is contradictory to the reported behavioral effects of alcohol advertisements (127,133,178), it is in agreement with Moschis and Moore's (53) finding than over a three-month period, formation of a brand preference for coffee or soft drinks did not occur.

In the current study, only nine (11%) of the subjects reported using diet beverages at least once during the four days; five of the nine drank diet drinks just once. In Valdrighi's (174) study of 34 pregnant adolescents, only 12% of the participants reported drinking diet beverages. The frequency of consumption also was low, less than once a week.

Whether or not the adolescent attended to the commercial is an important consideration in evaluating the lack of impact of television advertising on pregnant adolescents' food choices. Although not directly examined in this study, information provided by participants during the interview indicated that some subjects did not pay much attention to advertisements or use them as a source of information as illustrated by the following comments (a) "I can't really remember advertisements with foods," (b) "Most of the time I don't watch them. I'm usually changing channels while they're on," (c) "They're just commercials," and (d) "I really don't pay much attention to them unless like I said they catch my sense of humor."

The preference for name brand items combined with the lack of influence of television on food selection and nutrient intake suggest that television viewing may not influence what foods are selected but does influence the brand preference. In other words, an adolescent who

likes chocolate chip cookies will eat chocolate chip cookies, but exposure to commercials, by increasing product recognition and making the product look appetizing, may be a determinant of the brand selected.

Parent Communication

Eighty-five percent of the pregnant adolescents indicated that they go grocery shopping at least sometimes with their parents. This is slightly higher than the results of other surveys of adolescents' food purchasing patterns. According to a survey by Campbell Soup Company, 63% of all adolescent females do some grocery shopping (71). A survey of high school home economics students revealed that 80% are responsible for making at least some decisions regarding food purchases for the family (144).

It appears the parent/adolescent communication occurs more at the product evaluation stage rather than at the decision making stage. The pregnant adolescents reported that their parents ask them for advice about buying things and what they think about what they buy for themselves but not for assistance in buying things. The finding that parents did not ask their adolescents for advice in buying things is inconsistent with the frequency adolescents report grocery shopping with their parents. This may be due to the fact that the former statement asked about buying consumer goods in general and not specifically food.

As shown in Table 20, the mean responses of the pregnant adolescents to the parent communication items were significantly greater than those of the non-pregnant adolescents (19) with the exception of

Table 20. Female Adolescents' Communication with Parents about Food Advertisements and Food Purchasing

Statement	LSM±SEM[a]	
	Non-Pregnant[b,c]	Pregnant[d,e]
My parents complain when they do not like the types of food I buy for myself.	1.19±0.05	1.38±0.13
My parents and I talk about buying food.	1.38±0.05	2.08±0.12***
My parents and I talk about the food advertisements we see on television.	1.05±0.05	1.74±0.12***
I help my parents decide what foods to buy.	2.06±0.06	2.51±0.13**
My parents want to know what foods I purchase with my money.	0.83±0.05	1.136±0.11*
My parents tell me I should decide about the foods I should or should not buy.	1.17±0.06	1.73±0.14***
My parents tell me what kinds of food I should or should not buy.	0.73±0.05	1.10±0.11**
I ask my parents for advice about buying food.	0.72±0.04	1.51±0.10***
I go grocery shopping with my my parents.	2.07±0.06	2.77±0.14***

[a]Least squares means ± standard error were derived from responses to a frequency scale: 4=very often, 3=often, 2=sometimes, 1=rarely, and 0=never.

[b]N = 463.

[c]Data from Carruth, B.R., Goldberg, D.L. & Skinner, J.D. (submitted), Adolescents' television viewing habits, snack choices, and communication with parents and peers, J. Adolesc. Res.

[d]N = 79.

[e]Data from current study.

*P<0.05

**P<0.01

***P<0.001

one item: "my parents complain when they do not like the types of food I buy." Thus, the pregnant adolescents reported more frequent communication with parents regarding food advertising, and selecting and buying food. Additionally, the pregnant adolescent reported grocery shopping with their parents more often than the non-pregnant adolescents. Perhaps, pregnancy increased the adolescents' dependency on their parents, and their other contacts are limited.

Socio-Oriented Family Communication Style

The type of family communication patterns did not affect the salience of specific advertising claims examined. A socio-oriented family communication style did not increase the likelihood of a consuming a food product advertised as promoting a particular lifestyle or image. This is not in accordance with consumer socialization research. It is purported that adolescents from socio-oriented families, which are more susceptible to outside influences (such as peers and television), feel the source of information in an advertising message is important and are more likely to change their attitudes when the expertise of the message source is manipulated (104,152). As shown by responses on the Important Qualities of Snack Food Questionnaire (Table 15, page 135), what friends think of the food, what type of people eat this food, what others think of people who eat this food, and whether eating this food will make a good impression on others were not important considerations in the selection of snack foods.

Concept-Oriented Family Communication Style

Consumer socialization research indicates that adolescents from pluralistic families, which are concept-oriented, prefer functional types of information. However, results of this study indicate that this is not applicable to food-related behaviors; a concept-oriented family communication style was not associated with the likelihood of consuming a food advertised as nutritious or healthy.

Advertising Claims Most Likely to Promote the Purchase of the Product

Taste and health/nutrition-related claims were the attributes most likely to entice the pregnant adolescents to try a new product. Nutrition claims were salient for one-half of the participants. Perhaps pregnancy increased many adolescents' interest in eating nutritious foods.

The importance of taste and health and nutrition claims has been reported in other studies of female adolescents (143). According to English (75), adolescent females respond to advertisements with health/nutrition claims. Similarly, Contento and coworkers (143) identified a subgroup of adolescents who were motivated to consume healthful food and avoid foods that contain sugar, are fattening, and promote heart disease. The importance of taste in this study, as an attribute that would encourage trying a new food product, is in agreement with the finding of Contento and coworkers that taste is a significant influence

on the food selection of a subgroup of adolescents. White and Skinner (179) reported that sensory characteristics, especially taste, were important determinants of food selection by adolescents.

Other suggestions offered by the pregnant adolescents to encourage purchase of a new food product included having lots of action or music and dancing in the commercial, showing other people of all ages enjoying the food, making it look good, and pointing out that the food doesn't cost a lot. Trachtenberg (74) stated that teenagers respond to commercials with dance, music, and action.

Peer Communication

As shown in Table 21, the non-pregnant East Tennessee adolescents' responses (19) to the peer communication statements were similar to this sample of pregnant adolescents with 60% to 89% responding rarely or never to the statements. Mean responses to the peer communication items of the pregnant and non-pregnant adolescents were significantly different on only two items. The pregnant adolescents reported that their friends more often ($P<0.05$) asked them for advice about what food product to buy for snacks and that they more often ($P<0.01$) talked with their friends about the food advertisements they see on television. Perhaps, the pregnant adolescent was sharing nutrition information received from her health care providers with her friends.

Similar to the pregnant adolescents there was a subgroup who reported some communication with peers; about 24% to 32% reported sometimes talking about buying food, what foods to buy at fast food

Table 21. Female Adolescents' Communication with Peers about Food Advertisements and Food Purchasing

Statement	LSM±SEM[a]	
	Non-Pregnant[b,c]	Pregnant[d,e]
My friends and I talk about buying food.	1.10±0.05	1.01±0.11
My friends tell me what foods I should or should not buy.	0.37±0.00	0.50±0.08
I ask my friends for advice about what food products to buy for snacks.	0.62±0.04	0.79±0.10
My friends ask me for advice about what food products to buy for snacks.	0.70±0.04	0.99±0.10*
I talk with friends about what foods to buy at fast food places (McDonald's, Wendy's, Burger King).	1.39±0.05	1.34±0.12
My friends and I talk about the food advertisements we see on television.	0.98±0.05	1.34±0.11**

[a]Least squares means ± standard error were derived from responses to a frequency scale: 4=very often, 3=often, 2=sometimes, 1=rarely, and 0=never.

[b]N = 463.

[c]Data from Carruth, B.R., Goldberg, D.L. & Skinner, J.D. (submitted), Adolescents' television viewing habits, snack choices, and communication with parents and peers, J. Adolesc. Res.

[d]N = 79.

[e]Data from current study.

*P<0.01

**P<0.001

restaurants, and food advertisements seen on television with their friends. The existence of a subgroup of adolescents whose food choices may be influenced by peers is supported by additional studies. Moschis, Moore and Stephens (158) reported that 26% of the 607 adolescents they surveyed usually purchased snack foods with friends. Contento and coworkers (143) also found that what friends eat was a salient influence on the food choices of a subgroup of adolescents.

A Model of Television Advertising Effects

According to the results of this study, the model of adolescent consumer socialization developed by Moschis (49) and Moschis and Churchill (50) does not apply to food-related behavior. Television, parents, and peers did not have a direct impact on food-related behavior. However, the notion that television does have an indirect effect can not be rejected. Fast food restaurants and food manufacturers are willing to spend a substantial amount of money on television advertising (71,72,77), and the high degree of preference for heavily advertised brands, even though they were not always thought to be a better product, is indicative of some advertising effects.

Despite the fact that adolescents may not give commercials their full attention, repeated exposure may be sufficient to allow for product recognition in the store. This lack of interest combined with research indicating that food and nutrition does not play a significant role in the lives of adolescents (89,180) suggests that the low involvement model of advertising effects offers an explanation for the influence of

advertising. In other words, because decisions regarding food selection are not salient, the adolescent may not take the time and effort to critically evaluate the commercial claims. The effect of repeated exposure then is to promote product awareness and recognition in the store where the product is purchased on a trial basis.

According to the low involvement model, interpersonal influences are not significant because different brands are not seen as having distinguishing characteristics (118). Thus, information gathering and social approval is not necessary. Findings from this study support this model. Peer influences were weak; greater than two-thirds rarely or never discussed food purchasing or asked for advice in snack selection, and over one-half rarely or never discussed food selection at fast food restaurants or food advertisements with friends. Other adolescents who have completed the Parent/Peer Communication Questionnaire have indicated that food selection represents personal choice and was not influenced by others (19).

The Important Qualities of Snack Foods Questionnaire (Table 15) indicated that social approval and presenting a particular image are not salient; 84% to 98% indicated that what friends think of the food, what type of people eat this food, what others think of people who eat this food, and whether eating this food will make a good impression on others were not important considerations in the selection of a soft drink, corn chips, chocolate candy bar, cookie, and crackers.

However, communication with parents regarding food selection occurred more frequently than with peers. This communication appears to reflect the role adolescents play in making food choices within the

family, rather than a need for information or approval. These adolescents reported some discussion with parents about food selection and going grocery shopping with parents.

In summary, television viewing appeared not to have a direct impact on the food choices of these pregnant adolescents. Taste, familiarity, and appearance were apparently more salient factors. As shown in Figure 6, television, however, may have indirect effects by increasing the recognition of the product and emphasizing the appearance of the product.

Implications and Future Research Needs

The pregnant adolescents in this study reported spending approximately 35 hours per week watching television and consumed about 40% of their nutrient intake while watching television. Additionally, health and nutrition claims were salient for one-half of the sample. Thus, television would appear to be an ideal medium to reach pregnant adolescents with pro-nutrition messages.

The fact that the amount of time spent watching television did not influence food selection and dietary adequacy does not exclude the possibility that advertising nutrient dense foods would improve the adequacy of pregnant adolescents' diets. Results of this study suggest that television advertising has an indirect effect by emphasizing the appearance and increasing product recognition. The pregnant adolescents in this study did eat in response to seeing television advertisements. They reported that eating was associated with physiological cues, such

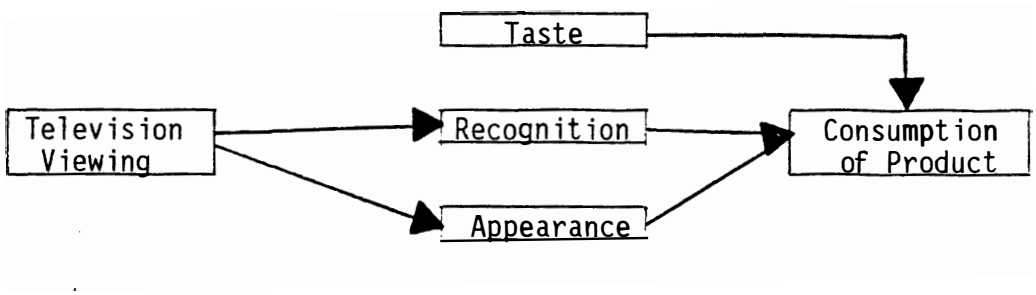

Figure 6. Model Describing the Indirect Effects of Television on the Food Consumption of Pregnant Adolescents.

as hunger and thirst, and attributes emphasized in the commercial, such as appearance and taste. Adolescents also indicated that they might respond to commercials having lots of action or music and dancing, showing people enjoying the food, making the food look good, and stating that the product is relatively inexpensive. Perhaps advertisements for nutrient dense foods that utilize these techniques might increase the consumption of nutrient dense foods. No one has explored the impact of pro-nutrition advertisements on adolescents' food choices, although a mass media education campaign that included television increased nutrition knowledge (128).

Additional research should examine the influence of television viewing on the nutrient intake and frequency of consumption of heavily advertised foods to see if the findings in this study are replicated. Additional studies should also determine the extent to which adolescents pay attention to commercials and their reasons for watching or not watching and explore more in depth the attributes of persuasive commercials. In conclusion, results of this study indicate that television viewing does not have detrimental effects on the dietary adequacy of pregnant adolescents but could play a role in promoting healthy food choices for this population group.

CHAPTER VI

SUMMARY

The purposes of this study were to (a) test the applicability of Moschis (49) and Moschis and Churchill's (50) model of consumer socialization to food purchasing and consumption in particular, (b) investigate the impact of television viewing on pregnant adolescents' snack choices and dietary adequacy, (c) examine pregnant adolescents' response to television commercials, types of advertising claims salient to them, and their attitudes toward name brand and generic products, and (d) determine whether self-reported communication with family and friends mediated the consumption of heavily advertised foods. Seventy-nine pregnant East Tennessee adolescents, aged 14-to 18-years, were recruited from private and public medical clinics, government assistance programs, public schools, and special programs for pregnant adolescents. Participants were low income; over half lived with one or both parents, and about one-third were married.

Questionnaires completed by the participants provided information about their television viewing habits, the extent to which they talked with parents and friends about food advertisements and food selection, and whether they selected snack foods because they associated them with a particular image or life style. Dietary information collected included two 24-hour diet recalls and a two-day food record. A semi-structured interview was used to gather information regarding participants' reactions to a videotape of commercials, advertising

claims most likely to promote the purchase of the product, brand preferences, and snacking patterns while watching television.

Results of the study indicate participants spent over five hours per day watching television. Soap operas, movies, and comedy shows were the most frequently viewed programs.

Approximately two-thirds of the subjects expressed a preference for the name brand snack food over its generic counterpart. Preference for the name brand was not necessarily related to believing it was a better product. Only 40% felt the name brand was of better quality, a better value, and/or more nutritious. Preference for the name brand was based on familiarity, appearance, and/or positive experiences with the product.

Total dietary intake of kilocalories, calcium, protein, thiamin, niacin, riboflavin, and vitamin C all met or exceeded the RDA while intakes of magnesium, iron, folate, and vitamin B_6 were below the RDA. Total snacks per day supplied 21% of kilocalories and 10% to 22% of vitamin and mineral intake. Snacks consumed while watching television accounted for about 50% of total nutrient intake from all snacks. Meals and snacks consumed while watching television supplied about 38% of total daily nutrient intake. Foods consumed while watching television were as nutrient dense for iron, vitamin A, folate, cholesterol, magnesium, zinc, vitamin B_6, and calcium as foods consumed while not watching television. Nutrient density for fat was lower in television foods compared to non-television foods.

Eating while watching television (39% of all eating occasions) was not uncommon and was in response to both commercial-related and

physiological cues. The frequency of watching television was not significantly related to caloric intake or weight gain during pregnancy.

Based on four days of food recalls and food records, the pregnant adolescents in this study did not necessarily select the most heavily advertised snack foods. Television advertising apparently does not influence the type of foods selected but may influence the brand preference.

Advertising claims most likely to entice the adolescent to buy the product included tastes good, it is not fattening, and it is nutritious. Additional suggestions included having lots of action or music and dancing in the commercial, showing other people of all ages enjoying the product, and pointing out that the food doesn't cost a lot.

Communication with parents and peers about food advertisements and food selection did not mediate the consumption of heavily advertised snack foods. The family communication style did not increase the likelihood of consuming a food advertised as more healthy and more nutritious or promoting a particular image or lifestyle.

Results of this study do not support the applicability of the model of consumer socialization proposed by Moschis (1978) and Moschis and Churchill (1978) to food-related behavior. Overall the results suggest that the low involvement model of advertising effects is applicable. Decisions regarding food selection are not important, and different brands are not seen as having distinguishing characteristics. Thus, interpersonal influences are not salient and the adolescent may not take the time and effort to critically evaluate advertising claims. Repeated exposure to commercials enhances product recognition and may lead to

purchase of the product in the store. Thus, television advertising may indirectly influence food selection by increasing recognition of the product and emphasizing the appearance of the product.

REFERENCES

REFERENCES

1. Nielsen Media Research (1989) 1989 Nielsen Report on Television, A.C. Nielsen Co., Northbrook, IL.

2. Greeson, L.E. & Williams, R.A. (1986) Social implications of music videos for youth An analysis of the content and effects of MTV. Youth Soc. 18: 177-189.

3. Leibert, R.M. & Sprafkin, J. (1988) The Early Window Effects of Television on Children and Youth (3rd Ed), pp. 1-18, Pergamon Press, New York, NY.

4. Tucker, L.A. & Friedman, G.M. (1989) Television viewing and obesity in adult males. Am. J. Public Health 79: 516-518.

5. Tucker, L.A. (1987) Television, teenagers, and health. J. Youth Adolesc. 16: 415-425.

6. Gerbner, G., Morgan, M. & Signorielli, N. (1982) Programming health portrayals: What viewers see, say, and do. In: Television and Behavior 10 years of Scientific Progress and Implications for the Eighties. Vol II (Pearl, D., Bouthilet, L. & Lazar, J., eds.) pp. 291-307, USDHHS Public Health Service Pub No. (ADM) 82-1196, Rockville, MD.

7. Kaufman, L. (1980) Prime-time nutrition. J. Communication 29: 37-46.

8. Story, M. (1984) Adolescent life-style and eating behavior. In: Nutrition in Adolescence (Mahan, L.K. & Rees, J.M., eds.), pp. 77-103, Times Mirror/Mosby, St. Louis, MO.

9. Story, M. Bass, M.A. & Wakefield, L. (1986) Food preferences of Cherokee Indian teenagers in Cherokee, North Carolina. Ecol. Food Nutr. 19: 51-59.

10. Story, M. & Harris, L.J. (1988) Food preferences, beliefs, and practices of Southeast Asian refugee adolescents. J. Sch. Health 58: 273-276.

11. Carlisle, J.C., Bass, M.A. & Owsley, D.W. (1980) Food preferences and connotative meaning of foods of Alabama teenagers. Sch. Food Serv. Res. Rev. 4: 19-26.

12. Schorr, B.C., Sanjur, D. & Erickson, E.C. (1972) Teen-age food habits. J. Am. Diet. Assoc. 61: 415-420.

13. Singleton, N. & Rhoads, D.S. (1984) An assessment of the nutrition education of students in grades 3-12. J. Am. Diet. Assoc. 84: 59-63.

14. Skinner, J.D. & Woodburn, M.J. (1984) Nutrition knowledge of teenagers. J. Sch. Health 54: 71-74.

15. Thomsen, P.A., Terry, R.D. & Amos, R.J. (1988) Nutrition information sources used by adolescents. Home Econ. Res. J. 16: 215-221.

16. Bigler-Doughten, S. & Jenkins, R.M. (1987) Adolescent snacks: Nutrient density and nutritional contribution to total intake. J. Am. Diet. Assoc. 88: 1678-1679.

17. Ezell, J.N., Skinner, J.D. & Penfield, M.P. (1985) Appalachian adolescents' snack patterns: Morning, afternoon, and evening snacks. J. Am. Diet. Assoc. 85: 1450-1454.

18. Skinner, J.D., Salvetti, N.N., Ezell, J.M, Penfield, M.P. & Costello, C.A. (1985) Appalachian adolescents' eating patterns and nutrient intakes. J. Am. Diet. Assoc. 85: 1093-1099.

19. Carruth, B.R., Goldberg, D.L. & Skinner, J.D. (Submitted) Adolescents' TV viewing habits, snack choices, and communication with parents and peers about food related purchases. J. Adolesc. Res.

20. Solderman, A.K., Greenberg, B.S. & Linsangan, R. (1988). Television and movie behaviors of pregnant and non-pregnant adolescents. J. Adolesc. Res. 3: 151-170.

21. Blum, R. (1987) Contemporary threats to adolescent health in the United States. J. Am. Med. Assoc. 257: 3390-3395.

22. Hollingsworth, D.R. & Felice, M. (1986) Teenage pregnancy: A multiracial sociologic problem. Obstet. Gynecol. 155: 741-746.

23. Alan Guttmacher Institute (1981) Teenage pregnancy: The Problem That Hasn't Gone Away, Alan Guttmacher Institute, New York, NY.

24. Blum, R.W. & Goldhagen, J. (1981) Teenage pregnancy in perspective. Clin. Pediatr. 5: 335-340.

25. Frisancho, A.R., Matos, J., Leonard, W.R. & Yaroch, L.A. (1985) Developmental and nutritional determinants of pregnancy outcome among teenagers. Am. J. Phys. Anthropol. 66: 247-261.

26. Horon, I.L., Strobino, D.M. & MacDonald, H.M. (1983) Birth weights among infants born to adolescent and young adult women. Am. J. Obstet. Gynecol. 146: 444-449.

27. Zuckerman, B.S., Walker, D.K., Frank, D.A., Chase, C. & Hamburg, B. (1984) Adolescent pregnancy: Biobehavioral determinants of outcome. J. Pediatr. 105: 857-863.

28. Stevens-Simon, C. & McAnarney, E.R. (1988) Adolescent maternal weight gain and low birth weight: A multifactorial model. Am. J. Clin. Nutr. 47: 948-953.

29. Elster, A.B. & McAnarney, E.R. (1980) Medical and psychosocial risks of pregnancy and childbearing during adolescence. Pediatr. Ann. 3: 89-94.

30. Leppert, P.C. Namerow, P. B. & Barker, D. (1986) Pregnancy outcomes among adolescent and older women receiving comprehensive prenatal care. J. Adolesc. Health Care 7: 112-117.

31. Scholl, T.O., Miller, L.K., Salmon, R.W., Cofsky, M.C. & Shearer, J. (1987) Prenatal care adequacy and the outcome of adolescent pregnancy: Effects on weight gain, preterm delivery, and birth weight. Obstet. Gynecol. 69: 312-316.

32. Spivak, H. & Weitzman, M. (1987) Social barriers faced by adolescent parents and their children. J. Am. Med. Assoc. 258: 1500-1504.

33. Food and Nutrition Board. (1989) Recommended Dietary Allowances, 10th Edition, National Academy of Science, Washington, D.C.

34. Bailey, L.B., Mahan, C.S. & Dimperio, D. (1980) Folacin and iron status in low-income pregnant adolescents and mature women. Am. J. Clin. Nutr. 33: 1997-2001.

35. Hunt, I.F., Murphy, N.J., Cleaver, A.E., Faraji, B., Swendseid, M.E., Browdy, B.L., Coulson, A.H., Clark, V.A., Settlage, R.H. & Smith, J.C. (1985) Zinc supplementation during pregnancy in low-income teenagers of Mexican descent: Effects on selected blood constituents and progress and outcome of pregnancy. Am. J. Clin. Nutr. 42: 815-828.

36. McGanity, W.J., Little, H.M., Fogelman, A., Jennings, L., Calhoun, E. & Dawson, E.B. (1969) Pregnancy in the adolescent I. Preliminary summary of health status. Am. J. Obstet. Gynec. 103: 773-788.

37. Endres, J.M., Poell-Odenwald, K., Sawicki, M. & Welch, P. (1985) Dietary assessment of pregnant adolescents participating in a supplemental-food program. J. Reprod. Med. 30: 10-17.

38. Endres, J., Dunning, S., Poon, S., Welch, P. & Duncan, H. (1987) Older pregnant women and adolescents: Nutrition data after enrollment in WIC. J. Am. Diet. Assoc. 87: 1011-1016, 1019.

39. Schuster, K., Bailey, L.B. & Mahan, C.S. (1981) Vitamin B_6 status of low-income adolescent and adult pregnant women and the condition of their infants at birth. Am. J. Clin. Nutr. 34: 1731-1735.

40. Martner-Hewes, P.M., Hunt, I.F., Murphy, N.J., Swendseid, M.E. & Settlage, R.H. (1986) Vitamin B-6 nutriture and plasma diamine oxidase activity in pregnant Hispanic teenagers. Am. J. Clin. Nutr. 44: 907-913.

41. Osofsky, H.J., Rizk, P.T., Fox, M. & Mondanaro, J. (1971) Nutritional status of low income pregnant teen-agers. J. Reprod. Med. 6: 52-56.

42. Hansen, C.M., Brown, M.L. & Trontell, M. (1976) Effects on pregnant adolescents of attending a special school. J. Am. Diet. Assoc. 68: 538-541.

43. King, J.C., Cohenour, S.H., Calloway, D.H. & Jacobson, H.N. (1972) Assessment of nutritional status of teenage pregnant girls. I. Nutrient intake and pregnancy. Am. J. Clin. Nutr. 25: 916-925.

44. Worthington-Roberts, B. (1989) Maternal nutrition and pregnancy outcome. In: Nutrition in Pregnancy and Lactation (Worthington-Roberts, B. & Williams, S.R., eds.), pp. 47-140, Times Mirror/Mosby College Publishing, St. Louis, MO.

45. Cherry, F.F., Bennett, E.A., Bazzano, G.S., Johnson, L.K., Fosmire, G.J. & Batson, H.K. (1981) Plasma zinc in hypertension/toxemia and other reproductive variables in adolescent pregnancy. Am. J. Clin. Nutr. 34: 2367-375.

46. Lazebnik, N., Kuhnert, B.R., Kuhnert, P.M. & Thompson, K.L. (1988) Zinc status, pregnancy complications, and labor abnormalities. Am. J. Obstet. Gynecol. 158: 161-166.

47. Cherry, F.F., Sandstead, H.H., Rojas, P., Johnson, L.K., Batson, H.K. & Wang, X.B. (1989) Adolescent pregnancy: Associations among body weight, zinc nutriture, and pregnancy outcome. Am. J. Clin. Nutr. 50: 945-954.

48. Burdine, J.N., Chen, M.S., Gottlieb, N.H., Peterson, F.L. & Vacalis, T.D. (1984) The effects of ethnicity, sex and father's occupation on heart health knowledge and nutrition behavior of school children: The Texas youth health awareness survey. J. Sch. Health 54: 87-90.

49. Moschis, G.P. (1978) Acquisition of the consumer role by adolescents. Publishing Services Division College of Business Administration/Georgia State University, Atlanta, GA.

50. Moschis, G.P. & Churchill, G.A. (1978) Consumer socialization: A theoretical and empirical analysis. J. Marketing Res. 15: 599-609.

51. Lyle, J. & Hoffman, H.R. (1972) Children's use of television and other media. In: Television and Social Behavior Television in Day-to-Day Life: Patterns of Use. Vol. 4 (Rubenstein, E.A., Comstock, G.A. & Murray, J.P., eds.), pp. 129-256, U.S. Government Printing Office, Washington D.C.

52. Rubin, A.M. (1977) Television usage, attitudes and viewing behaviors of children and adolescents. J. Broadcasting 21: 355-369.

53. Greenberg, B.S. (1974) Gratifications of television viewing and their correlates for British children. In: The Uses of Mass Communications: Current Perspectives on Gratifications Research (Blumler, J.G. & Katz, E., eds.), pp 71-92, Sage Publications, Beverly Hills, CA.

54. Lawrence, F.C., Tasker, G.E., Daly, C.T., Orhiel, A.L. & Wozniak, P.H. (1986) Adolescents' time spent viewing television. Adolescence 21:431-436.

55. Anderson, D.R., Lorch, E.P., Field, D.E., Collins, P.A. & Nathan, J.C. (1986) Television viewing at home: Age trends in visual attention and time with TV. Child Dev. 57: 1024-1033.

56. Comstock, G., Chaffee, S., Katzman, N., McCombs, M. & Roberts, D. (1978) Television and Human Behavior, Columbia University Press, New York, NY.

57. Moore, R.L. & Moschis, G.P. (1983) Role of mass media and the family in development of consumption norms. Journalism Q. 60: 67-73.

58. Williams, T.H. & Hanford, A.G. (1986) Television and other leisure activities. In: The Impact of Television: A Natural Experiment in Three Communities. (Williams, T.H., ed.), pp. 143-213, Academic Press, Orlando, FL.

59. Bower, R.T. (1985) The changing television audience in America, Columbia University Press, New York, NY.

60. Television and Cable Factbook (1988) Warren Publishing, Washington, D.C.

61. Brown, J.D., Campbell, K. & Fischer, L. (1986) American adolescents and music videos: Why do they watch? Gazette 37: 19-32.

62. Sun, S. & Lull, J. (1986) The adolescent audience for music videos and why they watch. J. Communication 36(1): 115-125.

63. Larson, R. & Kubey, R. (1983) Television and music contrasting media in adolescent life. Youth Soc. 15: 13-31.

64. Comstock, G. (1979) The impact of television on American institutions. J. Communication 29(2): 12-28.

65. Weigel, R.H. & Jessor, R. (1973) Television and adolescent conventionality: An exploratory study. Public Opinion Q. 37: 76-90.

66. Comstock, G. & Strasburger, V.C. (1990) Deceptive appearances: Television violence and aggressive behavior. J. Adolesc. Health Care 11: 31-44.

67. Signorielli, N. (1990) Children, television, and gender roles. J. Adolesc. Health Care 11: 50-58.

68. Brown, J.D., Childers, K.W. & Waszak, C.S. (1990) Television and adolescent sexuality. J. Adolesc. Health Care 11: 62-70.

69. Peterson, G.W. & Peters, D.F. (1983) Adolescents' construction of social reality The impact of television and peers. Youth Soc. 15: 67-85.

70. Way, W.L. (1983) Food-related behaviors on prime-time television. J. Nutr. Educ. 15: 105-109.

71. Malcolm, A.H. (1987, November 29) Teen-age shoppers: Desperately seeking spinach. New York Times Business Section 3, page 10 F.

72. Freeman, L. (1985, September 12) Teen buying power not just cosmetic. Adv. Age 56: 28,30,32.

73. If both parents are breadwinners, teenagers often are the bread buyers. (1987) Marketing News 21(4): 5.

74. Trachtenberg, J.A. (1986) Big spenders: Teenage division. Forbes 138(10): 201,204.

75. English, M.M. (1985, September 19) Teens push the shopping cart. Adv. Age 56: 15.

76. Hall, C. (1987) Tween power Youth's middle tier comes of age. Mar. Media Decis. 22(10): 56-62.

77. Hauser, G. (1986) How teenagers spend the family dollar. Am. Demogr. 8(12): 38-41.

78. Cuneo, A.Z. (1987, November 23) Dairy board targets 'tweens'. Adv. Age 58: 51.

79. Everybody wants their MTV!. (1985, Spring) Mark. Media Decis. 20: 61.

80. Story, M. & Faulkner, P. (1990). The prime time diet: A content analysis of eating behavior and food messages in television program content and commercials. Am. J. Public Health 80: 738-740.

81. Gortmaker, S.L., Dietz, W.H., Sobol, A. M. & Wehler, C.A. (1987) Increasing pediatric obesity in the United States. Am. J. Dis. Child. 141: 535-540.

82. Gussow, J. (1972) Counternutritional messages of TV ads aimed at children. J. Nutr. Educ. 4: 48-52.

83. Beals. T.L., Anderson, G.H., Peterson, R.D., Thompson, G.W. & Hargreaves, J.A. (1981) Between-meal eating by Ontario children and teenagers. J. Can. Diet. Assoc. 42: 245-247.

84. McCoy, H., Moak, S., Kenney, M.A., Kirby, A., Chopin, L., Billon, W., Clark, A., Disney, G., Ercanli, F.G., Glover, E., Korslund, M., Lewis, H., Ritchey, S.J., Schilling, P., Schoffner, S. & Wakefield, T. (1986) Snacking patterns and nutrient density of snacks consumed by southern girls. J. Nutr. Educ. 18: 61-66.

85. Thomas, J.A. & Call, D.L. (1973) Eating between meals--A nutrition problem among teenagers? Nutr. Rev. 31: 137-139.

86. Bundy, K.T., Morgan, K.J. & Zabik, M.E. (1982) Nutritional adequacy of snacks and sources of total sugar intake among U.S. adolescents. J. Can. Diet. Assoc. 43: 358-374.

87. Hinton, M.A., Chadderdon, H., Eppright, E. & Wolins, L. (1962) Influences on girls' eating behavior. J. Home Econ. 54: 842-846.

88. Musgrave, C.L., Achterberg, C.L. & Thornbury, M. (1981) Strategies for measuring adolescent snacking patterns. Nutr. Rep. Int. 24: 557-573.

89. Prattala, R. (1989) Teenage meal patterns and food choices in a Finnish city. Ecol. Food Nutr. 22: 285-295.

90. Crawford, L. (1977) Junk food in our schools? A look at student spending in school vending machines and concessions. J. Can. Diet. Assoc. 38: 193-197.

91. Hruban, J.A. (1977) Selection of snack foods from vending machines by high school students. J. Sch. Health 47: 33-36.

92. Olds, R.S. (1987) An assessment of attitudinal and behavioral patterns of selected secondary school students in relationship to snack foods. Wellness Perspect. 4: 25-28.

93. Committee on Diet and Health, Food and Nutrition Board Commission on Life Sciences, National Research Council. (1989) Diet and Health Implications for Reducing Chronic Disease Risk, National Academy Press, Washington DC.

94. American Heart Association. (1988) Position statement dietary guidelines for healthy American adults. Circulation 77: 721A-724A.

95. United States Department of Agriculture. (1985) Nutrient intake: Individuals in 48 states, year 1977-1978; Nationwide Food Consumption Survey, 1977-1978, Human Nutrition Information Service Report No. 1-2, U.S. Government Printing Office, Washington, D.C.

96. McCoy, J.H., Kenney, M.A., Kirby, A.L., Chopin, L.F., Clark, A.J., Disney, G.W., Ercanli, F.G., Glover, E.E., Korslund, M.K., Liebman, M., Moak, S.W., Ritchey, S.J., Stallings, S.F. & Wakefield, T. (1984) Southern adolescent girls' consumption of energy, energy-supplying nutrients, cholesterol and sodium. Nutr. Rep. Int. 30: 1343-1353.

97. Weidman, W.H., Elveback, L.R., Nelson, R.A., Hodgson, P.A. & Ellefson, R.D. (1978) Nutrient intake and serum cholesterol level in normal children 6 to 16 years of age. Pediatrics 61: 354-359.

98. Lai, M.K., Shimabukuro, S.K., Wenkam, N.S. & Raman, S.P. (1982) A nutrient analysis of students' diets in the state of Hawaii. J. Nutr. Educ. 14: 67-70.

99. Saltz, K.M., Tamir, I., Ernst, N., Kwiterovich, P., Glueck. C., Christensen, B., Larsen, R., Pirhonen, D., Prewitt, T.E. & Scott, L.W. (1983) Selected nutrient intakes of free-living white children ages 6-19 years. The Lipid Research Clinics Program prevalence study. Pediatr. Res. 17: 124-130.

100. Dietz, W.H. & Gortmaker, S.L. (1985) Do we fatten our children at the television set? Obesity and television viewing in children and adolescents. Pediatrics 75: 807-812.

101. Tucker, L.A. (1986) The relationship of television viewing to physical fitness and obesity. Adolescence 21: 797-805.

102. Hendry, L.B. & Gillies, P. (1978) Body type, body esteem, school, and leisure: A study of overweight, average, and underweight adolescents. J. Youth Adolesc. 9: 181-194.

103. Ward, S. (1974) Consumer socialization. J. Consumer Res. 1: 1-14.

104. Moschis, G.P. (1987) Consumer Socialization, Lexington Books, Lexington, MA.

105. McLeod, J.M. & O'Keefe, G.J. (1972) The socialization perspective and communication behavior. In: Current Perspectives on Mass Communication Research (Kline, F.G. & Tichenor, P.J., eds.), pp. 121-168, Sage Publications, Beverly Hills, CA.

106. Brim, O.G. & Wheeler, S. (1966) Socialization After Childhood: Two Essays. John Wiley & Sons, Inc., New York, NY.

107. Riesman, D. & Roseborough, H. (1955) Careers and consumer behavior. In: Consumer socialization (Clark, L.H., ed.), pp. 1-18, New York University Press, New York, NY.

108. Moschis, G.P. & Churchill, G.A. (1977) Mass media and interpersonal influences on adolescent consumer learning. AMA Contemporary Thought, 68-73.

109. Moschis, G.P. (1978a) Teenagers' responses to retailing stimuli. J. Retailing 54(4): 80-93.

110. Moschis, G.P., Moore, R.L. & Stanley, T.J. (1984) An exploratory study of brand loyalty development. Adv. Consumer Res. 11: 412-417.

111. Bandura, A. (1986) Social Foundation of Thought and Action: A Social Cognitive Theory, pp. 283-334, Prentice-Hall, Englewood Cliffs, NJ.

112. Moschis, G.P. & Moore, R.L. (1982) A longitudinal study of television advertising effects. J. Consumer Res. 9: 279-286.

113. Ward, S. & Wackman, D. (1971) Family and media influences on adolescent consumer learning. Am. Behav. Sci. 14: 415-427.

114. Moschis, G.P. (1984) A longitudinal study of consumer socialization. Paper presented at American Marketing Association Winter Educators' Conference, Ft. Lauderdale, FL.

115. Mendelsohn, H. (1973) Some reasons why information campaigns can succeed. Public Opinion Q. 37: 50-61.

116. Macoby, N. & Farquhar, J.W. (1975) Communication for health: Unselling heart disease. J. Communication 25(3): 114-126.

117. Bauer, R.A. (1964) The obstinate audience: The influence process from the point of view of social communication. Am. Psychol. 19: 319-328.

118. Robertson, T.S. (1976) Low commitment consumer behavior. J. Advert. Res. 16: 19-24.

119. Atkin, C.K. (1982) Television advertising and socialization to consumer roles. In: Television and behavior 10 years of Scientific Progress and Implications for the Eighties. Vol II (Pearl, D., Bouthilet, L. & Lazar, J., eds.), pp. 191-200, USDHHS Public Health Service Pub No. (ADM) 82-1196, Rockville, MD.

120. Krugman, H.E. (1965) The impact of television advertising Learning without involvement. Public Opinion Q. 29: 349-356.

121. Petty, R.E., Cacioppo, J.T. & Schumann, D. (1983) Central and peripheral routes to advertising effectiveness: The moderating role of involvement. J. Consumer Res. 10: 135-146.

122. Sutherland, M. & Galloway, J. (1981) Role of advertising: Persuasion or agenda setting? J. Advert. Res. 21(5): 25-29.

123. Moore, R.L. & Stephens, L.F. (1975) Some communication and demographic determinants of adolescent consumer learning. J. Consumer Res. 2: 80-92.

124. Moschis, G.P. & Moore, R.L. (1978a) An analysis of the acquisition of some consumer competencies among adolescents. J. Consumer Affairs 12: 277-291.

125. Moore, R.L. & Moschis, G.P. (1979) Role perceptions in adolescent consumer learning. Home Econ. Res. J. 8: 66-74.

126. Goldstein, A.O., Fischer, P.M., Richards, J.W. & Creten, D. (1987) Relationship between high school student smoking and recognition of cigarette advertisements. J. Pediatr. 110: 488-491.

127. Atkin, C.K. & Block, M. (1984) The effects of alcohol advertising. Adv. Consumer Res. 11: 688-693.

128. Axelson, J.M. & DelCampo, D.S. (1978) Improving teenagers' nutrition knowledge through the mass media. J. Nutr. Educ. 10: 30-33.

129. Teens tune out TV (1988) Am. Demogr. 10: 20.

130. Guber, S.S. (1987) The teenage mind. Am. Demogr. 19(3): 42-44.

131. Nick canvass tracks kids' attitudes and behavior. (1987) TRA 34(20): 32.

132. Moschis, G.P. & Moore, R.L. (1981) A study of desires for products and brands. In: AMA Educators Conference Proceedings (Bernhardt, K.L. et al., eds.), pp. 201-204, American Marketing Association, Chicago, IL.

133. Atkin, C., Hocking J. & Block, M. (1984) Teenage drinking: Does advertising make a difference? J. Communication 34(2): 157-167.

134. Tucker, L.A. (1985) Television's role regarding alcohol use among teenagers. Adolescence 20: 593-598.

135. Linn, M.C., de Benedictis, T. & Delucchi, K. (1982) Adolescent reasoning about advertisements: Preliminary investigations. Child Dev. 53: 1599-1613.

136. Linn, M.C., Delucchi, K.L. & de Benedictis, T. (1984) Adolescent reasoning about advertisements: Relevance of product claims. J. Early Adolesc. 4: 371-385.

137. Capon, N. & Kuhn, D. (1980) A developmental study of consumer information-processing strategies. J. Consumer Res. 7: 225-233.

138. Eiser, J.R., Eiser, C., Patterson, D.J. & Harding, C.M. (1984) Effects of information about specific nutrient content on ratings of "goodness" and "pleasantness" of common foods. Appetite 5: 349-359.

139. Sanft, H. (1986) The role of knowledge in the effects of television advertising on children. Adv. Consumer Res. 13: 147-152.

140. Siegler, R.S. (1981) Information processing approaches to development. In: Handbook of Child Psychology Volume I (Mussen, P.H. ed.), pp. 129-211, Wiley, New York, NY.

141. George, R.S. & Krondl, M. (1983) Perceptions and food use of adolescent boys and girls. Nutr. Behav. 1: 115-125.

142. McElroy, J. & Taylor, B. (1966) Adolescents' values in selection of food. J. Home Econ. 8: 651-654.

143. Contento, I.R., Michela, J.L. & Goldberg, C.J. (1988) Food choice among adolescents: Population segmentation by motivations. J. Nutr. Educ. 20: 289-298.

144. Research results--Teenagers' attitudes about foods, labeling, nutrition--Profile tomorrow's consumers. (1985) Food Process. 46: 43-44.

145. Ward, S. & Robertson, T.S. (1972) Adolescents attitudes toward advertising: Preliminary findings. In: Television and Social Behavior Television in Day-to-Day Life: Patterns of Use. Vol. 4 (Rubenstein, E.A., Comstock, G.A. & Murray, J.P., eds.), pp. 526-542, vol. 4, U.S. Government Printing Office, Washington D.C.

146. Wackman, D.B., Reale, G. & Ward, S. (1972) Racial differences in responses to advertising among adolescents. In: Television and Social Behavior Television in Day-to-Day Life: Patterns of Use. Vol. 4 (Rubenstein, E.A., Comstock, G.A. & Murray, J.P., eds.), pp. 543-553, U.S. Government Printing Office, Washington D.C.

147. Allen, D.E., Patterson, Z.J., & Warren G.L. (1970) Nutrition, family commensality, and academic performance among high school youth. J. Home Econ. 62: 333-337.

148. Hertzler, A.A., Yamanaka, W., Nenninger, C. & Abernathy, A. (1976) Iron status and family structure of teenage girls in a low-income area. Home Econ. Res. J. 5: 92-99.

149. Chaffee, S.H. & Tims, A.R. (1976) Interpersonal factors in adolescent television use. J. Social Issues 32: 98-115.

150. Moore, R.L. & Moschis, G.P. (1978) Teenagers' reactions to advertising. J. Advert. 7(4): 24-30.

151. Festinger, L. (1954) A theory of social comparison processes. Human Rel. 7: 117-140.

152. Moschis, G.P. (1985) The role of family communication in consumer socialization of children and adolescents. J. Consumer Res. 11: 898-913.

153. Moschis, G.P. & Moore, R.L. (1979) Decision making among the young: A socialization perspective. J. Consumer Res. 6: 101-112.

154. Churchill, G.A. & Moschis, G.P. (1979) Television and interpersonal influences on adolescent consumer learning. J. Consumer Res. 6: 23-35.

155. Moschis, G.P. & Mitchell, L.G. (1986) Television advertising and interpersonal influences on teenagers' participation in family consumer decisions. Adv. Consumer Res. 13: 181-185.

156. Moschis, G.P. & Moore, R.L. (1983) A longitudinal study of the development of purchasing patterns. In: AMA Educators Conference Proceedings (Murphy, P. et al., eds.), pp. 114-117, American Marketing Association, Chicago, IL.

157. Belch, G.E., Belch, M.A., & Ceresino, G. (1985) Parental and teenage child influences in family decision making. J. Bus. Res. 13: 163-176.

158. Moschis, G.P., Moore, R.L. & Stephens, L.F. (1977) Purchasing patterns of adolescent consumers. J. Retailing 53: 17-26,92.

159. Moschis, G.P., Moore, R.L. & Smith, R.B. (1984) The impact of family communication on adolescent consumer socialization. Adv. in Consumer Res. 11: 314-319.

160. McLeod, J.M., Fitzpatrick, M.A., Glynn, C.J. & Fallis, S.F. (1982) Television and social relations: Family influences and consequences for interpersonal behavior. In: Television and Behavior 10 Years of Scientific Progress and Implications for the Eighties. Vol II (Pearl, D., Bouthilet, L. & Lazar, J., eds.) pp. 272-2867, USDHHS Public Health Service Pub No. (ADM) 82-1196, Rockville, MD.

161. Newcomb, T.M. (1953) An approach to the study of communicative acts. Psychol. Rev. 60: 393-404.

162. Moschis, G.P., Prahasto, A.E. & Mitchell, L.G. (1986) Family communication influences on the development of consumer behavior: Some additional findings. Adv. Consumer Res. 13: 365-369.

163. Moschis, G.P. & Moore, R.L. (1978) Family communication and consumer socialization. Adv. Consumer Res. 6: 359-363.

164. Moschis, G.P. & Moore, R.L. (1979) Family communication patterns and consumer socialization. AMA Proceedings 16: 226-230.

165. Moore, R.L. & Moschis, G.P. (1981) The role of family communication in consumer learning. J. Communication 31(4): 42-51.

166. Hollingshead, A.B. (1976) Four Factor Index of Social Status. Hollingshead, New Haven, CT.

167. N-Square Computing (1989) Nutritionist III, Version 5.0. N-Square Computing, Silverton, OR.

168. Williams, S.R. (1989) Nutrition assessment and guidance in prenatal care. In: Nutrition in Pregnancy and Lactation (Worthington-Roberts, B. & Williams, S.R., eds.), pp. 141-171, Times Mirror/Mosby College Publishing, St. Louis, MO.

169. SAS Institute. (1985) SAS User's Guide: Statistics, Version 5 Edition, Statistical Analysis System Institute, Cary NC.

170. Moschis, G.P. & Moore, R.L. (1981) Racial and socioeconomic influences on adolescent consumer socialization. AMA Proceedings 18: 261-265.

171. Sanjur, D. (1982) Social and Cultural Perspectives in Nutrition, pp. 91-122. Prentice-Hall, Inc., Englewood Cliffs, NJ.

172. Avery, R.K. (1979) Adolescents' use of the mass media. Am. Behav. Sci. 23: 53-71.

173. Hansen, B.C. & Wyse, B.W. (1980) Expression of nutrient allowances per 1,000 kilocalories. J. Am. Diet. Assoc. 76: 223-227.

174. Valdrighi, M. (1986) Use of sugar substitutes and dietary habits of pregnant adolescents in East Tennessee. Master's thesis, University of Tennessee, Knoxville.

175. Loris, P., Dewey, K.G. & Poirier-Brode, K. (1985) Weight gain and dietary intake of pregnant teenagers. J. Am. Diet. Assoc. 85: 1296-1302, 1305.

176. Worthington-Roberts, B. & Rees, J.M. (1989) Nutritional needs of the pregnant adolescent. In: Nutrition in Pregnancy and Lactation (Worthington-Roberts, B. & Williams, S.R., eds.), pp. 209-243, Times Mirror/Mosby College Publishing, St. Louis, MO.

177. Raper, N.R., Rosenthal, J.C. & Woteki, C.E. (1984) Estimates of available iron in diets of individuals 1 year old and older in the Nationwide Food Consumption Survey. J. Am. Diet. Assoc. 84: 783-787.

178. Atkin, C.K. (1990) Effects of televised alcohol messages on teenage drinking patterns. J. Adolesc. Health Care 11: 10-24.

179. White, A.A. & Skinner, J.D. (1989) Adolescents' perceptions about their nutrition education needs. Tenn. Farm Home Sci. 150: 5-9.

180. Story, M. & Resnick, M.D. (1986) Adolescents' views on food and nutrition. J. Nutr. Educ. 18: 188-192.

APPENDICES

APPENDIX A

STATEMENT OF INFORMED CONSENT

TN860

Code Number _____

Date _____

Statement of Informed Consent

I understand that I am being asked to participate in a research project focused on beliefs and practices of adolescent females. I have had the following explained to me:

1. I will be asked to respond to several questionnaires. These will contain questions about such things as my eating habits and food preferences, my ideas about food, and my television viewing habits. I also will be asked to keep a record of the food I eat for two days. The amount of time required for me to provide this information will be about five hours, divided into two sessions during pregnancy, and another three sessions after the baby is born.

2. I am also willing for the project personnel to get medical information about my pregnancy (e.g., pre-pregnancy weight, weight gain, infant weight and gestational age, APGAR scores).

3. If I participate in this project, I will get $5.00 for each of the interview sessions in which I complete all questionnaires.

4. I can choose whether I want to participate in the project, and I can quit at any time. If I do not participate or decide to quit, there will not be any penalty other than not receiving the $5.00 per session.

5. There are no specific risks to me or my baby anticipated from my participation in the project.

6. The results from this project are expected to be helpful to professionals who work with other teenagers.

7. If I participate in this project, nobody other than project staff will be given any information about me. Nobody will be told anything in a way that would let them know I participated in this project.

8. If I have any questions, I can contact Dr. Betty Ruth Carruth or Dr. Jean Skinner, Department of Nutrition and Food Sciences, The University of Tennessee, Knoxville, Tennessee 37996-1900, 974-5445.

Based on this information, I agree to participate in this project.

Date _____ Signature _____

Witness _____

APPENDIX B

INFORMATION, DEMOGRAPHICS AND BACKGROUND INFORMATION FORMS

TN860

Code Number _____

Date _____

Information Form

Name: _____ Phone Number: _____

Address: _____

_____

Name and address of person(s) through whom client may be reached:

Name: _____ Phone Number: _____

Address: _____

_____

Name: _____ Phone Number: _____

Address: _____

_____

Appointments:

Date	Time	Place	Comments

TN860

Code Number _____

Date _____

Demographics and Background Information

Age _____ Date of Birth _____

Grade in school or last grade completed _____

Living Arrangements (check one):
_____ live with one parent
_____ live with both parents
_____ live with spouse
_____ live with parents and spouse
_____ live with other relative, specify: _____
_____ live in group home
_____ other, specify: _____

Mother's Education: (check highest level)
_____ < 7th grade
_____ junior high school
_____ some high school
_____ high school graduate
_____ some college or specialized training
_____ college graduate
_____ graduate school or professional training
_____ not applicable

Father's Education: (check highest level)
_____ < 7th grade
_____ junior high school
_____ some high school
_____ high school graduate
_____ some college or specialized training
_____ college graduate
_____ graduate school or professional training
_____ not applicable

Spouse's Education:
_____ < 7th grade
_____ junior high school
_____ some high school
_____ high school graduate
_____ some college or specialized training
_____ college graduate
_____ graduate school or professional training
_____ not applicable

Mother's Occupation _____

Father's Occupation _____

Spouse's Occupation _____

Estimated Date of Delivery _____

Doctor's Name _____

Place of Delivery _____

APPENDIX C

FOOD RECALL/RECORD FORM AND INSTRUCTIONS FOR COMPLETING FOOD RECORDS FORMS

TN860

Code Number _____
Date _____
Record _____ Recall _____

Food Recall/Record Form

	Food and Description	Amount
1st time food was eaten: time _____ am ___ pm ___ where _____ who, if anyone ate with you? _____ watching TV, yes__ no __		
2nd time food was eaten: time _____ am ___ pm ___ where _____ who, if anyone ate with you? _____ watching TV, yes__ no___		
3rd time food was eaten: time _____ am ___ pm ___ where _____ who, if anyone ate with you? _____ watching TV, yes__ no___		
4th time food was eaten: time _____ am ___ pm ___ where _____ who, if anyone ate with you? _____ watching TV, yes__ no___		
5th time food was eaten: time _____ am ___ pm ___ where _____ who, if anyone ate with you? _____ watching TV, yes__ no___		

TN860

6th time food was eaten: time _____ am ___ pm ___ where _____ who, if anyone ate with you? _____ watching TV, yes__ no __		
7th time food was eaten: time _____ am ___ pm ___ where _____ who, if anyone ate with you? _____ watching TV, yes__ no___		
8th time food was eaten: time _____ am ___ pm ___ where _____ who, if anyone ate with you? _____ watching TV, yes__ no___		
9th time food was eaten: time _____ am ___ pm ___ where _____ who, if anyone ate with you? _____ watching TV, yes__ no___		

If you ate more than 9 times use the back of this sheet.

After completing this form, check yourself by answering the following questions:

1. Have you listed everything you ate and drank during the day?
2. Did you include the amount (i.e., 1 orange, 1 cookie, or 1 cup, 1 Tbsp., 1 tsp.) of each item consumed?
3. Did you describe the way the foods were prepared (i.e., egg - scrambled, fried, poached)?
4. Did you describe, in as much detail as possible, the ingredients in casseroles, salads, sandwiches, soups, and other mixed dishes?
5. Did you remember to list everything you added to your food before you ate it (i.e., sauces, gravies, butter, salad dressings)?
6. Did you add anything to your beverages (sugar, cream, milk, etc.)?

TN860

Code Number _____
Date _____

Instructions for Completing Food Record Forms

1. Use the attached pages to record your food intake for two days. Please keep your records for _____ and _____. Do not change your normal eating pattern for those days.

2. Record everything you eat and drink (except water) in each 24-hour period.

3. Remember to record the time you eat, where you eat, who you eat with, and if you are watching TV.

4. It is easier to complete this form as you go, rather than waiting until the end of the day. Carry the form with you, and record each food when you eat it.

5. Describe in as much detail as possible each food eaten, and indicate how it was prepared and served.

   a. Tell whether fruits and vegetables are eaten raw or cooked.

   b. Identify preparation methods. Are foods fried, boiled, or steamed?

   c. Indicate brand names where possible (e.g., 2 c. Campbells Chicken and Noodle soup; 3 Mrs. Paul's Fish Sticks with 1 Tbsp. catsup; 1 Burger King Whopper Junior with tomato, mustard, catsup, and pickles).

   d. For mixed dishes and sandwiches, estimate and record amounts of major ingredients (e.g., Vegetable Salad - 1 c. lettuce, 1/2 c. tomato, 1/4 c. broccoli, 1/4 c. carrots, 1/2 egg, 1/4 c. Kraft reduced calorie French dressing; Ham and Cheese Sandwich - 2 slices whole wheat bread, 1 slice Mr. Turkey smoked turkey ham, 1 slice American cheese, 2 slices tomato, 1 leaf lettuce, 1/2 Tbsp. mayonnaise).

   e. Do not forget to record anything you add to foods and beverages before eating (e.g. butter, salad dressings, gravies, sauces, sugar, cream).

   f. Also, don't forget to record foods eaten between meals and desserts eaten after meals.

   g. Sometimes you can get information from labels (e.g., 1 1/2 oz. milky way candy bar).

6. Estimate as closely as possible the amounts of each food eaten. Use the following abbreviations for measures:

   cup = c.
   tablespoon = T. or Tbsp.
   teaspoon = t. or tsp.
   ounce - oz.

7. If you have questions, please contact Dr. Jean Skinner, Dr. Betty Ruth Carruth, or Janet Pope, Department of Nutrition and Food Sciences, The University of Tennessee, Knoxville, TN 37996-1900, 974-5445.

APPENDIX D

TELEVISION VIEWING QUESTIONNAIRE

TN860

Code Number _____

Date _____

Television Viewing

Please answer the following questions about the television programs you watch.

About how often do you watch the following on television?

	Every Day	Several Times A Week	Once Or Twice A Week	Less Than Once A Week	Never
National or local news					
Sport events					
Movies					
Game shows					
Soap operas					
Police and adventure shows					
Comedy shows					
MTV					

About how many hours per day do you watch television? _____

Do you have cable television in your home? _____ **Yes** _____ **No**

APPENDIX E

PARENT/PEER COMMUNICATION QUESTIONNAIRE

TN860

Code Number _____

Date _____

Parent/Peer Communication

The following is a list of things parents often say or do to their children. Read each statement carefully and check whether your own parents (or whomever you live with most of the time) say or do it very often, often, sometimes, rarely, or never.

Your parents ...	Very Often	Often	Some-times	Rarely	Never
Ask you to help them buy things for the family.					
Say you may not buy certain things.					
Say you should decide for your-self how to spend your money.					
Say you should decide what things you should or shouldn't buy.					
Ask you what you think about things they buy for themselves.					
Ask you for advice about buying things.					
Want to know what you do with your money.					
Tell you what things you should or shouldn't buy.					
Say that they know what is best for you and you shouldn't question them.					
Say you shouldn't ask questions about things that teenagers like you don't normally buy.					
Say that buying things you like is important even if others do not like them.					
Complain when they don't like something you bought for yourself.					

TN860

Following is a list of things you may talk about or do with your parents or friends. Read each statement and check whether these things happen very often, often, sometimes, rarely, or never.

	Very Often	Often	Some-times	Rarely	Never
My parents complain when they do not like the types of foods I buy for myself.					
My friends and I talk about buying food.					
My parents and I talk about buying food.					
My parents and I talk about the food advertisements we see on television.					
I help my parents decide what foods to buy.					
My parents want to know what foods I purchase with my money.					
My friends tell me what foods I should or should not buy.					
My parents tell me I should decide about the foods I should or should not buy.					
I ask my friends for advice about what food products to buy for snacks.					
My friends ask me for advice about what food products to buy for snacks.					
My parents tell me what kinds of food I should or should not buy.					
I talk with friends about what foods to buy at fast food places (McDonalds, Wendy's, Burger King).					

TN860

CONTINUED

	Very Often	Often	Some-times	Rarely	Never
I ask my parents for advice about buying food.					
My friends and I talk about the food advertisements we see on television.					
I go grocery shopping with my parents.					

APPENDIX F

FOOD COMMERCIALS: WHAT SELLS THE PRODUCT

Interview Protocol

The pregnant adolescent's reaction to commercials, the advertising claims most likely to promote the purchase of the product, attitudes toward name brand products and their generic counterparts, and snacking patterns while watching television will be determined in a semi-structured interview. To facilitate the completeness and accuracy of data collected form the interview, permission will be requested to tape the interview. The primary investigator will explain the reason for wanting to tape the interview. Subjects will be informed that they will be identified on the tape only by their code number and that the tape will be used only by the primary investigator. If the subject does not want the interview to be taped, the primary investigator will take notes during the interview. To facilitate the discussion about food advertisements the subject will be shown a videotape of television commercials.

1. Advertising Appeals

Interview questions:

You have just seen a videotape of food commercials. What commercials do you remember seeing?

What commercial or commercials did you like best?

What made that commercial appealing to you?

What commercial or commercials did you dislike?

What did you dislike about that commercial?

Did you want to go buy any of the advertised foods?

Why did you (not) want to buy any of the advertised foods?

How would you rate the believability of TV commercials in general on a scale of 1-10 with ten being most believable?

Can you give me an example of a commercial from the videotape or any other commercial you thought was very believable? In other words the commercial was giving you accurate information about the product.

What made you think the information was accurate?

Can you give me an example of a commercial from the videotape or any other commercial you thought was not believable at all? In other words, the commercial was giving you misleading information about the product or making it look better than it really is.

What made you think the commercial was misleading?

2. Advertising Claims Most Likely to Promote Purchase of the Product

Interview questions:

Suppose your are designing a television commercial to promote a new food product to teenagers. What would tell them about the product that would get them to try it? If needed give examples from the tape, i.e. a particular commercial

emphasized taste, appearance, caloric content, nutritional value, etc.

Are these the same attributes that would determine whether you would buy the product?

Prompt question if needed:

Think back to the last time you saw a food commercial on television. What did it tell you about the product? Did you want to try the product?

What made you decide to try (not try) the product?

3. Comparison of the Attributes of Name Brands and Generics

Containers of a heavily advertised food product and its generic (or store brand) counterpart will be shown to the participant to facilitate discussion.

Interview questions:

Here are two different brands of crackers (potato chips). If you were to buy one of them which one would you choose?

What makes _____ better than _____?

Is this the brand you would prefer to have someone buy for you?

Why or why not?

4. Snacking Patterns While Watching Television

Interview questions:

How often do you snack while watching television--everyday, several times a week, once or twice a week, less than once a week, never?

What foods do you usually eat?

Does seeing a food commercial make you want to get something to eat--everyday, several times a week, once or twice a week, less than once a week, never?

Think back to the last time a food commercial prompted you to get something to eat. Describe aspects of the commercial that made you want to get something to eat.

Prompt questions if needed:

Think about the television programs you watched during the past week. Do you remember if you snacked while watching these programs?

What foods did you eat?

What prompted you to get something to eat?

APPENDIX G

IMPORTANT QUALITIES OF SNACK FOODS QUESTIONNAIRE

TN860

Code Number _____

Date _____

Important Qualities of Snack Foods

Five common snack foods are listed below. There are four things (listed across from the food items) which you might think about before buying and eating these foods. Please check all that apply.

	What friends think of the food.	What type of people eat this food.	What others think of people who eat this food.	Whether eating this food will make a good impression on others.
Soft Drink				
Corn Chips				
Chocolate Candy Bar				
Cookie				
Crackers				

If none of these apply please check here. _____

APPENDIX H

FOOD COMMERCIALS AIRED DURING THE WEEKS OF MARCH 2-8 AND JULY 10-16, 1989

	ABC (N=13)[a]	CBS (N=13)	NBC (N=13)	MTV (N=12)	Total
			RESTAURANTS		
McDonalds[c]	32[b]	28	40	1	101
Burger King[c]	27	25	11	14	77
Wendy's	11	5	10	0	26
Domino's Pizza	6	5	6	3	20
Red Lobster	4	7	8	0	19
Kentucky Fried Chicken	9	2	7	0	18
Pizza Hut	10	3	3	0	16
Taco Bell	4	4	4	0	12
Krystal	5	5	2	0	12
Hardees	2	5	3	0	10
Long John Silvers	3	3	3	0	9
Shoney's	0	0	1	0	1
O'Charleys	0	0	1	0	1
Baskin Robbins	0	1	0	0	1
TCBY	0	0	1	0	1
Olive Garden	0	0	1	0	1
TOTALS	113	93	101	18	325
			BEVERAGES		
Coca Cola[c]	7	3	8	20	38
Pepsi[c]	4	1	8	19	32

	ABC (N=13)[a]	CBS (N=13)	NBC (N=13)	MTV (N=12)	Total
Coffee[d]	6	10	1	0	17
7-Up	2	3	2	5	12
Diet Pepsi	9	0	0	0	9
Fruit Drinks[d]	5	2	1	0	8
Diet Coke	2	1	0	1	3
RC Cola	0	0	3	0	3
Sunkist Soft Drink	0	0	0	3	3
Athletic Drinks[d]	2	1	0	0	3
A&W Root Beer	0	0	0	2	2
Diet Barqs Root Beer	0	0	0	0	1
Diet Mountain Dew	0	0	1	0	1
Crystal Lite	0	0	1	0	1
TOTALS	37	21	25	50	133
		CEREALS			
Frosted Mini-Wheats[c]	1	3	3	0	7
Nutri-Grain[c]	1	4	2	0	7
Cheerios[c]	4	2	1	0	7
Quaker Oat Squares[c]	1	2	4	0	7
Raisin Bran[c]	0	7	0	0	7
Just Right[c]	0	5	1	0	6
Grape-Nuts[c]	0	4	2	0	6

	ABC (N=13)[a]	CBS (N=13)	NBC (N=13)	MTV (N=12)	Total
Oat Flakes	0	4	1	0	5
Nut & Honey Crunch	1	2	2	0	5
Frosted Flakes	0	4	1	0	5
Cracklin' Oat Bran	1	3	1	0	5
Special K	0	2	2	0	4
All-Bran	0	1	2	0	3
Common Sense Oat Bran	0	0	3	0	3
Honey Bunches of Oats	0	3	0	0	3
Bran News	0	0	2	0	3
Shredded Wheat	1	0	1	0	2
Rice Krispies	0	1	1	0	2
Nut & Honey	0	0	2	0	2
Honey Nut Crunch	0	2	0	0	2
Oatmeal Raisin Crisp	0	1	1	0	2
Product 19	0	1	1	0	2
Sugar Crisp	0	0	1	0	1
Crispex	1	0	0	0	1
Quaker 100% Natural	0	0	1	-	1
Life	0	0	1	0	1
Fruit & Fibre	0	1	0	0	1
Muesli	0	1	0	0	1
Super Golden Crisp	0	1	0	0	1
TOTALS	11	54	36	0	101

	ABC (N=13)[a]	CBS (N=13)	NBC (N=13)	MTV (N=12)	Total
			CANDY AND GUM		
Chocolate Candy[c,d]	7	4	6	12	19
Gum[c]	5	1	4	8	18
Breath Mints[d]	3	2	0	9	14
Skittles	3	1	0	2	6
Fruit Juicers	2	1	2	0	5
Twizzlers	0	0	0	2	2
Sugarless Gum[d]	2	0	0	0	2
Starburst	0	0	0	1	1
TOTALS	22	9	12	34	77
			MEAT AND MEAT SUBSTITUTES		
Chicken[d]	2	4	6	0	12
Peanut Butter[d]	5	2	1	0	8
Pork	0	0	6	0	6
Turkey[d]	0	4	1	0	5
Beef	0	1	3	0	4
Oscar Mayer Cold Cuts	0	3	0	0	3
Van De Camps Beanie Weinees	0	2	0	0	2
Libby's Corned Beef	0	1	0	0	1
Oscar Mayer Franks	0	1	0	0	1
Bob Evans Sausage	1	0	0	0	1
TOTALS	8	18	17	0	43

	ABC (N=13)[a]	CBS (N=13)	NBC (N=13)	MTV (N=12)	Total
			FATS		
Light Mayonnaise[d]	6	2	4	0	12
Margarine[d]	1	8	1	0	10
Butter	1	5	2	0	8
Italian Salad Dressing[d]	3	0	0	0	3
Crisco	1	1	0	0	2
Mazola Light	0	1	1	0	2
Philly Cream Cheese	2	0	0	0	2
Best Foods Mayonnaise	1	0	0	0	1
TOTALS	15	17	8	0	40
			DAIRY PRODUCTS		
Cheese[c,d]	4	7	0	0	11
Yogurt[c,d]	5	2	1	0	8
Ice Cream[c,d]	3	2	3	0	8
Milk	1	2	1	2	6
TOTALS	13	13	5	2	33
			SALTY SNACKS		
Potato Chips[c,d]	8	1	4	0	13
Ritz Crackers[c]	2	2	2	0	6
Cheetos	4	1	0	0	5

	ABC (N=13)[a]	CBS (N=13)	NBC (N=13)	MTV (N=12)	Total
Orville Rechenbacher Popcorn	2	1	0	0	3
Teddy Grahams	0	0	1	0	1
TOTALS	16	5	7	0	28
SPICES, CONDIMENTS, AND SAUCES					
Salt Free Mrs. Dash	0	5	2	0	7
Catsup[d]	2	1	1	0	4
Butter Flavoring[d]	0	2	2	0	4
Mustard[d]	0	1	2	0	3
Spaghetti Sauce[d]	1	1	1	0	3
Vlasic Pickles	0	0	2	0	2
Sugar	0	1	0	0	1
TOTALS	3	11	10	0	24
FRUIT AND VEGETABLES					
Orange Juice[d]	9	2	1	0	12
Birds Eye Classics	0	5	0	0	5
Raisins[d]	1	0	1	0	2
Grapes	0	1	0	0	1
TOTALS	1	6	1	0	20

	ABC (N=13)[a]	CBS (N=13)	NBC (N=13)	MTV (N=12)	Total
		WEIGHT CONTROL PRODUCTS			
Slim Fast[c]	4	2	2	0	8
Nutra Sweet[c]	3	2	3	0	8
TOTALS	7	5	5	0	17
		PASTA DISHES			
Macaroni and Cheese[d]	2	3	3	0	8
Chef Boyardee	5	1	0	0	6
Frozen Pasta Dishes[d]	0	2	0	0	2
TOTALS	7	6	3	0	16
		SWEETS			
Chocolate Cookie[c,d]	4	1	3	0	8
Martha White Nut Brownies[c]	1	2	0	0	3
Pepperidge Farm Cookies	0	2	0	0	2
Jello Pudding	0	1	0	0	1
Sugar Free Jello	0	1	0	0	1
Weight Watchers Chocolate Mousse	0	1	0	0	1
TOTALS	5	8	3	0	16

	ABC (N=13)[a]	CBS (N=13)	NBC (N=13)	MTV (N=12)	Total
			MAIN DISH ITEMS		
Campbell's Soups	2	1	4	0	7
Frozen Pizza[d]	2	3	0	0	5
Suzi Wan	0	0	1	0	1
Weight Watchers Dinners	0	1	0	0	1
TOTALS	4	5	5	0	14
			GRAINS		
Waffles and Pancakes[d]	0	4	1	0	5
Uncle Ben's Rice	3	0	1	0	4
Bread[d]	0	0	2	0	2
TOTALS	3	4	4	0	11

[a]Number of days prime time was videotaped.

[b]Total number of times the food product was advertised during the two weeks.

[c]Considered a heavily advertised food for the purposes of this study.

[d]Two or more brands of this product were advertised during the two weeks.

APPENDIX I

DESCRIPTION OF COMMERCIALS SELECTED FOR A VIDEOTAPE SHOWN TO PREGNANT ADOLESCENTS[A]

Food Product	Length in Seconds	Description	Quotation/Implied Message
TAPE 1[B]			
Pepperidge Farm Distinctive Cookies	15	Picture was shown of the different varieties of Pepperidge Farm Cookies.	"Pepperidge Farm Distinctive Cookies. Everyone thinks their favorite is the best. They're right."
Ritz Bits	30	Different people of all ages commenting on the different sizes and taste of Ritz Bits Crackers.	"Ritz Bits every bit as good as a Ritz."
Oreo Cookies	30	Little boy sits next to elderly gentleman on a plane and shares his Oreo Cookies.	"Chocolate cookie with creamy middle--luscious."
Twix	60	Teenagers at school in hallway by lockers. Male admires attractive female who is snacking on a Twix.	"Who ever said you can't get everything in a snack never tried a Twix."
Pepsi	15	Setting is the Soviet Union. Two different scenes were shown: teenager and his parents at home and the streets.	"Since the United States introduced Pepsi to the Soviet Union, a lot of refreshing changes have taken place ever since. Pepsi--a generation ahead."
Yoplait Yogurt	30	Commercial shows attractive, slender woman in shorts in her backyard enjoying yogurt. Commercial also shows pictures of yogurt and fruit.	"You've been searching for it all your life. Something rich that doesn't have a billion calories. Something sweet and non-fat with no added sugar... only 90 little calories. New Yoplait Light. Um, the light at the end of the tunnel."
Frosted Flakes	30	Animated cartoon featuring bowl and spoon.	"When you get into the kitchen, don't just pick any snack, don't get any snack. Find the box with the tiger's face...It's the low fat low cholesterol snack... the good for you snack that's great."

Food Product	Length in Seconds	Description	Quotation/Implied Message
Minute Maid Orange Juice	30	Different families preparing, drinking, and enjoying orange juice.	"Minute Maid--the Gourmet O.J."
7-Up	30	Teenage male and female at a dance.	"7-Up cool me down."
Sour Cream Ruffle Potato Chips	15	Elderly gentleman showing that Lay's Cheddar and Sour Cream Ruffle potato chips don't have too much Cheddar.	"Try Lay's Cheddar and Sour Cream Ruffle Potato Chips. They're wondermous."
Snickers	30	Teens involved in various activities describing how Snickers satisfies their mid-afternoon hunger.	"Packed with peanuts Snickers really satisfies."
Diet Pepsi	30	Salesman talking to another gentleman about the fact he's missing a million people.	"Last year a million families stopped buying Diet Coke and switched to Diet Pepsi...The move is to the great taste of Diet Pepsi."
Pepsi	30	Music Video with man singing and woman dancing.	"Simply Irresistible."
TAPE 2[b]			
Pepsi	30	Children and adults engaged in several different activities such as dancing, milking a cow, and playing a violin.	"...A generation of change...a generation of laughter coming on strong. A generation of color, bright yellow red. A generation of Pepsi...A generation ahead."
Ice Cream	15	Woman eating ice cream and describing how ice cream saved her son's birthday party.	"There's just something about ice cream."
Jiff Peanut Butter	30	Woman talking to friends about interviewing seven babysitters for her son.	Woman tastes Jiff and says, "It smells and tastes more like fresh roasted peanuts."
Diet Pepsi	30	Commercial shows how different types of people are choosing Diet Pepsi over Diet Coke.	"More people are moving to Diet Pepsi, the right one."

Food Product	Length in Seconds	Description	Quotation/Implied Message
Lay's Cheddar Cheese Flavor Potato Chips	30	Woman shares one potato chip with her neighbor. Neighbor then begs for more.	"No one can eat just one."
Minute Maid Orange Juice	30	Family is eating breakfast. Teenage daughter leaves for a date to play tennis.	"Minute Maid Orange Juice... better than ever. The minute you taste it, you'll know."
Cheetos	15	Cartoon depicts animated Chester Cheetah character who gets his foot run over by a car.	"Cheetos, the cheese that goes crunch."
Milk	30	Girl talking to her brother about how milk is going to help her grow and develop.	"Milk, it does a body good."
Nut & Honey Crunch	30	Wife is playing piano. Husband is in the kitchen eating cereal.	Wife asks husband what is he eating. He answers, "Nut & Honey." She thinks he says, "Nothing, honey."
Coca Cola	30	Boys are watching a scary movie. The sister of one of the boys comes in dressed in bathrobe, with curlers in her hair, and a facial mask.	"Coca Cola, you can't beat the feeling."
Skittles	30	Scenes of teenagers involved in different outdoor activities interspersed with pictures of fruit.	"What's it like when a Skittles Rainbow kicks in?...Taste the rainbow."
Chips Ahoy Selections	30	Woman brings cookies to a friend's house so they won't eat them.	"Dangerously Delicious."

[a]These commercials were aired on ABC, CBS, NBC, and MTV during prime time the week of March 2 to 9.

[b]These commercials were aired on ABC, CBS, NBC, and MTV during prime time the week of July 5 to 12.

APPENDIX J

CONSENT TO TAPE INTERVIEW FORM

TN860 Code Number _____

Consent to Tape Interview

The last portion of today's session deals with your reaction to television commercials. You will view a tape of food commercials and then be asked questions about the commercials. Questions will also be asked about your brand preferences and what foods if any you eat while watching television. I would like to tape the interview because I feel your responses to these questions are very important. Taping will assure that I have a complete and accurate record of your answers. You will be identified on the tape only by the code number used on the questionnaires you have completed. The only persons having access to the tape will be the personnel working with the project. Do you have any objections to my taping the next interview?

I agree to taping the interview.

Date: _____

Signature: _____

Witness: _____

APPENDIX K

DEMOGRAPHIC AND BACKGROUND CHARACTERISTICS AND TELEVISION VIEWING HABITS OF THE 7 PREGNANT WHO DID NOT COMPLETE THE STUDY AND THE 79 PREGNANT ADOLESCENTS WHO COMPLETED THE STUDY

	Mean	
	Participants Completing the Study	Participants Not Completing the Study
Age	16.4	16.1
Grade	10.1	10.2
Hollingshead Four Factor Index of Social Status Score[b]	25.7	28.6
Television Viewing Viewing Per Day (Hours)	5.3	5.6
TV Program[a]		
News	2.38	1.57
Sports Events	0.89	0.85
Movies	2.83	2.71
Game Shows	2.25	1.85
Soap Operas	3.01	2.28
Police and Adventure Shows	2.09	2.00
Comedy Shows	2.73	2.42
MTV	1.06	0.57

[a]Means derived from responses to a frequency scale for television viewing: 4=every day, 3=several times a week, 2=once or twice a week, 1=less than once a week, 0=never.

[b]Hollingshead, A.B. (1976) Four Factor Index of Social Status, Hollingshead, New Haven, CT.

APPENDIX L

FREQUENCY OF CONSUMPTION[a] OF HEAVILY ADVERTISED FOODS BY 79 PREGNANT ADOLESCENTS

Number of Times Foods Appeared on Food Record for Four Days	Frequency	Percent	Cumulative Frequency	Cumulative Percent
McDonalds				
0	54	68.4	54	68.4
1	19	24.1	73	92.4
2	6	7.6	79	100.0
Burger King				
0	76	96.2	76	96.2
1	3	3.8	79	100.0
Coke				
0	24	30.4	24	30.4
1	18	22.8	42	53.2
2	15	19.0	57	72.2
3	5	6.3	62	78.5
4	6	7.6	68	86.1
5	4	5.1	72	91.1
6	5	6.3	77	97.5
8	1	1.3	78	98.7
12	1	1.3	79	100.0
Pepsi				
0	51	64.6	51	64.6
1	7	8.9	58	73.4
2	11	13.9	69	87.3
3	2	2.5	71	89.9
4	1	1.3	72	91.1
5	2	2.5	74	93.7
6	3	3.8	77	97.5
10	1	1.3	78	98.7
12	1	1.3	79	100.0
Frosted Mini Wheats				
0	79	100.0	79	100.0
Nutri Grain				
0	78	98.7	78	98.7
2	1	1.3	79	100.0

Number of Times Foods Appeared on Food Record for Four Days	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Cheerios				
0	67	84.8	67	84.8
1	8	10.1	75	94.9
2	4	5.1	79	100.0
Quaker Oat Squares				
0	79	100.0	79	100.0
Raisin Bran				
0	74	93.7	74	93.7
1	4	5.1	78	98.7
2	1	1.3	79	100.0
Just Right				
0	78	98.7	78	98.7
2	1	1.3	79	100.0
Grape Nuts				
0	78	98.7	78	98.7
1	1	1.3	79	100.0
Gum				
0	77	97.5	77	97.5
1	2	2.5	79	100.0
Candy				
0	59	74.7	59	74.7
1	13	16.5	72	91.1
2	5	6.3	77	97.5
3	2	2.5	79	100.0
Yogurt				
0	78	98.7	78	98.7
1	1	1.3	79	100.0
Ice Cream				
0	43	54.4	43	54.4
1	22	27.8	65	82.3
2	8	10.1	73	92.4
3	4	5.1	77	97.5
4	1	1.3	78	98.7
5	1	1.3	79	100.0

Number of Times Foods Appeared on Food Record for Four Days	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Cheese				
0	17	21.5	17	21.5
1	14	17.7	31	39.2
2	20	25.3	51	64.6
3	17	21.5	68	86.1
4	8	10.1	76	96.2
5	2	2.5	78	98.7
6	1	1.3	79	100.0
Potato Chips				
0	47	59.5	47	59.5
1	20	25.3	67	84.8
2	5	6.3	72	91.1
3	6	7.6	78	98.7
4	1	1.3	79	100.0
Ritz Crackers				
0	78	98.7	78	98.7
1	1	1.3	79	100.0
Diet Beverage				
0	70	88.6	70	88.6
1	5	6.3	75	94.9
2	1	1.3	76	96.2
3	1	1.3	77	97.5
5	1	1.3	78	98.7
7	1	1.3	79	100.0
Chocolate Cookie				
0	61	77.2	61	77.2
1	11	13.9	72	91.1
2	4	5.1	76	96.2
3	1	1.3	77	97.5
4	2	2.5	79	100.0
Brownie				
0	69	87.3	69	87.3
1	9	11.4	78	98.7
3	1	1.3	79	100.0

Number of Times Foods Appeared on Food Record for Four Days	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Orange Juice				
0	45	57.0	45	57.0
1	11	13.9	56	70.9
2	9	11.4	65	82.3
3	9	11.4	74	93.7
4	4	5.1	78	98.7
5	1	1.3	79	100.0

[a]Consumed foods summed from two 24-hour diet recalls and two day food records. Sum does not include quantity of food consumed at each eating occasion.

VITA

Dena Leah Goldberg has a Bachelor of Science degree in Dietetics from the University of California, Davis and a Master of Science degree in Public Health Nutrition from Case Western Reserve University. She has also completed a post master fellowship in adolescent health at the University of Minnesota and has worked as the director of the Supplemental Food Program for Women, Infants, and Children (WIC) in Modesto, California and as a consultant for the state WIC Program at the Indiana State Board of Health.

In September 1986 Dena Leah Goldberg entered the Graduate School of the University of Tennessee, Knoxville, and began study toward a Ph.D. in the Department of Nutrition and Food Sciences. During her graduate program, she worked as a Graduate Teaching Assistant and a Graduate Research Assistant. In spring 1990 she received the College of Human Ecology Outstanding Graduate Student Award. After graduation, Dena Leah Goldberg will begin a post doctoral traineeship working with children with developmental disabilities and chronic illnesses at the Meyer Rehabilitation Institute at the University of Nebraska Medical Center in Omaha.