Ann. Rev. Nutr. 1986. 6:345–63

THE IMPACT OF CULTURE ON FOOD-RELATED BEHAVIOR

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CONTENTS

INTRODUCTION

Every day, people must procure, select, prepare, and consume food to sustain life. The manner in which they do this reflects complex interrelationships and interactions among the individuals, their culture, and the society in which they live. Linton (41) defines culture as the way of life of a society—that is, culture provides the societal members with "an indispensable guide in all affairs of life." This guide consists of the shared agreements among societal members about the way individuals should think, feel, and act. In other words, culture designates the socially standardized activities of people.

0199-9885/86/0715-0345$02.00

Those activities related to food are called *foodways*. A culture's foodways are exhibited by what substances are considered edible as well as the activities related to food selection, procurement, distribution, manipulation, storage, consumption, and disposal (10). One way of studying a culture's foodways is to examine the food-related behavior (commonly called food habits) of individuals within a society, because their behaviors are reflections of the culture. By definition then, *food-related behavior* is "the way in which individuals or groups of individuals, in response to social and cultural pressures, select, consume, and utilize portions of the available food supply" (17). Or, as the title of a recently published book succinctly states, *You Eat What You Are* (9).

Two points that are important to the topic of this chapter should be made about culture. First, culture is transmitted from generation to generation, which means that culture is learned. Second, individuals or groups of individuals participate differentially in their culture. Some socially standardized activities may only apply to certain groups because, for example, of their physiological status (gender or age) or social class. On the other hand, individuals may want to participate but cannot for some reason like income.

Already, the reader may be protesting that humans are biological creatures and that this fact cannot be ignored when studying food-related behavior. This author agrees and would like to orient the sociocultural determinants of behavior in relation to physiological determinants. Organisms need nourishment and must feed on a regular basis. Thus, for organisms to survive, sources of nourishment must meet minimal criteria; namely, these sources must be available and safe and nutritious enough so that reproduction can occur (i.e. the society can perpetuate itself). On the other hand, cultures do not define as edible all sources of nutrients that meet these criteria. Herman & Polivy (34) have developed a model that "attempts to provide an explicit place for both physiological and nonphysiological determinants of eating." The model is illustrated by a continuum of the amount or rate of food consumption. This continuum is divided into three ranges: hunger, appetitive control, and satiety. They hypothesize that hunger and satiety, the two end ranges, are predominantly under physiological control. The appetitive control in the center is seen as the zone of biological indifference, which is predominantly influenced by nonphysiological factors. Although these authors formulated their model to examine the regulation of eating of various types of eaters (e.g. dieters, binge eaters), it seems to provide a useful and cogent framework for understanding the relative relationship between the physiological and sociocultural determinants of food-related behavior.

The purpose of this chapter is to examine the sociocultural determinants of individuals' food-related behavior within their zone of biological indifference. The sociocultural variables (the predictor variables) are divided into two major categories—sociodemographic and psychosocial. The primary level of analysis

of the influence of the sociocultural determinants will be food acceptance (the criterion variable) because this level seems to be the one with which nutritionists are most concerned.

Sociodemographic variables are thought to reflect an individual's access to socially mediated activities; these variables often are called external variables and include income, ethnicity, age, etc. Psychosocial variables are thought to reflect the individual's internal state, and commonly examined variables include knowledge, beliefs, and attitudes. Food acceptance has been conceptualized in two general ways: as a behavior and as an outcome of behavior. Behavioral measurements include types and amounts of food consumed and food expenditures. A commonly measured outcome of behavior is nutrient intake, or some dietary quality index (49). For this chapter, the literature examined is limited to studies conducted in the United States (US).

THEORETICAL MODELS

Everyone seems to believe that the determinants of food-related behavior are complex and that a multidisciplinary approach is needed. The question then becomes, which determinants are the best predictors of behavior? To answer this question, various models have been proposed, although none have been studied extensively. These models, which vary in degree of specificity and thus testability, seem to be cited most often by researchers to justify studying variables like income and attitudes. These models lack the specificity expected in formal, theoretical models; however, they have provided an important framework for researchers in the comparatively young field of food-related behavior.

Dickens (21) presented four concepts (culture, social, personal, and situational) under which the determinants of food practices could be categorized. She viewed cultural causes as determining the food combinations eaten, and suggested that these cultural food patterns resulted from environmental conditions such as climate, technology, geography, and food availability. Social determinants included friends, relatives, and family members; personal factors included age, education, and psychological characteristics; situational factors were income and employment of homemaker. Leininger (39) conceptualized that differences in food practices are related to how people use food within a culture. People use food for nourishment, to express friendliness and maintain interpersonal relationships, to promote and maintain their social status, to cope with stress and tension, to influence others' behavior, and for religious and creative expression.

In his now classic "channel theory," Lewin (40) suggested that food moved through channels and that the person who was primarily responsible for the food for a household was the "gatekeeper" of the channels. He thought that the social

and psychological characteristics of the "gatekeeper" should be examined to understand food acceptance because once the food was through the gate and on the table, it would be eaten by the household members.

Lund & Burk (42) published a framework for examining children's food consumption behavior and it included the following concepts: the child's biogenic, psychogenic, and sociogenic needs for food; his/her food-related knowledge, beliefs, attitudes, and values; and the school, home, and family environment, which influenced the child's needs and psychosocial characteristics. Similarly, Sims & co-workers (73) published a model for studying the final outcome of food consumption, i.e. the nutritional status of the child.

SOCIODEMOGRAPHIC DETERMINANTS

Income

The functional relationship between income and food consumption (most often measured as monetary value of food consumed) is expressed by the Engel demand curve. According to Engel's law, when there is an increase in personal income, there is a decrease in the relative importance of the sum of money spent on food purchases as compared to other expenses, but it may result in an absolute increase in expenditure (79). This relationship is usually expressed as either the marginal propensity to consume, which is defined as the change in food consumption resulting from a $1 increase in household income, or income elasticity, which is defined as the percentage change in food consumption resulting from a 1% change in income (52). For food in the US, the marginal propensity to consume or the income elasticity is very low (inelastic). Estimates of income elasticity for total food expenditures range from 0.17 (53) to 0.36 (62), which means that a 1% increase in household income produces a 0.17 to 0.36% increase in food expenditures. Thus, the relationship between income and food expenditures is not strong. The reason generally given is that food in the US is plentiful and relatively cheap compared to other countries.

Income elasticities also have been estimated for at-home and away-from-home food expenditures. Estimate of income elasticity for away-from-home food purchases is about 0.80 compared to 0.15 for at-home food purchases (62, 75). Findings from the US Department of Agriculture's 1977–1978 Nationwide Food Consumption Survey (NFCS) illustrate this point (58). Low-income households (below $5000) spent approximately 14% of their food dollar for food away from home, whereas high-income households ($20,000 or more) spent 29% of their food dollar on food away from home. High-income households spent approximately five times more on food away from home than the low-income households.

Most foods have income elasticities of less than 0.50. The foods that are considered staples like milk, bread, and eggs have extremely low income

elasticities (values approach zero), but meats and fresh fruits and vegetables are generally considered to have higher income elasticities (52). More specifically, the food group containing meat, poultry, and fish had an estimated income elasticity of about 0.25, fruits had 0.25, vegetables 0.17, and milk products 0.16. In comparison, eggs' and cereal products' elasticities were close to zero, fresh milk 0.08, and bread 0.04 (2, 62, 75). Using the 1972–1973 Consumer Expenditure Survey, Blanciforti et al (12) calculated income elasticities for relatively more nutritious foods and relatively less nutritious foods, and found them to be equal.

The food usage pattern by income of individuals participating in the 1977–1978 NFCS was examined by Cronin et al (18). Food usage was defined as percentage of persons who reported using a food over a 3-day period. The pattern of food usage by income seems to reflect the pattern of the foods' income elasticities. Income was positively related to the usage of non-citrus fruits and "other" vegetables; cheese; meat, fish, and poultry; nuts; desserts, snack foods, and candy; and fats and salad dressings, whereas use of dried beans and peas, rice, and eggs was inversely related to income. Two other items of interest that were related positively to income were low-fat milk and whole-grain bread usage: these items probably are not related to income per se, but may reflect a growing concern about health in the higher socioeconomic groups.

Compared to the income–food expenditure relationship, less work has been done on the income–nutrient intake and food expenditure–nutrient intake relationships (19). In analyzing data from the 1965–1966 NFCS, Adrian & Daniel (3) found all nutrients except carbohydrate significantly and positively related to disposable income. Windham et al (84), however, did not find income related to the nutrient density of individuals' diets in the 1977–1978 NFCS. This may reflect measurement issues associated with using nutrient density as the criterion variable instead of using an indicator of dietary quality. Peterkin et al (50) examined over 4000 low-income households that took part in the 1977–1978 NFCS and found that the nutritional quality of the diets, as measured by the percentage of diets meeting the Recommended Dietary Allowances, increased as food costs increased. Higher incomes or food expenditures do not necessarily result in an adequate diet. Nevertheless, as personal income increases, the possibility of adequate nutrient intakes seems to increase.

Household Size

Economists have observed that given the same income, larger households spend more on food than smaller households, but the value of the food purchased per person decreases with increasing household size. To assess the impact of household size on food expenditures, household size elasticities can be estimated. Household size elasticity (like income elasticity) is defined as the

percentage change in food expenditures resulting from a 1% change in household size. Thus, a household size elasticity of more than 1.0 would indicate that a greater than 1% increase in food expenditure would result, and an elasticity of less than 1.0 means that a 1% increase in household size would result in less than a 1% increase in food expenditures (75). Because an increase in household size given the same income is in effect a decrease in income, an inverse relationship between income and household elasticities would be expected; that is, food items that are not responsive to income would be more responsive to changes in household size. Conversely, food products that are more responsive to income would have lower household size elasticities.

Using data from the 1977–1978 NFCS, Smallwood & Blaylock (75) examined food spending patterns by calculating both income and household size elasticities. For total food expenditures, income and household size elasticities were 0.32 and 0.57, respectively, which means that the addition of members to a household will cause a greater increase in food expenditures than will an increase in income. Household size elasticities for food at home and away from home were 0.73 and 0.11, respectively, whereas the income elasticities for food at home and away from home were 0.15 and 0.81, respectively. As expected, there was an inverse relationship between income and household size elasticities.

The food products most responsive to household size were fresh milk (household elasticity of 1.04) and dairy products (0.85); cereal products (1.10), bakery products (0.84), and bread (0.87); sugar products (1.00); potatoes (0.96); fats and oils (0.77), and eggs (0.75). Lower household size elasticities were estimated for fresh fruits (0.53), fresh vegetables (0.45), and juices (0.52). Although meats would be expected to have a relatively low household size elasticity because of its relatively high income elasticity, this was not the case. The household elasticities for beef (0.70) and poultry and fish (0.60) were higher than would be expected from their income elasticities—0.23 for beef and 0.17 for poultry and fish. In comparison, income elasticity for fresh vegetables was 0.18, with a household size elasticity of 0.45.

Windham et al (84) found household size to be significantly related to the nutrient density of individuals' diets. They found that households with 5+ members had a significantly lower nutrient density consumption of fat, but the mean difference was only 2 g/1000 kcal; households with 3+ members had a significantly higher nutrient density consumption of carbohydrate. These results correspond to the general pattern of the cereal products, sugar products, potatoes, bakery products, and breads having greater household size elasticities than fats and oils and meat. They also found vitamin C nutrient density consumption to be significantly and inversely related to household size, which corresponds to the lower household size elasticities of fresh fruits and vegetables. Vitamin B_6 was inversely related to household size, but vitamin B_6 is

difficult to interpret because information on its content in foods and knowledge of bioavilability is limited.

Education

Investigators have included level of formal education as a predictor variable when examining some aspect of food-related behavior. Depending on the study, the educational level of the individual, male head of household, or female head of household is examined. Using household data from the 1965–1966 NFCS, Abdel-Ghany & Schrimper (2) found that the educational level of the female head of household was positively related to total food expenditure in addition to expenditures for four out of nine food groups, even after accounting for income and other pertinent factors. Their calculated education elasticity was 0.12, compared to an income elasticity of 0.23. The education elasticities for fruits (0.32) and milk equivalents (0.18) were actually larger than their income elasticities, 0.25 and 0.11, respectively. The vegetable group and the meat, fish, and poultry group had education elasticities of 0.11 and 0.07, respectively. However, using data from the 1972–1973 Consumer Expenditure Survey, Abdel-Ghany & Foster (1) did not find a significant education elasticity (0.02). Both Adrian & Daniel (3), using the 1965–1966 NFCS, and Windham & co-workers (84), using the 1977–1978 NFCS, found the female head of household's educational level positively related to vitamin C consumption, which corresponds to the higher educational elasticity for fruit expenditures (2).

A number of investigators (4, 15, 23, 67, 90) have examined the relationship of mothers' (and sometimes fathers') educational levels to dietary quality, and they generally have found a positive, significant relationship. In addition, others (e.g. 66, 71) have found positive relationships (or trends) between women's educational levels and their dietary intake.

Although investigators have used educational level to predict food consumption and dietary quality, they often do not state explicitly how or why it should be related. Abdel-Ghany & Schrimper (2) hypothesized that the educational level of the female head of household may be related to food consumption patterns for three reasons: the educational experience may increase productive capabilities by increasing household-related knowledge and skills; may increase nutrition knowledge or at least a general concern for health; and may affect preferences and general life-style. Educational level has been found to be related to nutrition knowledge by a number of investigators (e.g. 23, 51, 71, 86, 89), with reported zero-order correlation coefficients ranging from 0.25 to 0.63. In addition, level of formal education has been found to be inversely related to the use of convenience foods (56, 57), directly related to the number of meals that a household eats together (48), but not related to the number of meals eaten away from home (48, 56).

Gender and Age

Gender and age are physiological states that influence individuals' food consumption patterns. Cultures also may ascribe food patterns based on these physiological states. Consequently, the difficulty in examining differences between males and females of various ages is separating the physiological from the cultural effects.

Cronin & associates (18) found few differences in food usage between males and females participating in the 1977–1978 NFCS. For 54 out of 65 food groups examined, they found no difference in food usage. Of the remaining food groups, a greater percentage of women than men reported using citrus fruit, yogurt, coffee and tea, and low-calorie carbonated beverages in a 3-day period. A greater percentage of men reported using whole milk; luncheon meats; meat, fish, and poultry sandwiches; desserts, sugar, and sweet spreads. These differences, however, were not dramatic. The largest difference was in the use of luncheon meat, with 61% of the men versus 51% of the women reporting its use. These investigators also calculated the mean number of times per day that the foods were used by the individuals who reported using the food. Means between males and females did not differ for 21 out of 32 food groups, but females did report using foods in 11 groups fewer times per day. These food groups included breads and cereals; milk, yogurt, and cheese; meat, fish, poultry, and eggs; desserts, sugar, and sweet spreads.

Differences in food preferences (degree of liking) between males and females have been reported (e.g. 22, 87). A consistent finding is that women more than men prefer fruits and vegetables. However, the relationship between food preferences and consumption seems to be low to moderate in field studies within a culture (e.g. 54, 87). One explanation for these differences in food preferences is that women are socialized to like fruits and vegetables more than men are, but there appears to be no evidence to support this explanation. A more likely explanation is that adoption of a particular food consumption pattern (due perhaps to a physiological need) causes a greater exposure to particular foods, which may then enhance the preferences for them (59, 91).

Basically, because women are usually smaller and have less lean body mass than men, they need less energy; consequently, they eat less than men. As a result of the lower energy needs, the food consumption patterns of women may differ from men in three general ways: women may eat the same variety of foods but in smaller amounts than men, or they may eat a smaller variety of foods but in the same amounts, or they may show a combination of the two strategies. Even though Cronin et al (18) present data based on food usage and not food quantities consumed, the results still seem to indicate that women may be using the strategy of eating the same variety of foods as men, but in smaller amounts.

Most studies that consider age have cross-sectional research designs or just examine a particular age group at one point in time (teenagers and the elderly

are especially popular). This type of study does not allow the partitioning of the effect due to aging or the effect due to cohort. As Garcia et al (27) point out, differences in food-related behavior among cohorts may come about because of technological, economic, and social changes in a society, and "any effects of generational patterns of eating must be accounted for if valid inferences are to be made as to the effects of aging per se on dietary intakes."

A few longitudinal studies (27, 47, 78) have been reported. Garcia et al (27) followed 35 women, born between 1873 and 1931, over an 18-year period. Four dietary intake measurements were collected between 1948 and 1969. Using multiple regression, they estimated the effects of cohort and aging on nutrient intake. With increasing age, the women reduced significantly their fat intake and increased significantly their calcium intake. There also was a downward trend ($p < 0.10$) in energy intake due to age. The cohort effect accounted for more of the variation in nutrient intake among the women. The younger the cohort, the higher the intakes of protein, calcium, phosphorus, iron, riboflavin, and niacin. Intakes of carbohydrate, thiamin, vitamin A, and ascorbic acid were not related to either cohort or age effects. These authors concluded that nutrient intakes do not change significantly from middle to old age. Investigators (47, 78) of other longitudinal studies reported similar results, in that a general decrease in food energy was observed with age, but not any dramatic changes in food consumption patterns; unfortunately, their lack of statistical analyses precludes more specific comment.

Windham et al (85) compared the nutrient densities (amount of nutrient/1000 kcal) of foods consumed by various sex-age groups. Comparing nutrient density rather than absolute amounts of nutrients corrects for the differences in energy needs due to gender or age. Using the 1977–1978 NFCS data, these investigators found that the nutrient densities of diets did not differ between males and females, with the exception that females consumed diets that contained more vitamin A and vitamin C per 1000 kcal than males. They also found no dramatic differences among age groups (range 4–65+), with again the exceptions of vitamins A and C. The younger and older age groups had diets more dense in these nutrients.

In our culture there seem to be virtually no dietary proscriptions based on gender or age; thus, physiologically based rather than culturally based reasons are more likely to explain most of the variance found in food consumption patterns between males and females within a cohort. On the other hand, differences found among age groups (cohorts) in food consumption patterns, after correcting for energy needs, seem to be more culturally based.

Wife's Employment Status

Women in our culture perform most of the housework. Food-related activities like meal preparation are still the domain of women and account for a large

proportion of time spent in housework (81). Because of the dramatic increase in women's employment outside the home, especially of married women with young children (81), investigators have turned their attention to studying the effect of wives' employment on households' food production and consumption. Contrary to the perception that husbands and wives are sharing more household-related tasks as a result of the changing sex roles in our society, working wives still perform most of the housework; in fact, Waite (81) reports that the hours spent in housework by working wives was six times greater than the hours spent by married men. Consequently, research has focused on the strategies used by working wives to satisfy the competing demands of their jobs and households.

Investigators (32, 45, 46, 76) have found that as the number of wives' employment hours increases, the number of hours they spend in housework decreases. More specifically, the more hours wives spent employed outside the home, the fewer hours they spent in meal preparation, with estimates of about 15–20 minutes per day less for employed wives compared to nonemployed wives (28, 29, 48). This inverse relationship between employment time and meal preparation time has generated speculation and investigation as to the means by which working wives decrease their meal preparation time.

Collective wisdom has attributed some of the increase in away-from-home food consumption in the US to the increased employment of women outside the home because purchasing meals would be an obvious way to decrease housework time. Goebel & Hennon (28, 29), controlling for income, found no relationship between wives' employment status (e.g. part time, full time) and expenditures for meals away from home, but they did find (28) a significant but low, positive correlation ($r = 0.14$) between number of hours employed and expenditures for food away from home. Ortiz et al (48) found the percentage of meals eaten away from home by households increased significantly when the female head of household worked full time (30 hr or more per week) but not when she worked part time. Similarly, hours of wives' employment were directly related to eating at fast-food establishments and school cafeterias, but not eating at other types of restaurants (45). The inconsistencies in findings are probably related to differences in the operationalization of the variables under study (e.g. hours of employment versus employment status). There does seem to be a trend for households with employed wives to eat more meals away from home; however, as Goebel & Hennon (28) comment, there is probably "no substantial substitution of money for time in the sense of purchasing meals away from home."

Another strategy women may use to decrease meal preparation time is to increase their use of convenience foods. Both Havlicek et al (33) and Redman (56), using national surveys, found employment of wives (or of primary meal planners) to be positively and significantly related to use of convenience foods.

When examining use of convenience foods by about 200 households in Wisconsin, Reilly (57) did not find a relationship between convenience food use and wives' employment status. A problem with studying convenience food use is trying to define convenience foods. Reilly seems to have used a more restricted definition (smaller number of foods) than Havlicek et al and Redman.

Wives' employment also has not been found to be related to food preparation style (as measured by number of food items per meal, difficulty of food preparation, frequency of preparing food ahead) (45) or to the number of meals eaten together by the household (29, 48). These factors seem to be more related to age of the children in the household. In addition, the nutritional implications of wive's employment status has been investigated (74, 84), and there appears to be no relationship between nutrient intakes of household members and female head of household's employment status.

Ethnicity and Race

The literature related to cultural subgroups in the US can be divided according to the primary question that is addressed. There seem to be three basic questions: (*a*) What are the foodways of a particular ethnic group in the US? (*b*) How does a particular ethnic group's foodways in the US differ from the group's foodways in their culture of origin? (*c*) How does a particular ethnic group differ from the dominant cultural group?

Descriptions of cultural subgroups in the US dominate the literature. The method of examining one group at one point in time, however, has limitations. The food-related practices described are attributed either implicitly or explicitly to ethnicity, which may not be the case because alternative explanations (like income and geographic region) cannot be rejected. At the least, when studying ethnicity as a determinant of behavior, the ethnic group should be compared to a dominant cultural group that is similar in socioeconomic status and living in the same geographic area. Even though these descriptive studies of only one ethnic group contribute little to the understanding of ethnicity as a determinant of food-related behavior, they can provide, if current, useful information to health practitioners in the field working with particular cultural subgroups.

Because the US has so many ethnic groups, descriptions of each are not addressed in this chapter. The reader is referred to Sanjur's (64) book, where she describes from a nutritional point of view the ethnic food patterns of five major groups in the US: Puerto Ricans, Mexican Americans, Black Americans, Native Americans, and Asian Americans. Another recently published book, *Ethnic and Regional Foodways in the United States* (14), is a compilation of essays on the use of food as a marker of group identity and provides a more anthropological point of view.

When individuals immigrate to the US, what impact does the American culture have on their food-related behavior? The measured degree of cultural

impact depends greatly on the level of analysis (e.g. food preparation methods, meal patterns, or foods consumed). To assess changes in the types and amounts of foods consumed, Dewey et al (20) provide a tripartite food categorization system: "traditional" foods—those that are more common in the culture of origin; "basic" foods—those that are common to both cultures; and "new" foods—those that are more common in the host culture.

Using this food categorization system, Dewey et al (20) examined the degree of acculturation of two groups (nonmigrants and migrants) of low-income, first-generation Mexican Americans. The food-use frequency of 54 foods was assessed. They found that even though both groups reported an increased use of both basic and new foods, the nonmigrants' (or more permanent groups') use of these foods was significantly greater than the migrants. The nonmigrants and migrants, however, were similar in their decreased use of traditional foods. Controlling for income and household size, Wallendorf & Reilly (82) examined the consumption of basic foods of urban Mexican Americans and urban Mexicans. They found that Mexican Americans ate fewer eggs but more meat, white bread, cereals, soft drinks, and caffeine-containing beverages than their counterparts in Mexico. The Mexican Americans continued using tortillas, but used more pre-prepared ones than did the Mexicans. Pattern of alcohol consumption differed, with Mexican Americans drinking more beer and wine and Mexicans more spirits.

The nutrient intakes of Puerto-Rico-born females who lived in Puerto Rico (nonmigrants), lived in the US (forward migrants), and lived in Puerto Rico after living in the US (return migrants) were compared (35). Even after controlling for socioeconomic variables, the forward migrants had better nutrient intakes than either the nonmigrants or return migrants. The authors also observed that the women who returned to Puerto Rico resumed their customary Puerto Rican diets.

First-generation Chinese Americans were asked about their food consumption of traditional and nontraditional foods available in the US when living in China and after living in the US (30, 88). Results, which were similar to the studies of Spanish-speaking populations, indicated a decreased use of traditional foods, even though they were available, and an increased use of basic and new foods. This trend also was identified by Jerome (37) in Blacks who had migrated from the southern to northern part of the US. Terry & Bass (80) found a positive correlation ($r = 0.37$) between the use of traditional Cherokee foods and degree of Indian genetic inheritance of the female household head. At a different level of analysis, however, acculturation is not evident. The food-related beliefs about appropriate foods for the elderly did not differ between Chinese and first-generation Chinese Americans (44). On the other hand, Freedman & Grivetti (26) found that the abandonment of traditional beliefs associated with diet and pregnancy was fairly complete by the third generation in a group of Greek American women.

These studies indicate that food-related behavior is modified by culture, and many of the observed changes in the amounts and types of foods consumed cannot be explained by availability of the foods or by change in socioeconomic status of the individuals. Although the types of foods consumed may change, some investigators (37, 80, 88) have observed that the characteristic food preparation methods of the culture of origin often are retained.

Do ethnic groups differ in their food-related behaviors from the dominant cultural group? Even though answers to this question are important to investigators of food-related behavior as well as to food and nutrition policymakers, there is a paucity of empirical research. Nevertheless, results of investigations that have controlled for sociodemographic variables indicate that there are differences between cultural subgroups and dominant cultural groups (e.g. 16, 43, 63, 82, 84).

According to data from the 1972–1974 Consumer Expenditure Survey, when compared to Whites, Blacks purchased more beef, pork, poultry, fish and seafood, but less cereal and bakery products, sugary products, dairy products, and nonalcoholic beverages (63). Other investigators (13) also have reported more meat purchases by Blacks than Whites. Rozin & Cines (60) found less use of coffee among Blacks compared to Whites and attributed the differences to socialization. Caster (16) compared low-income Black and White women living in the same geographic region on their food-use frequency of 150 foods in 3 groups—core diet (24% of the foods, which provided 69% of the diets' energy), secondary diet (33% foods and 27% energy), and peripheral diet (43% foods and 4% energy). The two groups did not differ in their core diets, but differences were found in their secondary diets. Because the peripheral diet was considered to be of little nutritional consequence, it was not analyzed.

Comparing Mexican Americans and Anglos (researchers' term), Wallendorf & Reilly (82) found that the Mexican Americans consumed more eggs, white bread, and tortillas and less dry cereals, pastries, wine, and beer than the Anglos, but the two groups consumed the same amount of convenience foods, soft drinks, and coffee and tea. They concluded that the Mexican Americans' consumption patterns were not like their culture of origin or their culture of residence. In fact, they felt that the Mexican American patterns were reminiscent of stereotypical American patterns of consumption before the widespread interest in food and health.

The nutrient density of calcium was found to be greater in the diets of Whites than of either Blacks or Spanish-speaking individuals. The nutrient density of vitamin A also differed among the groups, with Blacks having diets that were the most dense and Spanish-speaking individuals the least dense. Asians were found to have diets higher in carbohydrate but lower in fat, vitamin A, riboflavin, and calcium than Whites (43).

Cultural subgroups seem to exhibit food-related behavior unlike their culture of origin as well as unlike their culture of residence. Thus, ethnicity seems to be

a significant predictor of food-related behavior. Within physiological constraints (e.g. lactose intolerance), however, this determinant probably becomes a poorer predictor for descending generations of immigrants and when social barriers are removed, which allows access to the dominant culture.

PSYCHOSOCIAL DETERMINANTS

Psychosocial determinants of food-related behavior have been systematically studied only within the past 20 years. Interest seems to have grown out of the realization that the sociodemographic determinants accounted for a fairly low proportion of the variance observed in individuals' food consumption patterns. That is, even though individuals had the resources with which to obtain a good diet, they displayed food consumption patterns that, from the nutritionists' point of view, needed improving. It was hypothesized that if individuals increased their knowledge of nutrition, then desirable changes in their food-related behaviors would result. Thus, to increase knowledge and change attitudes through nutrition education programs, information was required about individuals' eating patterns (how they behave) and the knowledge (what they think) and attitudes (what they feel) related to their eating patterns.

Nutrition Knowledge

Many investigators (e.g. 11, 15, 23, 31, 36, 51, 71, 86, 90) have examined nutrition knowledge and its relationship to food-related behavior. Nutrition knowledge (the predictor variable) was usually viewed as a unidimensional concept, meaning a person's nutrition knowledge was represented by the use of only one score. The food-related behavior (the criterion variable) was measured generally in either of two ways: as a specific behavior, e.g. participation in school lunch (90), or as an outcome of behavior, e.g. dietary intake (15).

Using meta-analytic techniques, Axelson et al (6) reviewed the relationship between dietary behavior (as measured by an overall dietary quality score) and nutrition knowledge. Meta-analytic techniques allow researchers conducting reviews to address quantitatively two questions: Is there a relationship between two variables? And, what is the strength (effect-size) of the relationship? They found a significant, positive relationship between nutrition knowledge and dietary intake, but the relationship was relatively small ($r = 0.10$). They concluded that there was a relationship between nutrition knowledge and dietary intake, but the effect-size was small because of the lack of specificity in measurements. Researchers who have more specifically defined the food-related behavior or the nutrition concepts in their studies have found a greater effect-size between the predictor and criterion variables—e.g. the relationship between percentage of presweetened cereals purchased and the mother's nutrition knowledge ($r = -0.35$) (51).

Attitudes

Although the definitions of attitude vary, investigators for the most part have tried to identify individuals' organized sets of beliefs, feelings, and intentions associated with food and eating. The food- and nutrition-related attitudes that have been identified and studied include nutrition (7, 11, 23, 25, 31, 65, 71), general health and specific health apprehensions (8, 25, 31, 36, 38, 65, 68, 77), sensory-aesthetics (5, 7, 25, 38, 65), economics (5, 7, 8, 38, 65, 77), convenience (38, 65, 77), creative/adventuresomeness (7, 8, 68, 77), sociability and prestige (7, 8, 38, 69, 77), familiarity (38), and meal planning and preparation (15, 23, 68, 71). When using attitudes to predict behavior, investigators have used specific attitudes such as enjoyment in meal preparation (15, 23, 68, 71) or a general attitude such as nutrition is important (11, 23, 31, 71). Similarly, the criterion variables have been either more specific behaviors such as food-use frequencies (38, 55), food-purchase frequencies (68), and food purchasing practices (11) or outcomes of behavior such as nutrient intake (23, 31, 71) and dietary quality (15, 65).

Using meta-analytic techniques on the limited number of studies available, Axelson et al (6) found a significant relationship between food- and nutrition-related attitudes and dietary intake. Estimated effect-size of the relationship was $r = 0.18$. As with nutrition knowledge, they concluded that when the attitudes and behaviors under study are more specifically defined, a stronger relationship is usually found. For example, Jalso et al (36) found a relatively strong relationship ($r = 0.61$) between opinions about specific nutrition-related practices and practice scores. Likewise, the relationship between intention to eat at a fast-food restaurant and eating at such a restaurant was estimated to be $r = 0.41$ (5). Although attitudes as predictor variables have had limited success, researchers still feel that they are worth studying because the problem seems to be in the identification and measurement of the relevant attitudes and behaviors and not in the concept. The reader is referred to the article by Sims (72) for a more complete discussion of the issues related to attitude measurement in food and nutrition.

Eating Types

Besides the obvious measurements of nutrient intake and of food consumption and expenditures, actual food-related behaviors have received little attention. Some investigators have begun examining food-related behaviors in an effort to identify eating patterns. The underlying hypothesis is that individuals who exhibit a particular pattern of food consumption or preference may have similar psychological and social characteristics.

The foods consumed by individuals participating in the Ten-State Nutrition Survey and Health & Nutrition Examination Survey I were factor analyzed, and seven eating patterns were identified: eating pattern I was characterized by the

consumption of more dairy products and soups and less sugary foods and beverages; II by more nonsugary beverages and less dairy products; III by more eggs, legumes, nuts, and grain products; IV by more meats, fruit and vegetable products, and desserts; V by more poultry and less meat; VI by more protein-containing mixed dishes and shellfish; and VII by more fish, fats, and oils (70). Williams & Penfield (83) developed an instrument, the Food-Related Behavior Characterization Instrument, based on food consumption patterns that successfully predicted whether individuals were traditional eaters (consumed foods accepted by the dominant culture) or nontraditional eaters (excluded culturally accepted foods).

Grouping respondents according to their preferences for 68 foods, four types of eaters were identified: finicky eaters, health-conscious dieters, diverse diners, and high-calorie traditionalists (24). Similarly, Sadalla & Burroughs (61) found that when given five eating types—the vegetarian, the gourmet, the health food fan, the fast-food devotee, and the synthetic food user—respondents consistently identified particular foods with each type of eater. They concluded that food preference patterns are derived from the symbolism associated with foods, which means that individuals choose foods to present images to those around them.

SUMMARY

Some of the sociodemographic and psychosocial determinants of individuals' food-related behaviors were examined in this chapter. The empirical research indicates that individuals do participate differentially in their culture. But, the reasons for why people eat what they eat are still incompletely understood, as evidenced by the inadequate predictive ability of the determinants examined.

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