Why Americans eat what they do: Taste, nutrition, cost, convenience, and weight control concerns as influences on food consumption

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ABSTRACT

Objective To examine the self-reported importance of taste, nutrition, cost, convenience, and weight control on personal dietary choices and whether these factors vary across demographic groups, are associated with lifestyle choices related to health (termed health lifestyle), and actually predict eating behavior.
Design Data are based on responses to 2 self-administered cross-sectional surveys. The main outcomes measured were consumption of fruits and vegetables, fast foods, cheese, and breakfast cereals, which were determined on the basis of responses to questions about usual and recent consumption and a food diary.
Subjects/setting Respondents were a national sample of 2,967 adults. Response rates were 71% to the first survey and 77% to the second survey (which was sent to people who completed the first survey).
Statistical analyses Univariate analyses were used to describe importance ratings, bivariate analyses (correlations and t tests) were used to examine demographic and lifestyle differences on importance measures, and multivariate

analyses (general linear models) were used to predict lifestyle cluster membership and food consumption.
Results Respondents reported that taste is the most important influence on their food choices, followed by cost. Demographic and health lifestyle differences were evident across all 5 importance measures. The importance of nutrition and the importance of weight control were predicted best by subject's membership in a particular health lifestyle cluster. When eating behaviors were examined, demographic measures and membership in a health lifestyle cluster predicted consumption of fruits and vegetables, fast foods, cheese, and breakfast cereal. The importance placed on taste, nutrition, cost, convenience, and weight control also predicted types of foods consumed.
Applications Our results suggest that nutritional concerns, per se, are of less relevance to most people than taste and cost. One implication is that nutrition education programs should attempt to design and promote nutritious diets as being tasty and inexpensive. *J Am Diet Assoc. 1998; 98:1118-1126.*

Dietary patterns of Americans differ widely, but most Americans eat a diet that could best be described as in need of improvement (1). During the past few decades, health professionals and food marketers have engaged in systematic efforts to understand why people choose to eat the foods they do. Marketers have 2 main reasons to be interested: so they can develop and produce foods that consumers will buy, and so they can create successful advertising and promotional campaigns to generate higher sales of foods and brand-name products. Health professionals want to under-

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stand the determinants of food choice as a foundation for effective nutrition education and counseling, which may include developing food plans that are acceptable and appealing to their clients and patients (2,3).
    Both health professionals and marketers recognize that people seek the things they like and that give them pleasure, and that they take action to obtain these things (4). Identifying those concerns that are most important to a person's decision about performing a specific behavior can lead to development of interventions, products, and decision aids to promote desirable behaviors (5,6).
    This study uses multiattribute utility theory (MAU) (7) to explore why people eat the way they do. The purpose of this study was to examine how a variety of factors, including demographics and health lifestyle orientation, are related to the importance of taste, nutrition, cost, convenience, and weight control as well as to investigate whether particular factors, in turn, affect peoples' food choices.

THEORETICAL AND EMPIRICAL BACKGROUND
Research on determinants of food choice has used models grounded in the social-psychological theories of decision mak-

ing and behavior (5,6). Value expectancy theory provides a framework for systematically evaluating the issues a person may consider in deciding whether to take a specific course of action, and can help to specify how people define and evaluate the elements of decision making about performing a specific behavior. Key elements of value expectancy theory are the valence, or importance, of a particular characteristic or feature (of a behavior or product, for example); and the expectancy, or the subjective probability, that a given consequence will occur if the behavior is performed (7,8). A multiplicative relationship is assumed; that is, "value times expectancy" affects the decision to act. Thus, for example, if a person believes the nutritional value of a food is very important in choosing whether to eat it, and rates a food as highly nutritious, then there is a good chance that she or he will choose to eat that food.

MAU is one form of value expectancy theory with particular relevance to understanding influences on food choice. MAU posits that people evaluate decisions according to multiple attributes, and either explicitly weigh the alternatives, or make mental representations of choices before deciding what actions to take (9). According to this theory, a variety of factors may be considered for any given behavior, each with its own importance or weight.

In the literature that examines food choice, taste has often been found to be a key predictor of food (10,11) and beverage (12) consumption. Typically, taste has been investigated as one of several variables (10,11,13,14), but it is usually not the main emphasis in research undertaken with the aim of establishing underpinnings for health promotion strategies and messages. Further, most past research has focused on a specific type of food (eg, fast food, beverages, fruits and vegetables) or nutrient (eg, fat, fiber) to be avoided or increased (10-12,14-17). Only a few studies have focused on both "undesirable" (eg, high-fat foods) and "desirable" (eg, high-fiber foods, fruits and vegetables) food groups in their attempt to understand dietary choices (14,18).

Most of the studies published to date have focused on limited or geographically based populations (14,18). Such research has investigated expectancies and food-choice patterns with regard to demographic differences—generally focusing on the effects of age, gender, education level, and ethnicity. Few studies have been able to draw conclusions about those differences based on representative samples of Americans. Still fewer have applied the benefits of social marketing approaches using lifestyle to examine distinct orientations to health-related behaviors (termed *health lifestyle* herein). Recent research on health lifestyle clusters indicates that the relationship between expectancies and subsequent behaviors can be enhanced by segmenting heterogeneous audiences into smaller, more homogeneous groups according to their orientations toward health (19). This approach, which is central to the investigation reported here, might provide additional insights into the relationship between expectancies and behaviors.

RESEARCH AIMS AND HYPOTHESES

Our study examines how a variety of factors, including demographic characteristics and health lifestyle orientation, are related to the importance of taste, nutrition, cost, convenience, and weight control as influences on food selection. We also investigate whether these factors, in turn, affect people's food choices in several categories: fast foods, cheese, fruits and vegetables, and breakfast cereals. We tested 3 related hypotheses derived from theory and the findings of other published research:
■ Based on the findings of Kristal et al (14) and Glanz et al (18), we expect that demographic factors will predict the importance of taste, nutrition, cost, convenience, and weight control to individual persons.
■ Based on studies that show the importance of lifestyles in health behavior, such as the study by Maibach et al (19), we expect that the membership profile of the audience related to health lifestyle cluster will also predict the importance of taste, nutrition, cost, convenience, and weight control to those persons.
■ Based on the findings of Glanz et al (13), Kristal et al (14), Sporny and Contento (11), and Nguyen et al (10), we expect that taste, nutrition, cost, convenience, and weight control expectations will each contribute substantially to predicting food consumption.

METHODS

Data Collection and Sample
Data for this study were collected from 2 surveys conducted by Market Facts, Inc (Arlington Heights, Ill). The first was a lifestyles survey of a nationwide sample of 5,000 adults (commissioned by DDB Needham Worldwide). A supplemental mailing of 420 surveys was used to increase response of minorities and low-income persons. The second survey was a "healthstyles" survey, which was sent to persons who responded to the first survey. Of the 3,835 respondents to the lifestyles survey (71% response rate), 2,967 responded to the healthstyles survey (a 77% response rate). Final results were weighted to compensate for nonresponse rates among certain demographic categories. A full description of sampling and data collection procedures is presented in Maibach et al (19).

Measures
Independent variables assessed in the surveys included demographic factors and measures of membership in a particular health lifestyle cluster. Demographic factors assessed included age, gender, income, and race; data were gathered using single-item questions. Survey items from previous national health surveys were used or adapted to measure the constructs composing what we termed "health lifestyle cluster membership." Cluster membership was determined on the basis of responses to questions about social cognitive constructs (behavior, internal personal factors, and social environment factors) and constructs across 5 domains of health lifestyle choices: smoking, alcohol consumption, nutrition, exercise, and weight control (19). The specific constructs and items used to derive health lifestyle cluster membership are in the Figure. Seven health lifestyles were identified using a κ-means cluster analysis of the social cognitive and health lifestyle constructs (19). We determined that the health lifestyles exhibited reliability and discriminant, construct, and predictive validity (19). We had sufficient information to place 2,910 respondents (98.1%) into health lifestyle clusters; 57 respondents did not provide enough information to be classified. The 7 clusters, and the proportion in each cluster in this study sample, are as follows:
■ **Physical Fantastics** (24% of the population) are the most health-oriented group. They neither smoke nor drink beyond moderation. They also exercise routinely, eat a healthful diet, and watch their weight.
■ **Active Attractives** (13% of the population) are also relatively health-oriented, although more for reasons of appearing attractive than for purely health reasons. They are unlikely to smoke, but they drink frequently. Although they intend to exercise, eat healthfully, and watch their weight, their actions fall short of their intentions.
■ **Tense but Trying** (10% of the population) persons drink only in moderation and are average or above average in terms

Health behaviors

■ Smoking
On average, how many cigarettes a day do you usually smoke?

■ Alcohol consumption
How often do you usually have any kind of beverage containing alcohol, including beer, wine, wine coolers, cocktails, etc?
On those days you drink an alcoholic beverage (beer, wine, or liquor), about how many drinks do you usually have per day?

■ Strenuous activity (exercise)
How many days each week do you do strenuous activities (like the ones listed in the survey) for at least 20 minutes at a time?

■ Moderate activity (exercise)
On average, how many days each week do you do moderate activities (like the ones listed in the survey)?
On the days you do moderate activities (like the ones listed in the survey), about how much total time do you spend doing them?

■ Dietary fat consumption
Which of the following activities have helped you lower the fat in your diet?
– I select restaurants that offer lower-fat options.
– I ask for gravy, dressing, butter, and sauces on the side.
– I plan or cook meals ahead of time.
– I read the Nutrition Facts panel on food packages.
– I grocery shop with a shopping list.
– I switch to lower-fat foods and snacks.
- I choose "regular-sized" rather than "super-sized" items.
– I eat smaller portions.

■ Consumption of fruits and vegetables
About how many servings of vegetables do you usually eat or drink on an average day—including fresh, frozen, canned, and juices (not counting french fries)?

■ About how many servings of fruit do you usually eat or drink on an average day—including fresh, frozen, canned, dried, and juices?
Weight control activities
How often do you eat (list of various desserts)?

Outcome expectations

■ Threats to health
How much harm do you believe is likely to occur to a person's health in the long run if they do the following things?
– Drink more than 2 alcoholic beverages every day or almost every day.
– Smoke 5 or more cigarettes a day.
– Eat a diet that is high in fat (more than 40% of energy from fat).
– Avoid exercising regularly (once a week or less).
– Are 20 lb or more overweight.

■ Risk perception
My current use of alcohol is a threat to my health.
My current use of cigarettes is a threat to my health.
The amount of fat currently in my diet is a threat to my health.
My exercise habits (or lack of exercise) are a threat to my health.
My current body weight is a threat to my health.

■ Hedonic expectations
I enjoy smoking cigarettes.
I enjoy drinking alcoholic beverages.
I enjoy eating rich (high-fat) foods such as desserts, meats, or gravies.
I enjoy getting regular exercise.
I enjoy eating lots of foods each day.

■ Self-satisfaction
I feel pleased with myself if I don't smoke cigarettes.
I feel pleased with myself if I drink alcohol only in moderation, or not at all.
I feel pleased with myself if I eat a diet that is low in fat.
I feel pleased with myself if I exercise regularly.
I feel pleased with myself if I stay thin or lose weight.

■ Perceived social support
The people who matter most to me are pleased if I smoke cigarettes.
The people who matter most to me are pleased if I drink alcoholic beverages.
The people who matter most to me are pleased if I eat a low-fat diet.
The people who matter most to me are pleased if I exercise regularly.
The people who matter most to me are pleased if I stay thin or lose weight.

Self-efficacy
Assuming that you want to, how confident are you that you can do each of the following, starting this week and continuing for at least 1 month?
– Quit smoking cigarettes (or not start if you currently don't smoke).
– Drink no more than 2 alcohol beverages per day.
– Eat a low-fat diet (less than 30% of energy from fat).
– Exercise at least 3 times a week for 20 minutes each time.
– Stay thin or lose weight and keep it off.

Motivations
I really want to quit smoking cigarettes (or refrain from starting).
I really want to limit my intake of alcohol to no more than 2 drinks per day.
I really want to eat a diet that is low in fat (30% or less of energy from fat).
I really want to exercise regularly (at least 3 times per week) for at least 20 minutes each time.
I really want to stay thin or lose some of my excess weight.

Intentions/personal goals
Over the next month, I intend to quit smoking cigarettes (or refrain from starting).
Over the next month, I intend to limit my intake of alcohol to no more than 2 drinks per day.
Over the next month, I intend to eat a diet that is low in fat.
Over the next month, I intend to exercise regularly (at least 3 times per week) for at least 20 minutes each time.
Over the next month, I intend to stay thin or lose some of my excess weight.

Social influences
■ Perceived social norms
Most of my friends smoke cigarettes.
Most of my friends drink alcoholic beverages regularly.
Most of my friends try to maintain a low-fat diet.
Most of my friends exercise regularly.
Most of my friends are careful to stay thin or try to lose some of their excess weight.

■ Social meaning of health behaviors
People who smoke cigarettes are more attractive than people who don't.
People who smoke cigarettes are more fun to be with than people who don't.
People who drink alcoholic beverages are more attractive than people who don't.
People who drink alcoholic beverages are more fun to be with than people who don't.
People who exercise regularly are more attractive than people who don't.
People who exercise regularly are more fun to be with than people who don't.
People who eat what they want are more attractive than people who don't.
People who eat what they want are more fun to be with than people who don't.

Health as a value
Living a long life is very important to me.
Having an attractive physical appearance is very important to me.
Being physically fit is very important to me.
Living life in the best possible health is very important to me.
There are few things more important than good health.

Life satisfaction
I often wish for my life to be different.
On the whole, I am at peace with myself.
I have everything I really need to be happy.
All things considered, I am very satisfied with the way my life is going right now.

Sensation seeking
I often wish I could be a mountain climber.
I sometimes like to do things that are a little frightening.
I would like to try parachute jumping.
I like to explore a strange city or section of town, even if it means getting lost.

Items used to determine health lifestyle cluster membership.

Table 1
Mean scores[a] reflecting the importance of selected factors on food choice by race

	n	Taste	Nutrition	Cost	Convenience	Weight control
Overall	2,967[b]	4.68	3.85	4.08	3.80	3.41
White	2,262	4.67	3.81	4.02	3.73	3.37
African-American	329	4.74	4.08	4.24	4.13	3.62
Hispanic	269	4.73	3.96	4.32	3.93	3.46
Other	95	4.63	3.91	4.30	3.95	3.41
F		3.31*	9.72***	13.3***	25.2***	5.12**
Eta[2c]		.003	.010	.013	.025	.005

[a]Range=1 to 5; 1=not at all important and 5=very important.
[b]Includes 12 respondents who did not state their race.
[c]Eta^2 is a measure of effect size (association) for analysis of variance; it is similar to r^2 but does not require ordering or a linear assocaition.
*P<.05.
**P<.01.
***P<.001.

Table 2
Mean scores[a] of the importance of selected factors on food choice by lifestyle cluster[b] (N=2,910)

Health lifestyle cluster	n	Taste	Nutrition	Cost	Convenience	Weight control
Physical Fantastics	714	4.7	4.4	4.1	3.8	4.2
Active Attractives	376	4.7	3.9	4.0	3.7	3.6
Tense but Trying	286	4.8	3.9	4.2	3.9	3.5
Decent Dolittles	695	4.7	3.7	4.2	3.9	3.3
Passively Healthy	458	4.7	3.9	4.1	3.8	3.4
Hard-living Hedonists	188	4.6	3.5	4.1	3.7	2.8
Noninterested Nihilists	193	4.6	3.1	4.1	3.9	2.3
F		3.26**	95.9***	2.94**	4.09***	166***
Eta[2c]		.007	.166	.006	.008	.257

[a]Range=1 to 5; 1=not at all important and 5=very important.
[b]Health lifestyle clusters=Physical Fantastics: the most health-oriented group, consistently scoring above average on all health measures; Active Attractives: moderately health oriented, less likely to smoke, limiting fat intake, motivated to exercise; Tense but Trying: tend to smoke cigarettes but otherwise trying to live healthfully; Decent Dolittles: less likely to smoke or drink, but also less likely to exercise, control weight, or eat a healthful diet; Passively Healthy: in excellent health, relatively young, and avoid harmful practices (smoking, heavy drinking); Hard-living Hedonists: among the least health-oriented—often smoke, drink, eat high-fat foods, and exercise moderately; Noninterested Nihilists: the least health-oriented group, consistently scoring below average on health measures.
Note: 57 respondents did not give enough information to classify them into lifestyle clusters.
[c]Eta^2 is a measure of effect size (association) for analysis of variance; it is similar to r^2 but does not require ordering or a linear association.
*P<.05.
**P<.01.
***P<.001.

of exercise, nutrition, and weight control. They smoke cigarettes but would like to quit.

■ **Decent Dolittles** (24% of the population) neither smoke nor drink, but neither do they exercise or eat healthfully, and they are markedly overweight.

■ **Passively Healthy** (15% of the population) persons tend not to smoke or drink alcohol beyond moderation and get a considerable amount of exercise. However, they are unconcerned with what they eat and, as a consequence, consume a high-fat diet.

■ **Hard-living Hedonists** (6% of the population) smoke and drink heavily, eat poorly, and get an average amount of exercise.

■ **Noninterested Nihilists** (7% of the population) smoke heavily, eat poorly, and do not exercise, although they are unlikely to drink beyond moderation.

Additional data describing characteristics of persons in each cluster may be found in Maibach et al (19).

Dependent variables included importance factors (ie, influences on food choice/determinants) and 4 key dimensions of eating behavior. To measure importance, 15 items on the healthstyles survey asked respondents how important each of 5 factors—taste, nutrition, cost, convenience, and weight control—were for 3 food behaviors: purchasing food for themselves or their family, eating out at lunch, and eating out at dinner. Responses across the 3 food-choice occasions were reported on a 5-point scale ranging from 1=not at all important to 5=very important. These were combined into 5 scales: taste, nutrition, cost, convenience, and weight control. Analyses showed that these scales were reliable (Cronbach α of .83, .86, .87, .73, and .91, respectively).

Dietary data were collected on both the lifestyles and healthstyles surveys. Questions about eating behaviors were asked on both surveys with respect to usual and recent consumption. Also, on the healthstyles survey, respondents com-

Table 3

Predictors of importance: multivariate analyses of food choice factors, controlling for demographics[a] (N=2,910)

	Taste		Nutrition		Cost		Convenience		Weight control	
	F	Eta²	F	Eta²	F	Eta²	F	Eta²	F	Eta²
Demographics										
Age	0.1	.000	94.8	.029***	82.1	.025**	14.3	.004***	101.0	.031***
Gender	23.7	.007***	94.3	.029***	12.3	.004***	0.3	.000	44.1	.014***
Income	1.3	.000	12.6	.004***	172.0	.051***	26.2	.008***	4.0	.001*
Race	3.4	.003*	9.9	.009***	6.9	.006***	23.4	.022***	7.3	.007***
Block	3.3	.010**	95.9	.071***	280.0	.086***	4.1	.034***	166.0	.063***
Health lifestyle cluster membership										
Cluster	2.4	.004*	84.2	.136***	2.7	.005*	4.4	.008***	152.0	.222***
Full Model	4.7	.017***	77.6	.225***	29.2	.099***	13.0	.047***	113.0	.297***

[a]Adjusted for age, gender, income, and race.
*P<.05.
**P<.01.
***P<.001.

pleted a food diary for the first 4 eating occasions on the previous day. Here we describe specifically how each of 4 indicators of food consumption was assessed.

On the lifestyles survey, respondents were asked about fast-food consumption. "In the last 2 weeks, how many times did you visit or purchase food from each of the following restaurants listed below for breakfast, lunch, dinner, and snacks?" Respondents were asked to indicate how many times they had eaten at McDonald's, Burger King, Pizza Hut, Hardee's, Wendy's, Taco Bell, and all other fast-food restaurants under the categories breakfast, lunch, dinner, and snacks. A single index was constructed from these items and found to be reliable (Cronbach α=.70).

Fruit and vegetable consumption was assessed in 3 different ways. On the lifestyles questionnaire 1 item asked, "Including snacks, how many servings of fruits and vegetables did you eat or drink yesterday?" (respondents' choices ranged from 0 to 7 or more). On the healthstyles survey, separate questions asked, "About how many servings of vegetables do you usually eat or drink on an average day—including fresh, frozen, canned, and juices (not counting french fries)," and "About how many servings of fruits do you usually eat or drink on an average day—including fresh, frozen, dried, canned, and juices?" Also on the healthstyles survey, respondents completed a food diary for the first 4 eating occasions on the previous day. During data reduction, the number of fruit and vegetable servings was computed. The 3 separate measures all reflected fruit and vegetable consumption, but on different days and in slightly different ways. Because a combined measure was deemed most reflective of overall fruit and vegetable consumption, avoiding effects of the way the question was asked and day-to-day variation in fruit and vegetable consumption, a combined index of fruit and vegetable consumption was constructed (Cronbach α=.66).

The amount of cheese consumed was computed from the food diary. Because this was a simple additive index categorizing what type of cheese was eaten and how many times it was eaten, no reliability measure was appropriate.

To assess breakfast cereal consumption, respondents were asked to answer the lifestyles survey question "How often do you, yourself, use _____" in relation to 5 items: basic cereal; raisin bran cereal; plain, high-fiber cereal; cereal with a variety of fruits and nuts; and 100% vitamin-fortified cereal. These items were found to be correlated, and therefore were combined into an index (Cronbach α=.64).

For ease of interpretation, indicators of eating behaviors were converted into familiar units: fruits and vegetables were given in servings per day, fast-food consumption in meals per week, cheese consumption in servings per day, and breakfast cereal in servings per week.

Statistical Analysis

Preliminary analyses were performed to reduce data and create measures of key independent and dependent variables, as described under Measures. Univariate analyses were then performed to describe importance ratings, and bivariate analyses (correlations, t tests, and analyses of variance) were used to examine demographic and health lifestyle differences on importance measures. Multivariate analyses using general linear models were used to examine how independent variables predicted importance ratings, after controlling for demographic variables, and to predict food consumption of each variable controlling for other effects, and orthogonal to others (SPSS, version 6.1, 1995, SPSS Inc, Chicago, Ill) (20). As such, the eta² for each variable, which is a measure of effect size, can be added to develop an estimate of the overall contribution to variance explained.

RESULTS

Importance of Influences on Food Choice: Univariate Results

In general, taste was the most important consideration for respondents. On the 5-point scale, the mean score for importance of taste was 4.7, followed by cost (4.1), nutrition (3.9), convenience (3.8), and weight control (3.4).

Demographic Predictors of Importance

Our first hypothesis was that demographic factors would predict the importance of taste, nutrition, cost, convenience, and weight control to persons. This was tested with a series of Pearson correlations between importance factors and age, and with t tests and analyses of variance between importance factors and gender, ethnicity, and income categories. The importance of taste showed no significant relationship to age or income, but was more important to women (mean=4.73 vs 4.62; t=5.49,P<.001) and certain ethnic groups (F=3.31,P<.02); see Table 1.

The importance of nutrition showed certain demographic effects, such as that it was more important to older respon-

Table 4
Food consumption by health lifestyle cluster[a] (N=2,910)

Health lifestyle cluster	n	Fruits and vegetables (servings/d)	Fast food (meals/wk)	Cheese (servings/d)	Breakfast cereal (servings/wk)
Physical Fantastics	714	5.2	1.5	0.8	2.4
Active Attractives	376	3.8	1.7	1.0	2.1
Tense but Trying	286	3.7	1.8	1.1	2.0
Decent Dolittles	695	3.7	1.5	0.9	2.0
Passively Healthy	458	3.6	1.8	1.0	2.0
Hard-living Hedonists	188	3.3	2.3	0.8	1.7
Noninterested Nihilists	193	2.8	2.0	1.1	1.8
F		90.3***	5.19***	1.16	20.7***
Eta[2b]		0.157	0.011	0.002	0.041

[a]Health lifestyle clusters=Physical Fantastics: the most health-oriented group, consistently scoring above average on all health measures; Active Attractives: moderately health oriented, less likely to smoke, limiting fat intake, motivated to exercise; Tense but Trying: tend to smoke cigarettes but otherwise trying to live healthfully; Decent Dolittles: less likely to smoke or drink, but also less likely to exercise, control weight, or eat a healthful diet; Passively Healthy: in excellent health, relatively young, and avoid harmful practices (smoking, heavy drinking); Hard-living Hedonists: among the least health-oriented—often smoke, drink, eat high-fat foods, and exercise moderately; Noninterested Nihilists: the least health-oriented group, consistently scoring below average on health measures.
[b]Eta[2] is a measure of effect size (association) for analysis of variance; it is similar to r^2 but does not require ordering or a linear association.
***$P<.001$.

Table 5
Predictors of consumption of fruits and vegetables, fast foods, cheese, and breakfast cereals (N=2,910)

	Fruits and vegetables		Fast food		Cheese		Breakfast cereal	
	F	Eta[2a]	F	Eta[2]	F	Eta[2]	F	Eta[2]
Demographics								
Age	159.0***	.048	185.0***	.056	18.9***	.006	60.1***	.019
Gender	2.5	.001	6.3*	.012	6.7**	.002	1.2	.000
Income	0.2	.000	5.4*	.021	0.1	.000	0.7	.000
Race	1.2	.001	19.5***	.018	6.2***	.006	2.3	.002
Health lifestyle cluster membership								
Cluster	45.6***	.079	1.6	.003	0.7	.001	12.4***	.023
Importance factor								
Taste	9.4**	.003	0.2	.000	2.3	.001	3.0	.000
Nutrition	92.6***	.028	22.3	.007	1.9	.001	3.6	.001
Cost	1.4	.000	1.7	.001	0.6	.000	21.3***	.007
Convenience	42.2***	.013	41.7***	.013	0.9	.000	4.2*	.001
Weight control	5.6*	.002	9.5**	.003	8.1**	.003	1.0	.000

[a]Eta[2] is a measure of effect size (association) for analysis of variance; it is similar to r^2 but does not require ordering or a linear association.
*$P<.05$.
**$P<.01$.
***$P<.001$.

dents ($r=.211$, $P<.001$), women (mean=4.03 vs 3.66; $t=11.2$, $P<.001$), and certain ethnic groups ($F=9.72$, $P<.001$) (Table 1). The importance of nutrition had no significant relationship to income.

The importance of cost was highest for younger respondents ($r=-.156$, $P<.001$), women (mean=4.17 vs 3.99; $t=5.26$, $P<.001$), and people with lower incomes ($r=2.246$, $P<.001$). Table 1 shows a significant relationship between ethnicity and the importance of cost ($F=13.3$, $P<.001$); cost was more important to nonwhite respondents than to white respondents.

The importance of convenience was greatest for younger respondents ($r=-.078$, $P<.001$) and people with lower incomes ($r=-.116$, $P<.001$). Convenience was not significantly related to gender. Table 1 shows a significant relationship between ethnicity and the importance of convenience ($F=25.2$, $P<.001$),

with nonwhites and especially blacks rating convenience as more influential on their food choices.

Weight control concerns were most important to older respondents ($r=.234$, $P<.001$) and women (mean=3.59; vs 3.22; $t=9.29$, $P<.001$). Table 1 shows a small but significant relationship between the importance of weight and ethnicity ($F=5.12$, $P<.002$), with blacks rating it highest. Importance of weight concerns was not significantly associated to income level.

In summary, the importance of taste, nutrition, cost, convenience, and weight control to individual persons demonstrates clear demographic variation. Specifically, age predicts the importance of nutrition and weight control (more important to older persons) as well as cost and convenience (more important to younger persons). Gender predicts the importance of taste, nutrition, cost, and weight control; all were rated higher

by women than men. Income predicts the importance of cost and convenience, both of which matter most to those with lower incomes. Finally, ethnicity predicts the importance of taste, nutrition, cost, convenience, and weight control, with nonwhites rating them more highly.

Health Lifestyle Cluster Membership as a Predictor of Importance Factors
Our second hypothesis states that health lifestyle cluster membership will predict the importance of taste, nutrition, cost, convenience, and weight control to people. The health lifestyle clusters (shown in Table 2) differ with regard to the importance of all 5 factors—taste, nutrition, cost, convenience, and weight control. Clusters differ modestly on the perceived importance of taste, cost, and convenience, and markedly on the importance of nutrition and weight control. Health lifestyle cluster membership, therefore, appears to be a strong predictor of the importance of nutrition and weight control in food choices.

Although these results support our hypothesis, the multivariate analyses provide a more conservative test of the hypothesis. A series of general linear models analyses examined whether health lifestyle cluster membership predicts the importance measures after controlling for the demographic variables (see Table 3). The results show that health lifestyle cluster membership was a significant predictor of all 5 importance measures. The largest contributions, however, were in predicting the importance of nutrition (F=84.2, P<.001, eta^2=.136) and weight control (F=152, P<.001, eta^2=.222) to respondents. The finding that demographics are the better predictor of taste, cost, and convenience, whereas health lifestyle cluster membership is the better predictor of nutrition and weight control, is noteworthy.

Importance Factors and Cluster Membership as Predictors of Eating Behaviors
In addition to examining the relative importance of the 5 factors to people, we examined importance ratings and cluster membership in relation to eating behaviors. A summary of the eating patterns of the 7 health lifestyle clusters is shown in Table 4. Significant differences across clusters in consumption of fruit and vegetable, fast food, and breakfast cereal were observed. Our third hypothesis predicted that the reported importance of taste, nutrition, cost, convenience, and weight control expectations would predict food consumption. To test this prediction, multivariate analyses were used to control for demographic and health lifestyle cluster membership determinants of food consumption. Only after controlling for these other factors were effects of the 5 importance factors considered evidence of their independent effects in determining food consumption.

Four General Linear Models analyses were used to examine predictors of each dimension of eating behavior (all models shown in Table 5). The first examines predictors of fruit and vegetable consumption. Older people were most likely to eat more fruits and vegetables. After controlling for demographics, membership in certain health lifestyle clusters also predicted fruit and vegetable consumption: the Physical Fantastics consumed the most fruits and vegetables. Controlling for demographics and cluster membership, the importance of taste, nutrition, convenience, and weight concerns further predicts a person's fruit and vegetable consumption.

The second multivariate analysis examined predictors of fast-food consumption. Younger people, men, people with lower incomes, and blacks ate the most fast food. After controlling for demographics, health lifestyle cluster membership

does not significantly predict the amount of fast food consumed. After controlling for demographics and cluster membership, the importance of nutrition and the importance of weight control are inversely related and the importance of convenience is positively related to fast-food consumption.

The third set of multivariate analyses examined predictors of cheese consumption. Younger people, whites, and women ate the most cheese. After controlling for demographics, a person's health lifestyle cluster membership profile did not significantly contribute to the amount of cheese consumed. The importance of weight concerns, however, shows a significant inverse relationship with cheese consumption; thus, attaching higher importance to weight control is associated with less cheese consumption.

The final general linear models analysis examined predictors of breakfast cereal consumption. Younger people ate the most breakfast cereal. After controlling for demographics, health lifestyle cluster membership significantly predicted cereal consumption: Physical Fantastics consumed the most cereal. Cost and convenience were the only importance measures that predicted the consumption of breakfast cereal, and both were positively associated with consumption. These results, then, support the importance of taste, nutrition, cost, convenience, and weight control in determining certain key aspects of actual food consumption even after controlling for patterns of responses related to demographics and health lifestyle. Thus, the third hypothesis was confirmed.

DISCUSSION
Our study examined predictors of the importance of influences on consumers' food choices. We found that demographic factors were significant predictors of the importance of taste, nutrition, cost, convenience, and weight control for consumers. Health lifestyle cluster membership was also significantly associated with the relative importance of these factors, especially nutrition and weight control. In terms of food consumption, health lifestyle cluster membership plays a significant role in determining food consumption in ways beyond what can be predicted directly on the basis of the demographics of the audience. We have also shown that all of these factors—demographics; the health lifestyle cluster membership of the audience member; and the importance of taste, nutrition, cost, convenience, and weight concerns—play a role in determining food consumption. This study goes beyond other research that has sought to identify population segments in terms of food choice or weight control–related clusters (21-25) in that our health lifestyle clusters include important health behaviors other than diet (exercise, smoking, drinking).

People are most likely to consume foods that they evaluate as tasty (10-12, 23,26,27,28.) Taste, therefore, can be considered a minimal standard for food consumption. However, because taste was almost universally considered highly important by respondents in this study, it did not emerge as a predictor of food consumption in the final regression analyses, except for fruit and vegetable intake. The other 4 factors, therefore, appear to be important in determining food consumption as long as the food is seen as tasting good. The positive relationship between the importance of convenience and fast-food consumption vs the negative association between convenience and consumption of fruits and vegetables and breakfast cereal suggests that people who believe fast food is more convenient than fruits, vegetables, and breakfast cereals will eat fast food more often. Indeed, concerns about reductions in the taste quality of the diet are the most often mentioned obstacles to adopting reduced-fat and healthful diets (29,30). The positive relationship between nutrition and

fruit and vegetable consumption and the negative association between nutrition and fast-food consumption show that greater concern about nutrition does predict whether a person eats more fruits or vegetables and less fast food. Concerns about weight appear to increase fruit and vegetable consumption and help limit fast-food and cheese consumption. People who eat few fruits, vegetables, and breakfast cereals do so because they perceive them to be inconvenient.

It should be stressed that these concerns continue to show effects after controlling for demographics and health lifestyle cluster membership factors. As a result, these concerns appear to be shaped by the psychological perspective of the audience member. The importance of influences on food choice was significantly predicted by demographics and health lifestyle cluster membership. For example, the Physical Fantastics had high levels of concern about nutrition and weight control. Both the group cluster and these concerns affected fruit and vegetable consumption. These concerns are determined before food choices are made. In a person's mind, food choices are likely based on meeting these criteria (22-24).

APPLICATIONS

Nutrition campaigns have generally tried to stress the importance of nutrition to consumers (2). The results of our study suggest that the perceived importance of nutrition, however, appears to depend on a person's psychological perspective. The association with health lifestyle cluster membership suggests that a person's perception of the importance of nutrition is probably an attitude that is strongly held and, consequently, resistant to change. According to cognitive theories of psychology, people process messages in accord with their existing values, beliefs, and behavior (31). It would appear, therefore, that campaigns attempting to change people's perception of the importance of nutrition will be interpreted in terms of existing values and beliefs. A more promising strategy might be to stress the good taste of healthful foods. Also, one way to get people to eat more fruits, vegetables, and breakfast cereals is to stress their convenience and suggest convenient ways to include them in the diet.

Dietetics professionals and nutrition educators should also invest effort in designing food plans (including menus and recipes) that are good tasting and meet guidelines for healthful eating (32). In this way nutrition campaigns can take advantage of existing beliefs to encourage the consumption of healthful foods. Stressing the good taste of healthful foods would appeal to all groups, not just those that are more health oriented. This is a promising approach to encouraging those not currently eating a healthful diet to make more health-promoting food choices.

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