Research Article

College Students' Judgment of Others Based on Described Eating Pattern

Rebecca Pearson and Michael Young

ABSTRACT

Background: *The literature available on attitudes toward eating patterns and people choosing various foods suggests the possible importance of "moral" judgments and desirable personality characteristics associated with the described eating patterns.* ***Purpose:*** *This study was designed to replicate and extend a 1993 study of college students' judgments of others based on described dietary fat patterns.* ***Methods:*** *Participants rated male or female peer models described as having low-fat, high-fat, or "good fat" eating habits. Data were analyzed using factorial MANOVA to determine effects of model gender and described eating pattern on two scales: likeability and personal success orientation.* ***Results:*** *The results of this analysis revealed no significant overall effect of model gender. However, there was a significant overall effect of described eating pattern ($F(6, 574)=38.48$, $p<.01$). There were no significant model gender by described eating pattern interactions. Low-fat and good-fat male and female models were rated statistically higher on the success orientation scale, but these males were statistically less likeable than high-fat males.* ***Discussion:*** *Perceptions of others, and self-perceptions based on beliefs about others' attitudes and opinions, are strong influences in the college-age population. Thus, these attitudes may prove to be high barriers to adoption of healthier eating patterns.* ***Translation to Health Education Practice:*** *Understanding such judgments may help health education professionals tailor interventions designed to improve young adults' eating patterns.*

In 2004, more than 66% of Americans were classified as overweight or obese.[1] Weight and diet-related chronic disease are recognized as resulting from a combination of energy intake (amount and types of foods consumed) and energy output (level of physical activity).[2,3] Recent research findings indicate that modest weight loss, achievable through healthy eating patterns and activity levels, prevents the development of Type 2 diabetes better than drug regimens in at-risk people.[4]

A great deal of research is available on attitudes toward physical activity[5,6] and attitudes toward overweight and obese people[7]; thus, in this study, we chose to focus on attitudes toward those who consume certain types of foods, specifically high-fat, low-fat, and "good fat" foods. The literature available on attitudes toward eating patterns and people choosing various foods suggests the possible importance of "moral" judgments[8] and desirable personality characteristics[9,10] associated with the described eating patterns. Given this knowledge base, the current study was designed to determine the existence of similar types of attitudes in our sample. To do so, we used what Stein and Nemeroff refer to as a "universe of…adjectives,"[8(p483)] including some basic personality descriptors borrowed from two lists of traits developed by Asch[11] and Birnbaum.[12]

For the current study, it was important to choose variables that would be relevant for college students, with respect to influences on behavioral choices. This focus resulted in the selection of items that would address a person's perception that a peer was likeable and oriented toward personal success. If young adults view peers who eat a recom-

Rebecca Pearson is an assistant professor in the Department of Health, Human Performance, and Nutrition, Central Washington University, 400 E. University Way, Ellensburg, WA 98926.Michael Young is a professor and associate department head in the Department of Health Science, New Mexico State University, P.O. Box 30001, MSC 3HLS, Las Cruces, NM 88003.

mended diet as less likeable or less oriented toward success, they may believe others will view them similarly should they choose such a diet. Such attitudes may negatively influence the likelihood of optimal diet behaviors and other healthy choices, even in the face of information suggesting the benefit of such choices.

The food environment, and in particular the nutrition information environment, has changed, even within the last decade. For example, rather than a diet that is low in fat, many medical authorities and nutritionists now advise people to adopt eating patterns that approximate a Mediterranean-style diet[13]—one that includes abundant vegetables and a high olive oil intake, more fish than red meat, and the substitution of other monounsaturated fats for saturated fats.[14] Such a diet has been shown to be of value in reducing the risk of heart disease[14-16] and many types of cancer.[16-18] Given this change, it was decided that revisiting prior research with the addition of a Mediterranean-style described eating pattern would fill a gap in the literature regarding attitudes toward those who choose such a diet.

Several health behavior models incorporate attitudes toward a given behavior as an important contributor to a person's potential to make positive behavioral change. Reasonably, attitudes toward a given behavior might be viewed as potentially extending to people who practice the behavior. If a chocolate cake is "decadent," then a person accepting any, or certainly more than a very small slice, might be considered decadent as well.

In the health belief model,[19] perceived benefits and barriers of a given behavioral recommendation may be based in part on attitudes toward the behavior or toward those who practice it. For example, if a young man perceives peers who smoke as popular and fun to be with, smoking might, for him, have fairly significant perceived benefits. Correspondingly, attitudes toward peers who choose a recommended diet might influence attitudes toward the diet itself, resulting in perceived benefits or barriers to adopting the diet.

The theory of reasoned action[20] states that a person's attitudes toward a suggested behavior directly influence his or her intention to perform the behavior. If, as posited above, a student's attitudes toward a behavior can be extended to a peer who practices the behavior, then these resulting attitudes would inform a student's behavioral intention. Positive attitudes would predict an intention to perform the behavior, and negative attitudes would predict an intention not to perform the behavior. According to this theory, such an intention is "the most important determinant of behavior."[20(p70)]

Knowing the attitudes college students hold toward those who follow the eating patterns promoted by physicians and community health professionals may aid such practitioners in understanding this element of the chronic disease puzzle, and in using established behavioral models to plan more effective diet-improvement strategies. Typically, college students' eating patterns are either in flux or have only recently been adopted, meaning that college may be an effective intervention point. Additionally, students' eating behaviors are likely to have taken a turn for the worse since childhood.[21] If this is the case, designing messages and strategies that help this group improve their eating habits has the potential to improve their long-term health outcomes as well as those of their own children in the future, given parental influence on children's diets.[22,23]

Increasing rates of overweight and obesity, along with rising health care costs, mean health educators and other health professionals must promote diet and activity patterns that will improve population health outcomes. To date, however, nutrition education and the provision of more, and more in-depth, information to the public have not been effective in changing these trajectories. Part of the failure of these approaches to nutrition education may be related to the attitudes people hold toward various dietary patterns and those who practice them. Thus, it seems appropriate to determine current attitudes toward people who choose high-fat, low-fat, and good-fat (Mediterranean-style) dietary patterns.

The current study was conducted to replicate and extend a study by Fries and Croyle,[9] who examined stereotypes college students associated with low-fat versus high-fat diets. In their study, students judged a model (hypothetical person) based on gender in combination with a described eating pattern; for example, some participants rated a male described as choosing a low-fat diet, others rated a female described as choosing a low-fat diet, still others rated a male or female choosing a high-fat diet or a male or female without dietary information provided. As discussed above, medical advice is evolving regarding dietary fat intake, so it is appropriate to revisit this work. The current study extends the research through the addition of a Mediterranean, or good-fat, dietary pattern. This continued research is important because the examination of attitudes toward people who have adopted different dietary patterns will allow us to identify possible barriers to healthy eating.

PURPOSE

The current research was designed to determine whether college students judge a peer model differently depending on different sets of personal characteristics—specifically, gender and dietary pattern. Given previous findings,[9] four research questions were developed: (1) Do participants' ratings of models on the set of personal characteristics differ based on participant gender? (2) Do participants' ratings differ by model gender? (3) Do participants' ratings differ by described dietary fat pattern? (4) Do model gender and described dietary fat pattern interact with regard to participants' ratings?

METHODS

Study Design

This study was cross-sectional, employing a two-by-four factorial design modeled after the two-by-three design used by Fries and Croyle,[9] but with the addition of a fourth, good-fat condition. Factors were model gender and diet condition. Participants were systematically assigned to one of the eight conditions.

Participants

The participants comprised a convenience sample of 307 undergraduate students at a large southeastern university. Following approval from the Institutional Review Board for the Protection of Human Subjects, instructors teaching undergraduate health and wellness classes agreed to allow class time for data collection.

Procedure

The researcher visited classes to describe the study, answer students' questions, and distribute and collect surveys. Students voluntarily (and without compensation) agreed to participate and completed the questionnaire in their regular classroom setting. The participation rate was close to 100 percent: of the answer sheets distributed, only three were returned blank. There were eight survey forms labeled A through H, based on the eight gender/eating pattern combinations (male or female model, and one of four descriptions regarding eating patterns: high-fat, low-fat, good-fat, and no information).

In an effort to obtain approximately equal groups, surveys were distributed such that the first student in the first row received the male, low-fat model; the second student in that row the female, low-fat model; the third the male, high-fat model; and so on. Survey completion took approximately 20 minutes. On seven of the 307 surveys collected, the gender and diet pattern of the peer model was not indicated. Eliminating these surveys from the study yielded an effective sample size of 300. MANOVA and ANOVA analyses were carried out only for those participants who rated models on complete scales; thus, sample size for these analyses was 296.

Instrument

The instrument used in the current study was modeled, with permission, on Fries and Croyle's original tool[9] designed to elicit stereotypes held based on described eating patterns. Several additional items used in Oakes and Slotterbeck's study of attitudes toward food healthfulness[10] were included as well, also with permission. Each questionnaire included a scenario describing a college student—either a female model, "Susan," or a male model, "Mike." There were eight different versions of the scenario, four for the male model, four for the female.

Models were described as follows, using descriptions almost identical to those used in Fries and Croyle (with permission):

> Susan is a student at the University of Arkansas. She is 20 years old, a sophomore, and earns Bs in most of her classes. Susan has brown hair and brown eyes. She lives near campus. When she has time, she enjoys going to movies and doing things with her friends. Susan also works part-time for a little extra money.

> Mike is a student at the University of Arkansas. He is 20 years old, a sophomore, and earns Bs in most of his classes. Mike has brown hair and brown eyes. He lives near campus. When he has time, he enjoys going to movies and doing things with his friends. Mike also works part-time for a little extra money.

One phrase from the original scenarios—regarding Susan and Mike "listening to good music" as one of the things they like to do when they have time—was omitted from the current study's scenarios in order to make them more contemporary. Due to the ubiquitous nature of portable music players, college students of today would not recognize "listening to music" as an activity that happens solely when time permits.

In the two versions of the scenario that did not include information regarding dietary patterns, no other information about the model was provided to the participants. In the two low-fat versions of the scenario, the following information was added: "He [or she] usually eats salads and vegetables and avoids foods like pizza, burgers, and fried foods." Information was added to the two high-fat versions as well: "She [or he] usually eats foods like pizza, burgers, and fried foods and avoids salads and vegetables." And the two good-fat versions included their own addition: "He [or she] usually eats foods like almonds, peanuts, avocadoes, and olive oil with his [or her] meals, eats fish often, and avoids foods like burgers, pizza, and fried foods." The low-fat and high-fat information was identical to that used by Fries and Croyle; the good-fat information was written specifically for this study.

After reading the version of the scenario on their questionnaire, participants were asked to rate the model on adjectives describing personality traits and personal characteristics using a five-point scale (1="not at all" to 5="very"). These items included two scales: a 6-item Personal Success Orientation (PSO) Scale and a 4-item Likeability Scale, with possible scores of 6 to 30 and 4 to 20, respectively. Thus, a score of 13 on the Likeability Scale could be interpreted as fairly likeable, while a score of 13 on the PSO Scale could be interpreted as not very oriented toward personal success. The items were introduced as follows: "For each item below, mark the letter that best matches how you feel about the person described."

The decision to create scales addressing personal success orientation and likeability characteristics was based on the perception that such judgments would likely resonate with a college population. Young adults are often concerned about being popular and being perceived as likely to succeed. These concerns may be based in part on the fact that this age group tends to "evaluate important personal qualities—opinions and abilities, and likely many other key attributes as well—through social comparison."[24(p18)] Thus, the two scales appeared to address two relevant aspects of attitudes toward others.

The adjectives used in the PSO Scale were "hardworking," "health-oriented," "responsible," "athletic," "orderly," and "self-disciplined." The Likeability Scale adjectives were "humorous," "fun to be with," "spontaneous," and "interesting." These descriptors were similar to those used by Fries and Croyle and, more recently, by Oakes and Slotterbeck. Three of the adjectives—"responsible," "athletic," and "humorous"—were used by Oakes and Slotterbeck, while others were adapted from the prior studies in an attempt to better resonate with the current study's participants

or to be more user-friendly. Still others were created specifically for the current survey. Although Stein and Nemeroff did include a "morality" scale and an "attractiveness and sex-role appropriateness" scale in their study,[8(p485)] none of the past studies used scales composed of items similar to those chosen for this study; rather they conducted analyses using individual items. The present study's approach—grouping these items in the form of scales, demonstrating that each scale measures a single construct, and using multi-item scales to measure constructs—makes a stronger case for the validity of the instrument than the methods used by previous investigators.

Data Analyses

SAS programs were used to perform various statistical tests. These included frequency counts, chi-square to determine whether respondents to the eight different scenarios differed by demographic variables, factor analysis to confirm that each of the two scales measured a single construct, and Cronbach's alpha to test for internal consistency. A two-way MANOVA was performed to determine whether ratings on the PSO and Likeability Scales differed by model gender or model eating pattern, or if there was a model gender by eating pattern interaction. A second two-way MANOVA was performed to determine whether ratings differed by participant gender or if there was a participant gender by eating pattern interaction. Finally, an ANOVA was performed to determine if, for each model gender, differences in ratings existed for different diet conditions. Tukey's HSD test was subsequently used to locate differences found in the ANOVA.

RESULTS

Frequency Counts

The frequency counts indicated numbers and percentages of participants by gender, class rank, ethnicity, and age group. More females (189, 64.3%) than males (105, 35.7%) participated in the study. There was little difference in participants by undergraduate class: 68 (23%) were freshmen, 80 (26.7%) were sophomores, 70 (23.3%) were juniors, and 73 (24.3%) were seniors, with only one participant classified as a graduate student. A clear majority of the participants identified their ethnicity as White (257, 86.8%). The remainder identified themselves as African American (16, 5.4%), Asian or Pacific Islander (8, 2.7%), Hispanic (5, 1.7%), American Indian (3, 1.0 %), or "other" (2, 0.7%). Most of the participants indicated their age was in the 18–22 range (255, 86.1%); others were in the 23–27 range (25, 8.4%), the 28–32 range (4, 1.4%), or the 33–37 range (3, 1.0%). Eight participants (2.7%) indicated that they were older than 37. Participant gender, age, year in school, and primary identified ethnicity are presented in Table 1.

Approximately equal numbers of participants were assigned to each of the eight scenarios. The actual number of participants completing each form was as follows: male low-fat model—30; female low-fat model—39; male high-fat model—35; female high-fat model—38; male good-fat model—40; female good-fat model—40; male model no dietary information—38; and female model no dietary information—36.

Chi-Square Results

Chi-square analyses were conducted to determine whether the distribution of the eight participant/scenario groups differed by participant gender, age, or ethnicity. Due to the small number of observations in some cells, age was collapsed into two groups, 22 and under and over 22. Ethnicity was classified as either White or non-White. Results indicated there were no significant differences among the eight groups with regard to gender (p=.19), age group (p=.83), or ethnicity (p=.86).

Factor Analysis and Cronbach's Alpha Results

Confirmatory factor analysis was conducted using the items from the PSO and Likeability Scales to determine whether each scale measured a single construct. Separate analyses were conducted for each scale. Results indicated that the items comprising each scale did measure a single construct (e.g., only one factor per scale was identified). For both scales, all items comprising the scale loaded at .61 or above. Items comprising each scale and factor loadings for each item are shown in Table 2. Cronbach's alpha was calculated for each of the two scales as a measure of internal consistency: .80 for the PSO Scale, and .72 for the Likeability Scale.

Table 1. Descriptive Characteristics of the Sample

Sample Characteristics	N (%)*
Gender	
Female	189 (64.3)
Male	105 (35.7)
Class Rank	
Freshman	68 (23.0)
Sophomore	80 (26.7)
Junior	70 (23.3)
Senior	73 (24.3)
Graduate student	1 (0.03)
Primary Identified Ethnicity	
African American or Black	16 (5.7)
American Indian	3 (1.7)
Asian or Pacific Islander	8 (2.7)
Caucasian or White	257 (86.7)
Hispanic	5 (1.0)
Other	2 (0.7)
Age	
18–22	255 (86.3)
23–27	25 (8.3)
28–32	3 (1.0)
33–37	3 (1.0)
>37	8 (2.7)

*Totals may not equal the final sample size as data were missing for some of the responses. In all cases, however, missing data were less than 2% of the total sample. Figures may not total 100% due to rounding.

MANOVA Results

In order to determine the effect of model gender and described eating pattern on model ratings for the two subscales, a two-way factorial MANOVA was performed.

Table 2. Items and Factor Loadings for Personal Success Orientation and Likeability Scale

Scales	Factor Loadings
PSO Scale	
The person described is hardworking	0.71
The person described is health-oriented	0.67
The person described is responsible	0.79
The person described is orderly	0.61
The person described is athletic	0.65
The person described is self-disciplined	0.83
Likeability Scale	
The person described is humorous	0.65
The person described is fun to be with	0.79
The person described is spontaneous	0.76
The person described is interesting	0.68

The results of this analysis revealed that the two scales were moderately correlated (r=.26), making MANOVA a relevant statistical analysis tool. There was no statistically significant overall effect of model gender on the two scales ($F_{(2, 287)}$=1.67, p=.19). However, there was a statistically significant overall effect of described eating pattern ($F_{(6,574)}$=38.49, p<.01). There were no statistically significant model gender by described eating pattern interactions ($F_{(6, 574)}$=1.45, p=.19). Similarly, mean model ratings were statistically different for each scale based on described eating pattern, as shown in Table 3. Effect sizes for statistically significant results (indicated by Cohen's f in Table 3) ranged from fairly small to large. The effect sizes for model gender and model gender by described eating pattern interaction were small (f<.10).

MANOVA was also used to determine whether PSO and likeability ratings differed based on participant gender. No significant differences due to participant gender (p=.40) were found. The effect size for participant gender was quite small.

ANOVA Results

As shown in Table 4, described eating pattern had an effect on both PSO and likeability ratings for the male model and on the PSO Scale for the female model. Consequently, Tukey's HSD test for pairwise comparisons was used to locate differences on the scales. Confidence intervals for differences in means resulting in statistically significant comparisons are shown in Table 5.

For both male and female models, the low-fat and good-fat diet descriptions resulted in PSO rating means that were significantly higher (p<.05) than means under the high-fat description (and, for males, under the "no diet information" descriptions). With regard to likeability ratings, however, male models in the low-fat and good-fat descriptions were rated lower than models in the high-fat description (p<.05). The effect size for female likeability ratings was quite small (f=.08), but approached Cohen's criterion for a small effect size (f=.10).[25] Thus, a study with higher power based on larger gender-diet combination groups might have resulted in both statistical and practical significance.

DISCUSSION

The present study was designed to determine whether college students judged a peer model differently based on gender, described dietary patterns, or an interaction between both characteristics. The four research questions listed in the "Purpose" section were designed to determine how the current study's results fit with previous findings.

First, the results showed no statistically significant difference in model ratings based on either participant or model gender. There was, however, a statistically significant difference in model ratings by dietary pattern: high-fat males were rated significantly more likeable than good-fat or low-fat males. There was no difference in likeability scores for female models by dietary pattern.

There was also a difference—for both male and female models—in PSO scores by dietary pattern. Female models with the low-fat and good-fat descriptions had higher PSO scores than those with the high-fat descriptions, while male models with the low-fat and good-fat descriptions had higher PSO scores than those with the high-fat and "no diet information" descriptions.

There were no statistically significant gender by dietary pattern interactions for either likeability or PSO scores. This finding contradicts Fries and Croyle[9] and may reflect a lowered tendency among today's college students to view peers differently solely as a function of gender; however, the current study's data cannot definitely explain this lack of statistical significance. Replicating and extending the current study with a larger sample might enable researchers to determine the stability of these findings or ascertain reasons for this contradictory finding.

Regarding the effect of participant gender on ratings, the current study's findings reflect those of Fries and Croyle, who found no differences between male and female participants' ratings of models on adjectives similar to those used in the current study, including "likeable," "health-conscious," "fitness-oriented," and "easy-going."[9] However, the current results differ from those of Stein and Nemeroff, who reported that female participants rated "all targets" more positively than did males on fitness, activity level, and fatness.[8(p485)]

The literature available on attitudes toward eating patterns suggests the importance of "moral" judgments[8] and desirable personality characteristics[9,10] associated with various diets. The current study's findings

Table 3. MANOVA Summary Table for Effects of Described Eating Pattern on Subscale Ratings

Source of Variation	Wilk's Lambda	df	SS	MS	F	f
Described eating pattern						
Overall effect	.51	6			38.48*	.33
PSO subscale	.59	3	1887.19	629.06	67.75*	.44
Likeability subscale	.93	3	111.58	37.19	7.53*	.14

*$p<.01$

Table 4. ANOVA Results for Effects of Described Eating Pattern on Subscale Ratings for Male and Female Models

	Source	df	MS	F	η2
Male Model					
PSO	Described eating pattern	3	378.01	42.41*	.48
	Error	139	8.91		
Likeability	Described eating pattern	3	26.79	5.82†	
	Error	139	4.60		.11
Female Model					
PSO	Described eating pattern	3	256.74	26.65*	.35
	Error	149	9.63		
Likeability	Described eating pattern	3	11.95	2.28	.04
	Error	149	5.25		

*$p<.01$
†$p<.05$

are intriguing in that people who chose a low-fat or good-fat diet were viewed as more successful but, for the males, clearly less likeable than those who chose a high-fat diet, and vice versa. Perhaps ratings given by participants were motivated in part by what they viewed as the feasibility for themselves of the type of dietary pattern described.[26]

In a related study, Levi et al.[27] found men's level of concern regarding food decisions to be lower than women's. They attributed this lower involvement, in part, to male's perceptions of masculinity. In the fast food, convenience world of college society, relatively high-fat eating is the social norm and may correspond to perceptions that a person is more likeable—as possibly reflected in the current findings. If that is in fact the case, our findings would also be related to the work of Christakis and Fowler,[28] who used the phrase "social contagiousness of obesity" to refer to the relationship they found within social networks between weight gain and social ties. Adoption of a low-fat or good-fat diet requires greater involvement in food decisions (a behavior that may be perceived as less masculine) as well as the ability to adopt eating habits that differ from the social norm and perhaps those of close friends. Again, this points out the intriguing nature of our findings that males who choose a low-fat diet or good-fat diet are viewed as more successful.

It is difficult to interpret the seemingly contradictory findings regarding high PSO ratings for the good-fat condition alongside higher likeability ratings for the high-fat condition. It does follow the already evident pattern, however: the models that were seen to be more successful were also viewed as less likeable. It is possible that in our success-oriented society, young adults view those who are successful as competition. These findings are important: if health education professionals want to encourage young adults to adopt healthy eating patterns, they may need to seek a great deal more information regarding perceptions of men and women based on various eating behaviors and take these perceptions into account in developing health education messages.

If young adults do associate negative characteristics with the eating behaviors health professionals recommend, and positive characteristics with less optimal eating patterns, the difficulty of changing these

Table 5. Tukey Pairwise Comparisons for Differences Between Mean Ratings Based on Described Eating Pattern

Comparisons	Difference Between Means	95% CI*
Males		
PSO Subscale		
Low-fat vs. no info	2.5398	(0.72, 4.36)
Low-fat vs. high-fat	7.3381	(5.41, 9.27)
Good-fat vs. no info	2.3934	(0.63, 4.15)
Good-fat vs. high-fat	7.1917	(5.32, 9.07)
Likeability Subscale		
High-fat vs. good-fat	1.72	(0.3, 3.06)
High-fat vs. low-fat	1.90	(0.51, 3.28)
Females		
PSO Subscale		
Good-fat vs. high-fat	5.68	(3.85, 7.51)
Low-fat vs. high-fat	5.20	(3.36, 7.03)
No info vs. high-fat	4.13	(2.26, 6.01)

*Each comparison listed in the table demonstrates a statistically significant difference, $p<.05$

behaviors is understandable. Perceptions of others, and self-perceptions based on beliefs about others' attitudes and opinions, are strong influences in the college-age population. Thus, these attitudes may prove to be high barriers to adoption of healthier eating patterns.

Limitations

This study was based on self-report data from a convenience sample of college students. It did not take into account possible biases based on the participants' own eating patterns. It was assumed because of the systematic assignment of scenarios to participants that differences identified in the analyses were due to differences elicited by the scenarios rather than differences among the participant groups, but this assumption cannot be verified.

Despite these limitations, this study has value and makes a contribution to the literature. Understanding how those who engage in healthy and unhealthy eating patterns (and other health behaviors) are viewed by others can be important in developing messages that overcome negative perceptions, reinforce positive perceptions, and encourage healthy behavior.

Directions for Future Research

The results of this study suggest several possible directions for future research. Future studies might examine how a person's own dietary pattern influences his/her perceptions of persons with different dietary patterns. Research with populations other than college students might also be helpful. Additionally, this study was quantitative in nature. A qualitative study might elicit more detailed perceptions of others' eating patterns. In addition, this sort of study might identify the reasons for such perceptions. Research to examine other possible perceptual differences—e.g., attitudes toward dietary patterns varying by age group, ethnicity, socioeconomic status, or region—could help health educators tailor messages to better meet the needs of specific groups. Finally, high rates of overweight and obesity mean that understanding whether or not target audiences believe that adopting healthier behaviors is feasible becomes an important part of designing and implementing health promotion strategies.[26] Future research should incorporate items that address perceived feasibility along with items that determine participants' attitudes toward those who practice healthy behaviors.

TRANSLATION TO HEALTH EDUCATION PRACTICE

These results should be helpful to health education professionals seeking to craft healthy eating messages aimed at young adults. The results indicate that both healthy and unhealthy eating patterns are associated with positive and negative stereotypes. Health professionals may face an uphill battle to encourage more optimal eating patterns if they attempt to do so without understanding the potential complexity of such stereotypes.

In designing materials and messages, health educators could capitalize on our findings that people with healthy eating habits were viewed as more successful. For example, they could reinforce this perception by designing messages and materials portraying successful people making healthy food choices. These messages could show career advisors telling those starting out in the job market to hone their interview and communication skills, to "dress for success," but not to forget about adopting a healthy dietary pattern as well.

Health educators may also want to counteract our finding that males who follow a high-fat eating pattern are perceived as more likeable than healthy eaters. For example, they can design materials and messages showing likeable people making healthy eating choices and less likable people making unhealthy choices. Deliberate efforts like these to counteract, or capitalize on, attitudes toward healthy and unhealthy dietary patterns may be important in efforts to improve eating habits of this population.

REFERENCES

1. Ogden CL, Carroll MD, Curtin LR, et al. Prevalence of overweight and obesity in the United States, 1999–2004. *JAMA*. 2006;295:1549-1555.

2. Dickinson S, Brand-Miller J. Glycemic index, postprandial glycemia and cardiovascular disease. *Curr Opin Lipidol*. 2005;16:69-75.

3. Lefevre M, Champagne CM, Tulley RT, et al. Individual variability in cardiovascular disease risk factor responses to low-fat and low-saturated-fat diets in men: body mass index, adiposity,

and insulin resistance predict changes in LDL cholesterol. *Am J Clin Nutr*. 2005;82:957-963.

4. Franz MJ. The evidence is in: lifestyle interventions can prevent diabetes. *AJLM*. 2007;1:113-121.

5. Jackson C, Smith RA, Conner M. Applying an extended version of the theory of planned behaviour to physical activity. *J Sports Sci*. 2003;21(2):119-133.

6. Sollerhed AC, Ejlertsson G, Apitzsch E. Predictors of strong sense of coherence and positive attitudes to physical education in adolescents. *Scand J Public Health*. 2005;33:334-342.

7. Chambliss HO, Finley CE, Blair SN. Attitudes toward obese individuals among exercise science students. *Med Sci Sports Exerc*. 2004;36:468-474.

8. Stein RI, Nemeroff C. Moral overtones of food: judgments of others based on what they eat. *Pers Soc Psychol Bull.* 1995;21:480-490.

9. Fries E, Croyle RT. Stereotypes associated with a low-fat diet and their relevance to nutrition education. *J Am Diet Assoc*. 1993;93:551-555.

10. Oakes ME, Slotterback CS. Prejudgments of those who eat a 'healthy' versus an 'unhealthy' food for breakfast. *Curr Psychol*. 2004;23:267-278.

11. Asch SE. Forming impressions of personality. *J Abnorm Soc Psychol*. 1946;41:1230-1240.

12. Birnbaum MH. The nonadditivity of personality impressions. *J Exp Psychol Gen*. 1974;102:543-561.

13. Willett WC, Sacks F, Trichopoulou A, et al. Mediterranean diet pyramid: a cultural model for healthy eating. *Am J Clin Nutr*. 1995;61:1402S-1406S.

14. Psaltopoulou T, Naska A, Orfanos P, et al. Olive oil, the Mediterranean diet, and arterial blood pressure: the Greek European Prospective Investigation into Cancer and Nutrition (EPIC) study. *Am J Clin Nutr*. 2004;80:1012-1018.

15. Panagiotakos DB, Pitsavos C, Arvaniti F, Stefanadis C. Adherence to the Mediterranean food pattern predicts the prevalence of hypertension, hypercholesterolemia, diabetes and obesity, among healthy adults; the accuracy of the MedDietScore. *Prev Med*. 2007;44:335-340.

16. Assmann G, de Backer G, Bagnara S. International consensus statement on olive oil and the Mediterranean diet: implications for health in Europe. *Eur J Cancer Prev*. 1997;6:418-421.

17. Gallus S, Bosetti C, La Vecchia C. Mediterranean diet and cancer risk. *Eur J Cancer Prev*. 2004;13:447-452.

18. La Vecchia C. Mediterranean diet and cancer. *Public Health Nutr*. 2004;7:965-968.

19. Janz NK, Champion VL, Strecher VJ. The health belief model. In: Glanz K, Rimer BK, Lewis F, eds. *Health Behavior and Health Education: Theory, Practice, and Research.* 3rd ed. San Francisco: Jossey-Bass; 2002:45-66.

20. Montano DE, Kasprzyk D. The theory of reasoned action and the theory of planned behavior. In: Glanz K, Rimer BK, Lewis F, eds. *Health Behavior and Health Education: Theory, Practice, and Research*. 3rd ed. San Francisco: Jossey-Bass; 2002:67-98.

21. Demory-Luce D, Morales M, Nicklas T, et al. Changes in food group consumption patterns from childhood to young adulthood: the Bogalusa heart study. *J Am Diet Assoc*. 2004;104:1684-1691.

22. Agras WS, Hammer LD, McNicholas F, et al. Risk factors for childhood overweight: a prospective study from birth to 9.5 years. *J Pediatr*. 2004;145(1):20-25.

23. Norton DE, Froelicher ES, Waters CM, et al. Parental influence on models of primary prevention of cardiovascular disease in children. *Eur J Cardiovasc Nurs*. 2003;2:311-322.

24. Goethals G. *Peer Influences Among College Students: The Perils and the Potentials* (Discussion Paper no. 51). Williams Project on the Economics of Higher Education; September 1999. Available at: http://www.williams.edu/wpehe/DPs/DP-51.pdf. Accessed October 11, 2007.

25. Cohen J. *Statistical Power Analysis for the Behavioral Sciences*. Hillsdale, NJ: Lawrence Erlbaum; 1988.

26. Ball K, Crawford D, Warren N. How feasible are healthy eating and physical activity for young women? *Public Health Nutr*. 2004;7:433-441.

27. Levi A, Chan KK, Pence D. Real men do not read labels: the effects of masculinity and involvement on college students' food decisions. *J Am Coll Health*. 2006;55;91-98.

28. Christakis NA, Fowler JH. The spread of obesity in a large social network over 32 years. N Eng J Med. 2007;357:370-379.