Research Article

Perceived Parenting Style and the Eating Practices of College Freshmen

Seraphine Pitt Barnes, Kelli McCormack Brown, Robert J. McDermott, Carol A. Bryant, and Jeffrey Kromrey

ABSTRACT

Background: *Unhealthy eating contributes to morbidity in adolescents and college students and is an antecedent of premature mortality in adulthood. It has been suggested that the increase in independence (i.e., living away from parents) of adolescents contributes to their poor eating behaviors. Some literature reports that specific parenting styles may reduce the probability of engaging in poor eating practices.* ***Purpose:*** *We investigated the association between college freshmen's eating practices and their perceptions of parenting style.* ***Methods:*** *An Internet-based survey was used to sample 264 college freshmen between the ages of 18 and 20 years from a large southeastern university. Data analysis used univariate and bivariate statistics along with multiple regression analysis.* ***Results:*** *Student eating practices fell short of optimal dietary recommendations. Whereas the literature suggests that parenting style predicts healthy eating during early adolescence, it did not predict healthy eating in this sample of college freshmen, accounting for less than 1% of the variance in eating practices. Nevertheless, responses to an open-ended question suggested that some students believed that parents had influenced their current eating behaviors.* ***Discussion:*** *We found little evidence of any latent effects of parenting style on eating behaviors among college freshmen.* ***Translation to Health Education Practice:*** *Despite positive parental influences, as it relates to health eating, continued reinforcement at the individual (e.g., skill enhancement with regard to meal preparation), interpersonal (e.g., role modeling healthy eating practices among peers), community (e.g., establishing famers' markets) and organizational (e.g., increased access to healthy food options in cafeterias) levels is needed.*

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BACKGROUND

Reduction or elimination of poor food choices and unhealthy eating practices is one of the nation's priority health behaviors according to *Healthy People 2020*.[1] Unhealthy eating contributes to morbidity in adolescents and young adults and is an antecedent of premature mortality in later adulthood. According to a national study of adolescents, only about one-fifth eats five servings of fruits and vegetables per day.[2] Similarly, the number of college students who eat five or more servings of fruits and vegetables per day ranges from 6% to 26%.[3-5] Furthermore, 50% of freshmen consume fried foods at least twice a week and high-fat fast foods at least twice a week.[6, 7]

Eating practices during adolescence are influenced by a multitude of factors,[8-10] although social contexts may be the most fundamental.[11] Social environments are particularly relevant during the early adolescent years when standards for behavior are set and most activities are controlled by parents.[12] The behaviors and attitudes of parents facilitate the development of a variety of health behaviors among children and adolescents in the home.[13] According to some researchers, parent-child relationships may be one of the strongest factors that influence food choices among adolescents.[10] In particular, parenting styles may reduce the probability of engaging in certain health risk

Seraphine Pitt Barnes is a research consultant, Alpharetta, GA 30022; E-mail: seraphine.barnes@gmail.com. Kelli McCormack Brown is a professor in the College of Health and Human Performance, University of Florida, Gainesville, FL. Robert J. McDermott is a professor at the Florida Prevention Research Center, University of South Florida, Tampa, FL 33612. Carol A. Bryant is a professor at the Florida Prevention Research Center, University of South Florida, Tampa, FL 33612. Jeffrey Kromrey is a professor in the College of Education, University of South Florida, Tampa, FL 33620.

behaviors, including poor eating practices, because of the roles control and nurturance play in shaping behavior.[14-17]

Theoretical Framework

In the parenting style framework, parenting style has two dimensions: *demandingness* (of children's behavior) and *responsiveness* (to children's needs).[18, 19] These dimensions produce three distinct parenting styles: *authoritative*, *authoritarian* and *permissive*.[14, 15] Authoritative parenting is characterized by being involved and supportive, setting clear standards, enforcing rules, and encouraging independence, individuality and verbal give-and-take. Parents who are both highly demanding and highly responsive are considered authoritative. In contrast, authoritarian parenting sets absolute standards, uses discipline to shape and control behavior, values obedience and respect for authority, and discourages verbal give and take. Finally, permissive parenting establishes few standards, provides little enforcement of rules, allows considerable self-regulation of behavior, and offers little direct involvement with children and youth.

Parenting Style and Eating Practices

Authoritative parenting is related to multiple positive child and adolescent outcomes and has been used to investigate a variety of health-risk behaviors among adolescents.[20-22] The parenting style model identifies parents' responsiveness to their children's needs and the demands they place on children's behavior.[23] Authoritative parenting in particular has been found to lessen the probability of engaging in health risk-behaviors, including unhealthy eating.[11, 16, 17, 24] Adolescents raised in authoritative homes have been shown to eat significantly more fruit than adolescents raised using other parenting styles.[25] In contrast, children from authoritarian and neglectful homes eat the least amount of fruit.[25] Lytle, Varnell, Murray et al.[26] similarly found that children of authoritative mothers consumed more fruits and vegetables than children of non-authoritative parents. Interestingly, these same investigators found that children of non-authoritative fathers also consumed more fruits and vegetables.[26] Yet, another study reported that authoritative parenting did not significantly predict fruit and vegetable consumption.[27] Permissive parenting practices have been negatively associated with children's fruit consumption.[28] Kremers, Brug, deVries and Engels[25] found that adolescents from homes that were authoritative and indulgent had the most favorable attitudes toward eating fruits.

Authoritative parenting also may result in healthier eating by allowing children to develop general self-control skills, a practice that also has been demonstrated in dissuading youth from adopting cigarette smoking.[20] In addition, the use of appropriate limits and provision of positive reinforcement have been found to increase healthy eating among children.[29] Although food has been related to identity, authority, security and independence,[30] the relationship between parenting style and eating practices has not been studied extensively. Moreover, results have been contradictory. Whereas some studies have demonstrated a positive association between authoritative parenting and fruit and vegetable consumption among children,[25, 26] conflicting findings also exist.[27] The literature is also inconclusive with respect to the interactive effects of parental behavior, particularly parental warmth, involvement and authority, and eating practices of adolescents. However, most studies have been limited to the context of preschool and early adolescence. Few studies have examined the effects of parenting style on the college population.[31, 32] and no studies have determined whether parenting style influences eating practices of college students.

PURPOSE

Given the need for better understanding of the parental factors that influence adolescent eating behavior, we examined the long-term influence of parenting style on the food choices and eating practices of youth by studying their early college experience. Specifically, we examined the association between perceived parenting style and selected eating practices of college freshmen between the ages of 18 and 20. The parenting style framework was used to examine the association between perceived parenting style and eating practices. This framework provides a practical construct for expressing relationships between parenting behavior and child and adolescent growth and development.[18] This model was used to categorize the parenting styles as perceived by college freshmen in this study and to assess associations between each parenting style and the eating practices among students.

METHODS

Study Design and Sample

An Internet-based survey was conducted to investigate the relationship between perceived parenting style and the eating practices of college freshmen. Internet-based surveys have been used increasingly with the college student population because of this group's comfort level, experience and accessibility to computers.[33] When compared to traditional mail surveys, the benefits of using an Internet-based survey with the college student population include minimal costs, and less time for preparation, duplication, distribution and data entry.[34, 35] Other benefits associated with web surveys include fewer item completion errors, greater convenience for the participant, a more rapid and higher rate of return, and less vulnerability to social desirability response bias.[36]

Participants in this study consisted of a convenience sample of freshmen students enrolled at the University of South Florida during the fall 2004 and spring 2005 semesters. According to university statistics, 6,811 students enrolled as freshmen during fall 2004 semester on the same campus, of which 4,182 students were considered "first-time-in college." The freshmen population included: males (43.3%) and females (56.7%) with a mean age of 19. For this study, a college freshman was considered a late adolescent between the ages of 18 and 20. This age group reflected the most traditional age of college freshmen and represented a group of individuals who were experiencing the transition to college and were likely to be making decisions regarding their food choices for themselves.[37] Additionally, sampling college freshmen between the ages of 18 and

20 limited the period of recall of parenting style while living at home (one year or less in most cases).

Participant Recruitment

This study followed a modified version of the Dillman Tailored Design Method.[35] Students were recruited for participation in the survey through sections of a "university experience" course, an elective course that acquaints students with the opportunities and demands of higher education and supports their transition to college. The University Experience coordinator agreed to disseminate all communication from the researchers to instructors of the classes via e-mail. Course instructors received a series of e-mails that introduced the study, provided a link to the survey, encouraged them to inform their students about the upcoming survey and provided reminders about the study to increase participation. Instructors were also provided with an activity about the eating practices among college students that could be adapted for use in their classes. Instructors also were encouraged to post the survey link on Blackboard (an electronic instructional and communication medium).

Upon receiving the Uniform Resource Locator (URL) from their instructor, students were directed to the introduction page of the survey located on the principal investigator's home page. This home page provided an overview of the study, information about the principal investigator and the procedures for participation. Instructions for starting the survey were also provided. To prevent multiple submissions by an individual, a "cookie" was installed on the system. Students who completed the survey qualified to be entered in a drawing for one of four $75 cash incentives. The study aims and protocol were reviewed and approved by the Office of Research, Division of Research Compliance Institutional Review Board (#102853) of the University of South Florida.

Instrumentation

This study used a 72–item Internet-based survey that included demographic questions, modified versions of the Parental Authority Questionnaire (PAQ),[38] the Michigan Healthy Diet Indicator (HDI),[39] and an open-ended question addressing the influence of parents on current eating behavior. The PAQ, based on Baumrind's [15] typology of parenting styles, is designed for college students to measure their perceptions of parents' permissiveness, authoritarianism and authoritativeness.[38] Although this instrument does not assess parenting style in relation to eating practices it has been used successfully to assess the relationship between parenting style and a variety of adolescent behaviors. Responses for all items are arranged on five-point Likert-type scales with options that range from *strongly disagree* to *strongly agree*. The PAQ provides six separate scores, ranging from 10 to 50 (the higher the score, the greater the appraised level of the parental authority prototype measured) for each participant: mother's permissiveness, mother's authoritarianism, mother's authoritativeness, father's permissiveness, father's authoritarianism, and father's authoritativeness. This instrument has undergone reliability and validity testing.[38] Internal consistency reliability for the six scales varies from .77 to .92. Discriminant validity varies between -.52 and .12 and criterion-related validity varies from -.53 to .68. Internal consistency reliability was assessed for each of the six PAQ scales. Cronbach alpha coefficients for each of the six PAQ scales were as follows: .91 for mother's authoritarianism, .89 for mother's authoritativeness, .84 for mother's permissiveness, .97 for father's authoritarianism, .96 for father's authoritativeness, .93 for father's permissiveness. Overall, the range of values measuring internal consistency was higher for this study, when compared to the original study's range of .77 to .92.

The HDI was developed as a module of the 1997 Michigan Behavioral Risk Factor Surveillance System (BRFSS) to estimate overall diet quality among adults.[39] It consists of food frequency questions that ask about the usual number of servings consumed from fruit, juice, vegetables, grains, protein-rich foods, dairy products, sweets and snacks.[39] It also asks about overall quality of eating practices, variety in diet and behaviors regarding consumption of dietary fat, cholesterol and salt. The 10 components of the instrument include: grain, vegetables, fruits, meats, milk, total fat, saturated fat, cholesterol, sodium and variety in the diet. Each of the 10 components of the HDI consists of a maximum score of 10 points, resulting in a total individual score up to 100 points.[39, 40]

The Internet-based survey was developed using *Surveyor*™, a fully web-based survey application that enables production and publication of surveys on the Internet through a standard web browser.[41] The PAQ was modified to measure maternal and paternal parenting styles simultaneously. Items now referred to parents in general; however, responses were still recorded separately for mother and father. For example one question read, "While I was growing up, my parents felt that in a well-run home the children should have their way in the family as often as the parents do." In addition, two questions from the HDI were excluded that did not contribute to the final score.

The instrument underwent expert panel review and pilot testing to assess survey format, survey content, item appropriateness, and item clarity. Panel members were also asked to assess the instrument's ease of use, navigability, survey directions, readability on the screen, face validity, and format.[33, 42] Twenty-five college freshmen between the ages of 18 and 20 pilot-tested the survey. These students were enrolled in personal health undergraduate courses at the same institution used for primary data collection. A small group of students (N=17) was invited to complete the survey in the presence of the researcher. They were provided with a computer and the URL for the survey. Much like the expert panel, the students were asked to review the survey format, navigability, readability on the screen and face validity. In addition, students were asked to complete the survey. Completion rates, readability and how long it took to complete the instrument were also assessed. Students were also asked to provide comments regarding the modified formats of the instrument (e.g., are response options clear, are you able to differentiate

between mother and father when completing the PAQ).

Data Analysis

Univariate and bivariate descriptive statistics were used to summarize the demographic data. Multiple regression analysis assisted in determining the relationship between parenting style and eating practices, and determining whether student gender or parental gender was an effect modifier for the association between parenting style and eating practices. Analyses were carried out using SAS v.8.2.[43]

RESULTS

Overall, 291 freshmen voluntarily completed the online survey and 264 provided complete data. Of the total number of surveys completed, 27 were eliminated from the dataset for one or more of the following reasons: (1) incomplete survey submission, (2) incomplete data on the Healthy Diet Indicator (HDI) or the Parental Authority Questionnaire (PAQ), (3) indication that the student was not a first semester freshman or a freshman, and (4) indication that the student was not between the ages of 18 and 20. Table 1 summarizes the demographic characteristics of the participating students. Of these 264 students, 70% were female and 66% were 18 years old. Most respondents described themselves as white, non-Hispanic (66%). About two-thirds (67%) of the students classified themselves as a first semester freshman, and 95% indicated that they attended full-time. In addition, 37% reported living on campus and 36% reported living in an apartment or house not with their family. Demographically these results are similar to enrollment at the university, except that females are overrepresented in this sample.

Table 2 presents nutrition-related practices of respondents. Most students (58%) were not enrolled in a university meal plan. Of those not enrolled in a meal plan, 55% reported preparing their own meals. About 55% described themselves as being at "about the right weight" but 58% indicated that they were trying to lose weight. Approximately

Table 1. Demographic and Other Characteristics of Freshmen Respondents

Variable	Frequency	Percent
Gender (*N* = 264)		
Female	184	70
Male	80	30
Age (*N* = 263)		
18 years old	175	66
19 years old	54	21
20 years old	34	13
Ethnicity (*N* = 263)		
American Indian or Alaska Native	0	0
Asian	14	5
Black or African American	41	16
Hispanic or Latino	32	12
Native Hawaiian or Other Pacific Islander	3	1
White, Non-Hispanic	173	66
Year in College (*N* = 264)		
First Semester Freshman	178	67
Freshmen	86	33
Full-time Student (*N* = 264)		
Yes	252	95
No	12	5
Student Residence (*N* = 263)		
College dormitory or residence hall	89	34
Fraternity or sorority house Other university housing	3 4	1 2
Off-campus house or apartment	94	36
Family's house Other	72 1	27 <1
Primary Method of Financial Support (*N* = 264)		
Employment	61	23
Loans	19	7
Parents	128	48
Scholarship	56	21
Number of hours per week students worked for pay (*N* = 263)		
0 hours	102	39
1-9 hours	34	13
10-19 hours	53	20
20-29 hours	45	17
30-39 hours	18	7
40 hours	7	3
More than 40 hours	4	2

Note. Due to rounding, some percents may not equal 100.

Table 2. Frequencies and Percentages of Nutrition-Related Information Variables

Variable	Frequency	Percent
Enrolled in a meal plan (*N* = 263)		
Yes	110	42
No	153	58
Other method of obtaining meals (*N* = 154)		
I usually prepare my own meals	84	55
Someone else in my home usually prepares meals for me	28	18
I usually purchase meals	42	27
Vegetarian (*N* = 261)		
Yes	8	3
No	253	97
Description of Weight (*N* = 263)		
Very underweight	2	<1
Slightly underweight	23	9
About the right weight	145	55
Slightly overweight	81	31
Very overweight	12	5
Concern about Weight (N=264)		
Not concerned	49	19
Somewhat concerned	90	34
Concerned	69	26
Very concerned	56	21
Weight Management (*N* = 264)		
Lose Weight	152	58
Gain Weight	31	12
Stay the same weight	44	17
I am not trying to do anything about my weight	37	14
Ever Received Nutrition Information (*N* = 264)		
Yes, but not this university	154	58
Yes, here at university	57	22
No	53	20
Location of Obtaining Nutrition Information at the University (select more than one)		
In classes	82	–
Residence hall or other campus housing	29	–
Student club or organizations	4	–
Student health center	32	–
Health fair	7	–
Pamphlets, brochures, or newsletter	47	–
College newspapers (i.e., The Oracle)	19	–

Continued

Table 2. Frequencies and Percentages of Nutrition-Related Information Variables

Variable	Frequency	Percent
Informal discussion with friends	40	–
I did not receive any information	154	–
Does information on dieting appear to be correct? (*N* = 264)		
Yes	119	45
No	145	55
Dieted to lose weight or to keep from gaining weight (*N* = 264)		
Yes	136	52
No	128	48

Note. Due to rounding, some percents may not equal 100. Dashes indicate percentages were not calculated.

22% said they had received nutrition information at the university.

When asked about their typical eating practices, 44% stated they currently ate about the same as they did prior to entering college. About 20% stated that they now have healthier diets, and 35% indicated that their diet was less healthy.

In Table 3, means and standard deviations are provided for the number of reported servings consumed per day by respondents for each of the ten indicators that comprise the HDI. The largest number of servings per day was consumed in the grain group (M = 3.10, SD = 3.09). Fish or poultry (M = .62, SD = .92) and peanut butter or cooked dried beans, such as navy, pinto, or kidney beans (M = .23, SD = .29) were the least consumed foods. These results also demonstrate that survey respondents only consumed an average of 1.39 servings of fruits/ fruit juices and an average of 1.23 servings of vegetable/ vegetable juices per day. These averages are well below the national recommendations of 2 servings for fruits and 3 servings of vegetables.[44]

In Table 4, means and standard deviations were calculated for the PAQ. The parenting styles with the highest mean scores were mother's authoritativeness (M = 36.25, SD = 6.29) and father's authoritativeness (M = 35.02, SD = 7.09). Father's permissiveness (M = 22.53, SD = 6.52) had the lowest mean score.

Control variables for the following analyses included age, gender and ethnicity. Independent variables for the following analyses included authoritarian, authoritative and permissive parenting styles. Nutrition-related information variables found to be associated with HDI scores also were included in the model. These variables included concerns about weight (N = 263, H = 10.69, df = 3, P < 0.05), weight management (N = 263, H = 14.46, df = 3, P < 0.01), and eating habits before entering college (N = 263, H = 10.66, df = 2, P < 0.01). Studentized residuals, Hat Diagonal and Cook's Distance statistical procedures were performed to determine whether the sample was unusual with respect to outliers, high leverage and influence.[45] All variables came sufficiently close to meeting the assumptions needed for multivariate analyses.

Perceived parenting style, was not associated with eating practices (F (9, 252) = 3.48, P < .001) (Table 5). Overall, parenting style accounted for less than one percent (R^2 = .069) of the variance in eating practices, represented by the HDI score. However, age (P < 0.01) and eating habits before entering college (P < 0.05) were statistically significant. When parenting style was taken into account, men and women did not differ in their eating practices. Similarly, no statistically significant differences were detected between maternal and paternal parenting styles and freshmen eating practices. The absence of statistical significance was sustained when examined separately for men and women in the sample.

Qualitative Findings

Participants were asked one open-ended question, "How do you think your parents have influenced your eating behavior?" Altogether, 205 students (139 women, 66 men) responded. Analysis for themes was performed using open coding. Approximately 116 students (73 women and 43 men) commented on how their parents positively influenced their food choices and eating practices. Overall, respondents generally believed their mothers positively influenced their eating practices, usually through the preparation of balanced meals. Additionally, some respondents mentioned that parents would talk to them about healthy foods they should consume and encouraged them to eat sweets, sodas and fast foods in moderation. Some respondents indicated that parents were strict in encouraging them to eat healthy, whereas others stated that parents were role models for eating healthy and credited them for instilling good eating practices. Pertinent representative remarks by students included:

> *"I think that my parents have each greatly influenced the eating behavior in our household. My mom has always cooked meals with many strong vegetables and lots of healthy choices. She has always been against lots of sugar and caffeine. I believe that ultimately played a role on my*

Table 3. Means and Standard Deviations for Consumption within Each Food Group by Number of Servings per Day (*N* = 264)

Reported Servings per day of:	M	SD	Min	Max
Bread, rolls, or other grain foods	3.10	3.09	0	30
Beef, pork, hot dogs, lunch meats, or eggs	1.62	1.81	0	15
Milk or yogurt	1.45	1.80	0	15
Fruit or fruit juice (including fresh, canned, frozen, or dried)	1.39	1.51	0	10
Sweets, (including cakes, pies, doughnuts, cookies, or candy bars)	1.38	2.22	0	21
Vegetables or vegetable juice (including fresh, canned, frozen, or dried)	1.23	1.29	0	8
Snack foods, such as crackers, chips, or nuts	1.23	1.90	0	25
Cheese	1.04	1.41	0	15
Fish or poultry	.62	.92	0	10
Peanut butter or cooked dried beans (including navy, pinto, or kidney beans)	.23	.29	0	1.7

Table 4. Means and Standard Deviations for Response to the PAQ

Parenting Styles	M (*N* = 264)	SD	Min	Max
Mother's authoritarianism	33.49	7.43	10	50
Father's authoritarianism	34.93	7.78	10	50
Mother's authoritativeness	36.25	6.29	10	50
Father's authoritativeness	35.02	7.09	10	50
Mother's permissiveness	23.29	6.27	8	40
Father's permissiveness	22.53	6.52	8	40

diet growing up and helped instill healthy habits now." (White Female)

"*I think that they did an excellent job of preparing different meals for us. We could then decide which foods we liked. I like maintaining a healthy body so I watch what I eat a little bit, but my parents are really the ones that instilled good eating habits in me.*" (White Male)

Thirty respondents (20 women and 10 men) also stated that their parents negatively influenced their eating behaviors. Negative influences included overweight parents, lack of encouragement for healthy eating from parents, parents who dieted regularly, lack of healthy foods in the home, and not eating meals as a family. Some representative comments included:

"*Both of my parents are overweight, but they are actively trying to lose weight, my motivation to eating healthy and exercising often is so I will not grow up to be as overweight as my parents.*" (White Male)

"*My family and I never really ate together. We were all so busy we just kind of ate when we could.*" (White Female)

"*My mom may have taught me bad eating habits with her greasy, high-cholesterol southern cooking…*" (White Female)

"*My mother influenced my eating behaviors greatly. She and I are overweight. When she would work, I would eat anything that was around in the house that I didn't need to cook.*" (Hispanic Female)

"*I do believe my parent had influenced my eating behavior by simply allowing me to eat the things that weren't good for me. My parent didn't monitor the type of foods I was eating at all times. Children need a balanced diet so that they can have the nutrients their body needs in order to grow…My parent influenced my eating behavior by not continuing to make sure that me and my sibling ate the well balanced meals daily in our young lives.*" (African American Female)

Three respondents (2 women and 1 man) believed their respective fathers spoiled them with sweets.

"*My father on the other hand gave desert with every meal, and encouraged me to eat until I was full.*" (White Female)

Fourteen respondents (8 women and 6 men) were adamant that their parents did not influence their eating behaviors. Responses were as simple as "no" and "not at all."

DISCUSSION

Despite hypotheses and some previous evidence of an association between parenting style and eating practices,[11, 25] bivariate correlations and multiple regression results indicated no long lasting relationship in this sample of college freshmen. Parenting style accounted for less than one percent of the variance in eating practices. In previous studies, where moderate relationships were found, the study samples were considerably younger (e.g., elementary and middle school-aged children).[11, 20, 24-28] If parenting style does influence eating in children and youth, the present study found little evidence of any latent effects of this phenomenon once they have entered college.

This study and others continue to suggest that by the later years of adolescence, the recommended pattern for fruit and vegetable consumption is sub-optimal.[3, 4, 10, 46, 47] Mean scores for saturated fat, total fat, cholesterol and sodium consumption, all of which were far from nutritional recommendations, may be a reflection of the types of foods most available to and accessible to college students, especially in their first year. A study with college freshmen and sophomores found that 54% of students consumed three or more fried foods and 50% of students consumed three or more high-fat fast foods during a one-week period.[48] Poor eating practices such as these have been associated with coronary heart disease, some cancers, stroke, type 2 diabetes, and obesity.[49, 50] The results of this study suggest that college students are placing themselves at risk for diminished health in later adulthood.[49, 50]

Neumark-Sztainer et al.[10] suggest that youth view parent-child relationships as one of the strongest factors that influence their food choices. Responses to the open-ended question support their findings. These college students revealed that, in general, parents have influenced their eating behavior positively by providing a healthy food environment, having conversations about healthy eating, and serving as good role models.

Results of this study provide further evidence that adolescents and young adults do not consume the recommended number of daily servings of nutritious foods. These findings indicated that most students did not receive nutrition information at college. The university experience courses and related curricular and extracurricular activities might be appropriate venues to incorporate nutrition education. Additionally, residence halls can provide opportunities for learning about healthy eating. Health education about healthy eating can reinforce the practice for freshmen who eat properly, while also discouraging improper or unhealthy eating habits among those who do not.

The challenges faced in this study, although not unique, provide a breadth of opportunity for future researchers. Measurement of overall eating behavior among individuals has been and continues to be difficult. The HDI captured the overall quality of food choices and eating practices of these college students. Compared to the findings of the original study with an older population, only slight variations were found. This consistency suggests that the instrument is an appropriate tool for use with college-aged students. However, it may be advantageous for future studies to assess the association between eating practices and parenting style by focusing on individual food groups (i.e., fruits, vegetable, grains, meats and dairy) as opposed to overall eating practices, as Kremers et al.[25] suggested in their study on fruit consumption.[25] Future findings may reveal that parenting style is primarily associated with fruit and vegetable consumption, a possibility suggested by previous research. Alternatively, it may be beneficial to assess eating behavior more holistically. For example, in addition to food consumption, an examination of other behaviors like snacking, meal times and regular meal patterns may be necessary to assess food choices and eating practices more completely. Future research on food-specific parenting practices, as suggested by the qualitative findings of this study, may also shed some light on understanding the eating practices of adolescents.

Table 5. The Effect of Overall Parenting Style on the HDI

	Beta	*P*-value
Control Variables		
Age	.19	<0 .001
Gender	.01	0.88
Ethnicity	-.02	0.74
Nutrition Information Variables		
Concern about weight	.10	0.16
Weight management	-.12	0.08
Eating habits before entering college	.13	0.02
Independent Variables		
Authoritarianism	.07	0.32
Authoritativeness	.02	0.81
Permissiveness	.01	0.86
Model Summary		
Adjusted R-Squared		0.08
F-statistic		3.48
P-value		< .001

In this study, the PAQ demonstrated excellent internal consistency. Although the PAQ has been used widely, it has never before been paired with food consumption. Future studies should consider using an instrument that assesses parenting style as it relates to food consumption.

The two primary variables of interest in this study also depended heavily on the recall of the respondent and their self-report. This study consisted of persons in late adolescence reporting their perceptions of parental behavior that may be different from actual parental behavior. In addition, recall bias related to earlier life eating behaviors may have affected study outcomes. The ability and accuracy of the participant to recall these behaviors may have been limited. A review of literature revealed that youth are likely to underreport food intake when using food frequency questionnaires.[51] Triangulation of data from different sources, such as parents and direct observation, may provide more valid data.

Finally, there is limited generalizability beyond college freshmen enrolled in university experience classes. These findings are not generalizable to ethnic minorities and non-college students. Moreover, the sample size was relatively small and participants were volunteers recruited through convenience sampling. Additionally, the study used a cross-sectional research design that provided only a snapshot of the relationship between parenting style and eating practices.

These limitations notwithstanding, this study is the first to explore the association between parenting style and eating practices with persons in this age group. Most studies that have looked at parenting style have examined it in the context of preschool and early adolescence. However, few studies of eating practices have examined the college population, and none has reported on parenting style as an influence on eating practices of college-aged youth.[38] This study extends beyond childhood and early adolescence, into late adolescence and young adulthood to examine the latent effects of parenting style on health risk behaviors, specifically eating practices.

A further strength of this study is that it utilized the Internet to administer a health-related survey. The use of Internet surveys to collect health information continues to gain popularity.[33, 52] Internet surveys can minimize errors associated with data entry by researchers and their assistants. Internet surveys are an ideal method for conducting survey research with college students.[36, 53] However, challenges exist in recruiting students to complete the survey. College students are inundated with Internet "spam" on a daily basis. Thus, it is beneficial to have a "champion" (e.g., course instructor, peer) for the survey that students trust.

TRANSLATION TO HEALTH EDUCATION PRACTICE

The current Internet-based study extends previous research by examining the association between college freshmen's eating practices and their perceptions of parenting style. Parental influences on healthy food behaviors does not appear to have a latent effect once adolescents move away from home and have greater freedom to select the foods they eat. Nevertheless, responses to an open-ended question suggested that some students believed that parents had positively influenced their current eating behaviors. This suggests a potentially greater influence from socio-ecological factors.[41] This study focused solely on the influence of parents, yet roommates, classmates, and friends in the college environment may influence eating practices. The fact that only 27% of study participants lived at home with their parents supports the notion that these other influences may overshadow any long lasting effect that parents may have had during formative years. Moreover, economic factors may affect food choices as some high nutrient foods, including fresh fruits and vegetables, may cost more than some of the other lower nutrient food items against which they compete. At the organizational and community levels, food outlets on college campuses and in the surrounding areas may have an impact on food choices and eating practices. These findings suggest that despite positive parental influences, as it relates to health eating, continued reinforcement at the individual (e.g., skill enhancement with regard to menu planning and meal preparation), interpersonal (e.g., role modeling of healthy eating practices among peers), community (e.g., establishing community farmers' markets) and organizational (e.g., increased access to healthy food options in school cafeterias) levels is needed to impact healthy food choices among adolescents entering into new phases of their lives.

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