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Social Norms and Dietary Behaviors Among Young Adults

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Abstract

Objective—To examine associations between young adults' dietary behaviors and perceived social norms for healthy eating.

Methods—Cross-sectional survey of 1000 diverse college students. Associations between perceived behaviors of family, friends, and significant other and participants' dietary behaviors were examined using t-tests and linear regressions.

Results—Young adults consumed more fast food if they perceived that their family, friends, or significant other did so ($p < .003$). Sugar-sweetened beverage consumption was associated with perceived consumption by family and friends ($p < .034$). Fruit and vegetable consumption and dinner preparation were associated with perceived behavior of friends only ($p < .001$).

Conclusions—Young adults' dietary behaviors appear to reflect their perceptions of normative behavior, particularly among friends.

Keywords

young adults; nutrition; social norms; dietary behaviors

Young adulthood is a unique developmental period during which many health behaviors are formed.¹ Unfortunately, young adults exhibit some of the poorest dietary patterns of all age groups, marked by low consumption of fruits and vegetables² and high consumption of fast food and sugar-sweetened beverages.³⁻⁵ These behaviors, together with declining rates of physical activity, put young adults at increased risk of unhealthy weight gain.¹ Few nutrition- and weight-related interventions are tailored to the needs of young adults⁶; thus, research is needed on the factors that contribute to dietary behaviors during this period.

Growing evidence indicates that adolescents and young adults tend to have similar dietary patterns as their peers.⁷⁻¹⁰ In addition, descriptive social norms, or perceptions of peer behavior, are theorized to influence behavioral intentions and health behaviors,¹¹⁻¹⁴

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Human Subjects Statement

The study protocol was approved by the University of Minnesota Institutional Review Board.

Conflict of Interest Statement

The authors report no conflict of interest.

particularly among children, adolescents, and young adults.¹⁴ Regardless of whether perceptions are accurate representations of peer behavior,¹⁵⁻¹⁷ studying the relationship between descriptive social norms and dietary behaviors can provide insight on a potentially modifiable contributor to young adults' diet. Understanding the nature of social norms can inform the design of dietary interventions that specifically target young adults' perceptions as a means of influencing behavior. Although these types of norms-based interventions have been used to address alcohol consumption among young adults,¹⁸⁻²² this approach has not yet been applied to dietary behaviors among this age group.

Studies of adults (mean age 34-52 years) and adolescents have found descriptive social norms to be associated with several weight-related health behaviors, including consumption of fast food, sugar-sweetened beverages, and fruit and vegetables^{15,16,23,24}; overall dietary intake^{13,25}; and physical activity.^{13,23} In contrast, little research has investigated the role of descriptive social norms in shaping young adults' weight-related behaviors, with most research on social norms in this age group focusing on alcohol use.^{12,26-28}

The few studies that have examined weight-related behaviors in young adults found that peer social norms significantly predicted strenuous leisure-time exercise,²⁹ fruit intake,³⁰ and intention to engage in physical activity and healthy eating,³¹ and that parents continue to shape young adults' diet and exercise behaviors years after they leave the home.^{9,32} Berge et al also found that perceptions of significant others' weight-related behaviors and attitudes were associated with young adult females' diet, physical activity, and weight status and young adult males' physical activity.³³

This study adds to the literature on social norms and weight-related behaviors among young adults in 2 ways. First, this study uses data on descriptive social norms for 3 types of social contacts (ie, family, friends, and significant other) and proximity (ie, whether young adults live with each type of social contact) to enable comparisons between different sources of social norms and the strength of the association in more versus less proximal relationships. Second, this study broadly examines dietary intake, including both unhealthy behaviors (consumption of sugar-sweetened beverages and fast food) and healthy behaviors (fruit and vegetable consumption and preparation of meals at home) to examine whether the relationship with social norms is similar across dietary behaviors. All of these behaviors have been consistently linked to overall diet quality and/or health outcomes, particularly among adolescents and young adults.³⁴⁻³⁸

The study hypothesis was that social norms would be significantly associated with young adults' dietary behaviors and that this association would be stronger for young adults who live with their social contacts (ie, the effect of family social norms would be stronger for young adults who live with their family).³¹ In addition, friend and significant other social norms were hypothesized to be more strongly associated with young adult dietary behaviors than family social norms, based on findings for social norms related to alcohol use.²⁶

METHODS

Study Design and Participants

The Student Health and Wellness Study was a cross-sectional study of nutrition- and weight-related issues among a large, diverse, convenience sample of students enrolled at a 2-year community college and a large, public 4-year university in the Twin Cities metropolitan area of Minnesota. Between March and May 2010, data collectors approached college students on campus and provided them with "pass codes" to enter a secure online survey assessing diet, physical activity, weight control behaviors, and personal, social, and environmental factors that may influence these behaviors. A team of experts developed the survey, which

included items adapted from previous studies and formative work with young adults. All items were pilot tested with young adults prior to data collection.

The survey took approximately 30 minutes to complete, after which participants had their height, weight, and body composition measured on campus and received a \$50 gift card for their participation. Participants were also entered in a lottery to win an iPod touch® device (Apple, Inc., Cupertino, CA, 2009). The sample included 1,201 participants (598 community college students and 603 public university students). Further details on the online survey design and study population have been described elsewhere.³⁹ The University of Minnesota Institutional Review Board approved the study protocol. All participants provided informed consent prior to participation.

Descriptive Social Norms

Descriptive social norms were measured by participants' responses to a series of questions adapted from Project EAT (Eating Among Teens) that asked, "To what extent does/do your (family, friends, significant other)...(drink sugar-sweetened beverages, eat fast food, eat fruits and vegetables, prepare meals at home)?"^{33,40} Test-retest reliability for the original items in Project EAT ranged from .58 to .79.⁴¹ Responses to each question were collapsed into 2 categories: lower frequency/intake ("not at all" or "a little bit") and regular frequency/intake ("somewhat" or "very much"). Responses of "don't know" were coded as a separate category. Because only 37% of the sample reported having a significant other, an additional category of "no significant other" was created to facilitate analysis of the entire sample.

Living Arrangement

Participants' living arrangements were measured by their response to the question, "With whom do you usually live?", adapted from Project EAT (test-retest reliability = 1.00).⁴¹ Participants were able to select all options that applied, including an option to indicate that they lived alone. Those who responded that they lived with their parents or other family members were coded as living with family (of origin); those living with roommates or friends were coded as living with friends; and those living with their husband or wife, same-sex partner, or significant other were coded as living with a significant other.

Parents living with children (N = 66) and participants who reported living on campus (N = 130) were excluded because these home environments are fundamentally different from those that were of interest to this study. Parenthood may alter young adults' dietary behaviors in profound ways as they become responsible not only for their own diet but that of their children.⁴² Likewise, young adults living on campus have meal patterns that fundamentally differ from other students. In this sample, 85% of those living on campus participated in a university dining plan (compared to 13% among other students) and 41% never prepared their own dinner (compared to 12% among other students) (data not shown). An additional 5 participants were excluded due to missing data on living arrangement.

Dietary Behaviors

Participants self-reported fruit and vegetable intake using the 5 Factor Screener developed by the National Cancer Institute for the 2005 National Health Interview Survey Cancer Control Supplement.⁴³ A summary measure of usual servings of fruits and vegetables per day (excluding french fries) was constructed using validated scoring procedures that provide estimates comparable to 24-hour dietary recalls (Pearson $r = .54-.73$).⁴³

Sugar-sweetened beverage consumption was measured by summing participants' responses to questions asking how often in the past 30 days they drank regular soda, fruit drinks, sports drinks, coffee drinks with added sugar, and other drinks with added sugar (response range:

0-10 drinks/day after removing outliers). Test-retest reliability for these items ranged from .63 to .84.⁴⁴

Frequency of fast food consumption was measured using a question adapted from Project EAT,⁴⁵⁻⁴⁷ “During the past 7 days, how often did you eat a meal at a fast food restaurant (like McDonald’s, Burger King, Hardees, etc.)?” (response options: never, one or 2 times, 3 or 4 times, 5 or 6 times, 7 times or more).

Frequency of preparing meals at home was measured in response to a question asking, “In the past 7 days, how often did you prepare your own dinner?” (response options: never, one or 2 times, 3 or 4 times, 5 or 6 times, 7 times).

Socio-demographic Characteristics

Participants self-reported socio-demographic characteristics, including 2-year or 4-year college student, sex, age, and race/ethnicity. Difficulty living on household income (not at all difficult, somewhat difficult, very difficult, or extremely difficult/impossible) measured financial strain as an indicator of socioeconomic status. These characteristics have been linked to dietary behaviors among young adults in prior research.^{39,48,49}

Analysis

Fruit and vegetable, fast food and sugar-sweetened beverage consumption were square root-transformed prior to analysis due to their right-skewed distribution. Independent sample t-tests were used to compare mean dietary behaviors of young adults who perceived high versus low frequency of each behavior among their family, friends, and significant other. Linear regression was used to assess the association between social norms and each dietary behavior, controlling for socio-demographic characteristics; living arrangement; and family, friend, and significant other social norms simultaneously.

To assess whether living arrangement was an effect modifier of the relationship between social norms and dietary behaviors, independent sample t-tests were used to examine stratified differences (eg, among those living/not living with each social contact) in mean dietary behaviors for each type of social norm. Additionally, interaction terms were examined in linear regression models (eg, equal to 1 if high family consumption of fruits and vegetables and participant lives with family and 0 otherwise) for each behavior and type of social contact.

Living alone was designated as the reference group because it was considered neutral in terms of proximity to different types of social contacts and because this enabled assessment of interactions between living with social contacts and perceived behavior of those contacts. Results were robust to the use of different reference groups (eg, living with family or living with friends).

Observations with missing data were excluded from analysis; sample sizes for each model are presented in the tables. Statistical significance was assessed at $\alpha = .05$. All analyses were conducted using Stata version 10.1 (StataCorp, College Station, TX, 2009).

RESULTS

The final analytical sample included 1000 participants. Participants’ mean age was 21.6 ± 4.4 years, and 50% were female (Table 1). Ninety-five percent of the sample was under 28 years of age. Self-reported racial/ethnic composition was 40% white; 19% black; 29% Asian; and 13% other race/ethnicity (including Hispanic). Four percent of participants lived alone, 62%

lived with family, 21% lived with friends, 9% lived with a significant other, and 4% lived with more than one type of social contact.

Patterns of descriptive social norms varied across the 4 behaviors and the social contacts examined (Table 2). A large majority (84-89%) of young adults reported that their family regularly engaged in healthy dietary behaviors (eating fruits and vegetables and preparing meals at home). Fewer young adults reported that their family regularly consumed sugar-sweetened beverages (47%) and fast food (33%). In contrast, reports of perceived friend behavior varied less across the 4 behaviors, with approximately 60-69% of young adults reporting that their friends regularly engaged in each behavior. Perceptions of significant others' dietary behaviors fell between those of family and friends.

Unadjusted analyses indicated that descriptive social norms were significantly associated with young adults' dietary behaviors (Table 3). Young adults who perceived that their family regularly consumed sugar-sweetened beverages or fast food had significantly higher mean intake of these foods/beverages compared to those who perceived less frequent consumption by family members ($p < .001$). Young adults' fruit and vegetable intake was also .4 servings higher among those who perceived regular family consumption, but this result was not statistically significant ($p = .055$).

Perceived behaviors of friends were associated with all 4 dietary outcomes examined. Young adults consumed .2 more sugar-sweetened beverages per day, .5 more servings of fruits and vegetables per day, and consumed fast food .6 more days per week when they perceived that their friends regularly consumed these foods/beverages ($p < .001$ for each comparison). Participants also prepared their own dinner .8 more days per week when they perceived that their friends regularly prepared their own dinner ($p < .001$).

Similarly, young adults had higher mean intakes of sugar-sweetened beverages ($p = .005$), fast food ($p < .001$), and fruits and vegetables ($p = .01$) if they perceived higher intake by their significant other. Not having a significant other was also associated with greater consumption of these foods/beverages compared to having a significant other with lower perceived intake. Frequency of preparing dinner did not differ by significant other social norms.

Adjusted associations between social norms and participant dietary behaviors were similar to the unadjusted results (Table 4). No evidence of effect modification was found between social norms and living arrangement in stratified analyses or in any of the regression models (data not shown).

In the adjusted models, family social norms were more strongly associated with sugar-sweetened beverage consumption than either friend or significant other norms ($\beta = .16, p < .001$). Family, friend, and significant other norms were each positively associated with fast food consumption ($\beta = .22-.25, p = .002$). Having no significant other yielded an association with one's own fast food intake that was similar to having a significant other that regularly consumes fast food ($\beta = .21, p = .003$). Living arrangement was not associated with either of these dietary behaviors.

Friend social norms were also positively associated with fruit and vegetable consumption ($\beta = .13, p < .001$) and frequency of dinner preparation ($\beta = .51, p < .001$). Living with friends was negatively associated with fruit and vegetable intake, but this result was not significant ($\beta = -.13, p = .093$). In addition, preparing one's own dinner was negatively associated with living with family ($\beta = -.67, p = .011$) and positively associated with living with friends ($\beta = .80, p = .003$).

DISCUSSION

As hypothesized, descriptive social norms of family, friends, and significant others were positively associated with young adults' dietary behaviors (ie, perceiving greater frequency of dietary behaviors among social contacts was related to greater engagement in these behaviors by the respondent). Family social norms were associated with sugar-sweetened beverage and fast food consumption, while friend social norms were associated with all dietary behaviors examined. Significant other social norms were associated only with fast food consumption in adjusted analyses.

In contrast to the study hypothesis, the strength of these associations did not differ by living arrangement, and living arrangement was significantly associated only with preparing one's own dinner (ie, young adults living with their family were less likely to prepare their own dinner and young adults living with their friends were more likely to prepare their own dinner compared to those living alone).

The study findings are consistent with research on adolescents and adults that found significant associations between descriptive social norms and fast food, sugar-sweetened beverage, and fruit and vegetable consumption.^{15,16,23,24} While evidence suggests that social norms exert a stronger influence on health behavior when referencing more proximal social relationships,³¹ a study by Rozin et al found weak influence of cohabitating roommates on college student preferences for food and music.⁵⁰ Living arrangement may therefore not be a good measure of social proximity in this sample (ie, participants did not live with their closest friends); alternatively, participants may have had proximal relationships with their family, friends, and significant others, regardless of living situation.

The associations between family norms and unhealthy dietary behaviors, regardless of whether young adults still live with their family, could suggest tracking of unhealthy dietary behaviors and/or continued influence of parents as adolescents transition into young adulthood.⁹ In fact, longitudinal studies have found that a wide range of dietary behaviors, including fast food consumption, dieting and disordered eating, and preparing meals at home, track from adolescence to young adulthood and are associated with diet quality.^{35,51,52} In the current study, family social norms were not associated with healthy dietary behaviors, perhaps reflecting the powerful influences working against healthy eating for this age group (eg, food and beverage marketing, campus food environments, lack of food preparation skills).^{1,53,54}

This study also found that young adults who lived with their family were less likely to prepare their own dinner, perhaps because their family members prepared dinner for them. Meal preparation among young adults in their early 20s has been linked to better dietary quality in the mid-to-late 20s,³⁵ suggesting that this group of young adults may be an important audience for interventions targeting meal planning and meal preparation skills development. Taken together, these findings indicate that family continues to play a role in shaping young adult dietary behaviors even after young adults move out on their own.

Friend social norms showed the most robust associations with young adults' dietary behaviors in adjusted and unadjusted analyses, suggesting that friends may be the most relevant or influential social group among young adults. This conclusion, consistent with research examining social influences on young adult alcohol use,²⁶ suggests the need to include young adults' friends in nutrition intervention activities. If young adults have accurate perceptions of their social contacts' behaviors, interventions could identify entire friend groups with high-risk dietary behaviors. Targeting intact groups for behavior modification could change group norms and promote social support for behavior change, which both independently predict weight-related health behaviors.²³ Future research should

examine whether targeting groups of friends rather than individuals improves the effectiveness of dietary interventions and whether peer leadership models could successfully build new peer connections, social norms, and support for healthy eating.

While young adults are frequent consumers of fast food and sugar-sweetened beverages, the present participants may have overestimated the extent to which their peers engaged in unhealthy dietary practices.¹⁵⁻¹⁷ Regardless, efforts to create the perception that healthy behaviors are normative may be one way to encourage healthier diets. Messages would need to be phrased creatively in order to emphasize healthy, yet accurate, peer norms. For example, an experiment by Croker et al found that a sample of adults in Britain increased their fruit and vegetable intake after they were told, "Eighty percent of people in Britain try to eat at least 5 portions of fruits and vegetables per day."²⁴ However, results from social norms marketing campaigns around alcohol use have been mixed.¹⁸⁻²² Efforts to change behavior through social norms may require individualized messaging,⁵⁵ attention to injunctive as well as descriptive norms⁵⁶ and/or inclusion within a more comprehensive behavior-change strategy.

Living with friends and having friends who regularly prepare meals both appear to affect young adults' frequency of preparing their own dinner. While this study did not examine whether cohabitating friends were preparing and eating meals together, this behavior presents an interesting topic for future research. Eating family meals and participating in meal preparation is associated with dietary quality among adolescents.⁵⁷⁻⁵⁹ For young adults who no longer live in their family home, the extent to which family meals are substituted by meals prepared and eaten with friends, and the effect of this behavior on cooking skills development and dietary quality, could be a new topic and setting for intervention delivery.

In addition, significant others have previously been found to be protective against unhealthy dietary behaviors, physical inactivity, and unhealthy weight gain, particularly among females.³³ In the present study, this association was found only with fast food consumption in adjusted analyses. About one-third of participants in this study reported having a significant other, but few were cohabitating, and it is not known how long they had been in their relationship at the time of the survey. Future research should examine the role that significant others play in shaping young adults' health behaviors over the course of relationships and relationship transitions.

This analysis has several strengths, including the use of validated dietary assessment methods and the inclusion of a diverse sample of young adult college students. The study is unique in that it examined multiple dietary behaviors and considered descriptive social norms in reference to multiple types of social contacts and living arrangements. Despite these strengths, this analysis is limited by its cross-sectional design and inability to identify the extent to which peer selection and misperception of others' behavior contributed to the observed results. In addition, the dietary screeners used, while validated, provide a more limited view of dietary quality than more comprehensive dietary assessment methods such as 24-hour recalls.⁴³ The generalizability of this study is also limited to young adults who are college students since social norms may operate differently among non-students or college graduates.

Young adults' dietary behaviors appear to reflect their perceptions of normative behavior, particularly among friends. Incorporating norms-based components in dietary interventions may be one way to better tailor interventions to young adults' social context. Targeting existing friend groups for dietary interventions, using a peer leadership model to build new peer connections around healthy behaviors, and teaching meal preparation skills are important areas for future research with this age group. Given the lack of evidence on

successful weight gain prevention among young adults,⁶ more research is needed on intervention content and delivery methods that are appropriate and meaningful to this age group in order to shape healthy habits that can carry into later adulthood.

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Table 1

Demographic Characteristics of Study Sample

	N	Mean (SD)
Age	996	21.6 (4.4)
Student type		%
2-year	531	53.1
4-year	469	46.9
Race		
White	397	39.7
Black	188	18.8
Asian	286	28.6
Other	129	12.9
Sex		
Male	500	50.3
Female	494	49.7
Difficulty living on household income		
Not at all difficult	291	29.2
Somewhat difficult	516	51.7
Very difficult or can barely get by	153	15.3
Extremely difficult or impossible	38	3.8
Living situation		
Alone	43	4.3
With family	615	61.5
With friends	212	21.2
With significant other	89	8.9
More than one type of contact	41	4.1

Table 2
Young Adult Perceptions of Family, Friend, and Significant Other Dietary Behaviors

	N	Not at all/A little bit %	Somewhat/Very much %	Don't Know %
Family's perceived behavior				
Drink sugar-sweetened beverages	985	50.8	46.7	2.5
Eat fast food	986	65.7	32.5	1.8
Eat fruits and vegetables	985	13.5	83.9	2.6
Prepare meals at home	984	9.6	88.7	1.7
Friends' perceived behavior				
Drink sugar-sweetened beverages	981	25.0	69.2	5.8
Eat fast food	985	30.1	64.1	5.9
Eat fruits and vegetables	985	32.6	59.7	7.7
Prepare meals at home	985	33.3	59.8	6.9
Significant other's perceived behavior				
Drink sugar-sweetened beverages	343	46.1	51.6	2.3
Eat fast food	341	52.5	45.2	2.3
Eat fruits and vegetables	342	25.4	71.3	3.2
Prepare meals at home	344	26.5	70.6	2.9

Note. Sample size is smaller for significant other analysis because 659 respondents reported not having a significant other.

Table 3
 Unadjusted Mean Young Adult Dietary Behaviors by Perceived Behaviors of Family, Friends, and Significant Other

	Sugar-sweetened beverages (drinks/day)			Fast food (days/week)			Fruits and vegetables (servings/day)			Prepare own dinner (days/week)		
	Mean	95% CI	N	Mean	95% CI	N	Mean	95% CI	N	Mean	95% CI	N
Family's perceived behavior												
Not at all/A little bit	0.6	(0.57,0.71)	500	0.8	(0.72,0.93)	645	3.3	(2.93,3.68)	123	2.8	(2.45,3.24)	94
Somewhat/Very much	1.1	(1.01,1.25)	456	1.7	(1.46,1.87)	318	3.7	(3.56,3.84)	794	3.0	(2.86,3.14)	862
p-value	<0.001			<0.001			0.055			0.467		
Friends' perceived behavior												
Not at all/A little bit	0.7	(0.56,0.78)	245	0.7	(0.53,0.80)	294	3.3	(3.10,3.51)	307	2.5	(2.31,2.75)	328
Somewhat/Very much	0.9	(0.86,1.03)	676	1.3	(1.21,1.49)	629	3.8	(3.66,4.00)	561	3.3	(3.13,3.47)	580
p-value	<0.001			<0.001			<0.001			<0.001		
Significant other's perceived behavior												
Not at all/A little bit ^a	0.7	(0.53,0.80)	158	0.6	(0.42,0.77)	177	3.2	(2.78,3.57)	82	3.0	(2.52,3.48)	90
Somewhat/Very much	1.0	(0.80,1.11)	176	1.2	(0.98,1.51)	154	3.8	(3.54,4.02)	236	3.3	(3.03,3.55)	240
p-value	0.005			<0.001			0.010			0.292		
Does not have significant other	0.9	(0.80,0.98)	645	1.2	(1.09,1.34)	644	3.6	(3.48,3.81)	615	2.9	(2.70,3.02)	637
p-value	0.008			<0.001			0.033			0.579		

Note. Fruit and vegetable, fast food and sugar-sweetened beverage intake analyzed on square root scale and back-transformed for presentation in table. CI is confidence interval.

^aReference group for both comparisons

Table 4
Regression-adjusted Associations between Perceived Behaviors of Family, Friends, and Significant Other and Young Adult Dietary Behaviors

	Sugar-sweetened beverages		Fast food		Fruit and vegetables		Prepare own dinner					
	β	SE	β	SE	β	SE	β	SE				
Perceived behavior												
Family performs behavior somewhat/very much	0.16	0.04	<0.001	0.24	0.05	<0.001	0.09	0.05	0.085	-0.06	0.22	0.776
Friends perform behavior somewhat/very much	0.09	0.04	0.035	0.22	0.05	<0.001	0.13	0.04	<0.001	0.51	0.14	<0.001
Significant other performs behavior somewhat/very much	0.11	0.06	0.074	0.25	0.08	0.002	0.06	0.07	0.371	-0.03	0.24	0.896
Does not have significant other	0.06	0.06	0.306	0.21	0.07	0.003	0.04	0.07	0.517	0.06	0.23	0.781
Living arrangement												
Lives with family	-0.04	0.07	0.604	0.03	0.09	0.731	-0.06	0.07	0.432	-0.67	0.26	0.011
Lives with friends	-0.02	0.08	0.768	0.01	0.10	0.938	-0.13	0.08	0.093	0.80	0.27	0.003
Lives with significant other	0.00	0.08	0.997	0.04	0.10	0.684	-0.01	0.08	0.866	-0.09	0.27	0.733
Adj. R²	0.15			0.19			0.09			0.19		
N	966			970			937			963		

Note. SE is standard error. Models control for 2-year vs. 4-year student, race, age, sex and difficulty living on household income. Fruit and vegetable, fast food and sugar-sweetened beverage intake analyzed and presented on square root scale.