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Does involvement in food preparation track from adolescence to young adulthood and is it associated with better dietary quality? Findings from a ten-year longitudinal study

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Abstract

Objectives—To examine whether involvement in food preparation tracks over time, between adolescence (15–18 years), emerging adulthood (19–23 years), and the mid-to-late twenties (24–28 years), as well as examine 10-year longitudinal associations between home food preparation, dietary quality and meal patterning.

Design—Population-based, longitudinal cohort study.

Setting—Participants were originally sampled from Minnesota public secondary schools (USA).

Subjects—Participants enrolled in Project EAT (Eating Among Teens)-I, EAT-II, and EAT-III (n=1,321).

Results—Most participants in their mid-to-late twenties reported an enjoyment of cooking (73% of males, 80% of females); however, few prepared meals including vegetables most days of the week (24% males, 41% females). Participants in their mid-to-late twenties who enjoyed cooking were more likely to have engaged in food preparation as adolescents and emerging adults ($p<0.01$); those who frequently prepared meals including vegetables were more likely to have engaged in food preparation as emerging adults ($p<0.001$), but not adolescents. Emerging adult food preparation predicted better dietary quality five years later in the mid-to-late twenties, including higher intakes of fruit, vegetables, dark green/orange vegetables, and less sugar

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sweetened beverage and fast food consumption. Associations between adolescent food preparation and later dietary quality yielded few significant results.

Conclusions—Food preparation behaviors appeared to track over time, and engagement in food preparation during emerging adulthood, but not adolescence, was associated with healthier dietary intake during the mid-to-late twenties. Intervention studies are needed to understand whether promoting healthy food preparation results in improvements in eating patterns during the transition to adulthood.

Keywords

Adolescence; emerging adulthood; dietary intake; food preparation

Background

Obesity and poor dietary intake are major public health concerns [1, 2]. Nearly half of U.S. adults report eating three or more commercially-prepared meals each week[3],and fast food consumption is high [4]. Compared to meals prepared at home, commercially-prepared meals contain more calories, saturated fat, sodium and cholesterol, as well as lower levels of beneficial nutrients like fiber and calcium[5]. Adolescents and young adults are among the most frequent consumers of away-from-home meals, and many adolescents and young adults currently fail to meet national recommendations for health, such as the Dietary Guidelines for Americans[6, 7]. Effective promotion of healthy dietary practices during adolescence and young adulthood is needed, as these are critical life stages during which long-term behavior patterns are beginning to be established and the health behaviors engaged in during these life stages are predictive of long-term disease risk [6].

Previous research indicates that contextually-related factors, including home food environments and home eating behaviors, may have an important impact on youth and adult dietary patterns[8–13]. Cross-sectional findings from Project EAT (Eating Among Teens), a large, diverse cohort of youth, indicates that engaging in home food preparation activities during early-to mid-adolescence (11–18 years of age) and emerging adulthood (19–23 years) is associated with healthier dietary intake[14, 15]. Furthermore, nutrition promotion interventions targeting home food preparation skills are well-received by a wide range of age groups, and may yield changes in nutrition knowledge, attitudes, skills, and some eating behaviors, such as fruit and/or vegetable consumption[16–20].

The adolescent and emerging adult years are viewed as formative periods during which long-term eating behaviors may be adopted and maintained, and consequently influence long-term health[6]. However, little longitudinal research to date has examined the extent to which involvement in food preparation, particularly during adolescence and emerging adulthood, predicts future involvement in food preparation and more healthful dietary intake over time[21]. The current study addresses these gaps in the literature. The first study aim was to examine whether involvement in food preparation activities as an adolescent (ages 15–18 years) was associated with food preparation as an emerging adult (19–23 years), as well as the extent to which these behaviors were associated with food preparation and enjoyment of cooking during the mid-to-late twenties (24–28 years). The second aim was to examine how adolescent and emerging adult home food preparation were associated with dietary quality and meal patterning 5–10 years later, in the mid-to-late twenties.

Methods

Data were drawn from Project EAT-I, -II and -III, a three-wave, population-based study to examine dietary intake and weight-related factors among adolescents and young adults. The

sample for these analyses included 565 males and 756 females who completed surveys at EAT-I (mean age = 15.8 ±0.8 years), EAT-II (20.4±0.8 years), and EAT-III (26.2±0.7 years). For Project EAT-I (Time 1), 31 public junior high and high schools in 3 school districts in the Minneapolis/St. Paul metropolitan area of Minnesota participated in the study. All students enrolled in health, physical education, or science classes were invited to take participate. These classes were chosen in an effort to reach a census of students in each grade served by the school. Participating students completed surveys and height and weight measures during the 1998–1999 academic year[22, 23].

Five years later (2003–2004), for Project EAT-II (Time 2), original participants were mailed follow-up surveys to examine changes in weight behaviors as they progressed through adolescence into emerging adulthood[24, 25]. Project EAT-III (Time 3) was designed to follow-up with participants in 2008–2009 as they progressed through their mid-to-late twenties. At Time 3, participants were mailed survey invitation letters, providing the web address and a unique password for completing the EAT-III survey online and a food frequency questionnaire (FFQ).

The current analysis includes only participants who were in high school at EAT-I, in order capture the unique life changes between mid-adolescence (EAT-I), emerging adulthood (EAT-II) and the mid-to-late twenties (EAT-III). Among high school students in EAT-I, the response rate at Time 2 among those who could be contacted was 68%. Among those who could be contacted at Time 3, the response rate was 68% (53% of the Time 1 high school sample). The University of Minnesota's Institutional Review Board approved all study protocols.

Survey Measures

Food Preparation Practices

Food preparation practices were assessed in all study waves. Additionally, measures were modified over time to assess developmentally appropriate information for the different age groups being assessed.

At Time 1, measures of adolescent involvement in household food tasks were developed for the EAT-I survey[14]. Frequency of helping prepare food for dinner was assessed by asking: "In the past week, how many times did you help prepare food for dinner?" Response categories were never, one or two times, three or four times, five or six times, and seven times.

Five years later, additional survey items were developed for EAT-II and pretested with emerging adults. To assess additional behaviors related to home food preparation that were age-appropriate for emerging adults, participants were asked how often they performed five behaviors over the past 12 months: (a) bought fresh vegetables; (b) wrote a grocery list; (c) prepared a green salad; (d) prepared a dinner with chicken, fish, or vegetables; and (e) prepared an entire dinner for two or more people. Response categories were never, one to two times, four to five times, monthly, weekly, or daily. As in previous research, these items were used to form a summary Food Preparation Frequency Score[15]. To form this score, frequency of each behavior was assigned a score of 1, 2, 3, 4, 5, or 6, such that 1 represented "never" and 6 represented "daily" involvement in preparation. When the scores for each preparation behavior were summed, food-preparation scores ranged from 5 to 30 (with higher scores indicative of more food preparation) and had a Cronbach's alpha of .80.

In EAT-III, participants were asked, "During the past month, how often have you prepared a meal that included vegetables?" with the response categories including never, one time, a

few times, weekly, a few times a week, most days of the week. Participants were also asked the extent to which they agreed with the following statement: "I like to cook" (hereafter referred to as " enjoyment of cooking"). Possible response options were strongly agree (hereafter referred to as "greatly enjoy"), somewhat agree ("somewhat enjoy"), somewhat disagree ("somewhat dislike"), and strongly disagree ("strongly dislike").

Dietary behaviors

Dietary intake

For EAT-III, data dervied from the Willett semi-quantitative food frequency questionnaire (FFQ) (2007 grid form) was used to assess usual past year intake of fruit, vegetables, whole grains, calcium-rich foods, and sugar-sweetened beverages (i.e., sodas, sports drinks, punch, lemonade, sugared ice tea)[26]. Given the heavy empahsis specific types of vegetables in national recommendations for health[27], these data were also used to assess intake of dark green and orange vegetables (i.e., broccoli, carrots, yams/sweet potatoes, dark orange squash, kale, mustard greens, chard, spinach, Romaine or leaf lettuce, bok choy), in addition to participants' total vegetable intake. Daily servings were defined as the equivalent of one-half cup for fruits (excluding fruit juice) and vegetables (excluding French fries), and one ounce for whole grains. A serving of sugar-sweetened beverages was defined as the equivalent of one glass, bottle, or can. The FFQ was also used to assess usual daily intakes of total energy (calories), total fat (percent of total calories), and saturated fat (percent of total calories). Nutrient intakes were determined in 2009 by the Nutrition Questionnaire Service Center at the Harvard School of Public Health using a specially designed database, primarily based on the United States Department of Agriculture's Nutrient Database for Standard Reference (release 19). Previous studies have examined the reliability and validity of intake estimates[28, 29]. A youth form of the FFQ was used to assess dietary intake at EAT-I and EAT-II[30, 31].

Meal frequencies were also assessed using the EAT-I, -II, and -III surveys. Participants were asked: how often they ate breakfast, lunch and dinner during the past week (response categories included never, 1–2 days, 3–4 days, 5–6 days and every day), and how often they ate at a fast-food restaurant (like McDonald's, Burger King, Hardee's, etc.) in the past week (response categories included never, 1–2 times, 3–4 times, 5–6 times, 7 times and ≥7 times).

Covariates

Sex, race/ethnicity, parental employment status and socioeconomic status (SES) were based on self-report on the baseline EAT survey. SES was based primarily on reports of parental educational level, defined by the higher level of either parent during the administration of the EAT-I survey, and has been described in detail elsewhere.[22] In EAT-II, participants reported their current living situation (e.g., living in a college or university residence hall). Participants also reported age, employment status, relationship status, and other demographic characteristics in EAT-III.

Analysis

Descriptive statistics were calculated to examine attitudes towards cooking and involvement in food preparation among young adult men and women at EAT-III as well as relationships between food preparation practices in adolescence (EAT-I) and emerging adulthood (EAT-II). Gender-stratified linear regression models were used to explore whether food preparation practices during adolescence and emerging adulthood were related to food preparation during the mid-to-late twenties (EAT-III). Finally, gender-stratified linear regression models were used to examine 5-year and 10-year longitudinal associations between food preparation practices and outcomes of interest (i.e., dietary intake and meal

frequencies) while controlling for baseline diet. All regression models included young adult age, race/ethnicity, and SES. Models relating to emerging adult food preparation were additionally adjusted for living situations (i.e., living in a residence hall at EAT-II). Models related to adolescent food preparation adjusted for parental employment. Dietary intake outcomes were also adjusted for total energy consumption using the regression approach. When the outcome variable of interest exhibited positive skewness, testing was carried out using the square root transformation. A 95% confidence level was used to interpret the statistical significance of probability tests, corresponding to a P value of <0.05.

Because attrition from the baseline sample did not occur at random, the data were weighted using the response propensity method [32]. The weighting resulted in estimates representative of the demographic make-up of the original school-based sample, thereby allowing results to be more fully generalizable. Specifically, the weighted EAT-III sample was 55.1% white, 15.9% African American, 17.6% Asian, 5.5% Hispanic, 2.2% Native American, and 3.7% mixed or other race/ethnicity. The weighted EAT-III sample is somewhat more diverse than the overall Minnesota population of 25–29 year olds in 2007–2009, which was 80% white, 6% African American, 5% Asian, 4% Hispanic (white), 1% American Indian or Alaskan Native, and 4% other or two or more races[33]. The weighted EAT-III sample was well-distributed across categories of SES: 36.2% low or low-middle, 25.8% middle, and 38.0% upper-middle or high. Analyses were conducted using the Statistical Analysis System (SAS, version 9.1, 2002–2003, SAS Institute, Cary, NC).

Results

Descriptive characteristics

A majority of participants (65% of males, 55% of females) were employed full time at the time of EAT-III. About a fourth (27% of males, 28% of females) were married or living with a domestic partner, while 33% of males and 42% of females were in a committed dating relationship. Approximately one-third reported being parents (30% males, 37% females).

Descriptive characteristics of food preparation behaviors and enjoyment of cooking among participants in their mid-to-late twenties are presented in Table 1. More females (41%) than males (24%) reported that they prepare a meal with vegetables most days of the week. Most male and female participants reported they greatly or somewhat enjoy cooking.

Five-year associations between food preparation during adolescence and emerging adulthood

Food preparation during adolescence (EAT-I) was associated with food preparation in emerging adulthood (EAT-II) (Table 2). Adolescents who helped prepare food for dinner at least 1–2 times per week were more likely to engage in food preparation-related behaviors as emerging adults, such as buying fresh vegetables ($p<0.001$), writing a grocery list ($p<0.001$), preparing a dinner with chicken, fish or vegetables ($p=0.01$), and preparing an entire dinner for two or more people ($p<0.001$). Adolescent food preparation was not associated with preparing a green salad five years later in emerging adulthood.

Longitudinal associations in food preparation behaviors

Associations between food preparation during adolescence and emerging adulthood (EAT-I and II) and food preparation in the mid-to-late twenties (EAT-III) are presented in Table 3. Helping to prepare food for dinner during adolescence was significantly associated with enjoyment of cooking 10 years later among males and females ($p=0.003$ and $p<0.001$, respectively). However, helping to prepare dinner as an adolescent was not significantly

associated with frequency of preparing meals that included vegetables 10 years later. Food preparation in emerging adulthood significantly predicted both liking to cook and more frequent preparation of meals with vegetables five years later for males and females in their mid-to-late twenties ($p<0.001$).

Longitudinal associations between food preparation behaviors dietary patterns

Adjusting for baseline meal patterns, adolescent food preparation did not predict breakfast, lunch, dinner, or fast food frequency during the mid-to-late twenties for either males or females (Table 4.) In contrast, food preparation during emerging adulthood significantly predicted more frequent breakfast and lunch consumption, and less frequent fast food intake among males and females in their mid-to-late twenties ($p<0.05$). For example, with every one standard deviation increase in the emerging adult food preparation frequency score (5.3 units), breakfast frequency increased by 0.24 times/week (0.10 standardized units) among males in their mid-to-late twenties. A five-unit increase in the food preparation frequency score would represent the difference between performing one of the five key food preparation behaviors (e.g., prepared a green salad; prepared a dinner with chicken, fish, or vegetables; etc.) never versus performing the behavior daily, with all other factors being equal.

As shown in Table 5, adolescent food preparation yielded few associations with dietary patterns ten years later. Males who frequently helped prepare food for dinner as adolescents tended to consume fewer vegetables ($\beta=-0.17$, $p<0.001$) when they were in their mid-to-late twenties. Females who frequently helped prepare food for dinner as adolescents tended to consume fewer whole grains ($\beta=-0.09$, $p=0.03$) in their mid-to-late twenties.

Findings indicate more robust associations between food preparation in emerging adulthood and better dietary quality 5 years later. Males with higher food preparation scores in emerging adulthood tended to consume more fruit, vegetables, and dark-green and orange vegetables in their mid-to-late twenties, as well as fewer sugar sweetened beverages ($p\leq0.01$). For example, among males, every one standard deviation increase in the food preparation frequency score was associated with an increase in energy-adjusted intake of fruit of 0.15 servings/day (0.10 standardized units). Females with higher emerging adult food preparation scores consumed more fruit, vegetables, dark-green and orange vegetables, and whole grains, and had lower sugar-sweetened beverage and saturated fat consumption 5 years later ($p<0.01$).

Discussion

More than two-thirds of participants in EAT-III, ages 24–28, reported that they enjoy cooking. Participants who enjoyed cooking in their mid-to-late twenties were significantly more likely to have been engaged in food preparation activities as adolescents (ages 15–18 in EAT-I) and emerging adults (ages 19–23 in EAT-II). However, many young people in their mid-to-late twenties may not be routinely utilizing cooking skills for healthy home food preparation; for example, few of our participants, especially young men, reported preparing a meal that included a vegetable on most days of the week (24% of males, 41% of females). In addition, food preparation during emerging adulthood was associated with better dietary quality during the mid-to-late twenties, including higher intakes of fruit, vegetables, dark-green and orange vegetables, whole grains (females only), lower intakes of sugar-sweetened beverages and saturated fat (females only), more routine consumption of breakfast and lunch, and less frequent consumption of fast food. Although the magnitude of the effect estimates indicated here were not extremely large, the consistency and robustness of these findings point to the potential role of emerging adult food preparation as one of numerous significant factors influencing young adult dietary intake and suggest a need for

nutrition educators to work with emerging adults in building skills around home food preparation and meal planning.

In contrast, our findings on the associations between adolescent food preparation and dietary factors during the mid- to late-twenties were largely null. However, food preparation during adolescence was associated with a *lower* consumption of vegetables (males only) and whole grains (females only) among those in their mid-to-late twenties. Fruit, calcium-rich foods, sugar-sweetened beverages, total fat and saturated fat intake among those in their mid-to-late twenties was not associated with adolescent food preparation. It is possible that adolescents were participating in home food preparation due to a more limited parental involvement and/or presence in the home, factors that could yield independent, negative associations with long-term dietary patterns. Although we were able to control for parental employment in our models examining adolescent food preparation, we were not able to control for other characteristics, such as family structure and/or number of adults living in the household. Such factors may yield an influential role in the relationship between food preparation and dietary intake; for example, adolescents living in single-parent households may help prepare food for dinner more frequently than those living in two-parent households, but may be at additional risk for poor dietary intake later in life due to a variety of socioeconomic and/or family-related factors that are not attributable to home food preparation.

To our knowledge, this study is the first of its kind to examine longitudinal associations between home food preparation and dietary outcomes during the transition from adolescence to young adulthood. Our study utilizes unique data from a large, diverse cohort of youth followed over a decade. Despite these important strengths, a limitation of this study is a lack of consistent measures of food preparation across all three time points. Food preparation measures included in EAT-II (i.e., among emerging adults) were rather robust and included numerous behavioral dimensions, including buying fresh vegetables; writing a grocery list; preparing a green salad; preparing a dinner with chicken, fish, or vegetables; and preparing an entire dinner for two or more people. Together, these dimensions may reflect many important elements of a sustainable behavioral pattern. In contrast, we have a more limited ability to characterize adolescent food preparation (i.e., one survey item on the frequency of helping prepare food for dinner). Although these differences between the EAT-I and EAT-II surveys were developmentally appropriate, it is important to note these differences in interpreting our results. Given that we have only a limited ability to characterize adolescent food preparation, it is possible that our estimates of the association between adolescent food preparation and later dietary intake may be subject to an increased degree of imprecision and error, thus making it less likely that we would be able to detect a significant association if one did exist.

Overall, this study addresses an issue that has not yet been the topic of much rigorous scientific research[21], but may be critical in understanding the determinants of excess weight gain among young adults. Recent findings from Laska et al [34] indicate that establishing healthy mealtimes at home may be particularly challenging for emerging adults; in a study of participants ages 18 to 23 using real-time data collection, approximately half or more of eating occasions occurred alone, while engaging in other activities (e.g., watching television, using a computer), and/or with little to no advanced planning. Although many documented eating occasions among these emerging adults consisted of a wide range of highly processed, energy-dense, convenience products, findings from this research also suggested that more traditional meal settings (i.e., eating with other people in the absence of distractions such as television) resulted in more structured mealtimes and healthier food choices[34]. Thus, promoting more structured and traditional mealtimes may be a valuable component of nutrition promotion among the emerging adult age group, and it may be

important for future research and healthy promotion efforts to target at-home food preparation as an integral factor this healthy, structured mealtime process.

Declines in secondary school-based home economics courses are often cited as a reason for which many young adults lack cooking skills and do not engage in home food preparation[35]. Somewhat surprisingly, recent national survey data indicate that the proportion of U.S. secondary school students enrolled in Family and Consumer Science programs has not changed since the 1950s[36]. However, food preparation and meal planning have traditionally been only one part of the Family and Consumer Science curriculum, and it is very possible that the food-related content of these programs has significantly declined over time. Further research is needed to explore what young people are learning about food preparation, within school and other settings. While it may be important to introduce cooking skills to young people early on in their education, it is also likely that these courses alone are insufficient to equip youth in beginning a life-long habit of healthy home food preparation. Overall, more intensive efforts may be needed to not only help young people develop skills to prepare healthy meals at home, but also to develop an enthusiasm for healthful lifestyle habits over time and better cope with the obesogenic environments in which they live. Efforts to do so need to be targeted not only within schools, but also within family, home and community settings. Although the findings from our study do not indicate that adolescent food preparation is associated with improved dietary intake later in life, our work does provide evidence for tracking of food preparation-related behaviors over time; therefore, engaging adolescents in healthy food preparation may result in better home food preparation habits later on, which in turn may have a positive impact on dietary outcomes.

Overall, rigorous behavioral intervention research is needed to understand how to successfully promote young adult health. Today, most young adults across the US fail to meet the national dietary recommendations for health. For example, data from the 2009 Behavioral Risk Factor Surveillance System indicate that only 20% of 18–24 year olds and 25% of 25–34 year olds consume vegetables three or more times daily[37]. Our findings indicate that most participants in their mid-to-late twenties are not engaged in healthy home food preparation on most days of the week, particularly young men. This is highly consistent with previous research, indicating that young men tend to be particularly disengaged from the process of cooking and/or preparing food at home[14, 15, 38, 39]. It is important that future intervention research explores the ways in which we can more effectively connect young adults, particularly young men, with their food and engage in healthy meal preparation at home in enjoyable ways, as well as exploring the potential dietary impacts of such behavioral changes.

The transition from adolescence to young adulthood is an age of dramatic lifestyle transitions, and an age at which many young people do not engage in healthful behaviors. Our findings suggest that engaging adolescents in food preparation activities may increase the likelihood that they will continue with these activities during the transition out of their parents' homes and into independent lifestyles, but there are also many barriers that may be challenging throughout the transition from adolescence to young adulthood[40]. Effective strategies are needed to aid and support young adults in engaging in healthy diet-related practices, such as frequent healthy home food preparation, during this critical transition period. Our findings suggest that emerging adulthood, rather than adolescence, may be a particularly important period during which healthy lifestyle habits need to be established as part of an individuals' independent lifestyle in order to be adopted in the long-term.

In summarizing the most important food environment changes needed in order to support individuals in meeting the Dietary Guidelines for Americans, the first necessary change cited by the 2010 Dietary Guidelines Advisory Committee was to "improve nutrition

literacy and cooking skills, including safe food handling skills, and empower and motivate the population … to prepare and consume healthy foods at home[41].” Overall, the findings from this study and others suggest that the transition to young adulthood may be an important age for acquiring and reinforcing these skills, and for promoting positive advances to long-term diet-related health outcomes. Additional research is needed to confirm these findings.

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Table 1

Food preparation and enjoyment of cooking among males and females in their mid-to-late twenties (Project EAT-III).

	Males (n=565), %	Females (n=756), %
Frequency of preparing a meal including vegetable(s)		
Never	4.7	3.0
One time	5.9	2.8
A few times	26.3	15.6
Weekly	15.7	12.2
A few times per week	23.6	25.5
Most days	23.9	40.8
Enjoyment of cooking		
Greatly enjoy	39.5	38.9
Somewhat enjoy	33.6	40.6
Somewhat dislike	18.0	13.2
Strongly dislike	8.8	7.3

Table 2

Food preparation behaviors in emerging adulthood (EAT-II) by involvement in food preparation during adolescence (EAT-I).

	Percent of participants who report helping to prepare food for dinner *as adolescents* (in EAT-I)		
% of participants who report engaging in food preparation-related behaviors at least weekly *as emerging adults* (in EAT-II)	***Never* *N=420***	***At least 1–2 times in the past week* *N=892***	***P-value***
Buying fresh vegetables	19.4%	33.9%	<0.001
Writing a grocery list	12.0%	21.4%	<0.001
Preparing a green salad	29.1%	28.5%	0.83
Preparing a dinner with chicken, fish or vegetables	44.9%	52.4%	0.01
Preparing an entire dinner for two or more people	28.5%	41.0%	<0.001

Table 3

Enjoyment of cooking and food preparation practices in the mid-to-late twenties (EAT-III), by food preparation practices five and ten years earlier (EAT-I and EAT-II).

	--Young adulthood (EAT-III)--	
	Enjoyment of cooking	**Frequency of preparing meals that include vegetables**
	Beta (p-value)	***Beta (p-value)***
MALES:		
Adolescence (EAT-I) *: *Frequency of helping to prepare food for dinner*	0.18 (p=0.003)	0.06 (p=0.35)
Emerging adulthood (EAT-II) †: *Food Preparation Frequency Score*	0.38 (p<0.001)	0.37 (p<0.001)
FEMALES:		
Adolescence (EAT-I) *: *Frequency of helping to prepare food for dinner*	0.16 (p<0.001)	0.06 (p=0.14)
Emerging adulthood (EAT-II) †: *Food Preparation Score*	0.24 (p<0.001)	0.33 (p<0.001)

Note: All models adjusted for: age at EAT-III, as well as race/ethnicity and SES at EAT-I.

* Models using EAT-I data were additionally adjusted for parental employment status. Coding of scores for "frequency of helping to prepare food for dinner" ranged from 1–5 (reflecting five possible response options ranging from never to 7 times in the past week).

† Models using EAT-II data were additionally adjusted for living situation (i.e., living in residence hall at the time of EAT-II). Food preparation scores were calculated as the sum of five food preparation frequency items included in the EAT-II survey: buying fresh vegetables; writing a grocery list; preparing a green salad; preparing a dinner with chicken, fish or vegetables; and preparing an entire dinner for two or more people. Scores ranged from 5 to 30 (with higher scores indicative of more food preparation).

Table 4

Adjusted associations between food preparation during adolescence (EAT-I) and emerging adulthood (EAT-II) and meal patterns during the mid-to-late twenties (EAT-III).

	--Young adulthood (EAT-III) --			
	Breakfast (times/week)	**Lunch (times/week)**	**Dinner (times/week)**	**Fast food (times/week)**
	Beta (p-value)	***Beta (p-value)***	***Beta (p-value)***	***Beta (p-value)***
MALES:				
Adolescence (EAT-I) [*]: *Frequency of helping to prepare food for dinner*	−0.05 (p=0.33)	−0.03 (p=0.61)	−0.10 (p=0.06)	−0.005 (p=0.94)
Emerging adulthood (EAT-II) [†]: *Food Preparation Frequency Score*	0.10 (p=0.03)	0.09 (p=0.05)	0.03 (p=0.44)	−0.14 (p=0.01)
FEMALES:				
Adolescence (EAT-I) [*]: *Frequency of helping to prepare food for dinner*	−0.02 (p=0.66)	0.01 (p=0.79)	0.0004 (p=0.99)	−0.03 (p=0.38)
Emerging adulthood (EAT-II) [†]: *Food Preparation Frequency Score*	0.11 (p=0.007)	0.10 (p=0.01)	−0.01 (p=0.77)	−0.09 (p=0.01)

All models adjusted for: age at EAT-III, as well as race/ethnicity, SES, and baseline dietary variables (i.e., meal patterns).

[*] Models using EAT-I data were additionally adjusted for parental employment status. Coding of scores for “frequency of helping to prepare food for dinner” ranged from 1–5 (reflecting five possible response options ranging from never to 7 times in the past week).

[†] Models using EAT-II data were additionally adjusted for living situation (i.e., living in residence hall at the time of EAT-II). Food preparation scores were calculated as the sum of five food preparation frequency items included in the EAT-II survey: buying fresh vegetables; writing a grocery list; preparing a green salad; preparing a dinner with chicken, fish or vegetables; and preparing an entire dinner for two or more people. Scores ranged from 5 to 30 (with higher scores indicative of more food preparation).

Table 5

Adjusted associations between food preparation during adolescence (EAT-I) and emerging adulthood (EAT-II) and dietary intake during the mid-to-late twenties (EAT-III).

	--Young adulthood (EAT-III) --							
	Fruit (servings/day)	***Vege- tables (servings/day)***	***Dark green and orange vegetables (servings/day)***	***Calcium- rich foods (servings/ day)***	***Whole grains (servings/day)***	***Sugar- sweetened drinks (servings/ day)***	***% fat***	***% saturated fat***
	-- Beta (p-value) --							
MALES:								
Adolescence (EAT-I) [*]: *Frequency of helping to prepare food for dinner*	−0.03 (p=.52)	−0.17 (p<.001)	−0.04 (p=.35)	0.06 (p=.23)	0.03 (p=.57)	0.01 (p=.81)	−0.005 (p=.92)	−0.02 (p=.70)
Emerging adulthood (EAT-II) [†]: *Food Preparation Frequency Score*	0.10 (p<.001)	0.12 (p=.003)	0.14 (p<.001)	−0.03 (p=.57)	0.08 (p=.08)	−0.13 (p=.01)	0.04 (p=.35)	0.004 (p=.93)
FEMALES:								
Adolescence (EAT-I) [*]: *Frequency of helping to prepare food for dinner*	0.07 (p=.06)	−0.05 (p=.22)	−0.06 (p=.18)	−0.03 (p=.41)	−0.09 (p=.03)	0.02 (p=.54)	−0.03 (p=.43)	−0.03 (p=.46)
Emerging adulthood (EAT-II) [†]: *Food Preparation Frequency Score*	0.18 (p<.001)	0.20 (p<.001)	0.19 (p<.001)	−0.03 (p=.47)	0.11 (p=.003)	−0.16 (p<.001)	−0.04 (p=.36)	−0.12 (p=.007)

All models adjusted for: age at EAT-III, as well as race/ethnicity, SES, and baseline dietary variables (i.e., dietary intake).

[*] Models using EAT-I data were additionally adjusted for parental employment status. Coding of scores for "frequency of helping to prepare food for dinner" ranged from 1–5 (reflecting five possible response options ranging from never to 7 times in the past week).

[†] Models using EAT-II data were additionally adjusted for living situation (i.e., living in residence hall at the time of EAT-II). Food preparation scores were calculated as the sum of five food preparation frequency items included in the EAT-II survey: buying fresh vegetables; writing a grocery list; preparing a green salad; preparing a dinner with chicken, fish or vegetables; preparing an entire dinner for two or more people. Scores ranged from 5 to 30 (with higher scores indicative of more food preparation).