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Identifying Correlates of Young Adults' Weight Behavior: Survey Development

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Abstract

Objective—To describe the development and psychometric properties of survey measures relevant to eating, physical activity, and weight-related behaviors among young adults.

Methods—Focus groups and reliability testing guided the development of the Project EAT-III survey. The final survey was completed by 2,287 young adults.

Results—The systematic process employed led to a psychometrically sound and developmentally appropriate survey. Test-retest reliabilities for items included on the final survey were mostly moderate to good and Cronbach's alphas were >0.7 for 83% of developed scales.

Conclusions—Future studies may find the systematic process used to be helpful in creating other weight-related surveys.

Keywords

survey development; young adults; nutrition; physical activity; dieting

INTRODUCTION

Young adulthood (18–31 years) is a high risk period for the development of obesity and an important time for establishing long-term eating and physical activity behavior patterns.[1] Consuming a nutrient-dense diet and maintaining an active lifestyle consistent with current recommendations can help to protect individuals against excess weight gain and reduce future risk for chronic disease.[2, 3] Despite the importance of these lifestyle behaviors, the majority of young adults consume less than the recommended amounts of whole grains, fruit, vegetables, and calcium, and excessive amounts of sugar-sweetened beverages and high-fat, high-sodium foods.[4, 5] Of concern, short-term diets and extreme methods of weight control (e.g., taking diet pills, purging) are often reported by young adults who are dissatisfied with their body weight or shape.[6, 7] Approximately 30% of young adults do not engage in the recommended amount of moderate and vigorous physical activity.[8]

Although eating and activity behaviors are formed in childhood and adolescence, these behaviors continue to evolve during young adulthood as individuals broaden their social networks, leave their parents' home to establish independent living arrangements, assume greater autonomy in decision-making, continue the process of identity exploration, and take on new responsibilities.[9] Recent reviews of the scientific literature have found there is a paucity of research on young adults and have called for a national health agenda to address the unique contextual influences on behavior during this life stage.[1, 10] There is a need for

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research designed to build a greater understanding of how eating, physical activity, and weight-related behaviors change during young adulthood and the factors that influence these behaviors so that effective programs and services can be designed.[1] A number of surveys have been developed to assess health behaviors among young adults;[11–17] however, prior surveys have not comprehensively examined determinants of weight-related behaviors. Most health behavior surveys of young adults have been used exclusively to examine the behaviors of postsecondary students and very few surveys have been designed to understand the behaviors of non-students or diverse groups in their later twenties.

This article describes the development of a survey to assess potential influences on eating, physical activity, and weight-related behaviors in a population-based sample of diverse young adults. The process of survey development for Project EAT (Eating and Activity in Teens and Young Adults)-III was informed by an ecological framework[18, 19] in conjunction with Social Cognitive Theory (SCT),[20] findings from previous study waves (Projects EAT-I and EAT-II), an in-depth literature review, and focus groups with young adults. Piloting for readability and reliability was additionally conducted, and the final survey was formatted for data collection online and by mail. Given the time-intensive nature of this systematic process and its potential relevance for other researchers, this article describes the survey development process and the psychometric properties of measures included in the final survey.

METHODS

The Project EAT Study

Project EAT-III is the third wave of a 10-year longitudinal study, examining dietary intake, physical activity, weight control behaviors, weight status, and factors associated with these outcomes among young people. In Project EAT-I, 4,746 junior and senior high school students at 31 public schools in the Minneapolis/St. Paul metropolitan area of Minnesota completed surveys and anthropometric measures during the 1998–1999 academic year.[21, 22] Five years later (2003–2004), for Project EAT-II, original participants were mailed follow-up surveys to examine changes in their eating patterns, weight control behaviors, and weight status as they progressed through adolescence.[7, 23] Project EAT-III was designed to assess participants again in 2008–2009 as they progressed from adolescence to young adulthood and through their twenties. In addition, the aims of Project EAT-III added physical activity as a main outcome.

Survey Development

The survey development process for Project EAT-III is outlined in Figure 1. Project EAT-I and Project EAT-II were guided by SCT, and focused on socio-environmental, personal, and behavioral determinants of dietary intake and other weight-related behaviors. SCT provides a helpful and practical framework for designing interventions;[20] however, a growing body of research that addresses influences on weight status and related behaviors indicates it is important to consider not only the characteristics of individuals and their families, but also to examine characteristics of broader environments.[24–26] Thus, an ecological perspective was integrated with SCT for Project EAT-III to direct more attention toward the multiple physical and social environments (neighborhood, home, workplace, friends/family) that potentially influence behavior.[18, 19] An expanded initial list of topics for the Project EAT-III survey was constructed using an ecological framework developed by the research team (Figure 2), an in-depth literature review, and focus groups with young adults (see description of formative focus group procedures and sample below). To help ensure content validity, the framework was reviewed by the research team and other experts in nutrition, physical activity, body image, family relations, and urban design at each stage of survey revisions.

Suitable measures were identified for assessing the initial list of topics by searching the literature and reviewing other surveys of youth that focused on health and weight-related behaviors. To allow for consistency in conducting longitudinal analyses, measures of previously examined topics were drawn from Project EAT-I and Project EAT-II surveys if they were developmentally appropriate. Items were also generated by the research team when suitable measures were not found in the scientific literature. When a draft survey was complete, the measures were pilot tested by young adults in focus groups to determine the time required to complete them and to examine their understandability and relevance (see description of survey pilot testing procedures and sample below). Feedback from these groups was used to reword or eliminate problematic survey measures and expand on topic areas of perceived importance prior to additional pilot testing.

The revised survey was pilot tested with a larger group of young adults to examine test-retest reliability and the internal consistency of scales (see description of test-retest reliability testing procedures and sample below). The results were used to further refine the wording of measures and to inform decisions about reducing the overall length of the survey. The measures were finalized and the survey was formatted for data collection online and by mail. Additional pretesting of the online survey was completed by a convenience sample of young adults and the research team to check usability. All procedures involving human subjects and the piloted survey measures were approved by the University of Minnesota's Institutional Review Board.

Study procedures and sample

A total of 42 young adults participated in the formative and survey pilot testing focus groups. Focus group participants were diverse in terms of gender (31% male), age (20–30 years), race (50% white), student status (52% students) and employment status (48% employed full-time). An additional sample of 66 young adults participated in test-retest reliability testing and 15 young adults helped to pretest the online survey prior to fielding in the longitudinal sample (n=2,287 respondents). All participants were compensated for their time with a gift card for a local store.

Formative focus groups—Three 90-minute focus groups were conducted. Participants (n=15) ages 25–30 years were recruited from the Minneapolis/St. Paul metropolitan area by posting fliers on college/university/trade school campuses and in public libraries, coffee shops, restaurants, and grocery stores. The moderator used a question guide (see Appendix for key questions) developed by the Project EAT research team to ask young adults about perceived influences on weight-related behaviors in their neighborhoods, homes, and workplaces. In addition, several questions were asked regarding how the importance of different environmental and individual factors having an influence on weight-related behaviors had changed between early young adulthood (late teens and early twenties) and middle young adulthood (mid to later twenties).

Survey pilot testing—Four focus groups were conducted with young adults (n=27) ages 20–29 years. Young adults were recruited to participate by posting fliers around the University of Minnesota campus and surrounding neighborhoods, and by making an announcement in a graduate-level Public Health Nutrition course. Pilot test participants were asked to complete the first draft version of the Project EAT-III survey, noting any comments, questions, or concerns in the margins of their survey. When all participants had completed the survey, the moderators reviewed the Project EAT-III survey page by page and invited comments about each group of items. Participants were also asked to comment on the overall content of the survey and the plan for data collection.

Test-retest reliability testing—Three walk-in sessions were held to recruit participants at an urban public library and on the University of Minnesota campus. Participants (n=66, 33% male, 79% white, 20 to 29 years) were recruited by posting fliers around the campus and in local businesses. The fliers indicated the dates, times, and locations of the sessions so that young adults could select a time to participate without scheduling an appointment. A total of 40 young adults completed the test survey at a walk-in session and provided their address for completion of the retest survey by mail. Additional participants (n=26) were recruited by word of mouth and completed both surveys by mail. All but two of the young adults who completed a test survey (97%) also completed and returned the retest survey by mail within one to three weeks.

Online survey pilot testing—Young adults (n=15) were sent an invitation by e-mail or U.S. mail to pretest the online survey. The invitation included a website address for the survey and a unique seven-character password. Suggested changes were collected via an online comment box at the end of the survey.

Longitudinal survey administration—Project EAT-I participants were invited by U.S. mail to participate in the 10-year follow-up survey. Follow-up survey data were collected between November 2008 and October 2009 from 66% of those for whom contact information was available (n=2,287 of 3,442), representing 48% of the original cohort. The sample for the current study consisted of 1,030 males and 1,257 females who completed at least 25% of the Project EAT-III survey; the majority of online (n=1970 of 1979) and paper surveys (n=280 of 308) were at least 90% complete. Respondents were diverse in terms of race/ethnicity (64% white), socioeconomic status (28% low or low-middle), student status (33% students), and employment status (55% employed full-time). Approximately 30% of respondents were aged 20 to 25 years and 70% were aged 26–31 years. The amount of time required to complete the 10-year follow-up survey was collected via the online form among respondents who fully completed the survey.

Statistical Analyses

Audio recordings were used to produce unabridged transcripts of the formative focus groups. Full transcripts or a summary of themes were reviewed by all members of the research team in refining the ecological framework that guided survey development. Item analysis was conducted for each measure that was piloted for test-retest reliability, including an examination of descriptive statistics (ranges, frequencies, means, and standard deviations) and response distribution patterns, to identify potential problems with wording and variability in response. Test-retest correlations (Pearson correlations for interval variables and Spearman correlations for ordinal variables) or percent agreement (for nominal variables) were additionally computed for each piloted measure to examine reliability over time. Cronbach's alpha, item-total correlations, and inter-item correlations were computed for each developed scale to assess the internal consistency of multi-item scales in the test-retest pilot sample and among Project EAT participants that responded to the 2008–2009 survey. A Cronbach's alpha of >0.7 is considered an indicator of good to excellent internal-consistency.[27] Key findings are described here.

RESULTS

Formative Focus Groups and Survey Pilot Testing

The formative and pilot-test focus group findings provided insights pertinent to the plan for survey administration and informed the content of the final survey. Participants recommended providing an option to complete the survey online. Most felt they would be more likely to complete the full survey and return it in a timely way if they could go to a

secure website to respond. In addition, young adults involved in survey pilot testing provided assistance with refining the phrasing of items and response options to better capture the diversity of life experience and numerous transitions that occur during young adulthood.

Young adults involved in the formative focus groups confirmed the current relevance of hypothesized influences on weight-related behavior that were identified through the initial literature review, and further provided information on several specific physical and social environmental factors that impact behavior. For example, the facilities available in the workplace (e.g., microwave, kitchen sink, exercise equipment, showers) and the surrounding neighborhood (e.g., fast-food restaurants, fitness centers) were discussed in terms of their influence on eating and physical activity behaviors. Having a romantic partner was also noted as an important influence on eating behavior: *"I mean I have a boyfriend now that's serious. I cook for him a lot more than if it were just me.…When there's somebody else there it makes it easier for me to plan and buy healthy stuff."* In responding to how the importance of financial constraints changed between early and middle young adulthood, one participant said, *"I worry more about money even though I have more because I know that the money I have, a large chunk of it, has to go to things I don't actually want to pay for…each meal I eat out is money that doesn't go into my savings for other things."* Based on these comments and other insights, the research team expanded sections of the survey relating to the workplace environment, significant others, friends, and financial concerns.

Item Reduction

To limit response burden and ensure a higher response rate, a survey requiring no more than 40 minutes to complete was desired. Based on the results of pilot testing and item analysis, the survey form piloted for test-retest reliability was reduced in length from 398 to 355 items. Respondents to the 10-year follow-up survey required an average of 36 minutes (standard deviation = 39 minutes) to fully complete the final version of the Project EAT-III survey online. Items were generally deleted if the test-retest reliability was found to be poor (<0.4); however, some items with low reliabilities were retained if it was reasonable to expect that responses would vary over the course of a few weeks (e.g., the perception of being too busy to eat healthy foods, the amount of time spent doing physical work in and around one's residence during the current season). Scales were shortened if deleting certain items did not reduce the Cronbach's alpha or compromise content validity. Due the longitudinal nature of the study, theoretically important scales that had been included on surveys at earlier time points were retained intact. Decisions about eliminating items were also based on feedback from the survey pilot-test focus groups and assuring opportunities to compare the responses of Project EAT-III participants to young adult participants in other survey research. The final survey included a small number of items that were added (n=5) or revised (n=11) following test-retest piloting.

Psychometric Properties of Final Survey Items

Test-retest reliabilities for items included on the final survey were mostly moderate to good; 43% of computed correlations were >0.7 and 55% ranged from 0.4 to 0.7 (range: r = 0.24–1.00). For items assessed by percent agreement, all of the test-retest reliabilities were >0.7. Cronbach's alphas were >0.7 for 83% of proposed scales. Full psychometric data for the Project EAT-III survey are available online at http://www.sph.umn.edu/eat. Table 1 presents psychometric properties for selected items, which are also described below. The items highlighted here were selected to represent the range of topics included on the Project EAT-III survey. In addition, items were selected to represent modifications made to the content of surveys administered to adolescents at earlier time points to ensure the 10-year follow-up survey would be relevant to the lives of young adults. Test-retest reliabilities are based on

the test-retest pilot sample and Cronbach's alphas are reported in the full sample of respondents to the 10-year follow-up survey.

Environmental domain—Several items were included to assess characteristics of physical (neighborhood, home, workplace) and social (friends/family) environments with the potential to influence the weight-related behaviors of young adults. Thirteen items, adapted from the Neighborhood Environment Walkability Scale (NEWS),[28] were used to assess distances from home and work to common destinations (r = 0.54–0.85). In addition, selected items from NEWS were used to assess the aesthetic nature (α = 0.55, r = 0.73) and safety of residential neighborhoods (at night: r = 0.80; during the day: r=0.45).[28, 29]

In regards to the home environment, two scales used on previous Project EAT surveys to assess the availability of healthy (α = 0.68, test-retest r = 0.84) and unhealthy foods (α = 0.80; r = 0.86) were slightly modified to be age appropriate.[30] A measure of shared meals at home was also based on an item previously included in Project EAT surveys to assess family meal frequency; the modified item more broadly assessed eating together with other household members (r = 0.83). Three items adapted from a worksite obesity prevention study[31] were included to assess the food and physical activity environment at work (r = 0.69–0.71). Items assessing coworkers' eating and physical activity attitudes were based on measures from the Project EAT-I survey and the Activity Support Scale (eating: r = 0.79, physical activity: r = 0.73).[32, 33]

Measures of social environments included nine items designed to examine weight-related comments, weight control behaviors, and eating attitudes. These items, were based on measures from the Project EAT-I survey and other previously published measures (r = 0.44–0.85).[32, 34–36] Three additional items from the Activity Support Scale were adapted to assess support for physical activity from one's significant other (α = 0.81, r = 0.94) and friends (α = 0.84, test-retest r = 0.70).[33]

Individual domain—Within the individual domain, items were included to assess personal and behavioral factors of theoretical relevance to weight-related behaviors in young adulthood. Personal factors of hypothesized relevance for young adults included perceived barriers to healthy eating and physical activity, attitudes regarding food production, and perceptions of self. A measure of cost barriers to healthy eating was developed by the research team (r = 0.48). A three-item scale was included to assess concern for food production practices that impact the environment and personal health (α = 0.84, r = 0.72). Of relevance to physical activity, a measure modified from previous work[37, 38] was used to assess physical activity identity (r = 0.80). Barriers to physical activity were assessed using an abridged version of a previously published scale;[39] items were modified based on feedback from the pilot sample to ensure relevance for young adults (α = 0.72, r = 0.83). A single-item measure drawn from the work of Arnett and Nelson[40] was included to assess self-classification as an adult (92% agreement).

Several behavioral factors of relevance for young adults were assessed, including meal structure, food preparation at home, eating out at restaurants, and physical activity self-management. Four items originally developed for the Project EAT-II survey were used to form a scale assessing meal structure (α = 0.67, r = 0.68).[41] Items were also modified from published measures to assess meal preparation at home[42, 43] and eating out at restaurants[44] (r = 0.43–0.88). A previously published measure of physical activity self-management was shortened due to concerns regarding respondent burden.[39] Six items were selected to form a scale on the basis of perceived theoretical importance (α = 0.91, r = 0.81).

Sociodemographic factors—Sociodemographic factors were included on the survey to aid in describing and better understanding the diverse life situations of young adults in relation to their weight-related behaviors. Measures of household composition, relationship status, current employment, financial stress, and postsecondary student status were adapted from other health behavior surveys of young adults.[11, 17, 45, 46] An original measure was developed for assessing continuity of employment due to concerns that the measure of current employment did not capture periods of unemployment and seasonal employment. The psychometric properties of these sociodemographic measures are included in Table 1. The research team additionally explored several measures of socioeconomic status, but determined it would be best to rely on the baseline assessment of family socioeconomic status for Project EAT participants in the follow-up survey.[47] As many individuals do not complete their education before their mid or later twenties, widely used indicators of socioeconomic status such as education and income are likely poor measures.[48]

DISCUSSION

In response to research needs to build a greater understanding of eating, physical activity, and weight-related behaviors among young adults,[1] this study describes a systematic process of developing a survey to assess these behaviors and their potential correlates. Psychometric properties of the final survey measures are also described as a reference for other researchers conducting studies in young adults. The psychometric properties of measures retained for the final survey generally had good or modest reliabilities; however, there is a continuing need for the development of reliable measures to assess correlates of weight-related behaviors. Results from the Project EAT-III survey in the 10-year follow-up sample further suggested that the majority of young adults (20 to 31 years) had access to a computer and chose to complete the survey online.

Young adults who participated in the survey development process emphasized the influence of workplace environments, social environments, and financial concerns on their weight-related behaviors. It would be useful for future qualitative research to explore these factors in greater depth and build on our understanding of how they may interact with other factors to influence weight-related behavior. For example, formative focus group participants noted the importance of having both social support for physical activity (e.g., from a friend) and accessible places to be active. A review of the literature identified little previous work to develop reliable measures of workplace environments, attitudes and behaviors of significant others, or financial concerns relevant to weight-related behaviors in young adults. While most measures relating to the workplace environment, significant others, and general household financial stress that were included in the current study had good reliability, the item assessing perceived cost barriers to healthy eating had only moderate reliability. There is a need for the development of additional measures relating to these influences, particularly more reliable measures of cost barriers to healthy eating and activity behaviors.

The involvement of young adults in the survey development process also informed the mode of delivery. At the recommendation of young adults involved in formative and survey pilot-test focus groups, an online form was developed. The effort and resources devoted to developing the online form proved to be beneficial as 86% of those who completed the 10-year follow-up survey responded via this mode and staff time was not required to enter their survey responses. However, other mixed-mode research using both online and paper surveys has found the proportion of postsecondary students that respond online to be higher than the proportion reported here.[49] Given the diversity of the Project EAT sample in terms of student status, employment, and socioeconomic background, not all young adults in the longitudinal study population may have had ready access to a computer with an Internet connection. Future survey research in diverse samples of young adults should consider the

benefits of providing an option to respond via an online form while still providing a paper survey form.

Strengths and limitations of the survey development process for Project EAT-III relate to the use of theory and mixed methods (qualitative and quantitative). Project EAT-III made use of a comprehensive theoretical framework that was informed by the scientific literature and focus groups with a diverse sample of young adults. Whereas most health behavior surveys of young adults have included only postsecondary students, Project EAT-III collected feedback on the survey content from both students and non-students. However, the total number of participants involved in focus groups discussions was small (n=42) and it is possible that additional focus group discussions would have yielded further insights. The test-retest reliability testing produced useful information for reducing the total length of the survey and respondent burden, but the results were based on a sample of young adults who were less diverse demographically than participants in the longitudinal Project EAT study. It is possible the response rate to the 10-year follow-up survey would have been higher if the Project EAT-III survey had been further shortened. Finally, given the comprehensive nature of the survey, it was necessary to reduce the length of some established scales despite resulting decreases in internal consistency.

Implications for future research

The systematic process used to develop the Project EAT-III survey provided useful information for guiding survey development. In planning survey research, it is important to allow sufficient time for the development of reliable measures. The process described here required a full year from beginning to end, and built on over a decade of survey development and research conducted as part of Project EAT-I and Project EAT-II. Future studies may find that following a similar process for survey development is helpful and leads to the collection of usable survey data, which are applicable to the design of programs and services. Researchers interested in developing surveys for similar populations of young adults may also benefit from the information presented on the psychometric properties of the measures developed for Project EAT-III.

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Appendix

Key Questions from the Formative Focus Group Script for Young Adults

Take a minute to think about how your eating and drinking a few years ago, in your early twenties, may have been different from your eating and drinking habits now. If your eating or drinking habits changed, what is different now? How have your eating or drinking habits changed over time?

What are some reasons that your eating and drinking patterns have changed or have fluctuated with time? Often times people find when things change in their life like getting a new job that their eating and drinking also change. How have changes in your life changed your eating and or your drinking?

The people in our lives, the places where we live, and the food available in our surroundings can influence what we eat.

- In what ways does your home and the people that you live with influence your food choices and eating patterns?
- Now think about your neighborhood. In what ways does your neighborhood, and local stores and restaurants, influence your food choices and eating patterns?
- In what ways does your workplace or school, the people you work with, the surrounding neighborhood, and the route between your school or workplace and home influence your food choices and eating patterns?

Let's talk a bit about dieting. By diet, we mean changing the way that you eat or your physical activity to lose or maintain your weight. Do you or others that you are close to diet? How often?

- What are the reasons that you or friends diet?
- Now, think about the reasons that you or friends dieted in your early twenties. How are the reasons that prompt you or friends to diet now different from the reasons that prompted dieting a few years ago during your early twenties?
- What changes in eating do you or your friends make when dieting?
- What changes in physical activity do you or your friends make when dieting?

Now we also want to talk about being active – for this discussion please think about physical activity as any type of movement you do throughout your day. Some people are physically active at work while others do most of their physical activity in their leisure time. When do you and other young adults do most of your physical activity?

- In your leisure time, what other people are you physically active with?
- What about walking or biking as a means of transportation to and from work – how do you get to work?

Okay, now think about how your physical activity a few years ago may have been different from your physical activity now. If your physical activity now is different from your physical activity in your early twenties, what is different? How has your physical activity changed or fluctuated over time?

What are some reasons that your physical activity patterns have changed or have fluctuated with time? Often times people find when things change in their life like getting a new job

that their physical activity also changes. How have changes in your life changed your physical activity?

What kinds of things make it hard for you and other young adults to be physically active?

What kinds of things help you and other young adults to be physically active?

How does your family and the household in which you live influence your physical activity level?

What about your neighborhood…how does your neighborhood makes it easy or difficult for you to be active?

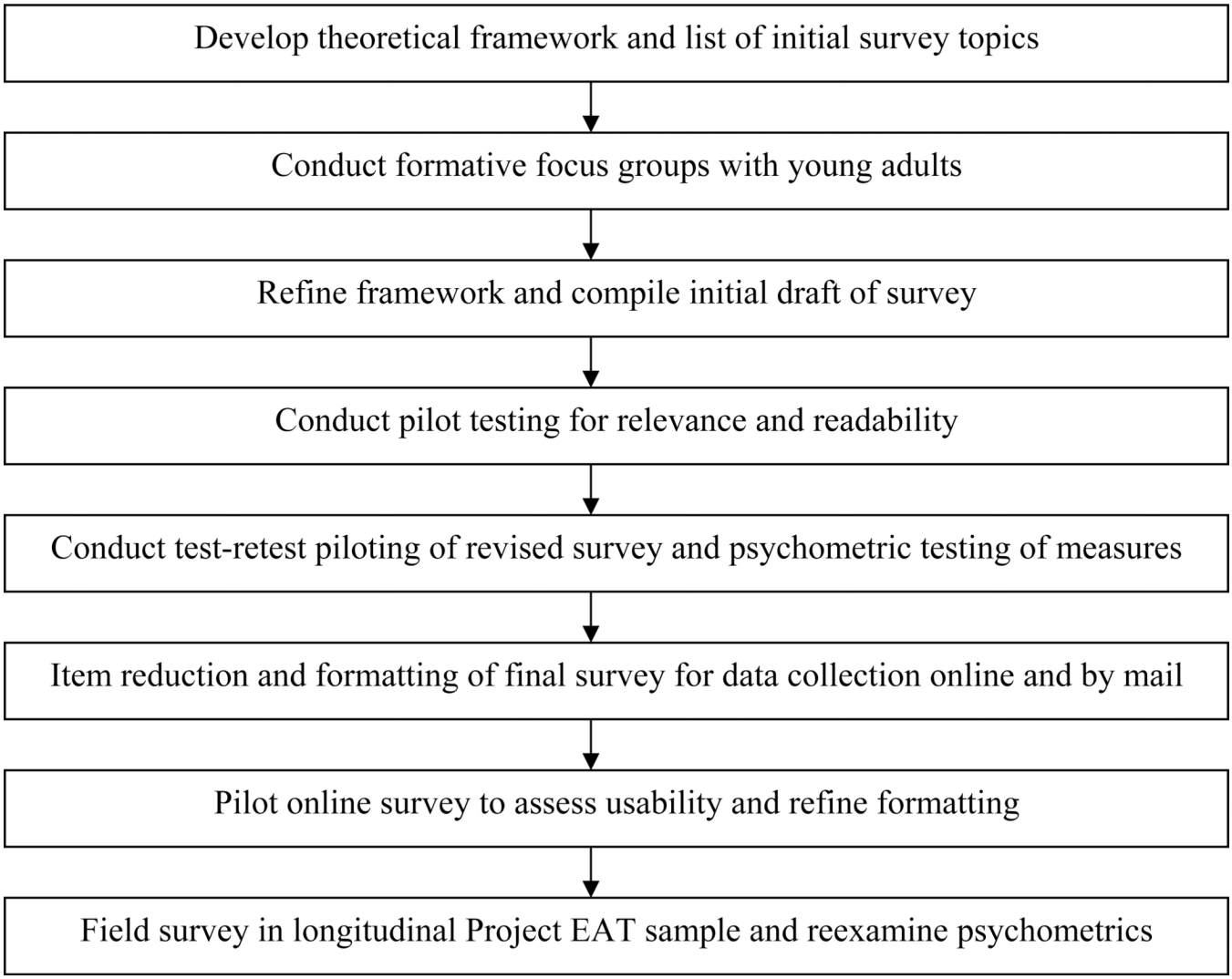

Figure 1.
Steps Taken in the Survey Development Process for Project EAT-III

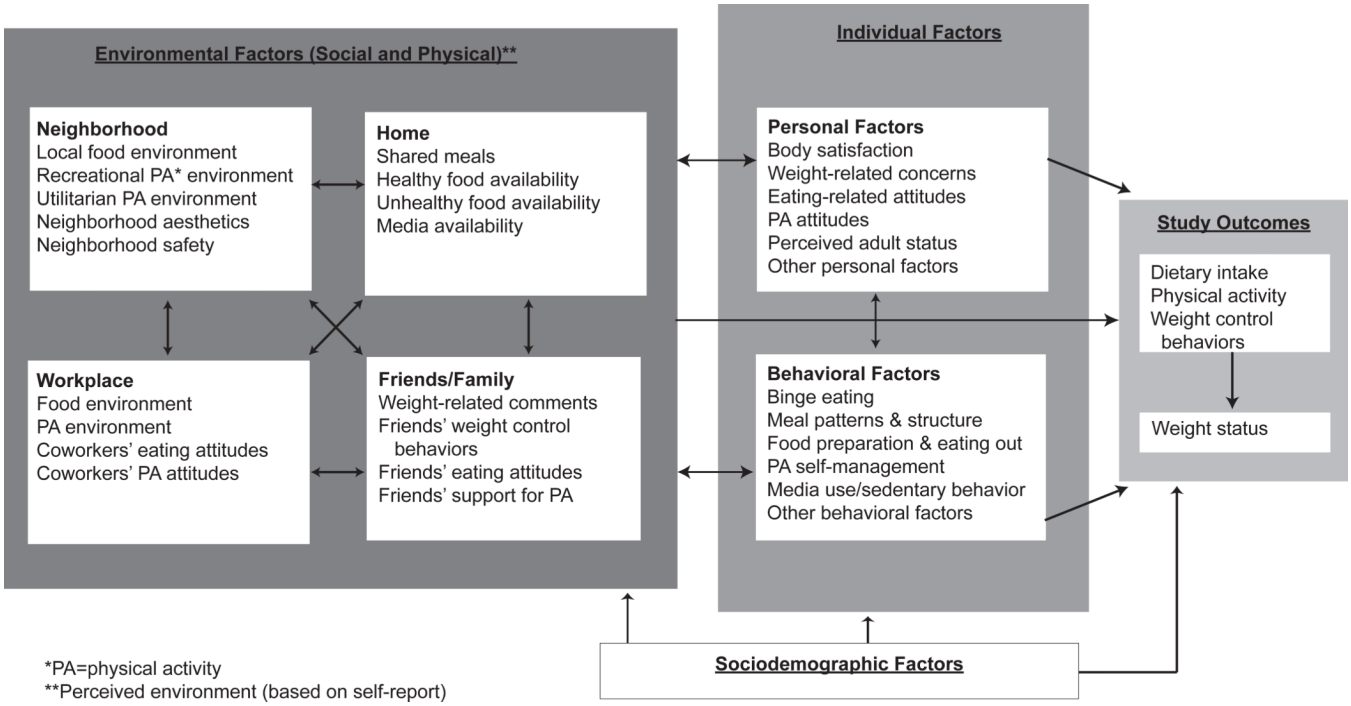

Figure 2.
Theoretical Framework Guiding Survey Development for Project EAT-III

Table 1

Description of Selected Measures included in the Final Project EAT-III Survey

	Item(s)
ENVIRONMENTAL FACTORS	
Neighborhood	
Local food environment	Time in minutes it would take to walk from *home* to the nearest fast-food restaurant, convenience or small grocery store, and supermarket or mid-size grocery store. Five response categories ranging from "1–5 minutes" to "31+ minutes." Test-retest r = 0.71–0.76.
	Time in minutes it would take to walk from *work* to the nearest fast-food restaurant. Five response categories ranging from "1–5 minutes" to "31+ minutes." Test-retest r = 0.54.
Recreational physical activity environment	Time in minutes it would take to walk from *home* to the nearest gym or fitness facility, park, lake, and walking or bike path. Five response categories ranging from "1–5 minutes" to "31+ minutes." Test-retest r = 0.60–0.85.
	Time in minutes it would take to walk from *work* to the nearest gym or fitness facility. Five response categories ranging from "1–5 minutes" to "31+ minutes." Test-retest r = 0.68.
Utilitarian physical activity environment	
Distance to work	Time in minutes it would take to walk from home to work. Five response categories ranging from "1–5 minutes" to "31+ minutes." Test-retest r = 0.71.
Distance to other destinations and public transit	Time in minutes it would take to walk from home to the nearest bus or train stop, coffee place, and shopping center. Five response categories ranging from "1–5 minutes" to "31+ minutes." Test-retest r = 0.74–0.83.
Neighborhood aesthetics	Shortened three-item version of Neighborhood Surroundings subscale, Neighborhood Environment Walkability Scale.[29,30] For example, "There are trees along the streets in my neighborhood." Four response categories ranging from "strongly disagree" to "strongly agree." Cronbach's α = 0.55; range = 3–12; Test-retest r = 0.73.
Neighborhood safety	Two items selected from the Safety from Crime subscale, Neighborhood Environment Walkability Scale.[29,30] "The crime rate in my neighborhood makes it unsafe to go on walks at night [day]." Four response categories ranging from "strongly disagree" to "strongly agree." Night: test-retest r = 0.80; Day: test-retest r = 0.45.
Home	
Shared meals	During the past seven days, how many times did all, or most, of the people living in your household eat a meal together? Seven response categories ranging from "never" to "more than 7 times." Test-rest r = 0.83
Food availability	"How often are the following true? (by 'home' we mean where you lived for the majority of the time for the past year)" Response categories were: "never;" "sometimes;" "usually;" and "always."
Healthy	(1) "Fruits and vegetables are available in my home;" (2) "Vegetables are served at dinner in my home;" (3) "I have fruit juice in my home;" (4) "Whole wheat bread is available in my home;" and (5) "Fruit is served at meals at my home." Cronbach's α = 0.68; range = 5–20; test-retest r = 0.84.
Unhealthy	(1) "I have 'junk food' in my home;" (2) "Potato chips or other salty snacks are available in my home;" (3) "Chocolate or other candy is available in my home;" (4) "Soda pop is available in my home." Cronbach's α = 0.80; range = 4–16; test-retest r = 0.86.
Media availability	"Do you have a television in the room where you sleep?" Dichotomous (yes/no) response options. Test-retest agreement = 97%.
Workplace	
Food environment	"At my work place it is easy to eat a healthy diet." Four response categories ranging from "strongly disagree" to "strongly agree." Test-retest r = 0.71.
	"At my work place, sweets and snacks are often available." Four response categories ranging from "strongly disagree" to "strongly agree." Test-retest r = 0.69.
Physical activity environment	"At my work place it is easy to be physically active." Four response categories ranging from "strongly disagree" to "strongly agree." Test-retest r = 0.71.
Coworkers' eating attitudes	"Many of my coworkers care about eating healthy food." Four response categories ranging from "strongly disagree" to "strongly agree." Test-retest r = 0.79.
Coworkers' physical activity attitudes	"Many of my coworkers think it is important to be physically active." Four response categories ranging from "strongly disagree" to "strongly agree." Test-retest r = 0.73.

	Item(s)
Friends/Family	
Weight-related comments	"How often does your significant other make comments to you about your weight or your eating that make you feel bad?" Five response categories ranging from "never" to "a few times a week." Same item for family members. Significant other: test-retest r = 0.61. Family members: test-retest r=0.72.
	"My significant other (for example, boyfriend/girlfriend, spouse, partner) encourages me to diet to control my weight." Four response categories ranging from "not at all" to "very much." Same item for mother and for father. Significant other: test-rest r = 0.85. Mother: test-rest r = 0.85. Father: test-rest r=0.77.
Weight control behaviors	"My significant other diets to lose weight or keep from gaining weight." Four response categories ranging from "not at all" to "very much." Same item for "many of my friends." Significant other: test-rest r = 0.85. Friends: test-retest = 0.44.
Eating attitudes	"My significant other cares about eating healthy food." Four response categories ranging from "not at all" to "very much." Same item for "many of my friends." Significant other: test-rest r = 0.77. Friends: test-retest r = 0.58.
Support for physical activity	"How strongly do you agree with the following statements?" Three statements: (1) "My significant other often plays sports or does something active;" (2) My significant other thinks it is important to be physically active;" and (3) "My significant other and I like to do active things together." Four response categories ranging from "not at all" to "very much." Same items for "my friends." Significant other: Cronbach's α = 0.81; range = 3–12; test-retest r = 0.94. Friends: Cronbach's α = 0.84; range = 3–12; test-retest r = 0.70.
INDIVIDUAL FACTORS	
Personal Factors	
Eating-related attitudes	
Cost barriers to healthy eating	"Eating healthy just costs too much." Four response categories ranging from "strongly disagree" to "strongly agree." Test-retest r=0.48.
Concern for production practices	"How important is it to you that your food is (a) organic, (b) not processed, and (c) locally grown." Four response categories ranging from "not at all" to "very important." Cronbach's α = 0.84; range = 3–12; test-retest r = 0.72.
Physical activity attitudes	
Physical activity identity	"Exercising is an important part of who I am." Four response categories ranging from "strongly disagree" to "strongly agree." Test-retest r=0.80.
Barriers to physical activity	"How often do these things keep you from being physically active?" Six statements (e.g., "It would take time away from my work or school."). Five response categories ranging from "never" to "very often." Cronbach's α = 0.72; range = 6–30; test-retest r = 0.83.
Perceived adult status	"Do you think that you have reached adulthood? Response categories were: "yes;" "in some respects yes, in some respects no;" "no." Test-retest agreement=92%.
Behavioral Factors	
Meal structure	"How strongly do you agree with the following statements?" Four statements (e.g., "It is hard to find time to sit down and eat a meal."). Four response categories ranging from "strongly disagree" to "strongly agree." Cronbach's α = 0.67; range = 4–16; test-retest r = 0.68.
Food preparation at home	"During the past month, about how often have you prepared a meal that included vegetables?" Six response categories ranging from "never" to "most days of the week." Test-retest r = 0.61.
	"During the past week, how many days did you bring lunch (or some other meal) from home to eat at work or school?" Six response categories ranging from "0 days" to "5 or more days." Test-retest r = 0.88.
Eating out at restaurants	"In the past month, how often did you eat something from the following types of restaurants (include take-out and delivery)?" Six restaurant categories (e.g., traditional fast-food restaurant, sit-down restaurant). Six response categories ranging from "never/rarely" to "1+ times per day." Test-retest r = 0.43–0.83.
Physical activity self-management	"How often was each of these things true for you in the LAST MONTH?" Six items (e.g., "When I get off track with my physical activity plans, I tell myself I can start again and get right back on track."). Five response categories ranging from "never" to "very often." Cronbach's α = 0.91; range = 6–30; test-retest r = 0.81.
SOCIODEMOGRAPHIC FACTORS	
Household composition	"During the past year, with whom did you live the majority of the time? Response categories were: "I live alone;" "my parent(s);" "roommates, friends;" my husband/wife;" "my partner of the opposite

	Item(s)
	sex;" "my partner of the same sex;" "my child(ren);" and "other." Participants could choose multiple categories. Test-retest agreement = 100%.
Relationship status	"What is your relationship status?" Response categories were: "single or casually dating;" "committed dating relationship or engaged;" "married;" "samesex domestic partner;" "separated or divorced;" and "widowed." Test-retest agreement = 98%.
Continuity of employment	"How many months in the past year did you work for pay?" Five response categories ranging from "I did not work for pay" to "10–12 months." Test-retest r = 0.95.
Current employment status	"How many hours a week do you currently work for pay?" Seven response categories ranging from "0 hours" to "more than 40 hours." Test-retest r = 0.94.
Financial stress	"How difficult is it for you to live on your total household income right now?"
	Four response categories ranging from "not at all difficult" to "extremely difficult or impossible." Test-retest r = 0.83.
Post-secondary student status	"Which of the following best describes your student status over the past 12 months?" Response categories were: "not a student; "part-time student at a community or technical college;" "full-time student at a community or technical college;" "part-time student at a four-year college;" "full-time student at a four-year college;" and "graduate student part-time or full-time." Test-retest agreement = 95%.