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College Environment Behavioral and Perceptions Survey (CEBPS): Using In-Depth Interviews as a Validation Method for Survey Development

Mackenzie Rae Ruppert
University of Tennessee - Knoxville, mrupper1@vols.utk.edu

To the Graduate Council:

I am submitting herewith a thesis written by Mackenzie Rae Ruppert entitled "College Environment Behavioral and Perceptions Survey (CEBPS): Using In-Depth Interviews as a Validation Method for Survey Development." I have examined the final electronic copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Nutrition.

Sarah E. Colby, Major Professor

We have read this thesis and recommend its acceptance:

Marsha L. Spence, Katie Kavanagh

Accepted for the Council:
Carolyn R. Hodges

Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

College Environment Behavioral and Perceptions Survey (CEBPS): Using In-Depth Interviews as a Validation Method for Survey Development

A Thesis Presented for the

Master of Science

Degree

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Mackenzie Rae Ruppert

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DEDICATION

To my mother and father

Bob and Julie Ruppert

my sister and brother-in-law

Meaghan and John Roethlisberger

and my nephew

Grey Roethlisberger

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ABSTRACT

Background: Although there are some validation procedures based in qualitative approaches (e.g. asking what someone thinks about the structure of a survey question during face, content validation, or cognitive interviews), there are no approaches to validate a subject's responses by a "gold standard assessment". The purpose of this study was to use a mix-methodology approach to validate subjects' perceptions, which used in-depth interviews as a criterion-based validation method.

Methods: 30 participants (15 male and 15 female) completed the CEBPS survey and an in-depth interview with questions mirroring those in the survey. *A priori* coding was used to develop the same codebook for the surveys and interviews. Each question (n=27) had three corresponding codes (first code= agree; second code=disagree; third code=neither), with a total of 81 possible codes. Surveys and interviews were checked to see if codes were used in both (recoded as 1), interview only (recoded as 2), or survey only (recoded as 3). Recoding was done by adding the recoding from the original three codes for each question together (total of 1=agree, >1=disagree). Frequencies were calculated to determine agreement rate between surveys and interviews.

Results: Out of 27 total questions, 21 were found to have >80% agreement in responses in both the survey and the interviews with an average of 92% agreement. For the remaining 6 questions, an average overall accuracy of 71% was calculated, with responses found to be missing more often in the interviews than the surveys (25% vs 11%). An average of 7% of participants agreed with the statement in the survey, whereas an average of 15% agreed in the interview on the same question.

Conclusions and Implications: Participants were more likely to agree in interviews than surveys, which could be due to social desirability. Participants may have had a desire to seem more healthful with researcher interviewing them. Results showed a weakness in survey only approach in that participants were more likely to choose "neither agree nor disagree" option on the survey than in the interview. This could be due to the participant taking time to think about the answer during the interview.

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CHAPTER 1: LITERATURE REVIEW

Data collection is an important step in many processes, including determining needs, evaluating programs, and gathering information about a certain subject.[1] Surveys, questionnaires, and tests are instruments used to collect data.[1] These methods of data collection are popular in the field of health, especially when trying to determine health related outcomes.[2] They can be important tools to provide information to the scientific field, and they can provide information needed to support decision-making processes.[3] Additionally, they are some of the best and most appropriate ways to attain valuable information and feedback in the health field.[4] Other advantages of surveys and questionnaires are that they are good ways to gather information and/or to study a population that is too large to look at as a whole.[5] If done properly, these methods of data collection can assist investigators to make generalizations or reveal characteristics about an entire population by studying only a sample of it. Another advantage of surveys is that they can generally be distributed to a large amount of people fairly quickly.[5]

Psychometrics is the field of study focused on the development and validation of new instruments (surveys, tests, questionnaires).[6] Psychometricians use different theories (e.g. classical test theory and item response theory [7,8]) and statistical approaches (e.g. factor analysis [9], multidimensional scaling [10], data clustering, and structural equation modeling[11]) in analysis. However, before these more advanced statistical approaches can be used in the process of survey development, there are several initial development and validation steps necessary.

Survey Development

There are numerous steps necessary for the development of successful surveys. These multiple steps (usually around 7-10) can be complex but are necessary to design a well-constructed survey that can produce adequate data points required to complete advanced statistical analyses necessary in survey development [3,5]. It is crucial not to skip any steps in the process because the success of one step may depend on the success of the previous step.[12]

First, the survey content needs to be identified, which includes determining the purpose of the survey and what it should be measuring.[5] It is easier to determine how the information from the survey will be used by establishing a goal for the survey first.[4] The instrument's purpose is based on what is to be evaluated in the study. In addition, it is crucial to determine the ultimate goal of the results and what knowledge is desired to be taken away from the study.[13] Survey goals should be concise and clear, for this will make the development process much easier. After goals are decided upon, they should be written down and referred to when deciding to include a certain question; if the question directly addresses the set goal, it should be used, but if not, then it should be avoided.[12] A common goal used to determine a purpose of a survey is to describe a specific population, while another is to compare two groups.[4]

After the purpose of the study is established, other instrument specifications should be considered. These help to decide what the design of the instrument should be.[5] One main specification to take into consideration is the target population. It is important to be sure that the sample being used in the study is representative of the target population. This is a good time to set inclusion and exclusion criteria for the participants of the study.[4,5]

Another important specification to take into account is the time.[5] This can refer to both the time intended for it to take the participant to complete the instrument, or it can mean the timeline of the study. For the former, typically researchers tend to get a better response rate with shorter surveys.[5,12] When considering the timing of the project, a timeline should be included with dates indicating when survey data is needed, when the best time to contact potential participants is, how long it will take to design, test, and validate the survey, and how long it will take to analyze the data once collected.[4] Other specifications that researchers may want to consider when developing a survey or questionnaire include: who will be administering the survey, the instrument delivery system, types of items to be used, number of items for each content area, scoring procedures, format of survey or questionnaire, and cost.[13,14]

Next, there should be a review of literature for existing instruments. A literature review can contribute to the identification of content needed and can be used to identify new items that need development, as well as informing about potential approaches for scoring the instrument.[3] Literature reviews can help researchers determine gaps in current research in the field in which they are interested. This can be done while determining the purpose or goal of the survey. Also, by seeing what has been done in the past, researchers can see what methods led to a more successful survey than others. In addition, researchers can view existing instruments to identify already validated instruments that can be used as a part of their survey.[5] If appropriate, this can save time and money. For example, there are plenty of existing demographic questionnaires that can be added to another survey.

Once a purpose or goal is established, and a review of the literature has been conducted, the new instrument questions are ready to be developed. Writing good survey questions requires much thinking, and several factors go into each question.[5] For all questions, the goal should be kept in mind. Each question included should address the goal directly, and no questions should be added just out of curiosity if they do not pertain to the goal.[4] It is suggested that twice as many questions be included in the first draft of the instrument than are intended to be in the final instrument, for questions will be combined or eliminated during the pilot testing and validation procedures.[15] Survey questions should be worded in a concise, clear, and direct way. In addition, they need to be specific with forced choices.[16] Survey questions should be worded so they are easily read, and researchers should avoid using short-hands, negativity, double negatives, passive voice, or anything indicating a strong point of view.[4] A strong survey question lets the participant know the context of the question by explaining and defining the topic of interest. The participant should have an idea of the purpose of the study by reading each of the questions.[4] Finally, the questions should be interesting to the participant, as well as meaningful.[12]

In addition to the wording and format of the actual instrument questions, it is also important to take into account the order in which the questions are arranged in the survey or questionnaire. All of the items should be grouped in a logical way. Questions that are similar in nature should be grouped together, as well as questions that have the same response format (e.g. multiple choice or true or false). By doing this, participants may feel that the instrument is easier to complete and flows better.[4,5,12]

After this initial process of survey development, there are several additional steps needed, including cognitive interviewing, pilot testing, validation studies, and reliability testing, some of which are explained in more detail below.[5] After the items of the instrument are developed, the researcher can have his or her colleagues review the items, looking at specifics including wording, relevance, spelling, readability, grammar, and other specifications set earlier by the researcher. The researcher should revise the items based on the feedback received from colleagues.[5] Following these revisions, the survey is then ready to go through the validation phase. See Figure 1 for a list of the typical steps of survey development.

Reliability and Validity

It is crucial for a survey to be both valid and reliable.[17] Validity refers to how well a survey measures what it is supposed to measure, whereas reliability is how consistent it is when repeated. [5,18]

Reliability

Reliability is defined as how well an instrument produces consistent and stable results.[19,20] Often tools are tested and then retested with the same respondents within a short period of time (generally within a week or two, but can vary[21]) to determine reliability. This is referred to as test-retest reliability, which is the most common type of reliability measurement in surveys.[18] The consistency between those repeated measurements can be assessed using the Pearson correlation coefficient, which should be .80 or higher for a good reliability score. [5] Some issues that can occur to decrease test-retest reliability include "practice effects, fatigue effects, and genuine changes".[21] With practice effects, the reliability may increase due to participants remembering the same

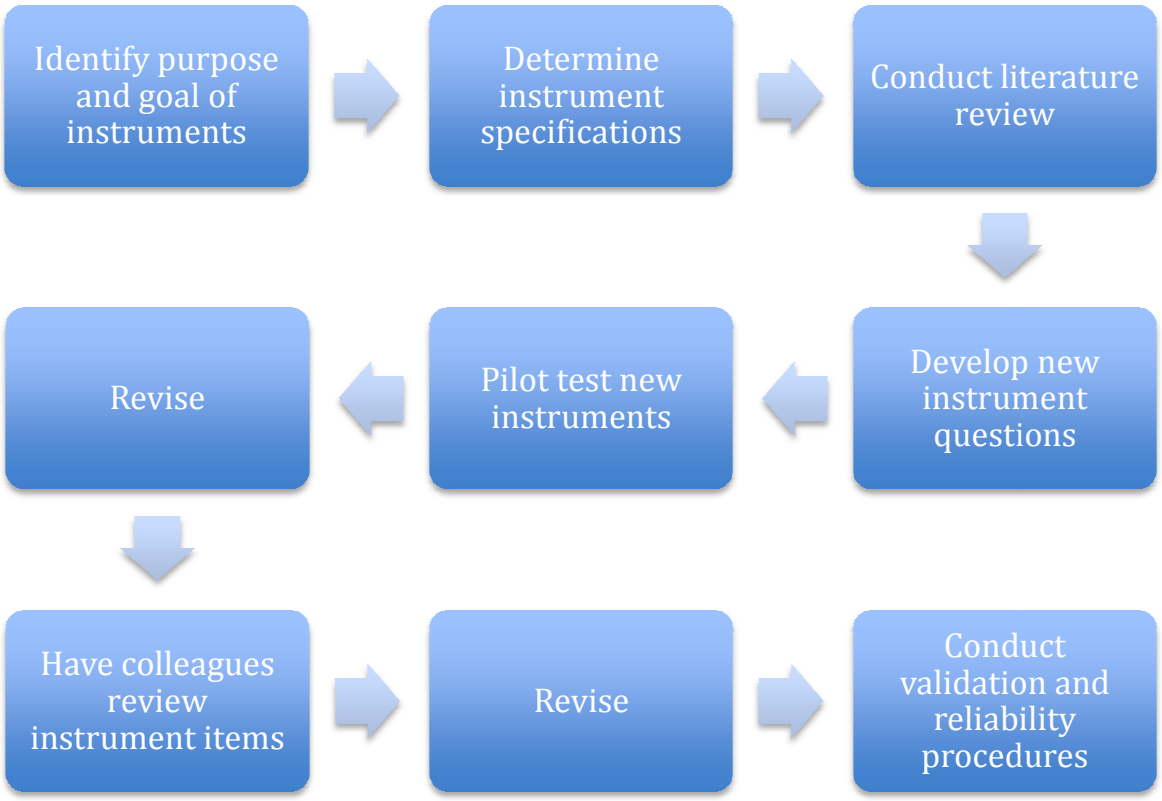

Figure 1: Steps in Survey Development
*Sources: Thayer-Hart N. Survey Fundamentals: A guide to designing and implementing surveys. 2010; http://oqi.wisc.edu/resourcelibrary/uploads/resources/Survey_Guide.pdf. Accessed March 14, 2014.
McDermott R, Sarvela P. *Health Education Evaluation and Measurement.* 2nd ed: McGraw-Hill; 1999.
Millman J, Greene J. *Educational Measurment.* 3rd ed. New York: Macmillan; 1998.

answers they used before, even if they are not true. Fatigue effects can reduce reliability due to the respondent randomly choosing an answer the second time taking the instrument to quickly finish it. For genuine changes, if too much time elapses between the first and second time taking the instrument, the participant could have a true change to make them choose a different choice, which will also decrease the reliability of the instrument. This is why the suggested elapse time between administering the instruments varies.[5,21] It may be dependent upon the instrument itself.[5,21]

Internal consistency reliability refers to how similar results are from different instrument items that test the same construct; i.e. it examines the average correlation between items in an instrument.[19] The homogeneity of a tool (or internal consistency) can be measured by assessing how strongly two halves of a test are correlated (e.g. split-half reliability; a Pearson product-moment correlation coefficient adjusted with the Spearman-Brown formula). The entire instrument is given to participants to take, and the total score for each "set" is totaled and a correlation between the two sets is computed.[19] This reliability concept using split-half coefficients is most commonly reported as the Cronbach's alpha (the mean score for all potential split-half coefficients).[5]

Another form of reliability testing is parallel forms reliability, which is a measure of the reliability between two different versions of a tool, which have the same purpose. Parallel forms reliability is the degree to which multiple tests that measure the same concept have equal means, standard deviations, and intercorrelations among the items".[20] The same individuals need to take both versions of the instrument, and the scores from both of the versions can be evaluated to determine the consistency of the results between

the different versions.[19] Therefore, with this type of reliability, there should be similar scores and errors between parallel forms of a test with the same constructs.[21]

Validity

Validity measurement techniques are more varied and subjective than reliability measurements.[5] As stated above, validity refers to how well an instrument measures what it is intended to measure.[18,19] Content validity is one of the most widely used methods of validity measurement, especially for knowledge tests, and it should be conducted in all data collection instruments developed.[5] It is a subjective measure in which reviewers (experts in the content area) are asked how appropriate the questions are for the content area and are the questions adequately assessing the content area.[5] It usually consists of the experts reviewing the survey in an organized manner to ensure that everything needed is included, while making sure that it does not include anything that is irrelevant.[18] There are two standard approaches commonly used to measure content validity: Instructional Quality Inventory (IQI) and classification approach.[5] In the IQI, the experts are asked to determine how well the objectives of the instrument are met by the items.[5] They are given a list of the goals of the instrument, as well as a list of the items, and rate the degree to which the items meet the objectives. During the classification approach, the experts are given a list of the different areas the instrument is designed to measure and are asked to assign the different items to one of these areas.[5,22] Based on this, the representativeness and appropriateness of the instrument's items are determined.[5,22]

Face validity measures if the survey is assessing what it is intended to.[19] Face validity is very similar to content validity in that a person is asked what they think about survey questions. The difference between content and face validation is that face validation

asks target audience members (instead of a content expert) what they think of how the survey questions are worded.[18] Both content and face validation procedures are very similar to the process of cognitive interviewing for survey development. In cognitive interviewing, the person (expert or target audience) is asked a series of more in-depth questions to find out what they think about the way the questions are worded or constructed. Often this involves the participant stating back in their own words what they think the question is asking. Even though face validity may be an important part of survey development, it should not be the only validation process used. An instrument may have high face validity, but could possess few other advantages in regards to measurement purposes.[5,21] In fact, some professionals do not even consider face validity a proper measure of validity.[18] Furthermore, there is no standard method for assessing and measuring face validity. It is not quite known how to measure it.[21]

Criterion (also called concrete validity) validity assesses how well survey items compare to another survey or predictor. Criterion-related validity measures how well the results of an instrument correlates with a current or future event.[23] It can be used to predict future or current performances (e.g. using ACT scores as a predictor of college success).[5,19] There are two main subtypes of criterion-related validity. The first is concurrent, which compares the newly developed survey or instrument to a "gold standard" that is known to be valid.[18] The new survey measure is assessed concurrently with another established method assessing the same criteria.[3] The second subtype, predictive validity, assesses how well survey items can predict past or future events, and require measurements to occur at two different times. Criterion validity testing works only if an objective "gold standard" is available for comparison.

The final main form of survey validation is construct validity.[24] Construct validity assesses how well the newly developed tool compares with constructs from an established theory. It basically is an indicator of how meaningful and useful the instrument may be when it is put to practical use.[18] Construct validity helps to determine if the score found from the survey adequately represents the main construct of the study.[5] There are two main approaches used for measuring construct validity: convergent and discriminant validity.[25] Convergent validity examines how well different methods for obtaining the same information about a specific construct produce similar results. In other words, it looks at to what degree constructs relate to each other.[5,18] Divergent validity is present when it is proven that items that should not be related to one another are not related. Having divergent validity proves that a new construct does not correlate too much with previously studied concepts.[5,18] Factor analysis is a common statistical approach to measure construct validity. In factor analysis, a set of items is measured for intercorrelations.[5]

Purpose of Study

If no objective measure is available, it may be difficult to validate a survey that is designed to measure an intangible facet such as perception. Although some validation procedures are based in qualitative approaches (e.g. asking what someone thinks about the structure of a survey question during face, content validation or cognitive interviews) these approaches do not validate the subjects' responses by a "gold standard assessment." To validate perception items, survey questions must be compared to what the individual thinks. Qualitative research techniques commonly used to understand what individuals think often include interviews or focus groups.[26] Therefore, in order to validate a survey

that measures an individual's perceptions, the best way to do this may be through qualitative approaches that ask individuals what they thinks. Currently, there is a lack of systematic validation qualitative procedures for perception-based survey questions. The purpose of this study was to develop and test a novel mix-methodology approach to validate these types of surveys, which uses in-depth interviews as a criterion-based validation method in survey validation.

CHAPTER 2: MANUSCRIPT

Background

Psychometrics is the field of study focused on the development and validation of new instruments (surveys, tests, questionnaires).[1] Psychometricians use different theories (e.g. classical test theory and item response theory[7,8]) and statistical approaches (e.g. factor analysis[9], multidimensional scaling[10], data clustering, and structural equation modeling[11]) in analysis. Before more advanced statistical approaches can be used in the process of survey development, there are several necessary initial validation steps.[3,5]

These multiple steps (usually around 7-10) can be complex, but are necessary to design a well-constructed survey that can produce adequate data points required to complete the more complex statistical analysis necessary in survey development.[3,5] First, the survey content needs to be identified, which includes determining the purpose of the survey and what it should be measuring. Then there should be a review of literature for existing instruments. A literature review can also contribute to the identification of content and can be used to identify new items that need development, as well as a informing about potential approaches for scoring the instrument.[5] After this initial process, there are several additional steps needed, including cognitive interviewing, pilot testing, validation studies, and reliability testing.[5]

It is crucial for a survey to be both reliable and valid.[17] Reliability is how consistent survey responses are when a survey is repeated with the same or similar population.[5,18] Often tools are tested and then retested with the same respondents within a short period of time (generally within a week or two) to determine reliability.[18,19] The consistency between those repeated measurements can be assessed using the Pearson correlation

coefficient.[5] The homogeneity of a tool (or internal consistency) can be measured by assessing how strongly two halves of a test are correlated (e.g. split-half reliability; a Pearson product-moment correlation coefficient adjusted with the Spearman-Brown formula). This reliability concept, tested using split-half coefficients, is most commonly reported as the Cronbach's alpha (the mean score for all potential split-half coefficients).[5,18,19] Another approach that could be used would be the intra-class correlation which assesses variance.[18,19] Validity measurement techniques are more varied and subjective.[18]

Validity refers to how well a survey measures what it is supposed to measure.[5] There are several types of validity. Content validity is one of the most widely used methods of validity measurement.[18] It is a subjective measure in which experts in the content area are asked how appropriate the questions are for the content area and how adequately the questions assess the content area.[5] Face validity is very similar to content validity in that a person is asked what they think about survey questions. The difference between content and face validation is that face validation asks a target audience member (instead of a content expert) what they think of how the survey questions are worded.[5,18] Both content and face validation procedures are very similar to the process of cognitive interviewing for survey development. In cognitive interviewing, the person (expert or target audience) is asked a series of more in-depth questions to find out what they think about the way the questions are worded or constructed. Often this involves the participant stating back in their own words what they think the question is asking.[5]

Two other forms of validation are construct and criterion validity.[5,18,19] Construct validity assesses how well the newly developed tool compares with constructs from an

established theory.[18] Criterion (also called concrete) validity assesses how well survey items compare to a "gold standard" (a concrete criteria that is known to be valid). There are two subtypes of criterion validity- concurrent or predictive. In concurrent validity the new survey measure is assessed concurrently with another established method assessing the same criteria. Predictive validity assesses how well survey items can predict past or future events.[5,18,19] Criterion validity testing works only if an objective "gold standard" is available for comparison.

If no objective measure is available, it may be difficult to validate a survey that is designed to measure an intangible facet such as perception. Although some validation procedures are based in qualitative approaches (e.g. asking what someone thinks about the structure of a survey question during face, content validation or cognitive interviews), these approaches do not validate the subjects' responses by a "gold standard assessment." To validate perceptions, it is necessary to compare survey answers to what the individual is actually thinking. Qualitative research techniques commonly used to understand what individuals think often include interviews or focus groups.[26] Therefore, in order to validate a survey that measures an individual's perceptions, the best way to do this may be through qualitative approaches that ask the individual what they think. Currently, there is a lack of qualitative systematic validation procedures for perception-based survey questions. The purpose of this article is to describe a novel mix-methodology approach, which uses in-depth interviews as a criterion-based validation method in survey validation of a survey measuring college students' perceptions on how healthy their campus is.

Methods

A multi-state research group, the Healthy Campus Research Consortium (HCRC), initially developed a College Environment Behavioral and Perception Survey (CEBPS). It was designed to parallel an objective measure of the healthfulness of college campus environments.[27-30] The objective tool evaluated many different health-related factors around college campuses, including food availability, walkability, bikeability, exercise facilities, and water fountains. The food availability measures included dining halls, food courts, vending machines, convenience stores, restaurants, and grocery stores. CEBPS, a 28 item multiple-choice survey, was developed as a subjective measurement tool to complement this objective tool to measure students' perception of each of these factors.

All procedures were approved by the university's Institutional Review Board (IRB #FWA 6629). Participants were recruited in the recreational center on campus, in the library, and through word of mouth. Students were asked if they were interested in participating in a research study, and the study was explained. If the student expressed interest, he or she was asked questions to see if he or she was eligible. The eligibility criteria was that students must be 18-24 years of age, a University of Tennessee student, and not a nutrition or kinesiology major. Eligible participants were scheduled a time to come into the research lab. During their scheduled time and upon written consent, students took the CEBPS survey and then engaged in an in-depth interview in person. If the participant did not have time to complete the in-depth interview at the time the survey was completed, the interviews were conducted via phone. The in-depth interviews lasted, on average, 20 minutes. The in-depth interview questions mirrored the content of the survey. Each survey question had a matched in-depth interview question. For example,

one survey item was “There are healthy foods available in convenience stores around campus” with answers ranging from strongly agree to strongly disagree. The mirroring in-depth interview question was “How healthy are the foods available in convenience stores around campus?”.

Interviews were digitally recorded and transcribed verbatim using Inqscribe (version 2.2.0.249; manufacturer: Inquirium). After the interviews were transcribed, the surveys and transcripts were coded. *A priori* codes were developed and used to code the survey responses. For each survey question, there were three possible codes, and these codes were in numerical order for each question (e.g. code options for question 1 were 1-3, for question 2 were 4-6, and so on). The answers “strongly agree” and “agree” were combined into the first code assigned to the question; “strongly disagree” and “disagree” were combined into the second code assigned to the question; and “neither agree nor disagree”, “choose not to answer”, or “I do not know because I do not use _____” were combined into the third code assigned to the question. Any survey questions left blank were coded as “choose not to answer”. Research assistants were given the codebook, trained on survey coding procedures, and practiced coding one sample survey as a group. The research assistants then independently coded a second survey. An inter-rater reliability (IRR) of 100% was reached when coding the second survey. Each participant survey was then coded and double-checked by another researcher. The primary researcher evaluated and resolved any discrepancies between codes.

The same codes used to code the survey were used to code the in-depth interview transcriptions. Interviews were coded as to whether participants agreed or disagreed with the questions or were not sure. Research assistants were given two sample interview

transcriptions to code. The primary researcher went through the first with them and answered any questions; and then the research assistants independently coded the second sample transcription. An IRR of 85% was achieved, which was above the goal of 80%. After IRR was completed, two different research assistants coded each participant's transcription. The primary researcher compared the two independently coded transcriptions and resolved any discrepancies. A new code was used when coding the transcriptions if there was not an existing established code. The new code ("85") indicated information obtained during the interviews that had not been captured in the surveys.

Analysis

For each participant, the codes from their survey and interview were compared for agreement. Each code was recoded into "1", "2", or "3", with "1" indicating the code appeared or did not appear in both the survey and the interview, "2" indicating the code was in the survey, but not the interview, and "3" indicating the code appeared in the interview but not the survey.

For each question, the three codes that corresponded to that question were added together. A score of "1" indicated agreement between the survey and interview, and anything higher denoted disagreement between the two. Frequencies were used to analyze all the questions. Frequencies were completed for the individual codes, as well as on the recoded questions where the three codes corresponding to that question were added together. All questions were checked to see if 80% agreement between the survey and interview had been reached. Eighty percent agreement was determined by evaluating the frequencies of "1" appearing in the recoded questions, which indicated that the participant answered the same way in the interview and in the survey. Any questions not reaching

80% agreement were further analyzed to determine if codes were missing more in the survey or interview (see Table 1). These questions were evaluated to see if it could be determined if participants were more likely to agree with the concept when presented in the survey or during the interview. This was determined by ascertaining if codes that represented the "strongly agree" or "agree" option for each question occurred more during the surveys or the interviews.

Results

A total of 30 participants were recruited (n=30, 50% female, ages 18-24, and college students). There were 27 questions in the survey and a possible three codes for each question. Therefore, there were a total of 81 codes identified from the surveys and interviews. Out of the 27 questions, 21 were found to have a ≥ 80% agreement in both the survey and interview responses (with an average of 92% agreement). Results for the 6 questions that did not show 80% agreement are displayed in the Table. For these six questions, there was an average overall agreement between the survey and interview of 71%. Responses were found to be missing more often in the interviews than in the surveys (25% vs 11%, respectively).

Based on the frequencies, participants were more apt to agree with questions in the interview than in the survey, whereas they were more likely to disagree with a question in the survey than in the interview. For the six questions below 80% agreement, an average of 7% of participants agreed with the statement in the survey only, whereas an average of 15% agreed in the interview only. For the same questions, an average of 12.7% disagreed with the question in the survey only as compared to an average of 11% in the interviews only. It also appeared that the survey captured the "neither agree nor disagree" response

Table 1. **Percentage of Participants Agreeing, Disagreeing, or Neither Agreeing nor Disagreeing with Statements in Survey Only or Interview Only**

Agreed in Survey Only	Agreed in Interview Only	Disagreed in Survey Only	Disagreed in Interview Only	Neutral in Survey Only*	Neutral in Interview Only*	Overall Agreement**
There are plenty of exercise classes offered at the rec center on campus.						
3%	0%	0%	0%	0%	3%	97%
There are policies (e.g. no cars on campus) that promote physical activity.						
13%	7%	7%	3%	0%	10%	80%
There are policies on campus that promote healthy eating.						
0%	7%	10%	0%	0%	3%	90%
Based on the above definition for green eating, overall my campus promotes green eating.						
10%	3%	3%	13%	3%	0%	83%
Healthy foods are on-hand at local grocery stores around campus.						
3%	0%	0%	3%	0%	0%	97%
The university's exercise facilities and equipment are in good condition.						
0%	0%	0%	0%	0%	0%	100%
There are low cost healthy foods available on campus.						
13%	3%	3%	**13%**	7%	7%	**77%**
The water in water fountains on campus taste good.						
3%	0%	3%	3%	3%	7%	90%
There are safe places for me to walk.						
0%	0%	0%	0%	0%	0%	100%
The stairs in most buildings on campus are clean and well lit.						
13%	0%	0%	10%	0%	3%	87%
There are signs in buildings encouraging people to use the stairs.						
3%	7%	17%	3%	0%	10%	80%
The campus living environment allows for quiet and restful sleep.						
13%	3%	7%	7%	0%	10%	80%
There are programs on campus that promote stress management.						
7%	3%	10%	7%	0%	7%	83%
There are healthy foods available where I usually eat in food courts/snack bars on campus.						
7%	**17%**	**17%**	10%	7%	3%	**70%**

Table 1. Continued

Agreed in Survey Only	Agreed in Interview Only	Disagreed in Survey Only	Disagreed in Interview Only	Neutral in Survey Only*	Neutral in Interview Only*	Overall Agreement**
There are healthy foods available at restaurants on or around campus.						
17%	3%	3%	13%	0%	3%	80%
There are lots of healthy choices in vending machines on campus.						
3%	0%	10%	7%	3%	10%	83%
There are enough exercise facilities and equipment on campus.						
17%	3%	0%	10%	3%	7%	80%
There are sports (intramural or club) available to play on campus.						
0%	0%	0%	0%	0%	0%	100%
There are enough bike racks on campus.						
3%	**23%**	13%	**17%**	**23%**	0%	**60%**
It is safe to walk around campus at night.						
13%	3%	7%	7%	0%	10%	80%
There are healthy foods available where I usually eat in dining halls on campus.						
13%	0%	7%	10%	10%	17%	80%
Healthy foods are on-hand at convenience stores on or around campus.						
13%	**20%**	**20%**	7%	3%	**10%**	**63%**
There are signs telling me which foods are healthy in vending machines on campus.						
3%	3%	10%	0%	0%	7%	90%
There are clean water fountains in most buildings on campus.						
3%	**17%**	**13%**	7%	**7%**	0%	**77%**
There are plenty of opportunities on campus to be moderately or vigorously active.						
0%	0%	0%	0%	0%	0%	100%
It is safe to bike around campus.						
10%	3%	3%	3%	0%	7%	87%
There are programs on campus that promote healthy eating.						
3%	**10%**	**10%**	**13%**	**10%**	0%	**77%**

* Participants neither agreed nor disagreed with the statement
* * Overall percent matching responses in both the survey and the interview
-Blacked in percentages indicate questions not reaching 80% agreement or higher

more often than the interview, with an average of 9.5% participants choosing this answer in the survey only and 3% of participants in the interviews only expressing this response.

Discussion

Since the CEBPS survey measures college students' perceptions on the healthfulness of their campus environment, there was a need to validate that the survey accurately captured students' true perceptions. No current validation methods adequately does this, so in-depth interviews were conducted to compare the students' perceptions to their responses in the survey. This made it possible to recognize questions that more accurately measured students' perceptions, while identifying questions that did not. According to the analysis, students were more likely to agree with the question when asked in the interview as compared to when asked on the survey. This may be due to social desirability[17], in that students may have wanted to appear less negative and more agreeable when being interviewed. According to Leggett, when a survey is given through in-person interviews, participants were 23-29% more likely to be agreeable than when participants take self-administered surveys.[31] Social desirability may bias the results, for students may be agreeing with statements because they believe that is the answer the interviewer desires. Social desirability bias takes place in almost all methods of data collection that include self-reporting.[32] Due social desirability, people's responses to questions may be a result of their desire to be socially accepted rather than express how they truly feel.[33] According to Paulhus, there are two causes of social desirability bias.[34] The first is unintentional self-deception, where the person does not realize they are not answering truthfully. The second cause is intentional impression, also referred to as "faking good", which is done to make a good impression.[34] Participants may have agreed that the campus is healthy in the

in-person interviews and not the survey because they may believe it shows a good impression to recognize this healthfulness. Also, participants may give answers that are favorable and will appear representative of their actual characteristics.[35] The participants may have been more agreeable to questions regarding the healthfulness of their campus for a couple of reasons. One, they may believe if they agree that there are healthy options available on campus, they will appear to live a healthier lifestyle themselves. Also, an individual may be more comfortable agreeing with a statement and may consider being agreeable a favorable trait to possess.

Reporting bias is when participants answer questions in the direction that they believe is of interest to the interviewer. This may be why participants are more agreeable in interviews than on self-administered surveys.[36] Participants may have underreported how unhealthy they perceived the campus to be in order to make their response seem more socially desirable. This may have made their perceptions seem more agreeable than they were in reality.

The results of this study show a potential weakness when only using a survey approach to assess perceptions; survey participants may be more likely to provide a neutral response, whereas participants may be more likely to commit to an either agreeable or disagreeable response during an interview. One explanation for this is that the person may not be taking time during the survey to think about the answer, and the neutral answer is more convenient to answer if hurrying through the survey.[37] During the interview, however, the person may take more time to think about the question since there is interaction with another person.[38] This could be related to the concept of social desirability. Since individuals tend to present themselves in a favorable light, they may be

more inclined to agree or disagree when talking to someone in person, rather than just saying "I do not know".[33]

Strengths

This study displayed several strengths. First of all, the sample size of 30 participants was a strength. Although there is debate on appropriate sample size in qualitative research, it is commonly agreed upon that 15 participants be the minimum.[39] Since this study had 30 participants, it is likely that the sample size was adequate. Another strength of this study was that it validated a novel method need that otherwise had not been met. This novel method can now be used to validate other surveys measuring perceptions.

Limitations

There are several limitations to this study. First, the content being studied was inherently subjective. There are no completely objective ways to measure a person's perceptions.[40] Also, coding the interviews was subjective to coder bias, since the coder indicated whether they believed the participant was agreeing or disagreeing with a question or statement. However, coders did complete training and an appropriate IRR was reached. Another limitation is interview bias, which may have occurred. It is possible that the interviewer could have influenced, through probing, the participants to answer a certain way. However, an interview guide was used to reduce the likelihood of this occurring. Additionally, the interview guide was limited to the scope of the survey. If the survey was lacking a particular element of the environment, it is possible this was not addressed during the interviews. This could result in not getting the full perception of the campus health environment from participants. To help with this, the participants were

asked at the end of the interview if there was anything else they would like to say about the healthfulness of their college campus environment that had not yet been discussed.

Implications for Further Research

Since this was a study testing a novel approach on validating perceptions through in-depth interviews, there is a need for this method to be repeated in additional settings. These methods can be repeated in other surveys to compare for similar results found here.

Conclusion

Overall, the results of this study support the usefulness of the qualitative research technique of interviewing as a survey validation technique when measuring something subjective, such as a person's perceptions. This is valuable since assessing a large population's perceptions using qualitative approaches is time consuming and resource prohibitive. This method provides an approach that can be used to validate a perceptions-based questionnaire.

CHAPTER 3: EXPANDED METHODS

Project Overview

The College Environment Perception Survey (CEPS) was initially developed by the multi-state research group Healthy Campus Research Consortium (HCRC). It was designed to parallel the Healthy Living Index, which is a tool also developed by the group that was intended to evaluate elements of a college campus, such as the number of sidewalks, vending machines, exercise facilities, and water fountains using objective measurements.[27-30] The CEBPS was developed as a complimentary survey to the index in order to measure students' perceptions of each of these categories. The survey was intended to have parallel questions to each index measure. The Healthy Living Index was an objective measure, whereas the CEBPS was subjective. After development of the survey, validation was the next step needed.

All procedures were approved by the university's Institutional Review Board (IRB #FWA 6629). The survey development went through a preliminary stage of cognitive interviewing. After revisions, the validation process occurred with participants taking the survey then completing an in-depth interview. The study was conducted as part of a multi-state project with eight state university partners. Participating universities included: the University of Tennessee (UT), Kansas State University, Florida State University, the University of Nebraska, Tuskegee University, Auburn University, Rutgers University, and the University of Rhode Island. Cognitive interviews were conducted in all locations, while surveys and in-depth interviews were done by Tennessee only. The focus of this project was on the comparison of the survey answers and in-depth interviews. The purpose of the surveys and in-depth interviews was to see if all perceptions made evident in the in-depth

interviews were also captured by the CEBPS survey. This provided a novel way to validate surveys that measure qualitative data, such as perceptions.

Cognitive Interviews

Cognitive interviewing was used in the preliminary stage of the study to test whether the target audience interpreted the questions the same way the researchers intended for the questions to be interpreted. Cognitive interviewing is a tool used in the pretesting phase of survey development to identify questions that may lead to an error in participant response or researcher interpretation.[41,42] There are three methods in cognitive interviewing: observation of the respondent's behavior, probing, and think-aloud/read-aloud as the respondent completes the questionnaire. For this study, probing was used. This method consisted of the researcher asking the participant to paraphrase questions, define words, explain answers, and identify any difficulties they had with the question. The goal of this was for the researcher to get an idea of the participant's overall understanding of the question.[43] Cognitive interviews were implemented in this project because they allowed for progression of the survey development process, so the new validation methods of interest could be tested.

Each participating university recruited ten male and ten female participants. Therefore, at the University of Tennessee location, trained graduate students obtained a convenience sample of ten male and ten female students. The graduate students recruited participants by asking students in the University Center's dining facilities if they would be willing to participate in a research project. Potential participants were asked a series of three eligibility questions (Appendix A), and they were eligible to participate if they were 18-24 years of age, a UT student, and not a nutrition or kinesiology major. The age range

limitation was used so participants in all states could be compared to one another, and the exclusion of the majors was to avoid potential bias in the responses. A total of 20 students from each state were recruited in order to reach an anticipated level of saturation of response for both males and females.[44]

The full original 38 item CEPS survey (Appendix C) was divided among the multi-state research team to reduce the number of questions each participant was asked. UT asked 14 of the questions from the original full CEPS survey. The participants were asked, after signing the consent form (Appendix B), to complete the shortened written CEPS survey (Appendix D). Then they were verbally asked a series of interview questions about the written CEPS survey questions (Appendix A). The cognitive interviewing process took approximately twenty minutes to complete per subject. At the end of the cognitive interviewing process, the participant received a $5.00 Wal-Mart gift card as an incentive.

The cognitive interview responses were hand-written at the time of the interview and later typed into a pre-formatted Excel worksheet. The worksheet was then sent for analysis to a multi-state research partner at the University of Maine. At the University of Maine, two research assistants analyzed each university's data. The process included coding responses to each question as either indicating "clarity," "some confusion," or "much confusion." No analysis software was used, and coding was done by highlighting in Excel as green=clear, yellow=somewhat confusing, and red=very confusing. Each reviewer then commented on each question using quotes from the data. If there was any disagreement among reviewers on which questions were clear and which were not, the primary investigator at the site served as the tie-breaker. The analysis was subjective to the reviewer. Therefore, having two research assistants reviewing the responses increased

the assessment accuracy. After the coding process had been completed, the multi-state team reviewed the results and made any changes to the questions necessary based on the identified confusion. Questions were kept as is, altered, or excluded. Seven questions were modified, and seven were excluded. The modified questions were then retested through the same cognitive interview process with different participants, and the final CEPS survey was formed. Several previously validated questionnaires were added to the final CEPS survey in order to obtain more information. New questions included demographic questions, a food frequency questionnaire, and a behavior survey. The final survey with the additions was then renamed the College Environment Behavior and Perception Survey (CEBPS) (Appendix E).

Interview Validation Process

A total of 30 participants (15 male and 15 female) were recruited for this project. All participants were college students between the ages of 18 and 24, were not members of a varsity sport team, and were not nutrition or kinesiology majors. Exclusion of nutrition or kinesiology majors was to avoid bias from nutrition focused individuals since they might have different perspectives. The age specifications were set in order to try to provide the most homogenous population possible in order to gain a reasonable sample size.

Recruitment: Male participants had already completed the online consent process and CEBPS survey as part of another research study approximately 2 weeks prior. They were contacted via e-mail to see whether they were interested in completing an in-depth interview. If they said they were, a time was set up for them to either come into the research lab or for the researcher to call them to do an interview via phone. The same recruitment procedures (as used with the previous study from which the males had been

recruited) were used with the females. This included in-person recruitment in the campus recreational center, the library, and through word of mouth. The primary researcher and a research assistant set up a table at the entrance of these facilities where they had information on the study available. Interested participants were asked a series of questions to see if they were eligible, and if they were they were scheduled for an appointment for the study. Potential participants contact information was also obtained to remind them of the appointment. When the females were recruited, they were given a brief summary of the study, and if interested, scheduled an appointment for an interview. The researcher contacted the participants via text message or e-mail to remind them of their scheduled appointment the day prior to the appointment. At the appointment, they completed an online consent process (Appendix F) and took the CEBPS survey, which took approximately 15 minutes to complete. The CEBPS survey was made available in the form of an online survey through the program Qualtrics. The software allowed for surveys to be easily administered via the web, as well as to store and download results. At the end of the survey, the researcher put in a participant's ID number. No identifiable information was obtained from the participants. At the end of the online survey, they were asked whether they were still interested in completing an in-depth interview. If they indicated "yes", the researcher conducted the interview and included reference to the participant's ID number at the beginning of the interview. The interviews were saved as the participant's ID number to match the CEBPS survey taken.

In-Depth Interviews: The study used in-depth interviewing to compare the answers between the online survey taken and the interview in order to determine if the survey captured the same perspectives identified during the interview process. In-depth

interviews are the most commonly used method for obtaining data in health-related qualitative research.[45,46] In semi-structured interviews, the goal is to focus on the context of what the participant is saying[46] about the main topic area of interest to the researcher.[47] After asking initial broad/general topic questions, the researcher probes with follow-up questions to encourage the participant to elaborate on the subject and provide detail. Some skills required of the interviewer include active listening, nonverbal cues, providing positive feedback, and building rapport.[45,46]

All interviews, whether in person or on the phone, were digitally recorded. The participants were informed they were being recorded, and verbal consent was obtained. After verbal consent, the researcher used the interview guide (Appendix G) to ask a series of in-depth questions. The in-depth interviews took approximately 20 minutes to complete. The main researcher conducted all in-depth interviews. The interview guide was followed for every participant. Questions in the interview mirrored questions asked on the CEBPS survey. For example, a question in the survey was "There are healthy foods available in the dining halls where I eat around campus" (with answer choices of “strongly agree”, “agree”, “neither agree nor disagree”, “disagree”, “strongly disagree”, “choose not to answer”, or “I do not know because I do not eat in dining halls around campus”). The corresponding interview question was "How healthy are the foods in dining halls around campus?”. For each category of questions, such as healthy food availability, physical activity, safety, etc., there was first a general question regarding that category in the interview. For example, the first question in the interview was "tell me about the foods available around campus". After the participant answered this general question, the interviewer used the interview guide to ask more specific questions regarding questions from the survey that were not

initially addressed in the first answer. All interviews were digitally recorded, and the interviews were saved as the participants' ID numbers as the file name.

Incentive: Upon completion of both the online survey and in-depth interview, participants were e-mailed or given a $15.00 Wal-Mart gift card for compensation.

Transcribing Interviews

Set protocols need to be initiated that address punctuation, spelling, and level of detail before transcribing begins in order for data to be consistent across different coders.[47] The interviews were transcribed using the program Inqscribe. The main researcher trained undergraduate assistants on how to transcribe the interviews. The interviews were transcribed verbatim, including laughs and long pauses. Undergraduate assistants were provided written instructions on how to transcribe (Appendix H). A log sheet to record the transcription process was provided to the undergraduate research assistants (Appendix I). In the records, research assistants indicated starting a new interview transcription, documented the participant ID number and noted if they finished transcribing the entire interview by signing in the corresponding box. If they did not finish transcribing the entire interview, they would note at what time location they transcribed up to. The next person to work on transcriptions would then start where the last person left off. Once the interview was fully transcribed, another research assistant (who had not worked on transcribing that particular interview) would double-check the transcription for any errors. The double-checking process involved the research assistant simultaneously listening to the recording and reading the written transcript. They would write down any discrepancies on the provided sheet (Appendix J) and indicate what the mistake was and at

what time point in the interview the error occurred. The primary researcher assessed all discrepancies and made changes accordingly.

Data Analysis

During qualitative research, analysis of data often begins while the data are still being collected.[44] This allows for researchers to refine any questions, as well as to go further in depth. Thematic analysis is the most widely used qualitative research analysis in health care.[47] In this type of analysis, researchers group the data into different themes, as well as make sure everything in each theme has been included.[48]

Developing A Priori Codes

A codebook is a tool that consists of a comprehensive list of all codes, descriptions of the codes, and an example of each for reference.[49] These are important to have when multiple researchers or research assistants code data from the same project.[49] Two different research assistants coded each survey and in-depth interview so as to reduce subjectivity bias.[50]

The main researcher used initial coding on the surveys to create an *a priori* codebook for the surveys and in-depth interviews. The researcher went through the survey and created codes for each question. Each question had three code options. The first code for the question would be if the participant agreed with the statement; so, if the participant answered “strongly agree” or “agree”, the first code would be used. The second code was if the participant chose “strongly disagree” or “disagree”. The third code for each question was for the answers “neither agree nor disagree”, “choose not to answer”, or “I don't know because ____”. If a question was left blank, the third code was used as "choose not to answer". Codes went in sequential order for each question (e.g. question 1 had codes

1-3, question 2 had codes 4-6, and so on). See Appendix K for the *a priori* codebook. These codes were made into another codebook, which was used as a reference when coding the in-depth interviews (Appendix L). The same codes used for the surveys were used to code the in-depth interviews, only in a different order to match how the questions were asked in the in-depth interview.

Research Assistant Training

The primary researcher trained the research assistants, seven in total, to code the surveys and in-depth interviews. The research assistants were given the codebook to study. The primary researcher went over the codebook with the research assistants as a group and gave detailed instructions on how to use it and code the survey. Then, the research assistants received hypothetical surveys to practice coding using the *a priori* codes provided in the codebook. The research assistants switched coded surveys with another research assistant for them to be checked for accuracy and agreement. The main researcher went over the correct answer for each question. No errors were found in the practice surveys. An inter-rater agreement of 100% was reached, which was above the goal of 80%.

After the research assistants were trained on coding the surveys, they were trained on coding the in-depth interviews. They were first given a codebook to study (Appendix L). The assistants were given two practice interviews to code. The main researcher went through the first practice interview with the assistants together, answering any questions that they had. The research assistants then coded the second practice interview independently. After the assistants had independently completed coding the practice material, the main researcher went through the practice coded interviews to assess the

agreement. An inter-rater agreement of 85% was reached, which was above the goal of 80%. Having high percentages of inter-rater agreement is essential to have reliable coding.[49]

Coding Surveys and In-Depth Interviews

After the research assistant training, the research assistants coded the 30 surveys via SPSS. All survey answers were transferred from Qualtrics to SPSS. A re-code column for each question was creating, and based on what the participant answered, the correct code was recorded in the re-code column. Each survey was coded according to the codebook, and a second research assistant double-checked each survey and made note of any errors. Any discrepancies were to be given to the primary researcher to review, and all marked errors were observed and corrected as needed.

For the in-depth interview coding, each transcript was coded by two different research assistants independently using the *a priori* list. Line-by-line analysis was used during the coding process of the in-depth interviews, meaning that coders coded each line of the transcript using the a priori codes provided. Research assistants hand-wrote the code they believed best fit the statement out to the side of the statement and highlighted the words that made them believe that code was appropriate. If research assistants found any statements that did not fit in the *a priori* coding, the code "85" was used, and the section was highlighted. All coded transcripts were given back to the primary researcher, who resolved any discrepancies between transcripts. The primary researcher also reviewed all "85" codes and added new codes to the codebook. The transcripts were given back to research assistants to recode any "85s" using the new codebook. The primary

researcher reassessed the recoded transcripts and resolved any remaining discrepancies that took place.

After both the surveys and the in-depth interviews had been coded, the researcher went through each pair matched by participant IDs and used the coding sheet (Appendix M) to indicate if codes were found in the survey, interview, both, or neither. Those were then recoded into a new agree/disagree column with a 1 (code was found in both interview and survey), 2 (code found in interview only) or 3 (code found in survey only). This was all done by hand. The recoded items were then added to the SPSS data for analysis.

Statistical Analysis

The data analysis program SPSS was used for the statistical analysis described below. For each question, the 3 codes that corresponded to that question were added together. For example, codes 1, 2, and 3 were added together for question 1. These codes that were added together were the recoded numbers described above. A score of 1 indicated agreement between the survey and interview, and anything higher noted disagreement. A new column was added after every three codes that corresponded with the question that the three codes were from. This new column consisted of the values from the codes added together. Frequencies were used to analyze all the questions. All questions were checked to see if 80% agreement between the survey and interview had been reached. The frequency of the score of 1 in the recoded questions was looked at to determine whether 80% agreement was reached or not. Any questions not reaching 80% agreement were further analyzed to determine if codes were missing more in the survey or interview and if participants agreed more with questions in the interview or the survey.

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APPENDICES

Cognitive Interview Instructions for Graduate Student Interviewers

You must review this manual and have completed CITI (human subjects) training and print out a certificate of completion before you start interviews. Once you have completed this, you are expected to complete 6 interviews with UT students 18-24 years who are not nutrition majors (3 male and 3 female) and complete the attached documentation. Use the protocol below:

1. Introduce yourself as a Nutrition Department graduate research assistant to a potential volunteer and ask for their help. Please ask potential participant
    - Are you 18-24 years old? Yes No
    - Are you a student at UT? Yes No
    - Are you a kinesiology or nutrition major? Yes No

    If a potential participant answers "Yes" to 18-24 years and "Yes" to college student and "No" to nutrition or Kinesiology major, ask if they would be willing to complete a short survey and answer some questions taking no more that about 10 minutes and explain that they will receive an incentive of a $5 Wal-Mart gift card once they have answered the questions.
2. If they agree, give them the attached survey, ask them to read the consent form and answer any questions about the study. If they agree to complete the survey, have them complete it and return it to you. If they ask questions about the survey, answer with non-leading responses, e.g., What do you think are healthy foods?
3. Once the questions have been completed, review them for completeness. Probe for responses to unanswered questions but if the participant refuses to answer mark refusal with an R.
4. Complete the following probes for each question and record on the back of the sheet by question number:
    a. "Please tell me in your own words what you think the question is asking?"
    b. "Are there any changes that you think need to be made to the way the question is worded?"
    c. "I see that you answered the question about *describe question.* Can you tell me some of the reasons you choose *answer choice*?
    d. How strongly do you feel about *question topic*?
    e. What was the first thing that came to your mind when you thought about *question*?
    f. What do you feel about the *question topic* at UT?
5. Record your name and the date of survey completion on the survey form.

Ask if they have any questions and answerer them. Thank them and have them sign the receipt acknowledging receipt of the incentive. Provide the incentive and a copy of the consent form.

Appendix B CEPS Cognitive Interview Consent Form

College Environment Perception Survey
Cognitive Interviewing- UT- Consent Form

Purpose of Study
Currently there is very little information about what college students feel about their school environment in terms of promoting health. The purpose of this study is to help nutrition educators develop an assessment of how college students perceive their environment. This will help us develop programs and encourage the administration of the university to make changes to improve the healthfulness of our campus.

Can I participate?
You must be a UT student between 18 and 24 years or older and can't be a Nutrition or Kinesiology Major to participate in this research study.

What will I be asked to do?
You will be asked to complete a short survey and then we will ask you some questions about that survey.

Benefits of Participation
After you have completed the survey and answered some questions about your answers to the survey you will be provided with a $5.00 Wal-Mart gift card and ask you to sign a receipt form indicating that you received your incentive. Note that there will be no link between your name on the receipt form and your answers.

Risks of Participation
There are no risks associated with this project. The entire survey and brief interview should take about 10 minutes to complete.

Confidentiality
All of your answers will remain confidential and your name is not listed on the survey, will not be listed on the interview form and will not be linked to your answers in any way.

Voluntary
Participation is entirely voluntary and you can select "Choose not to answer" for any questions if you don't want to answer it and can tell the interviewer you do not want to answer any questions.

Contact Information
This survey is part of research conducted by the University of Tennessee. If you have any questions, feel free to call me, Sarah Colby, at (865) 974-6248. If you have questions about your rights as a participant, contact the Office of Research Compliance Officer at (865) 974-3466. This study has been approved by the Institutional Review Board (IRB) of the University of Tennessee.

CONSENT
I have read the above information. I have received a copy of this form. I agree to participate in this study.

Participant's signature _____ Date _____

Appendix C CEPS

College Environment Perception Survey

Please read the following statements and indicate to what extent you agree or disagree (Check all that apply)

1. There are healthy foods available where I usually eat in dining halls on campus.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - I don't know
    - I don't eat in dining halls on campus
    - Choose not to answer

2. There are healthy foods available where I usually eat in food courts/snack bars on campus.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - I don't know
    - I don't eat in food courts/snack bars on campus
    - Choose not to answer

3. Healthy foods are on-hand at grocery stores around campus.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - I don't know
    - I don't shop at grocery stores around campus
    - Choose not to answer

4. Healthy foods are on-hand at convenience stores on or around campus.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - I don't know
    - I don't shop at convenience stores on or around campus
    - Choose not to answer

5. There are healthy foods available at restaurants on or around campus.
    - Strongly Agree

- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree
- I don't know
- I don't eat at restaurants on or around campus
- Choose not to answer

6. There are low cost healthy foods available on campus.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - I don't know
    - Choose not to answer

7. There are signs telling me which foods are healthy where I eat on campus.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - I don't know
    - Choose not to answer

8. There are enough working water fountains in most buildings on campus.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - I don't know
    - I don't use water fountains on campus
    - Choose not to answer

9. The water in water fountains on campus taste good.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - I don't know because I don't use water fountains on campus
    - Choose not to answer

10. There are clean water fountains water in most buildings on campus.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree

- Disagree
- Strongly Disagree
- I don't know because I don't use water fountains on campus
- Choose not to answer

11. There are lots of healthy choices in vending machines on campus.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - I don't know
    - I don't use vending machines on campus
    - Choose not to answer

12. There are signs telling me which foods are healthy in vending machines on campus.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - I don't know
    - I don't use vending machines on campus
    - Choose not to answer

13. There are plenty of exercise programs on campus.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - I don't know
    - I don't participate in exercise programs on campus
    - Choose not to answer

14. There are enough exercise facilities and equipment on campus.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - I don't know
    - I don't use exercise facilities or equipment on campus
    - Choose not to answer

15. The exercise facilities and equipment on campus are in good condition.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree

- Disagree
- Strongly Disagree
- I don't know
- I don't use exercise facilities or equipment on campus
- Choose not to answer

16. There are plenty of opportunities on campus to be moderately or vigorously active on campus. (Moderate or vigorous activity may include….)
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - I don't know
    - I am not moderately or vigorously active on campus
    - Choose not to answer

17. There are sports (Intermural or club) available to play on campus.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - I don't know
    - I don't play sports on campus
    - Choose not to answer

18. There are safe places for me to walk.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - I don't know
    - I don't walk on campus
    - Choose not to answer

19. It is safe to bike around campus.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - I don't know
    - I don't bike on campus
    - Choose not to answer

20. There are enough bike racks on campus.
    - Strongly Agree

- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree
- I don't know
- I don't bike on campus
- Choose not to answer

21. The stairs in most buildings on campus are clean, well lit, and labeled for use.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - I don't know
    - I don't use the stairs in most buildings on campus
    - Choose not to answer

22. The stairs in most buildings on campus are clean.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - I don't know
    - I don't use the stairs in most buildings on campus
    - Choose not to answer

23. The stairs in most buildings on campus are well lit.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - I don't know
    - I don't use the stairs in most buildings on campus
    - Choose not to answer

24. The stairs in most buildings on campus are labeled for use.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - I don't know
    - I don't use the stairs in most buildings on campus
    - Choose not to answer

25. There are signs in building encouraging people to use the stairs.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree
- I don't use the stairs in most buildings on campus
- I don't know
- Choose not to answer

26. It is safe to walk around campus at night.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - I don't know
    - I don't walk around campus at night
    - Choose not to answer

27. The campus living environment allows for quiet and restful sleep.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - I don't know
    - I don't sleep on campus
    - Choose not to answer

28. There are programs on campus that promote healthy eating.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - I don't know
    - I don't participate in programs on campus that promote healthy eating
    - Choose not to answer

29. There are programs on campus that promote physical activity.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - I don't know
    - I don't participate in programs on campus that promote physical activity
    - Choose not to answer

30. There are programs on campus that promote stress management.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - I don't know
    - I don't participate in programs on campus that promote stress management
    - Choose not to answer

31. There are policies on campus that promote health.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - I don't know
    - Choose not to answer

32. Overall my campus promotes healthy eating and being physically active.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - I don't know
    - Choose not to answer

Please give your campus a grade.

33. How healthy is your campus?

    - A+
    - A
    - A-
    - B+
    - B
    - B-
    - C-
    - D+
    - D
    - D-
    - F
    - I don't know
    - Choose not to answer

Appendix D CEPS Questions for UT Cognitive Interviews

College Environment Perception Survey
UT Cognitive Interviews

Please read the following statements and indicate to what extent you agree or disagree

1. There are healthy foods available where I usually eat in dining halls on campus.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - I don't know because I don't eat in dining halls on campus
    - Choose not to answer

2. Healthy foods are on-hand at convenience stores on or around campus.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - I don't know because I don't shop at convenience stores on or around campus
    - Choose not to answer

3. There are signs telling me which foods are healthy in vending machines on campus.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - I don't know because I don't use vending machines on campus
    - Choose not to answer

4. There are clean water fountains water in most buildings on campus.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - I don't know because I don't use water fountains on campus
    - Choose not to answer

5. There are plenty of exercise programs on campus.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - Choose not to answer

6. There are plenty of opportunities on campus to be moderately or vigorously active on campus. (Moderate or vigorous activity may include….)
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - Choose not to answer

7. It is safe to bike around campus.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - Choose not to answer

8. The stairs in most buildings on campus are clean.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - Choose not to answer

9. There are signs in building encouraging people to use the stairs.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - Choose not to answer

10. There are programs on campus that promote healthy eating.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - Choose not to answer

11. There are policies on campus that promote health.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - Choose not to answer

12. How often do you compare sodium (salt) in foods like soup, bread, and frozen meals — and choose the foods with lower numbers?
    - Almost Always
    - Most of the time
    - Sometimes
    - Seldom
    - Never
    - Choose not to answer

13. How would you rate the "healthiness" of your eating habits?
    - Poor
    - Fair
    - Average
    - Good
    - Excellent
    - Choose not to answer

14. The sleep I get is quiet and restful.
    - Never
    - Seldom
    - About half the time
    - Usually
    - Always
    - Choose not to answer

Thank you for completing the survey, please hand it back to the interviewer and he/she will ask you some follow-up questions.

Appendix E CEBPS Full Survey

College Environmental Perceptions and Behaviors Survey (CEBPS) *88 item*

SECTION A: College Environmental Perceptions Survey (CEPS) *28 item*

1. There are plenty of exercise classes offered at the rec center on campus.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - Choose not to answer

2. There are policies (e.g. no cars on campus) on campus that promote physical activity.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - Choose not to answer

3. There are policies (e.g. limits on sizes of sodas, minimum healthy items in vending machines) on campus that promote healthy eating.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - Choose not to answer

4. Green eating includes, participating in most of the following behaviors:

• Eating locally grown foods, produce that is in season and limited intake of processed foods.
• Consuming foods and beverages that are labeled fair trade certified or certified organic.
• Consuming meatless meals weekly and (if consuming animal products) selecting meats, poultry and dairy that do not contain hormones or antibiotics.

Based on the above definition for green eating, overall my campus promotes green eating.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree
- Choose not to answer

5. Healthy foods are on-hand at local grocery stores around campus.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - I don't know because I don't shop at grocery stores around campus
    - Choose not to answer

6. The university's exercise facilities and equipment are in good condition.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - Choose not to answer

7. There are low cost healthy foods available on campus.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - I don't know because I don't eat on campus
    - Choose not to answer

8. The water in water fountains on campus tastes good.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree

- I don't know because I don't use water fountains on campus
- Choose not to answer

9. There are safe places for me to walk.

    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - Choose not to answer

10. The stairs in most buildings on campus are clean and well lit.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - Choose not to answer

11. There are signs in buildings encouraging people to use the stairs.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - Choose not to answer

12. The campus living environment allows for quiet and restful sleep.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - Choose not to answer

13. There are programs on campus that promote stress management.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - Choose not to answer

14. There are healthy foods available where I usually eat in food courts/snack bars on campus.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - I don't know because I don't eat in food courts/snack bars on campus
    - Choose not to answer

15. There are healthy foods available at restaurants on or around campus.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - I don't know because I don't eat at restaurants on or around campus
    - Choose not to answer

16. There are lots of healthy choices in vending machines on campus.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - I don't know because I don't use vending machines on campus
    - Choose not to answer

17. There are enough exercise facilities and equipment on campus.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree

- Disagree
- Strongly Disagree
- Choose not to answer

18. There are sports (Intramural or club) available to play on campus.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree
- Choose not to answer

19. There are enough bike racks on campus.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree
- Choose not to answer

20. It is safe to walk around campus at night.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree
- Choose not to answer

21. There are healthy foods available where I usually eat in dining halls on campus.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree
- I don't know because I don't eat in dining halls on campus
- Choose not to answer

22. Healthy foods are on-hand at convenience stores on or around campus.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree
- I don't know because I don't shop at convenience stores on or around campus
- Choose not to answer

23. There are signs telling me which foods are healthy in vending machines on campus.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - I don't know because I don't use vending machines on campus
    - Choose not to answer

24. There are clean water fountains in most buildings on campus.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - I don't know because I don't use water fountains on campus
    - Choose not to answer

25. There are plenty of opportunities on campus to be moderately or vigorously active on campus. (*Vigorous physical activities refer to activities that take hard physical effort and make you breathe much harder than normal or make your heart beat much harder than normal. Moderate activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal or make your heart beat somewhat harder than normal.*)
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - Choose not to answer

26. It is safe to bike around campus.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree
- Choose not to answer

27. There are programs on campus that promote healthy eating.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - Choose not to answer

28. It is safe to walk around campus at night.
    - Strongly Agree
    - Agree
    - Neither Agree nor Disagree
    - Disagree
    - Strongly Disagree
    - Choose not to answer

SECTION B: College Environmental Behavioral Survey- CEBS *10 item*

1. I look for healthy food options when I shop and eat (including in grocery stores, vending machines, dining halls, restaurants, convenience stores and food courts/snack bars).

   Never 1 2 3 4 5 Frequently

2. I use the university's exercise facilities and equipment.

   Never 1 2 3 4 5 Frequently

3. I use the stairs in most buildings on campus.

   Never 1 2 3 4 5 Frequently

4. I walk on campus during day.

   Never 1 2 3 4 5 Frequently

5. I walk around on campus at night.

   Never 1 2 3 4 5 Frequently

6. I participate in exercise classes offered at the rec center on campus.

   Never 1 2 3 4 5 Frequently

7. I play sports (intramural or club) on campus.

   Never 1 2 3 4 5 Frequently

8. I bike on campus.

   Never 1 2 3 4 5 Frequently

9. I use water fountains on campus.

   Never 1 2 3 4 5 Frequently

10. I participate in programs on campus that promote health (healthy eating, physical activity, stress management).

    Never 1 2 3 4 5 Frequently

SECTION C: Physical Activity (IPAQ)*7 item*

How Active Are You?

We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the time you spent being physically active in the last 7 days. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport. Think about all the vigorous activities that you did in the last 7 days. Vigorous physical activities refer to activities that take hard physical effort and make you breathe much harder than normal or make your heart beat much harder than normal. Think only about those vigorous physical activities that you did for at least 10 minutes at a time, such as running,

aerobics, heavy yard work, or anything else that causes large increases in breathing or heart rate.

1) During the last 7 days, on how many days did you do vigorous physical activities like heavy lifting, digging, aerobics, or fast bicycling?
(1) 0 days (Skip to question 3)
(2) 1 day
(3) 2 days
(4) 3 days
(5) 4 days
(6) 5 days
(7) 6 days
(8) 7 days
(9) Choose not to answer

2) How much time did you usually spend doing vigorous physical activities on one of those days?
(1) Did not do vigorous physical activities
(2)10 minutes
(3) 20 minutes
(4) 30 minutes
(5) 40 minutes
(6) 50 minutes
(7) 60 minutes
(8) 70 minutes (1 hr 10 min)
(9) 80 minutes (1 hr 20 min)
(10) 90 minutes (1 hr 30 min)
(11) 100 minutes (1 hr 40 min)
(12) 110 minutes (1 hr 50 min)
(13) 120 minutes (2 hrs)
(14) 130 minutes (2 hrs 10 min)
(15) 140 minutes (2 hrs 20 min)
(16) 150 minutes (2 hrs 30 min)
(17) 160 minutes (2 hrs 40 min)
(18) 170 minutes (2 hrs 50 min)
(19) 180 + minutes (3 hrs or more)
(20) Don't know/not sure
(21) Choose not to answer

Think about all the moderate activities that you did in the last 7 days. Moderate activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal or make your heart beat somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time, such as brisk walking, bicycling, vacuuming, gardening, or anything else that causes some increase in breathing or heart rate.

3) During the last 7 days, on how many days did you do moderate physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.
(1) 0 days (Skip to question 5)
(2) 1 day
(3) 2 days
(4) 3 days
(5) 4 days
(6) 5 days
(7) 6 days
(8) 7 days
(9) Choose not to answer

4) How much time did you usually spend doing moderate physical activities on one of those days?

(1) Do not do moderate physical activities
(2)10 minutes
(3) 20 minutes
(4) 30 minutes
(5) 40 minutes
(6) 50 minutes
(7) 60 minutes
(8) 70 minutes (1 hr 10 min)
(9) 80 minutes (1 hr 20 min)
(10) 90 minutes (1 hr 30 min)
(11) 100 minutes (1 hr 40 min)
(12) 110 minutes (1 hr 50 min)
(13) 120 minutes (2 hrs)
(14) 130 minutes (2 hrs 10 min)
(15) 140 minutes (2 hrs 20 min)
(16) 150 minutes (2 hrs 30 min)
(17) 160 minutes (2 hrs 40 min)
(18) 170 minutes (2 hrs 50 min)
(19) 180 + minutes (3 hrs or more)
(20) Don't know/not sure
(21) Choose not to answer

Think about the time you spent walking in the last 7 days. This includes at work and at home, walking to travel from place to place, and any other walking that you might do solely for recreation, sport, exercise or leisure.

5) During the last 7 days, on how many days did you walk for at least 10 minutes at a time?
(1) 0 days (Skip to question 7)
(2) 1 day
(3) 2 days

(4) 3 days
(5) 4 days
(6) 5 days
(7) 6 days
(8) 7 days
(9) Choose not to answer

6) How much time did you usually spend walking on one of those days?

(1) Did not walk
(2)10 minutes
(3) 20 minutes
(4) 30 minutes
(5) 40 minutes
(6) 50 minutes
(7) 60 minutes
(8) 70 minutes (1 hr 10 min)
(9) 80 minutes (1 hr 20 min)
(10) 90 minutes (1 hr 30 min)
(11) 100 minutes (1 hr 40 min)
(12) 110 minutes (1 hr 50 min)
(13) 120 minutes (2 hrs)
(14) 130 minutes (2 hrs 10 min)
(15) 140 minutes (2 hrs 20 min)
(16) 150 minutes (2 hrs 30 min)
(17) 160 minutes (2 hrs 40 min)
(18) 170 minutes (2 hrs 50 min)
(19) 180 + minutes (3 hrs or more)
(20) Don't know/not sure
(21) Choose not to answer

This question is about the time you spent sitting on weekdays during the last 7 days. Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading or sitting or lying down to watch television.

7) During the last 7 days, how much time did you spend sitting on a week day?
(1) 10 minutes
(2) 20 minutes
(3) 30 minutes
(4) 40 minutes
(5) 50 minutes
(6) 60 minutes
(7) 70 minutes (1 hr 10 min)
(8) 80 minutes (1 hr 20 min)
(9) 90 minutes (1 hr 30 min)

(10) 100 minutes (1 hr 40 min)
(11) 110 minutes (1 hr 50 min)
(12) 120 minutes (2 hrs)
(13) 130 minutes (2 hrs 10 min)
(14) 140 minutes (2 hrs 20 min)
(15) 150 minutes (2 hrs 30 min)
(16) 160 minutes (2 hrs 40 min)
(17) 170 minutes (2 hrs 50 min)
(18) 180 + minutes (3 hrs or more)
(19) Don't know/not sure
(20) Choose not to answer

SECTION D: Sleep (BRFSS Module 5: Inadequate Sleep) *1 item*

1. On average, how many hours of sleep do you get in a 24-hour period? Think about the time you actually spend sleeping or napping, not just the amount of sleep you think you should get.

   _____

SECTION E: Eating Rate *1 item*

1. What is your usual rate of eating?

   Very slow 1 2 3 4 5 Very fast

SECTION F: Dietary (NHANES/NCI DIETARY SCREENER QUESTIONNAIRE- DSQ Self-administered) *28 item*

1. During the past month, how often did you eat hot or cold cereals? Mark one .

   (1) Never -Go to question 4.
   (2) 1 time last month
   (3) 2-3 times last month
   (4) 1 time per week
   (5) 2 times per week
   (6) 3-4 times per week
   (7) 5-6 times per week
   (8) 1 time per day
   (9) 2 or more times per day

2. During the past month, what kind of cereal did you usually eat?

_____

3. If there was another kind of cereal that you usually ate during the past month, what kind was it?

   _____

4. During the past month, how often did you have any milk (either to drink or on cereal)? Include regular milks, chocolate or other flavored milks, lactose-free milk, buttermilk. Please do not include soy milk or small amounts of milk in coffee or tea. Mark one .
   (1) Never -Go to question 8.
   (2) 1 time last month
   (3) 2-3 times last month
   (4) 1 time per week
   (5) 2 times per week
   (6) 3-4 times per week
   (7) 5-6 times per week
   (8) 1 time per day
   (9) 2-3 times per day
   (10) 4-5 times per day
   (11) 6 or more times per day

5. During the past month, what kind of milk did you usually drink? Mark one .
   (1) Whole or regular milk
   (2) 2% fat or reduced-fat milk
   (3) 1%, ½%, or low-fat milk
   (4) Fat-free, skim or nonfat milk
   (5) Soy milk
   (6) Other kind of milk

   _____

6. During the past month, how often did you drink regular soda or pop that contains sugar? Do not include diet soda. Mark one .
   (1) Never
   (2) 1 time last month
   (3) 2-3 times last month
   (4) 1 time per week
   (5) 2 times per week
   (6) 3-4 times per week
   (7) 5-6 times per week
   (8) 1 time per day
   (9) 2-3 times per day
   (10) 4-5 times per day
   (11) 6 or more times per day

7. During the past month, how often did you drink 100% pure fruit juices such as orange, mango, apple, grape and pineapple juices? Do not include fruit-flavored drinks with added sugar or fruit juice you made at home and added sugar to. Mark one .
   (1) Never
   (2) 1 time last month
   (3) 2-3 times last month
   (4) 1 time per week
   (5) 2 times per week
   (6) 3-4 times per week
   (7) 5-6 times per week
   (8) 1 time per day
   (9) 2-3 times per day
   (10) 4-5 times per day
   (11) 6 or more times per day

8. During the past month, how often did you drink coffee or tea that had sugar or honey added to it? Include coffee and tea you sweetened yourself and presweetened tea and coffee drinks such as Arizona Iced Tea and Frappuccino. Do not include artificially sweetened coffee or diet tea.
   (1) Never
   (2) 1 time last month
   (3) 2-3 times last month
   (4) 1 time per week
   (5) 2 times per week
   (6) 3-4 times per week
   (7) 5-6 times per week
   (8) 1 time per day
   (9) 2-3 times per day
   (10) 4-5 times per day
   (11) 6 or more times per day

9. During the past month, how often did you drink sweetened fruit drinks, sports or energy drinks, such as Kool-Aid, lemonade, Hi-C, cranberry drink, Gatorade, Red Bull or Vitamin Water? Include fruit juices you made at home and added sugar to. Do not include diet drinks or artificially sweetened drinks.
   (1) Never
   (2) 1 time last month
   (3) 2-3 times last month
   (4) 1 time per week
   (5) 2 times per week
   (6) 3-4 times per week
   (7) 5-6 times per week
   (8) 1 time per day
   (9) 2-3 times per day

(10) 4-5 times per day
(11) 6 or more times per day

10. During the past month, how often did you eat fruit? Include fresh, frozen or canned fruit. Do not include juices.
(1) Never
(2) 1 time last month
(3) 2-3 times last month
(4) 1 time per week
(5) 2 times per week
(6) 3-4 times per week
(7) 5-6 times per week
(8) 1 time per day
(9) 2 or more times per day

11. During the past month, how often did you eat a green leafy or lettuce salad, with or without other vegetables?
(1) Never
(2) 1 time last month
(3) 2-3 times last month
(4) 1 time per week
(5) 2 times per week
(6) 3-4 times per week
(7) 5-6 times per week
(8) 1 time per day
(9) 2 or more times per day

12. During the past month, how often did you eat any kind of fried potatoes, including french fries, home fries, or hash brown potatoes?
(1) Never
(2) 1 time last month
(3) 2-3 times last month
(4) 1 time per week
(5) 2 times per week
(6) 3-4 times per week
(7) 5-6 times per week
(8) 1 time per day
(9) 2 or more times per day

13. During the past month, how often did you eat any other kind of potatoes, such as baked, boiled, mashed potatoes, sweet potatoes, or potato salad?
(1) Never
(2) 1 time last month
(3) 2-3 times last month
(4) 1 time per week
(5) 2 times per week

(6) 3-4 times per week
(7) 5-6 times per week
(8) 1 time per day
(9) 2 or more times per day

14. During the past month, how often did you eat refried beans, baked beans, beans in soup, pork and beans or any other type of cooked dried beans?
Do not include green beans.
(1) Never
(2) 1 time last month
(3) 2-3 times last month
(4) 1 time per week
(5) 2 times per week
(6) 3-4 times per week
(7) 5-6 times per week
(8) 1 time per day
(9) 2 or more times per day

15. During the past month, how often did you eat brown rice or other cooked whole grains, such as bulgur, cracked wheat, or millet? Do not include white rice.
(1) Never
(2) 1 time last month
(3) 2-3 times last month
(4) 1 time per week
(5) 2 times per week
(6) 3-4 times per week
(7) 5-6 times per week
(8) 1 time per day
(9) 2 or more times per day

16. During the past month, not including what you just told me about (green salads, potatoes, cooked dried beans), how often did you eat other vegetables?
(1) Never
(2) 1 time last month
(3) 2-3 times last month
(4) 1 time per week
(5) 2 times per week
(6) 3-4 times per week
(7) 5-6 times per week
(8) 1 time per day
(9) 2 or more times per day

17. During the past month, how often did you have Mexican-type salsa made with tomato?
(1) Never

(2) 1 time last month
(3) 2-3 times last month
(4) 1 time per week
(5) 2 times per week
(6) 3-4 times per week
(7) 5-6 times per week
(8) 1 time per day
(9) 2 or more times per day

18. During the past month, how often did you eat pizza? Include frozen pizza, fast food pizza, and homemade pizza.
(1) Never
(2) 1 time last month
(3) 2-3 times last month
(4) 1 time per week
(5) 2 times per week
(6) 3-4 times per week
(7) 5-6 times per week
(8) 1 time per day
(9) 2 or more times per day

19. During the past month, how often did you have tomato sauces such as with spaghetti or noodles or mixed into foods such as lasagna? Do not include tomato sauce on pizza.
(1) Never
(2) 1 time last month
(3) 2-3 times last month
(4) 1 time per week
(5) 2 times per week
(6) 3-4 times per week
(7) 5-6 times per week
(8) 1 time per day
(9) 2 or more times per day

20. During the past month, how often did you eat any kind of cheese? Include cheese as a snack, cheese on burgers, sandwiches, and cheese in foods such as lasagna, quesadillas, or casseroles. Do not include cheese on pizza.
(1) Never
(2) 1 time last month
(3) 2-3 times last month
(4) 1 time per week
(5) 2 times per week
(6) 3-4 times per week
(7) 5-6 times per week
(8) 1 time per day
(9) 2 or more times per day

21. During the past month, how often did you eat red meat, such as beef, pork, ham, or sausage? Do not include chicken, turkey or seafood. Include red meat you had in sandwiches, lasagna, stew, and other mixtures. Red meats may also include veal, lamb, and any lunch meats made with these meats.
    (1) Never
    (2) 1 time last month
    (3) 2-3 times last month
    (4) 1 time per week
    (5) 2 times per week
    (6) 3-4 times per week
    (7) 5-6 times per week
    (8) 1 time per day
    (9) 2 or more times per day

22. During the past month, how often did you eat any processed meat, such as bacon, lunch meats, or hot dogs? Include processed meats you had in sandwiches, soups, pizza, casseroles, and other mixtures. Processed meats are those preserved by smoking, curing, or salting, or by the addition of preservatives. Examples are: ham, bacon, pastrami, salami, sausages, bratwursts, frankfurters, hot dogs, and spam.
    (1) Never
    (2) 1 time last month
    (3) 2-3 times last month
    (4) 1 time per week
    (5) 2 times per week
    (6) 3-4 times per week
    (7) 5-6 times per week
    (8) 1 time per day
    (9) 2 or more times per day

23. During the past month, how often did you eat whole grain bread including toast, rolls and in sandwiches? Whole grain breads include whole wheat, rye, oatmeal and pumpernickel. Do not include white bread.
    (1) Never
    (2) 1 time last month
    (3) 2-3 times last month
    (4) 1 time per week
    (5) 2 times per week
    (6) 3-4 times per week
    (7) 5-6 times per week
    (8) 1 time per day
    (9) 2 or more times per day

24. During the past month, how often did you eat chocolate or any other types of candy? Do not include sugar-free candy.
(1) Never
(2) 1 time last month
(3) 2-3 times last month
(4) 1 time per week
(5) 2 times per week
(6) 3-4 times per week
(7) 5-6 times per week
(8) 1 time per day
(9) 2 or more times per day

25. During the past month, how often did you eat doughnuts, sweet rolls, Danish, muffins, pan dulce, or pop-tarts? Do not include sugar-free items.
(1) Never
(2) 1 time last month
(3) 2-3 times last month
(4) 1 time per week
(5) 2 times per week
(6) 3-4 times per week
(7) 5-6 times per week
(8) 1 time per day
(9) 2 or more times per day

26. During the past month, how often did you eat cookies, cake, pie or brownies? Do not include sugar-free kinds.
(1) Never
(2) 1 time last month
(3) 2-3 times last month
(4) 1 time per week
(5) 2 times per week
(6) 3-4 times per week
(7) 5-6 times per week
(8) 1 time per day
(9) 2 or more times per day

27. During the past month, how often did you eat ice cream or other frozen desserts? Do not include sugar-free kinds.
(1) Never
(2) 1 time last month
(3) 2-3 times last month
(4) 1 time per week
(5) 2 times per week
(6) 3-4 times per week
(7) 5-6 times per week
(8) 1 time per day

(9) 2 or more times per day

28. During the past month, how often did you eat popcorn?
(1) Never
(2) 1 time last month
(3) 2-3 times last month
(4) 1 time per week
(5) 2 times per week
(6) 3-4 times per week
(7) 5-6 times per week
(8) 1 time per day
(9) 2 or more times per day

SECTION G: Demographics *13 item*

1) How old are you?
(1) Less than 18 years old
(2) 18
(3) 19
(4) 20
(5) 21
(6) 22
(7) 23
(8) 24
(9) More than 24 years old
(10) Choose not to answer

2) What is your gender?
(1) Male
(2) Female
(3) Choose not to answer

3) Are you Hispanic or Latino?
(1) Yes
(2) No
(3) Don't know / Not sure
(4) Choose not to answer

4) Which one or more of the following would you say is your race?
(1) White
(2) Black or African American
(3) Asian
(4) Native Hawaiian or Other Pacific Islander
(5) American Indian or Alaska Native
(6) Other [specify]_____

5) What is your year in school?

(1) Freshman
(2) Sophomore
(3) Junior
(4) Senior
(5) Graduate
(6) Choose not to answer

6) Where do you live?

(1) Campus residence hall
(2) Sorority or fraternity
(3) Other university/college housing
(4) Off campus housing
(5) Parent or guardian's home
(6) Other, specify ____

7) Where is the university you attend?

(1) Alabama- Tuskegee
(2) Alabama- Auburn
(3) Florida
(4) Kansas
(5) New Jersey
(6) Tennessee
(7) Rhode Island
(8) Nebraska
(9) Choose not to answer

9) What is your height?

**(If you choose *not to answe*r, please type CNA in the box)

Feet _____
Inches _____

10) What is your weight (in pounds)?

**(If you choose *not to answe*r, please type CNA in the box)

_____

11) How much do you want to weigh (in pounds)?

**(If you choose *not to answe*r, please type CNA in the box)

_____

12) How would you describe your weight?

(1) Very Underweight
(2) Slightly Underweight
(3) About The Right Weight

(4) Slightly Overweight
(5) Very Overweight
(6) Choose not to answer

13) Are you trying to do any of the following about your weight?
(1) I am not trying to do anything
(2) Stay the same weight
(3) Lose weight
(4) Gain weight
(5) Choose not to answer

Appendix F CEPS Consent Form

College Environment Perception Survey
Consent Form

Purpose of Study
Currently there is very little information about what college students feel about their school environment in terms of promoting health. The purpose of this study is to help nutrition educators develop an assessment of how college students perceive their environment. This will help us develop programs and encourage the administration of the university to make changes to improve the healthfulness of our campus.

Can I participate?
You must be a student between 18 and 24 years or older and can't be a Nutrition or Kinesiology Major to participate in this research study.

What will I be asked to do?
You will be asked to complete a short online survey.

Benefits of Participation
After you have completed the survey you may receive a gift card via email or class extra credit in course as previously arranged between you and your professor.

Risks of Participation
There are no risks associated with this project. The entire survey should take about 15 minutes to complete.

Confidentiality
All of your answers will remain confidential and your name will not be linked to your answers in any data records.

Voluntary
Participation is entirely voluntary and you can select "Choose not to answer" for any questions if you don't want to answer.

Contact Information
This survey is part of research conducted by the University of Tennessee. If you have any questions, feel free to call me, Sarah Colby, at (865) 974-6248. If you have questions about your rights as a participant, contact the Office of Research Compliance Officer at (865) 974-3466. This study has been approved by the Institutional Review Board (IRB) of the University of Tennessee.

CONSENT
I have read the above information. I have received a copy of this form. I agree to participate in this study.

Agree

Disagree

Appendix G Phone Interview Guide

Begin the interview with a welcoming introduction.

"Hi, we are going to start your phone interview. We are currently being recorded. Today we are going to talk about what you think about your college campus environment. In this interview there are no right or wrong answers. You may choose not to answer questions you do not feel comfortable answering. If you have any questions or comments during the interview, please feel free to ask at any time. I know you already completed an online consent form before you completed the online survey but I would like to check with you again today to make sure that you are still willing to participate in this research. Are you still willing? Do you have any additional questions?"

1. "Tell me about the foods available on campus."

Possible prompts-

How healthy are the foods in the dining halls?

How healthy are the foods in food courts/snack bars on campus?

How healthy are the foods at grocery stores around campus?

How healthy are the foods at convenience stores on or around campus?

How healthy are the foods at the restaurants on or around campus?

How affordable are the healthy foods on campus?

What kinds of signs, if any, exist telling you which foods are healthy where you eat around campus?

2. "Tell me about the water fountains on campus."

Possible prompts-

How available are the water fountains in most buildings on campus?

How do the water fountains on campus taste?

How clean are the water fountains around campus?

3. "Tell me about the foods available in vending machines on campus"

Possible prompts-

How healthy are the foods available in the vending machines?

What sort of signs have you noticed , if any, indicating which foods are healthy in vending machines on campus?

4. "Tell me about physical activity available around campus."

How are the exercise programs available on campus?

How is the availability of exercise facilities and equipment on campus?

How are the conditions of the exercise facilities and equipment on campus?

What types of opportunities are there to be moderately or vigorously active on campus?

How is the availability of sports (intermural or club) to play on campus?

5. “How is the safety around campus?”

Possible prompts:

How safe is it to walk around campus?

How safe is it to bike around campus?

How safe do you feel walking around campus at night?

Are there bike racks available around campus?

How does the campus environment affect restful and quiet sleep?

6. “Tell me about the stairs in the buildings around campus.”

Possible prompts-

How clean are the stairs in most buildings on campus?

How well lit are the stairs in most buildings on campus?

How well are stairs in most buildings on campus labeled for use?

How are the signs, if any, encouraging people to use the stairs in most buildings on campus?

7. “Tell me about any programs available on campus promoting healthy lifestyles.”

Possible prompts-

What types of programs on campus promote healthy eating?

How are the programs on campus that promote physical activity?

How are the programs on campus that promote stress management?

How are the policies on campus that promote health?

How well does the university promote green eating?

Overall, how well does your campus promote eating healthy and being physically active?

Appendix H Instructions for Interview Transcriptions

Transcription for Mackenzie's Interviews

You can find the audios on _____ laptop (Inqscribe5) login: username: _____ password: _____ They are in folders on the desktop labeled "Mackenzie's male interview" and "Mackenzie's female interviews". Transcriptions need to per done verbatim. Indicate the research talking with an "R" and the participant talking with a "P". Look at the log and see where the last transcriber left off. When you start a transcription, write the participant ID in the first column and your name in the second column. If you do not finish, write down at what time you stopped. If a different transcriber picks back up on the same participant, write the participant ID on the next line and where you stopped if you do not finish. Once an interview is finished, please initial and date on the correct line. Save unfinished transcriptions under the folder "Mack's InqScribes" on the desktop. Once a transcription is finished, save that under "Mack's Finished InqScribes" on the desktop. Save it as the participant ID number followed by the date. If you come in and the last transcriber before you finished a transcription, see if there are any finished transcriptions you can double check. You cannot double check your own transcriptions. If you do not get all the way through double checking, mark the time stopped and follow the same instructions as before. If you are double checking a transcription and need to make a change, note that on the sheet hanging on the wall. Please put your name, the time of the interview where the change was made, and what change was made. If you get into lab and the last transcriber finished an interview and there are no transcriptions to double check, you can start with a new interview. If you have any questions, and I am not in lab, you can call or text me. 423-312-9168. Thanks!

ID	Person Starting Transcription	Transcribed up to (time)	Finished (Initial & date)	Double Checked (Name & time up to)	Finished Double Check (name & date)	Computer Saved To
A5770						
AA601						
B641						
B662						
B681						
B703						
B742						
C751						
D541						
D737						
E524						
E681						
E730						
AA736						
B555						
400						
401						
402						
404						
405						
406						
407						
408						
409						
410						
411						
413						
417						
418						
424						

Appendix J Document Sheet for Discrepancies found while Transcribing

Changes Made While Double Checking Mackenzie's Interviews

ID	Person Making Changes	Time Change was Made	Changes Made	Double Checked (Mack only)

Appendix K: A Priori Codebook for Surveys

Question	**Code** ***NOTE: Only use the code not in parenthesis**	**Explanation**
Q1 There are plenty of exercise classes offered at the rec center on campus	1 (PAA_1A) 2 (PAA_1D) 3(PAA_10)	1=Strongly agree or agree 2=Strongly disagree or disagree 3= Neither agree nor disagree or choose not to answer
Q2 There are policies (e.g. no cars on campus) on campus that promote physical activity.	4 ($POPG_1A$) 5 ($POPG_1D$) 6 ($POPG_10$)	4= Strongly agree or agree 5= Strongly disagree or disagree 6= Neither agree nor disagree or choose not to answer
Q3 There are policies (e.g. limits on sizes of sodas, minimum healthy items in vending machines) on campus that promote healthy eating.	7 ($POPG_2A$) 8 ($POPG_2D$) 9 ($POPG_20$)	7= Strongly agree or agree 8= Strongly disagree or disagree 9= Neither agree nor disagree or choose not to answer
Q4 Green eating includes participating in most of the following behaviors: … based on the above definition for green eating, overall my campus promotes green eating.	10 ($POPG_3A$) 11 ($POPG_3D$) 12 ($POPG_30$)	10= Strongly agree or agree 11= Strongly disagree or disagree 12= Neither agree nor disagree or choose not to answer
Q5 Healthy foods are on-hand at local grocery stores around campus	13 (DFA_1A) 14 (DFA_1D) 15 (DFA_10)	13= Strongly agree or agree 14= Strongly disagree or disagree 15= Neither agree nor disagree, I don't know because I don't shop at grocery stores around campus, or choose not to answer
Q6 The university's exercise facilities and equipment are in good condition	16 (PAA_2A) 17 (PAA_2D) 18 (PAA_20)	16= Strongly agree or agree 17= Strongly disagree or disagree 18=Neither agree nor disagree or choose not to answer

Q7 There are low cost healthy foods available on campus	19 (DFA_2A) 20 (DFA_2D) 21 (DFA_20)	19= Strongly agree or agree 20= Strongly disagree or disagree 21= Neither agree nor disagree, I don't know because I don't eat on campus, or choose not to answer
Q8 The water in water fountains on campus tastes good	22 (DFA_3A) 23 (DFA_3D) 24 (DFA_30)	22= Strongly agree or agree 23= Strongly disagree or disagree 24= Neither agree nor disagree, I don't know because I don't use water fountains on campus, or choose not to answer
Q9 There are safe places for me to walk	25 (PAS_1A) 26 (PAS_1D) 27 (PAS_10)	25=Strongly agree or agree 26= Strongly disagree or disagree 27=Neither agree nor disagree or choose not to answer
Q10 The stairs in most buildings on campus are clean and well lit	28 (PAS_2A) 29 (PAS_2D) 30 (PAS_20)	28= Strongly agree or agree 29= Strongly disagree or disagree 30= Neither agree nor disagree or choose not to answer
Q11 There are signs in buildings encouraging people to use stairs.	31 ($POPG_4A$) 32 ($POPG_4D$) 33 ($POPG_40$)	31= Strongly agree or agree 32= Strongly disagree or disagree 33= Neither agree nor disagree or choose not to answer
Q12 The campus living environment allows for quiet and restful sleep.	34 (SlA) 35 (SlD) 36 (Sl0)	34=Strongly agree or agree 35= Strongly disagree or disagree 36= Neither agree nor disagree or choose not to answer
Q13 There are programs on campus that promote stress management.	37 ($POPG_5A$) 38 ($POPG_5D$) 39 ($POPG_50$)	37= Strongly agree or agree 38= Strongly disagree or disagree 39= Neither agree nor disagree or choose not to

		answer
Q14 There are healthy foods available where I usually eat in food courts/snack bars on campus.	40 (DFA_4A) 41 (DFA_4D) 42 (DFA_40)	40= Strongly agree or agree 41= Strongly disagree or disagree 42= Neither agree nor disagree, I don't know because I don't eat in food courts/snack bars on campus, or choose not to answer
Q15 There are healthy foods available in restaurants on or around campus.	43 (DFA_5A) 44 (DFA_5D) 45 (DFA_50)	43Strongly agree or agree 44= Strongly disagree or disagree 45= Neither agree nor disagree, I don't know because I don't eat at restaurants on or around campus, or choose not to answer
Q16 There are lots of healthy options in vending machines on campus.	46 (DFA_6A) 47 (DFA_6D) 48 (DFA_60)	46= Strongly agree or agree 47= Strongly disagree or disagree 48= Neither agree nor disagree, I don't know because I don't use vending machines on campus, or choose not to answer
Q17 There are enough exercise facilities and equipment on campus.	49 (PAA_3A) 50 (PAA_3D) 51 (PAA_30)	49= Strongly agree or agree 50= Strongly disagree or disagree 51= Neither agree nor disagree or choose not to answer
Q18 There are sports (intramural or club) available to play on campus	52 (PAA_4A) 53 (PAA_4D) 54 (PAA_40)	52= Strongly agree or agree 53= Strongly disagree or disagree 54= Neither agree nor disagree or choose not to answer
Q19 There are enough bike racks on campus	55 (PAA_5A) 56 (PAA_5D) 57 (PAA_50)	55= Strongly agree or agree 56= Strongly disagree or disagree 57= Neither agree nor disagree or choose not to answer

Q20 It is safe to walk around campus at night.	58 (PAS_3A) 59 (PAS_3D) 60 (PAS_30)	58= Strongly agree or agree 59= Strongly disagree or disagree 60= Neither agree nor disagree or choose not to answer
Q21 There are healthy foods available where I usually eat in dining halls on campus.	61 (DFA_7A) 62 (DFA_7D) 63 (DFA_70)	61= Strongly agree or agree 62= Strongly disagree or disagree 63= Neither agree nor disagree, I don't know because I don't eat in dining halls on campus, or choose not to answer
Q22 Healthy foods are on-hand at convenience stores on or around campus.	64 (DFA_8A) 65 (DFA_8D) 66 (DFA_80)	64= Strongly agree or agree 65= Strongly disagree or disagree 66= Neither agree nor disagree, I don't know because I don't shop at convenience stores on or around campus, or choose not to answer
Q23 There are signs telling me which foods are healthy in vending machines on campus.	67 ($POPG_6A$) 68 ($POPG_6D$) 69 ($POPG_60$)	67= Strongly agree or agree 68= Strongly disagree or disagree 69= Neither agree nor disagree, I don't know because I don't use vending machines on campus, or choose not to answer
Q24 There are clean water fountains in most buildings on campus.	70 (DFA_9A) 71 (DFA_9D) 72 (DFA_90)	70= Strongly agree or agree 71= Strongly disagree or disagree 71= Neither agree nor disagree, I don't know because I don't use water fountains on campus, or choose not to answer
Q25 There are plenty of opportunities on campus to be moderately or vigorously active on campus.	73 (PAA_6A) 74 (PAA_6D) 75 (PAA_60)	73= Strongly agree or agree 74= Strongly disagree or disagree 75= Neither agree nor disagree or choose not to answer

Q26 It is safe to bike around campus.	76 (PAS_4A) 77 (PAS_4D) 78 (PAS_40)	76= Strongly agree or agree 77= Strongly disagree or disagree 78= Neither agree nor disagree or choose not to answer
Q27 There are programs on campus that promote healthy eating.	79 ($POPG_7A$) 80 ($POPG_7D$) 81 ($POPG_70$)	79= Strongly agree or agree 80= Strongly disagree or disagree 81= Neither agree nor disagree or choose not to answer
Q28 It is safe to walk around campus at night.	82 (PAS_5A) 83 (PAS_5D) 84 (PAS_50)	82= Strongly agree or agree 83= Strongly disagree or disagree 84= Neither agree nor disagree or choose not to answer

Appendix L: In-Depth Interview Codebook

Overall, how healthy are the foods available on campus?	
86	They believe overall, there are healthy food options on campus
87	Overall, they do not agree there are healthy food options on campus. They believe most food options are unhealthy. (E.g. they can give examples such as fried foods, greasy foods, pizza, etc.
88	Overall, they believe there are both healthy or unhealthy food options on campus, or they are not sure.
89	They agree there are some fast food options around campus.
90	They do not think the food on campus is good (e.g. they think it taste bad or is "gross"
How healthy are the foods in the dining halls around campus?	
61	They strongly agree or agree that dining halls have healthy options.
62	They strongly disagree or disagree that dining halls have healthy options.
63	They either neither agree nor disagree, do not know because they do not eat at dining halls, or choose not to answer whether dining halls have healthy options.
How healthy are the foods in the food courts or snack bars around campus, like the UC?	
40	They either strongly agree or agree that food courts/snack bars on campus have healthy food options.
41	They either strongly disagree or disagree that food courts/snack bars on campus have healthy food options.
42	They either neither agree nor disagree, do not know because they do not eat in food courts/snack bars on campus, or choose not to answer whether food courts/snack bars on campus have healthy options.
How healthy are the foods at the grocery stores around campus?	
13	They strongly agree or agree that local grocery stores around campus have healthy foods.
14	They strongly disagree or disagree that local grocery stores around campus do not have healthy foods.
15	They either neither agree nor disagree, choose not to answer, or do not know because they do not shop at grocery stores around campus if grocery stores around campus have healthy options.
How healthy are the foods at the convenience stores around campus, like the Pods?	
64	The strongly agree or agree that convenience stores on campus have healthy foods available
65	They strongly disagree or disagree that convenience stores on campus have healthy foods available.
66	They either neither agree nor disagree, do not know because they do not shop at convenience stores on campus, or choose not to answer whether convenience stores on campus have healthy foods available

Are there healthy foods available at the restaurants around campus, like on the strip or downtown?	
43	They either strongly agree or agree that restaurants on or around campus have healthy options available.
44	They either strongly disagree or disagree that restaurants on or around campus have healthy options available.
45	They either neither agree nor disagree, do not know because they do not eat at restaurants on or around campus, or choose not to answer whether restaurants on or around campus have healthy options available.
How affordable are the healthy options around campus?	
19	They strongly agree or agree that there are healthy foods available on campus for a low cost.
20	They strongly disagree or disagree that there are healthy foods available on campus for a low price.
21	They either neither agree nor disagree, choose not to answer, or do not know because they do not eat on campus whether there are healthy foods available on campus for a low price.
How are the signs that indicate which foods are healthy where you eat around campus?	
91	They agree that there are signs that tell them which foods are healthy (this could include nutrition facts labels)
92	They do not agree that there are signs that tell them which are healthy where they eat around campus
93	They either neither agree nor disagree or are not sure if there are signs telling them which foods are healthy where they eat around campus.
How is the availability of water fountains around campus? (this includes water fountains and the new filtered water bottle refills)	
94	They agree that there are plenty and enough water fountains available around campus.
95	They do not believe there are plenty or enough water fountains available around campus.
96	They either neither agree nor disagree or are not sure if there are enough water fountains available around campus.
97	Overall, they do not like the water fountains on campus (this could be for various reasons)
How do the water fountains on campus taste?	
22	They either strongly agree or disagree that the water in water fountains tastes good.
23	They either strongly disagree or disagree that the water in water fountains tastes good.
24	They either neither agree nor disagree, choose not to answer, or do not know because they do not use water fountains if the water in water fountains tastes good.

How clean are most of the water fountains on campus? Not the water, but the water fountains themselves.	
70	They strongly agree or agree that most water fountains are clean.
71	They strongly disagree or disagree that most water fountains are clean.
72	They either neither agree nor disagree, do not know because they do not use water fountains on campus, or choose not to answer whether most water fountains are clean.
How healthy are the foods in vending machines on campus?	
46	They strongly agree or agree that vending machines on campus have healthy options.
47	They strongly disagree or disagree that vending machines on campus have healthy options.
48	They either neither agree nor disagree, do not know because they do not use vending machines on campus, or choose not to answer whether vending machines on campus have healthy options.
What kinds of signs, if there are any, exist telling you which foods are healthy in vending machines on campus?	
67	They strongly agree or agree that vending machines have signs saying which foods are healthy.
68	They strongly disagree or disagree that vending machines on campus have signs saying which foods are healthy.
69	They either neither agree nor disagree, do not know because they do not use vending machines on campus, or choose not to answer whether vending machines on campus have signs saying which foods are healthy.
How are the exercise programs available on campus?	
1	They strongly agree or agree that the rec center on campus offers a lot of exercise classes
2	They strongly disagree or disagree that the rec center on campus offers a lot of exercise classes.
3	They either neither agree nor disagree, don't know, or choose not to answer whether the rec center on campus offers a lot of exercise classes.
115	They agree the exercise classes offered are good and easy to get into
116	They disagree that the exercise classes are easy to get into.
117	They have never taken an exercise class before
118	They agree that there are exercise classes available for credit on campus.
How is the availability of exercise facilities and equipment on campus?	
49	They either strongly agree or agree that there are enough exercise facilities and equipment on campus.
50	They strongly disagree or disagree that there are enough exercise facilities and equipment on campus.
51	They either neither agree nor disagree, do not know, or choose not to answer whether there are enough exercise facilities and equipment on campus.
98	They believe the availability of the exercise facilities and equipment depends

	on the time of day.
How are the conditions of the exercise facilities and equipment on campus?	
16	They either strongly agree or agree that the exercise facilities and exercise equipment on campus are in good condition.
17	They either strongly disagree or disagree that the exercise facilities and exercise equipment on campus are in good condition.
18	They either neither agree nor disagree, do not know, or choose not to answer whether the exercise facilities and equipment on campus are in good condition
How is the availability of sports, either intramural or club, to play on campus?	
52	They strongly agree or agree that there are enough intramural or club sports to play on campus.
53	They strongly disagree or disagree that there are enough intramural or club sports to play on campus.
54	They either neither agree nor disagree, do not know, or choose not to answer whether there are enough intramural or club sports to play on campus.
Can you tell me any other opportunities there are on campus to be moderately or vigorously physically active?	
73	They strongly agree or agree that there are plenty of ways to be moderately or vigorously active on campus.
74	They strongly disagree or disagree that there are plenty of ways to be moderately or vigorously active on campus.
75	The either neither agree nor disagree, do not know, or choose not to answer whether there are plenty of ways to be moderately or vigorously active on campus.
99	They mention the bike rentals as physical activity around campus.
100	They mention physical activity opportunities available outside of the gym, including walking, biking, etc
Overall, how is the safety around campus?	
101	Overall, they think the safety around campus is good.
102	Overall, they think the safety around campus is not good.
103	Overall, they are not sure about the safety around campus, or believe it depends on the location (this could include areas around campus, such as the Fort)
How safe do you feel walking around campus during the day?	
25	They either strongly agree or agree that there are safe places to walk on campus.
26	They either strongly disagree or disagree that there are safe places to walk on campus.
27	They either neither agree nor disagree or choose not to answer whether there are safe places to walk on campus.

How safe do you feel walking around campus at night?	
58	They strongly agree or agree that it is safe to walk around campus at night.
59	They strongly disagree or disagree that it is safe to walk around campus at night.
60	They either neither agree nor disagree, do not know, or choose not to answer whether it is safe to walk around campus at night.
How safe is it to bike around campus?	
76	They strongly agree or agree that it is safe to bike on campus.
77	They strongly disagree or disagree that it is safe to bike on campus.
78	They either neither agree nor disagree, do not know, or choose not to answer whether it is safe to bike around campus.
How is the availability of bike racks around campus?	
55	They strongly agree or agree that there are enough bike racks on campus.
56	They strongly disagree or disagree that there are enough bike racks on campus
57	They either neither agree nor disagree, do not know, or choose not to answer whether there are enough bike racks on campus.
How does the campus environment affect restful and quiet sleep?	
34	They either strongly agree or agree that it is easy to get quiet and restful sleep living on campus.
35	They either strongly disagree or disagree that it is easy to get quiet and restful sleep living on campus.
36	They either neither agree nor disagree, are not sure, or choose not to answer whether it is easy to get quiet and restful sleep living on campus.
104	They think where you live around campus depends on if the environment affects restful and quiet sleep.
How is the availability of stairs in most buildings around campus?	
105	They agree there are enough stairs in most buildings around campus.
106	They disagree there are enough stairs in most buildings around campus.
107	They neither agree nor disagree that there are enough stairs around campus, or it depends on the building.
How are the stairs labeled for use around campus? How easy are the stairs to find in most buildings?	
108	They agree the stairs are labeled for use well and are easy to find in most buildings (this could include the mention of exit signs)
109	They disagree the stairs are labeled for use well and think they are hard to find in most buildings
110	They neither agree nor disagree that the stairs are labeled for use well in most buildings, or they think it depends on the building.

How clean are the stairs in most buildings? How well lit are the stairs in most buildings on campus?	
28	They either strongly agree or agree that the stairs are clean and well lit on campus.
29	They either strongly disagree or disagree that the stairs are clean and well lit on campus.
30	They either neither agree nor disagree or choose not to answer whether the stairs are clean and well lit on campus, or they think it depends on the building
How are the signs, if there are any, that encourage people to use the stairs in most buildings around campus?	
31	They strongly agree or agree that there are signs that tell people to use stairs in buildings around campus.
32	They strongly disagree or disagree that there are signs that tell people to use stairs in buildings around campus.
33	Their either neither agree nor disagree or do not answer whether there are signs that tell people to use stairs in buildings around campus.
Can you tell me about any programs available on campus that promote healthy lifestyles? Either programs that promote healthy eating, physical activity, or both?	
4	They strongly agree or agree that there are any programs on campus that promote physical activity.
5	They strongly disagree or disagree that there are any programs on campus that promote physical activity.
6	They either neither agree nor disagree, don't know, or choose not to answer whether there are any programs on campus that promote physical activity.
79	They strongly agree or agree that there are programs on campus that promote healthy eating
80	They strongly disagree or disagree that there are programs on campus that promote healthy eating.
81	They either neither agree nor disagree, do not know, or choose not to answer whether there are programs on campus that promote healthy eating.
How are the programs on campus that promote stress management?	
37	They either strongly agree or agree that there are programs on campus that help with stress management.
38	They strongly disagree or disagree that there are programs on campus that help with stress management.
39	They either neither agree nor disagree, are not sure, or choose not to answer whether there are programs on campus that help with stress management.

How are the policies on campus that promote health?	
7	They strongly agree or agree that there are policies on campus that promote health.
8	They strongly disagree or disagree that there are policies on campus that promote health.
9	They either neither agree nor disagree, do not know, or choose not to answer whether there are policies on campus that promote health.
How well does the university promote green eating?	
10	They strongly agree or agree that their campus promotes eating green.
11	They strongly disagree or disagree that their campus promotes eating green.
12	They either neither agree nor disagree, do not know, or choose not to answer whether their campus promotes eating green.
How well does the university promote being green in general.	
116	They agree the university promotes being green in general
117	They disagree the university promotes being green in general
118	They neither agree nor disagree or do not know if the university promotes being green in general
Overall, how well does your university promote a healthy lifestyle?	
111	They agree that the university promotes healthy lifestyles
112	They disagree that the university promotes healthy lifestyles
113	They agree that university promotes physical activity well, but not healthy eating
114	They agree that the university promotes healthy lifestyles some, but could make improvements.

Appendix M: Coding Sheet

Part ID _____

Code	Survey	Interview	A/D	Code	Survey	Interview	A/D	Code	Survey	Interview	A/D
1				42				83			
2				43				84			
3				44				85			
4				45				86			
5				46				87			
6				47				88			
7				48				89			
8				49				90			
9				50				91			
10				51				92			
11				52				93			
12				53				94			
13				54				95			
14				55				96			
15				56				97			
16				57				98			
17				58				99			
18				59				100			
19				60				101			
20				61				102			
21				62				103			
22				63				104			
23				64				105			
24				65				106			
25				66				107			
26				67				108			

Code	Survey	Interview	A/D	Code	Survey	Interview	A/D	Code	Survey	Interview	A/D
27				68				109			
28				69				110			
29				70				111			
30				71				112			
31				72				113			
32				73				114			
33				74				115			
34				75				116			
35				76				117			
36				77				118			
37				78				119			
38				79				120			
39				80				121			
40				81				122			

VITA

Mackenzie Ruppert graduated high school from Morristown West High School in 2008. She obtained her undergraduate degree from the University of Tennessee, Knoxville, where she worked in several research labs and volunteered with different dietitians in the area. Mackenzie graduated from the University of Tennessee, Knoxville in 2012 with a Bachelor's of Education, Health, and Human Sciences in Nutrition. Mackenzie began the graduate program at the University of Tennessee, Knoxville the following fall, and is currently pursuing her Master's of Science in Nutrition with a concentration in Public Health. She is expected to graduate in August 2014. At the University of Tennessee, Knoxville, Mackenzie accepted a graduate research assistantship and had the opportunity to work with a multi-state research group called the Healthy Campus Research Consortium on her research. She had the privilege of presenting part of her research at the Society of Nutrition Education and Behavior annual conference in Portland, Oregon in the summer of 2013. She is currently in the dietetic internship in Knoxville, TN.