

A Cookie for Your Thoughts: First Steps to Exploring Eating Attitudes

By

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Dissertation

Submitted to the Faculty of the  
Graduate School of Vanderbilt University  
in partial fulfillment of the requirements

for the degree of

DOCTOR OF PHILOSOPHY  
in

Psychology

August, 2014

Nashville, Tennessee

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To my family for their support and encouragement

and

To my friends, the sunshine on this long journey, the mirrors of the path in my heart

## **ACKNOWLEDGEMENTS**

This work was supported by a Ruth L. Kirschstein National Research Service Award (NRSA) from the National Institutes of Health.

Thank you to my Dissertation Committee who shared their scientific knowledge and enabled me to complete this important milestone. Special thanks to my advisor, David Schlundt, who helped to make a little girl's dream a reality. His continued support and down to earth guidance enabled me to navigate rough seas. Many, many thanks.

I am very grateful to family and friends whose unconditional support helped me to reach my goal.

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# CHAPTER I

## Introduction

We have yet to understand how the puzzle of eating choices comes together to form eating behaviors. Our extensive attempts to improve eating behavior have been thwarted by our poor understanding of individual food choice; efforts have been met with increased rates of obesity and comorbid chronic illness (O'Keefe & Cordain, 2004; Wells, 2006). New approaches focused on the individual can help us to identify and tailor effective interventions. Exploration of cognitive eating schema can improve our understanding of how complex pieces of cognitions fit to create healthy or unhealthy eating habits.

### **Food Choice and the External Environment**

We are influenced by a barrage of external and internal factors. Externally are a myriad of environmental pressures on our food choice. Our environment is overrun by opportunities to eat. Streets are lined with eateries offering an appealing variety of foods that are inexpensive and convenient. Portions are exceedingly large and laden with fat, sugar and salt. Add to this the constant barrage of advertisements for eating establishments, sugary cereals, candy, and fatty snacks.

These environmental pressures interact with internal mechanisms; our fine-tuned biological system, optimized for surviving with a lean and variable food supply, is being forced to operate in an environment with nearly unlimited access to food (Lev-Ran, 2001). Responses that once protected us from starvation now threaten our health as many people routinely ingest excess energy (O'Keefe & Cordain, 2004; Wells, 2006). These external and internal influences have greatly contributed to an

overwhelming increase in chronic disease, obesity, hypertension, heart disease and diabetes (Rippe, Crossley, & Ringer, 1998).

### **Food Choice and the Internal Environment**

To maintain a healthy weight in the face of this environment-metabolism interplay people need to manage their food choice and intake. Self-regulation, however, is a complex task that involves not only navigating the external environment but also managing internal biological and psychological factors.

In fact, an interesting paradox has resulted from our attempts to improve our understanding of food intake self-regulation. Behavioral theories describe people who successfully restrict their food intake until they are tempted by a “forbidden” food, at which point they lose control and overindulge. At odds with this paradox, however, are people to whom food intake regulation seems to come naturally, and those who adhere to a weight loss plan and maintain their weight loss.

How do we reconcile these competing behaviors? Currently, we have little understanding of what makes it possible to circumvent or succumb to unhealthy eating influences. If we are to encourage healthy eating habits, effectively staving off the development of comorbid diseases, we need to develop a greater understanding of how people regulate or fail to regulate their food intake.

So far, the majority of our efforts have focused on environmental and biological influences on food choice and intake. Exploration of the psychological dimensions has been limited to emotions and concepts of restricted and disinhibited eaters. There is even less research that addresses how people try to navigate all of these competing influences. Thus an integrated understanding of food intake regulation should include not just the biological and environmental perspectives, but also a cognitive perspective that mediates between the two.



## Schema Theory

Consideration of underlying cognitive influences can help to clarify our understanding of the nuances of these decisions. Understanding the role of eating cognitions can guide future preventive efforts by providing detailed insight into how individuals' self-perceptions of eating behaviors influence daily food choices.

Cognitions can be organized into schemas or "cognitive structures containing the individual's basic beliefs and assumptions which shape the individual's perceptions of events and their responses" (Pretzer & Beck, 1996). Beck defines schemas as "specific rules that govern information processing and behavior" (Beck et al., 1990). They are "stable cognitive patterns" by which people screen out and code differentiating stimuli (Beck, Rush, Shaw, & Emery, 1979).

The development of schemas is inherent to the maturation process. Our numerous and diverse experiences are categorized to streamline our ability to make future judgments about our environment. People have a number of schemas which they use to navigate the world and it is possible for these to overlap. For example, a child's schema of animals may include dogs, cats and lions. However, a child's schema of pets will most likely omit lions.

The relative stability of these cognitive structures presents, in essence, a double-edged sword (Beck, Freeman, & Davis, 2003). While schemas allow for the efficient navigation of the world, they also provide a framework by which individuals can make repeated erroneous assumptions that can lead to self-defeating behaviors (Pretzer & Beck, 1996). Thus some people with poor eating habits will likely find it difficult to incorporate new behaviors while others can effortlessly continue to make balanced eating choices. This schematic duality is integrated into our ability to automatically or deliberately process food related influences.

## **Automatic versus Deliberative Processing**

There is a distinction made between automatic and deliberative processing (Schneider & Chein, 2003). Automatic processing is established through repetition of a behavior. It is rapid, requires few cognitive resources, and occurs outside of conscious awareness. Controlled or deliberative processing is available to conscious thought. Not having the benefit of practice, it is slower, effortful and is costly in terms of cognitive resources. We have a preference for automatic processing. This stems from our need to efficiently organize and access vital information in a sea of external and internal cues (Dijksterhuis, 2004).

Automatic processing allows eating patterns to become habitual. Whether eating is ever entirely automatic or unconscious (Lyons, 1998) is controversial, except perhaps for night eating syndrome (Stein, 2007). There is, however, evidence that suggests that our decision making, including food choice, is influenced by automatic processing ( Hofmann, Rauch, & Gawronski, 2007). Fortunately, we clearly have the capacity to make deliberate choices about food intake, albeit with effort.

## **Measurement of Schemas**

### **Models of eating behavior.**

Theories of eating behavior are often used to guide research on schema measurement and food choice. Many of these conceptualizations integrate concepts of automatic and deliberative processing. There are quite a few models of eating behavior in the literature, with new models frequently being developed. The most prominent models are discussed below.

Elements of WADD and LEX are similar to concepts related to processing speed. The weighted additive mechanism (WADD) involves precise calculations before a decision is reached. WADD theory holds that “people search for multiple factors associated with each choice alternative, positive or negative, then weight each factor according to its subjective importance or valence, and

finally add them together for each alternative and choose from the alternatives based on the size of each sum” (Scheibehenne, Miesler, & Todd, 2007).

WADD may not be a useful model when explaining everyday decision making (Dawes, 1979; Einhorn & Hogarth, 1975), as its use requires a lot of cognitive resources. It is a process of weighting and adding numerous factors, which is at odds with our preference for automatic processing.

Since there is a small likelihood that people regularly use WADD, some researchers argued that people probably used heuristics, or rules of thumb, to make less effortful decisions. A lexicographic decision heuristic (LEX) is an example of one such rule of thumb (Bettman, 1979). Using a LEX, people will decide which attribute is most important and then make a decision based on which alternative has the highest value on that attribute. If two alternatives are equal, then a second attribute is considered to break the tie. Unlike WADD, people focus only on the attributes they deem most important and the process ends once they’ve found the discriminating attribute; they do not process all available information (Scheibehenne et al., 2007), making this a more accessible cognitive process.

Models that describe cognitions as “determinants of behavior, thereby implying that changes in cognitions will lead to changes in behavior,” are termed social cognition models (SCM; Barker & Swift, 2009). Unlike WADD and LEX these models focus on beliefs or attitudes that ultimately influence behavior and often contain a number of factors that must be considered before the actual behavior occurs. Three prominent SCM are the health belief model, the stages of change model, and the theory of planned behavior (TPB; Ajzen, 1988, 1991).

The health belief model predicts that in order for people to change their health behavior they must meet a number of conditions: (1) they must feel vulnerable to a threat, (2) believe the consequences of the threat to be severe, (3) believe that engaging in a behavior will prevent or reduce the consequence with few obstacles, (4) they must feel competent to engage in and maintain

the behavior, and (5) an internal (e.g., physiological) or external (e.g., public service announcement) must prompt the change in behavior.

The stages of change, or transtheoretical model (TTM) holds that there are five stages through which a person must pass in order to adopt a new health behavior. The stages are pre-contemplation (no intention to change), contemplation (thinking about changing), preparation (taking steps to change), action (actively engaging in changing) and maintenance (maintaining change) (Hargreaves et al., 1999). Movement among the stages is different for each person. It is possible for people to skip a stage or to move backward a stage. It is also possible to remain in one stage until the necessary skills are acquired which allow progression. People progress through the stages in their own time and it's possible to relapse and begin the process anew (Nisbet & Gick, 2008).

The theory of planned behavior (TPB; Ajzen, 1988, 1991) holds that a person's actual behavior is best predicted from intent to engage in that behavior. Intent is influenced by three variables: attitudes, subjective norm, and perceived behavioral control. Attitude toward the behavior is composed of behavioral beliefs or beliefs about the potential positive or negative outcomes associated with engaging in the behavior. Subjective norm is influenced by beliefs about how significant others would wish them to behave (i.e., normative beliefs), and by an individual's motivation to comply with their significant others' wishes. Perceived behavioral control is influenced by control beliefs (i.e., beliefs about variables that would positively or negatively influence engagement in the behavior). It is also influenced by beliefs about one's own ability to positively or negatively influence engagement in the behavior (Armitage & Conner, 2001).

The TPB has been heavily criticized (Barker & Swift, 2009). Researchers contend that its theoretical constructs are too similar to other social cognition models, which creates "fragmentation rather than synthesis of the body of knowledge" (Barker & Swift, 2009). Indeed the prominent models presented here would lead one to believe that eating influences are either based solely on external context (e.g., TPB, health belief model) or processing speed (e.g., WADD, LEX). A more likely

explanation is that decision making includes elements of both. Another criticism is that the TPB has been shown to account for only 27% and 39% of the variance in behavior and intention, respectively. These estimates increase when using self-report measures (Armitage & Connor, 2001).

### **Internal and external measures of cognitions.**

#### ***Interviews and questionnaires.***

In addition to the theoretical models used to guide research on food choice, researchers also use interviewing techniques and questionnaires.

A combination of interviews and the constant comparison method (Strauss & Corbin, 1990) has been used to investigate themes associated with evening meal consumption. Interviews were conducted for seven consecutive days; the first day consisted of an in person interview and a 24 hour food recall. The next six days consisted of only a 24 hour recall. Follow-up interviews were conducted at two weeks and two months. Transcripts of the interviews were studied for themes or cognitive constructions that influenced the evening meal. When a theme was discovered in one transcript all other transcripts were then checked for the presence of the same theme. The process continued until all potential themes were explored. Other studies have employed a similar process (Blake, Bisogni, Sobal, Jastran, & Devine, 2008; Jastran, Bisogni, Sobal, Blake & Devine, 2009; Blake, Bisogni, Sobal, Devine, & Jastran, 2007).

One-on-one interviews were used in a study on beliefs about fast food (Dunn, Mohr, Wilson, & Wittert, 2008). Participants were asked about the advantages and disadvantages of frequently eating fast food, who would approve and disapprove of their frequently eating fast food, and what factors would make it easier or more difficult to frequently eat fast food. They were also asked to relay their thoughts while imagining eating certain fast foods.

Besides interviews, questionnaires are also a primary research tool. The Food Choice Questionnaire (FCQ; Steptoe, Pollard, & Wardle, 1995) was used in a study of Russian consumers'

food choice motives (Honkanen & Frewer, 2009). The FCQ was modified in order to obtain data on ethical food choice motives; the ethical scale was divided into three factors and questions were added. Other modifications have been made to the FCQ to investigate simple heuristics that influence food choice (Scheibehenne et al., 2007). Questionnaire items about convenience were changed to reflect purchasing ready-made foods, and items were added that reflected ethical concerns such as “is being sold by companies that are committed to environmental protection.” Researchers also asked participants to consider a number of dishes from a local food court and fill out the FCQ for each dish. The Euclidian distance between these ratings was calculated for the 9 categories of the FCQ. The dishes used for the second part of the study were the dishes where the average distance was at its maximum.

As an alternative to using established questionnaires many researchers developed their own. In one study (Dunn et al., 2008) participants were asked to compile a list of foods and indicate which types of food they categorize as fast food, as well as how often they ate that fast food on a scale from 1 (“never eat it”) to 9 (“eat it more than once a day”). In another study (Geeroms, Verbeke & Van Kenhove, 2008) researchers constructed a 45-item questionnaire to study the influence of health related motives on meal consumption. Participants were asked about their perception of health across 8 dimensions including energy, enjoying life, emotional well-being, social responsibility, physical well-being and security, autonomy, outward appearance, and achievement. Another group of researchers who investigated food salience (Brown-Kramer, Kiviniemi, & Winseman, 2009) asked participants to list the first three foods that came to mind when asked what they thought about fruits and vegetables, high fat foods, and low fat foods.

Interviews and questionnaires are commonly used to explore the underlying motives that influence food choice. While some researchers use and modify established questionnaires, such as the Food Choice Questionnaire, other researchers opt to create questionnaires. The list of available food questionnaires is long and includes the State and Trait Food Cravings Questionnaire (FCQ-T;

(Jarosz, Dobal, Wilson, & Schram, 2007), the food frequency questionnaire ( McCrory et al., 1999), the Continuing Survey of Food Intakes by Individuals (CSFII) and the Diet and Health Knowledge Survey (DHKS), both sponsored by the US Department of Agriculture, the Three Factor Eating Questionnaire (Stunkard & Messick, 1985) and the Dieter's Inventory of Eating Temptations (DIET) (Schlundt & Zimering, 1988).

### ***Card sort.***

Researchers have also used card sort tasks to study underlying schemas that affect eating behavior. Study participants have been asked to sort food cards representative of both familiar and unfamiliar food (analysis of the sorted piles revealed 12 category types) (Blake et al., 2007). In one study (Blake et al., 2008) participants were asked to complete multiple card sorts. Food cards represented commonly consumed foods and beverages as well as foods and beverages of interest to health professionals (e.g., tofu). Participants first performed an open food card sort (they sorted the cards without a defined context). Next they were asked if they could sort the piles into additional piles which they then labeled. Researchers then asked participants a series of open ended questions about the sorted piles. Researchers used cluster analysis to categorize patients into 7 food schema clusters. The card sort has also been automated and posted online (Fried, 2007).

The process of measuring cognitions has been dominated by the use of interviews and questionnaires. These external measures come with a number of limitations.

Questionnaires tend to measure more deliberative processes and as such are less accurate in measuring attitudes associated with more habitual and automatic eating processes. Self-reports can be retrospective as in behavioral and food frequency questionnaires, or they can be prospective as in eating diaries or weighed food records. All self-report methods are hampered by limitations in memory, food knowledge, attention, and motivation (Goran, 1998). Prospective methods such as food diaries introduce less bias due to poor memory, but can be very reactive as people eat smaller

portions or healthier foods knowing they are being observed. Furthermore, these traditional methods can be costly. The expense of a measurement tool is comprised of the cost in time, money, and effort required by the subject to provide data and the investigator to process that data. Food diaries and weighed food records require a lot of time and effort for both the subject and the investigator.

In an effort to increase the accuracy and efficiency of eating behavior measurement, researchers have turned to the use of internal measures. Cognitive techniques such as the dichotic listening task, multidimensional scaling, and the modified Stroop color-naming task are designed to indirectly measure cognitions. Such methods reduce the influence of limitations in memory, food knowledge, attention, motivation, and reactivity. A variety of cognitive techniques that are now allowing us to indirectly measure eating cognitions are reviewed below.

### ***Cognitive methods for internal measurement.***

The cognitive methods that have been used to explore internal eating attitudes are varied and include the Stroop (Lattimore & Maxwell, 2004; Tucker & Schlundt, 1995; Wallis & Hetherington, 2004), the IAT (Ayres, Conner, Prestwich, & Smith, 2012; Houben, Roefs, & Jansen, 2010, 2012; Perugini, 2005), the EAST ( Craeynest et al., 2005; Hoefling & Strack, 2008) and other tasks (Czyzewska & Graham, 2008; Jansen et al., 2009; Westenhoefer et al., 2013; Meule, Lukito, Vögelem, & Kübler, 2011; Papies, Stroebe, & Aarts, 2007).

Criticisms of these methods include that IAT scores have been shown to be influenced by the environment and this has called into question its validity as an internal measure (Karpinski & Hilton, 2001). Other researchers have doubted its incremental validity above external measures (Ayres et al., 2012).

This same body of literature, however, has raised many questions. Chiefly among them is that the traditional and influential concepts of restraint and disinhibition no longer seem to provide adequate explanation for food intake (Yeomans & Coughlan, 2009; Jansen et al., 2008; Lowe & Kral,



2006). This assertion arises from the still only partially explained differences in eating patterns among the multiple categorizations of eaters in the literature (Yeomans & Coughlan, 2009). This has led to fragmentation in the literature with multiple groups under study including obese, non-obese, restrained, non-restrained, overweight, free eaters, dieters, non-dieters, disinhibited, emotional and all the combinations thereof.

Perhaps most important is that these multiple categorizations suggest a need to better understand individual differences in underlying cognitions that may help to explain conflicting results (Hoefling & Strack, 2008; Yoemans & Coughlan, 2009).

Given the mixed results due to varying study designs and the inadequate eating models covered in this paper, perhaps a broader view of eating attitudes can help to improve our understanding. The fragmentation in the literature hints at the need to reassess concepts related to food choice and intake. What is needed is an empirically derived taxonomy of eating-related cognitions, and a way to measure the degree to which these cognitions are important in an individual's food choices. Creating a measurement tool that captures a well-defined set of eating cognitions would provide an efficient way to facilitate better research on food choice. Reviewing these data can help us to distinguish helpful from unhelpful eating related attitudes and perhaps highlight patterns. A well-developed measurement tool could be used to study who is at risk for poor outcomes, changes over time as a function of intervention, and how food choice is sensitive to situational contexts.

In the present study we used an exploratory approach to investigate underlying cognitions. We aimed to characterize attitudes toward loss of control over eating that possibly influence food choice and intake. The objective of the work was to create an assessment tool that will successfully measure a range of internal and external influences on food intake. We used a three stage process to develop a tool: 1) qualitative work to establish an item pool; 2) an initial sample to refine the item pool; and 3) a larger sample to establish preliminary reliability and validity of the tool.

## CHAPTER II

### FOCUS GROUPS

#### Methods

##### Overview

The work proceeded in three distinct phases. We first conducted focus groups, and from a qualitative analysis of the transcripts, we then generated a pool of items that could measure internal and external influences on eating behavior. In the next phase we involved administered the tool to a relatively small sample of participants. Using these data we developed categories of items through cluster analysis. The number of items was reduced in preparation for phase 3. In the third phase we administered the measure to a larger sample of participants along with a set of existing measures of eating behavior. The goal of the third phase was to establish preliminary reliability and validity.

##### Participants and Procedure

###### **Focus groups to elicit eating-related cognitions.**

Conducting focus groups allowed for careful exploration of eating related thoughts in a community sample. This initial step provided us with a forum where we were able to probe individual concerns that influenced food choice and intake. It also provided an opportunity to capture cognitions important to individuals based on their unique lifestyle. We were then able to compare responses to each other and to the literature to search for patterns and similarities.

Four focus groups (n=48) were conducted in the Nashville area at local community centers (demographics presented in Table 1). Though invitations to participate in the study were extended to both the larger community and to university students, only community members elected to participate.

Focus groups were led by a doctoral candidate in psychology using a protocol (see Appendix A). Groups were approximately 60-90 minutes and were video and audio taped. Participants completed a brief demographic questionnaire which included self-reported height and weight. These data were used to calculate body mass index (BMI; kg/m<sup>2</sup>).

Table 1		
<i>Focus Groups Demographics</i>		
Variable	n	Mean(SD)
Age	48	57.2(18.9)
Gender		
%Male	6	12.5%
%Female	42	87.5%
Race		
%African American	48	100%
BMI (kg/m <sup>2</sup> )		31.3(7.7)
Employment Status		
%Full or part time	5	10.6%
%Other	42	89.4%
Marital Status		
%Married or cohabitating	6	13.3%
%Other	39	86.7%
Education		
< High School	16	33.3%
High School/GED	14	29.2%
> High School/GED	18	37.5%

### **Focus group protocol.**

Cognitive models and theories of eating behavior outlined in the literature were used as guidelines for creating the focus group protocol. Questions addressed how various aspects of health beliefs such as perceived barriers to change, perceived outcomes, perceived control, the influence of participants' current health on their eating decisions, their intent to change, and health knowledge

influenced their health behavior. The protocol contained questions developed to elicit thoughts about eating, loss of control over eating, and eating behaviors identified by our previous cluster analysis (data not shown). Questions about behaviors included: (1) How do you know when to start and stop eating? (2) What kinds of foods are healthy? (3) Are there times when you don't think much about the foods you eat? (4) What happens when you can no longer control your food intake?

### **Extraction of themes and generation of questionnaire items.**

Focus group responses were transcribed verbatim. Transcripts were qualitatively analyzed using Atlas TI software (Atlas TI, Berlin). The software was used to sort responses into eating related thematic groups. We did not find any differences between eating attitudes shared by focus group members and those in the literature related to a diverse sample. The groupings were used to generate lists of potential questionnaire items. Creating lists of items representing a range of themes allowed for broad coverage of eating behaviors, and ensured content validity of the measure.

Two types of items were created: internal and external. The grouping of an item as internal or external was based on the categories created during the analysis of the focus group transcripts.

External items were intended to reflect the variety of external influences on food choice and intake found in the research literature (e.g., evidence-based knowledge of nutrition and healthy eating behaviors, and barriers to healthy eating). Questions included were "I eat plenty of leafy green vegetables," and "I pick food items that will keep my grocery bill low."

Internal items were intended to reflect attitudes and beliefs about eating behavior that potentially informed and maintained eating schemas (i.e., eating cognitions). Given the plethora of attitudes and beliefs that any one individual can generate, items focused on factors that potentially influenced loss of control over eating and were thus derived from the focus group responses to questions about loss of control over food intake. Sample items included "I have detailed rules about eating that I try to

follow,” “If I’ve been eating badly, I feel angry at myself for not having willpower,” and “It’s very important to me to be thin for appearance reasons.”

Internal and external items were combined, along with a demographic questionnaire and questions on macro and micronutrient intake, to form the eating assessment questionnaire.

## CHAPTER III

### PSYCHOMETRIC EVALUATION OF THE PRELIMINARY QUESTIONNAIRE

#### Method

##### Participants and Procedure

The eating assessment questionnaire was administered to an initial community sample (n=33). Administration to an initial community sample allowed us to review the focus group derived preliminary items for relevance. It also allowed for review of the item-clusters for internal consistency prior to revisions and administration to a larger sample. Demographics are presented in Table 2.

Table 2		
<i>Preliminary Survey Group Demographics</i>		
	n	Mean(SD) or %
Age	33	37.6(11.2)
Gender		
Male	14	42.4%
Female	19	57.6%
Race		
African American	5	15.2%
Caucasian	27	81.8%
American Indian/Alaska Native	1	3.00%
BMI (kg/m <sup>2</sup> )	33	31.5(7.1)
Employment Status		
Full or part time	26	78.8%
Other	7	21.2%
Marital Status		
Married or cohabitating	15	45.5%
Other	18	54.5%
Education		
< High School	8	24.2%
High School/GED	10	30.3%
> High School/GED	15	45.5%

## Results

### Thematic Groupings and Internal Consistency

#### Development of internal subscales.

Our goal in creating subscales was to capture internal and external influences on food choice. Internal influences include emotions, concerns about health and weight, body image and other largely psychological or emotional influences on food choice. External items included situational factors such as setting, meal type, cultural influences, cost of food, family, and the taste/texture/quality of foods.

All items were measured using a Likert scale ranging from 1 (“Strongly agree”) to 5 (“Strongly disagree”). Each of the 33 participants rated each item on the five point scale, and an inter-item distance matrix was calculated using squared Euclidian distances. Internal items were analyzed using cluster analysis (Ward’s Method on squared Euclidian distances). Cluster analysis allowed the creation of item groupings that both simplified the data and allowed for the integration of qualitative information.

The resulting dendrogram (Figure 1) was reviewed and clusters determined by searching for large changes between fusions, and by making qualitative comparisons of cluster content to the eating literature. This resulted in five subscales: Health Behaviors, Weight Anxiety, Control, Hunger, and a fifth scale, which was later omitted. These scales are addressed in more detail below.



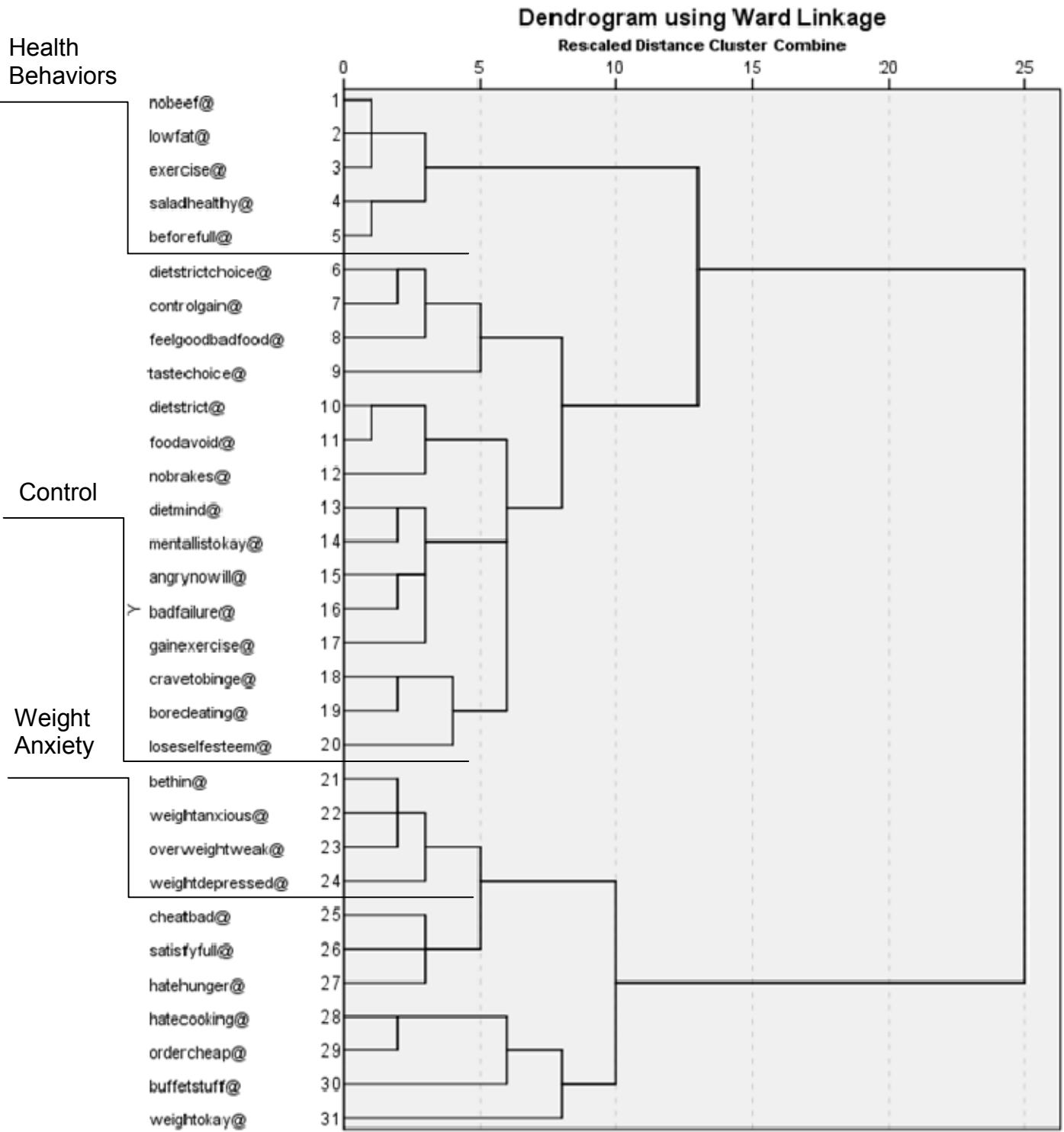


Figure 1. Dendrogram of preliminary items.

### **Development of external subscales.**

External items were grouped by item content, based on the earlier qualitative analysis, to create nine subscales (Nutrition Knowledge, Healthy Meal Preparation, Cost, Culture, Internal Influences, External Influences, Media, Medical Condition and Mood). No cluster analysis was done with the external items; they were grouped together on the basis of the qualitative analysis.

After completing the cluster analysis and combining the external and internal items, the eating questionnaire consisted of fourteen subscales and 86 items.

### **Evaluation of subscales.**

Scale reliabilities (internal consistencies) were calculated using Cronbach's alpha. A review of alphas and corrected item-total correlations was used to modify the scales.

The fifth internal subscale was omitted from the questionnaire because of very poor internal consistency and items that did not enhance the measure. Culture, Cost, and Media were included because of their influences on food intake as found in the literature. Due to categorical similarity and few items Mood and Media were combined with Internal and External Influences, respectively. The Medical Condition and Health Behaviors subscales were also combined. The revised eating questionnaire contained ten subscales and 70 items (items related to macro and micronutrient intake are not included in this total). A description of the preliminary thirteen subscales follows. Table 3 presents the name of each scale, the number of items, and the internal consistency (see Appendix B for corrected item-total correlations).

Nutrition Knowledge assessed participants' basic understanding of healthy food choices. Healthy Meal Preparation assessed willingness to spend time preparing healthy meals. Cost assessed the influence of cost concerns on food choice. The Culture subscale was designed to broadly assess the influence of cultural concerns on food choice. Internal Influences assessed the

impact of specific emotions on food intake, while External Influences assessed situational factors on food intake. Media assessed the influence of television and magazines on food choice. Medical Condition and Mood broadly assessed the influence of medical condition and mood on food choice and intake. Health Behaviors broadly assessed beneficial attitudes toward health. Control assessed personal rules used to limit food choice and intake. Weight Anxiety assessed attitudes toward weight gain and body shape. The Hunger subscale assessed beliefs about satiety and food intake.

Table 3

*Cronbach's Alphas of the Preliminary Subscales*

Scale	Alpha	Item n	Cluster
Nutrition Knowledge	0.824	6	External
Internal Influence	0.648	6	External
External Influence	0.635	7	External
Cost	0.555	5	External
Culture	0.401	4	External
Mood	0.784	2	External
Media	0.335	2	External
Medical Condition	0.792	2	External
Healthy Meal Prep	0.808	9	External
Health Behaviors	0.748	5	Internal
Control	0.799	15	Internal
Weight Anxiety	0.866	4	Internal
Hunger	0.693	3	Internal

## CHAPTER IV

### REVISED INSTRUMENT: ASSESSMENT OF RELIABILITY AND VALIDITY

#### Method

##### Participants and Procedure

In order to assess reliability and validity, the revised instrument was administered to a diverse online sample (n=217) recruited from Amazon Turk and ResearchMatch.org (demographics are presented in Table 4). The Amazon Mechanical Turk website (<https://www.mturk.com/mturk/welcome>) describes itself as a forum where members can post tasks, traditionally completed by temps, and offer compensation. People are free to search and complete tasks they find appealing. The Turk website provides the description below:

“Amazon Mechanical Turk is a marketplace for work that requires human intelligence. The Mechanical Turk web service enables companies to programmatically access this marketplace and a diverse, on-demand workforce. Developers can leverage this service to build human intelligence directly into their applications.

While computing technology continues to improve, there are still many things that human beings can do much more effectively than computers, such as identifying objects in a photo or video, performing data de-duplication, transcribing audio recordings or researching data details. Traditionally, tasks like this have been accomplished by hiring a large temporary workforce (which is time consuming, expensive and difficult to scale) or have gone undone.

Mechanical Turk aims to make accessing human intelligence simple, scalable, and cost-effective. Businesses or developers needing tasks done (called Human Intelligence Tasks or “HITs”) can use the robust Mechanical Turk APIs to access thousands of high quality, low cost, global, on-demand workers—and then programmatically integrate the results of that work directly into their business processes and systems. Mechanical Turk enables developers and businesses to achieve their goals more quickly and at a lower cost than was previously possible.”

A Vanderbilt University led collaborative effort among numerous research institutions, ResearchMatch.org (<https://www.researchmatch.org>) is a website designed to aid in research recruitment. Its aim is to bring together researchers and people interested in participating in scientific studies. The ResearchMatch database contains tens of thousands of potential participants from a diverse demographic nationwide. Search features such as geographic location, demographics, and existing medical conditions allow researchers to locate participants who meet their criteria. Researchers may send a ResearchMatch generated email to potential participants who then accept or decline the invitation. Participants on Amazon Turk and ResearchMatch were compensated.

Table 4		
<i>Online Survey Group Demographics</i>		
	n	Mean(SD) or %
Age	214	39.9(14.3)
Gender		
Male	84	39.3%
Female	130	60.7%
Race		
African American	45	21.0%
Caucasian	122	57.0%
Hispanic or Latino	11	5.1%
Asian	33	15.4%
American Indian/Alaska Native	2	0.9%
Multiracial	1	0.5%
BMI (kg/m <sup>2</sup> )	214	28.1(8.8)
Employment Status		
Full or part time	146	68.2%
Other	68	31.8%
Marital Status		
Married or cohabitating	110	51.4%
Other	104	48.6%
Education		
< High School	1	0.5%
High School/GED	9	4.2%
> High School/GED	204	95.4%

## **Additional Measures**

Additional measures of eating behavior, body image, eating cognitions, and social desirability were included in order to confirm the previous subscales and evaluate construct validity.

The Three Factor Eating Questionnaire (TFEQ; Stunkard & Messick, 1985) and the Dieter's Inventory of Eating Temptations (DIET; Schlundt & Zimering, 1988) were included as measures of primarily internal and external eating attitudes, respectively. The TFEQ is a 51-item measure composed of Disinhibition ( $\alpha=.91$ ), Hunger ( $\alpha=.85$ ), and Restraint ( $\alpha=.93$ ) scales. Participants are asked to respond to a number of eating related items. Items are either true-false or on a four-point Likert scale (scale designations varied).

The Dieter's Inventory of Eating Temptations (DIET) is a 30-item survey designed to measure behavioral competence in six situations related to weight control: overeating ( $\alpha= .790$ ), resisting temptation ( $\alpha= .733$ ), food choice ( $\alpha= .769$ ), positive social ( $\alpha= .780$ ), negative emotions ( $\alpha= .860$ ), and exercise ( $\alpha= .926$ ) Participants are asked to indicate the likelihood of engaging in a beneficial health behavior, using percentages from 0 to 100, given the scenarios presented.

Measures of body image included the Appearance Schemas Inventory (ASI;  $\alpha= .84$ ) (Cash & Labarge, 1996; Cash, Melnyk, & Hrabosky, 2004), and the Eating Disorders Inventory-Body Dissatisfaction Scale (EDI-BD;  $\alpha= 0.91$ ) (Garner, Olmstead, & Polivy, 1983). The 14-item ASI measures the importance of body image using a five-point Likert scale (1= "Strongly disagree" to 5= "Strongly agree"). The EDI-BD is a 9-item subscale that asks participants to rate their dissatisfaction with various parts of the body. The six-point Likert scale ranges from 1 ("Never") to 6 ("Always").

The Balanced Inventory of Desirable Responding (BIDR; Paulhus, 1984; Paulhus, 1988), a 40-item multidimensional measure of social desirability and self-presentation style, was also included as part of the assessment battery. Reported alphas for the Self Deceptive Enhancement and Impression Management subscales were .77 and .85. Test-retest reliability was .65 to .69.

The Dieter's Inventory of Eating Temptations (DIET) was included as a measure of external influences on food choice and intake, thus we expected significant positive correlations between the external scales and the DIET. We also expected some small to modest correlations between the internal scales and the DIET.

The Three Factor Eating Questionnaire (TFEQ) was included as a measure of internal influences on food choice and intake. We expected there to be strong positive correlations between the TFEQ and the internal scales of the eating questionnaire. Specifically, we expected the Control scale to be strongly correlated with the TFEQ. We also expected there to be some small to modest correlations between the TFEQ and the external scales of the eating questionnaire.

Due to the overlapping nature of cognitions, however, we do not expect these correlations to be mutually exclusive; some external and internal scales will likely significantly correlate with the TFEQ and the DIET, respectively. The main hypothesis was that the external scales would show stronger correlations with the DIET and the internal scales stronger correlations with the TFEQ,.

## Results

### Final Scale Reliabilities

Reliability (internal consistencies) of the ten revised subscales was determined using Cronbach's alpha (Table 5).

	Alpha
Nutrition Knowledge	.783
Internal Influence	.757
External Influence	.580
Cost	.697
Culture	.812
Healthy Meal Prep	.769
Health Behaviors	.612
Control	.786
Weight Anxiety	.802
Hunger	.386

A comparison of the original 13 subscales and the ten revised subscales shows increases in Cronbach's alpha for Internal Influence (.648 to .757), Cost (.555 to .697), and Culture (.401 to .812). Cronbach's alpha for Hunger decreased from .693 to .386 and was consequently omitted from additional analyses.



## **Convergent and Divergent Validity**

### **Inter-scale correlations.**

The eating questionnaire scales were correlated with each other and with the above described additional measures to evaluate construct validity (Tables 6-10). Internal and external scales did not correlate with each other. All the internal scales were significantly correlated with one another. Among the external scales Healthy Meal Prep and Nutrition Knowledge were significantly correlated with Internal Influence, External Influence and Cost. Correlations of particular interest are highlighted below.

Among the external scales Nutrition Knowledge was significantly correlated with all of the TFEQ and the DIET subscales (moderate positive correlations with Food Choice and Exercise). While it was significantly negatively correlated with the Body Dissatisfaction subscale of the EDI, it was not correlated with the ASI.

Internal Influence was significantly correlated with most scales of the TFEQ and significantly negatively correlated with all scales of the DIET. It was also significantly positively correlated with the Body Image Vulnerability scale and the total score of the ASI. Internal Influence was correlated with the Body Dissatisfaction scale of the EDI).

External Influence was significantly correlated only with the DIET-EX, the ASI-BV, and the EDI-BD.

Cost was significantly positively correlated with the TFEQ-R and significantly negatively correlated with TFEQ-H. Cost was also significantly positively correlated with all scales of the DIET. Among measures of body image, cost was significantly negatively correlated with only the ASI-BIV and the EDI-BD.

Culture was significantly positively correlated with only the TFEQ-H and total scores. Culture was significantly negatively correlated with the DIET-OE. Culture was significantly positively correlated with all scales of the ASI, but not with the EDI-BD.

Healthy Meal Prep was significantly correlated with most measures of eating and body image, except for the TFEQ total score and the ASI-SIF.

Among the internal scales, Health Behaviors was not significantly associated with any measures of eating. It was, however, significantly correlated with some measures of body image including the ASI-SIF, AS, and total scores.

Control was significantly positively correlated with all scales of the TFEQ. It was also significantly negatively correlated with the Resisting Temptation, Overeating, and Negative Emotional Eating subscales of the DIET, but significantly positively correlated with Food Choice. Control was significantly positively correlated with all measures of body image.

Weight Anxious was significantly positively, moderately correlated with all scales of the TFEQ and significantly negatively correlated with the DIET-NE. Weight Anxious was significantly positively correlated with all measure of body image.

Nutrition Knowledge, Cost and Healthy Meal Prep were significantly correlated with the BIDR-SDE and total scores. Culture was significantly correlated with the BIDR-IM and total score. Internal Influence was significantly negatively correlated with all measures of social desirability. External Influence, however, was not significantly correlated with any of the measures.

Control and Weight Anxious were significantly negatively correlated with all measures of social desirability. Health Behaviors was positively correlated with the BIDR-SDE and total score.

BMI was significantly positively correlated with Weight Anxious and Control, and significantly negatively correlated with Internal Influence, External Influence, Nutrition Knowledge, Healthy Meal Prep, and Cost.

Table 6

*External and internal scale inter-correlations*

	Weight Anxious	Control	Health Behaviors	Culture	Cost	External Influence	Internal Influence	Healthy Meal Prep	Nutrition Knowledge
Weight Anxious	-	.643**	.145*	.030	-.085	-.041	.204**	-.085	-.006
Control		-	.191**	.083	-.120	-.002	.377**	-.039	.128
Health Behaviors			-	-.029	-.094	.045	-.036	-.039	-.040
Culture				-	.057	.002	-.096	-.005	.133
Cost					-	.095	-.122	.297**	.391**
External Influence						-	-.011	.152*	.172*
Internal Influence							-	.268**	.221**
Healthy Meal Prep								-	.595**
Nutrition Knowledge									-

Note: \* p &lt; .05. \*\* p &lt; .01.

Table 7

*Pearson Correlations with TFEQ*

	TFEQ-R	TFEQ-D	TFEQ-H	TFEQ-C
Nutrition Knowledge	.532 <sup>***</sup>	-.158 <sup>*</sup>	-.135 <sup>*</sup>	.168 <sup>*</sup>
Internal Influence	-.088	.564 <sup>***</sup>	.336 <sup>***</sup>	.359 <sup>***</sup>
External Influence	.072	-.086	-.115	-.051
Cost	.162 <sup>*</sup>	-.133	-.210 <sup>**</sup>	-.064
Culture	.133	.061	.219 <sup>**</sup>	.201 <sup>**</sup>
Healthy Meal Prep	.361 <sup>***</sup>	-.262 <sup>***</sup>	-.200 <sup>**</sup>	-.005
Health Behaviors	.060	.031	.027	.060
Control	.411 <sup>***</sup>	.601 <sup>***</sup>	.431 <sup>***</sup>	.701 <sup>***</sup>
Weight Anxious	.344 <sup>***</sup>	.472 <sup>***</sup>	.348 <sup>***</sup>	.567 <sup>***</sup>

*Note:* TFEQ= Three Factor Eating Questionnaire; R= restraint; D= disinhibition; H=hunger; C= composite.  
\*p < 0.05. \*\*p < 0.01. \*\*\*p < .001.

Table 8

*Pearson Correlations with the DIET*

	DIET-RT	DIET-PSE	DIET-FC	DIET-EX	DIET-OE	DIET-NE
Nutrition Knowledge	.283 <sup>***</sup>	.355 <sup>***</sup>	.656 <sup>***</sup>	.523 <sup>***</sup>	.270 <sup>***</sup>	.319 <sup>***</sup>
Internal Influence	-.318 <sup>***</sup>	-.257 <sup>***</sup>	-.199 <sup>**</sup>	-.178 <sup>**</sup>	-.239 <sup>***</sup>	-.396 <sup>***</sup>
External Influence	.134	-.041	.077	.270 <sup>***</sup>	-.059	.152 <sup>*</sup>
Cost	.197 <sup>**</sup>	.203 <sup>**</sup>	.271 <sup>***</sup>	.242 <sup>***</sup>	.221 <sup>**</sup>	.208 <sup>**</sup>
Culture	-.081	-.088	-.122	.002	-.176 <sup>*</sup>	-.075
Healthy Meal Prep	.282 <sup>***</sup>	.223 <sup>**</sup>	.495 <sup>***</sup>	.472 <sup>***</sup>	.285 <sup>***</sup>	.236 <sup>***</sup>
Health Behaviors	-.011	-.076	.002	.021	-.034	-.064
Control	-.155 <sup>*</sup>	-.113	.164 <sup>*</sup>	-.035	-.182 <sup>**</sup>	-.279 <sup>***</sup>
Weight Anxious	-.027	.001	.105	-.051	-.090	-.154 <sup>*</sup>

*Note:* DIET= Dieter's Inventory of Eating Temptations; RT= Resisting Temptation; PSE= Positive Social Eating; FC=Food Choice; EX=Exercise; OE=Overeating; NE= Negative Emotional Eating.  
\*p < 0.05. \*\*p < 0.01. \*\*\*p < .001.

Table 9					
<i>Pearson Correlations with ASI and EDI</i>					
	ASI-BIV	ASI-SIF	ASI-AS	ASI-C	EDI-BD
Nutrition Knowledge	-.065	.087	-.061	-.017	-.280 <sup>***</sup>
Internal Influence	.216 <sup>**</sup>	.021	.101	.142 <sup>*</sup>	.423 <sup>***</sup>
External Influence	-.139 <sup>*</sup>	-.046	-.076	-.106	-.150 <sup>*</sup>
Cost	-.149 <sup>*</sup>	-.019	-.126	-.115	-.257 <sup>***</sup>
Culture	.217 <sup>**</sup>	.165 <sup>*</sup>	.239 <sup>***</sup>	.233 <sup>**</sup>	-.094
Healthy Meal Prep	-.212 <sup>**</sup>	-.055	-.192 <sup>**</sup>	-.177 <sup>**</sup>	-.265 <sup>***</sup>
Health Behaviors	.095	.266 <sup>***</sup>	.190 <sup>**</sup>	.196 <sup>**</sup>	.035
Control	.587 <sup>***</sup>	.437 <sup>***</sup>	.388 <sup>***</sup>	.557 <sup>***</sup>	.427 <sup>***</sup>
Weight Anxious	.698 <sup>***</sup>	.560 <sup>***</sup>	.543 <sup>***</sup>	.700 <sup>***</sup>	.366 <sup>***</sup>

*Note:* ASI= Appearance Schemas Inventory; BIV= Body Image Vulnerability; SIF= Self-Investment Factor; AS= Appearance Stereotyping; C= Composite; EDI-BD= Eating Disorders Inventory-Body Dissatisfaction Scale.  
<sup>\*</sup>p < 0.05. <sup>\*\*</sup>p < 0.01. <sup>\*\*\*</sup>p < .001.

Table 10			
<i>Pearson Correlations with the BIDR</i>			
	BIDR-SDE	BIDR-IM	BIDR Composite
Nutrition Knowledge	.220**	.111	.170*
Internal Influence	-.299***	-.173**	-.255***
External Influence	.096	.081	.047
Cost	.205**	.119	.217**
Culture	-.087	-.152*	-.153*
Healthy Meal Prep	.296***	.128	.226**
Health Behaviors	.140*	.062	.143*
Control	-.222**	-.151*	-.214**
Weight Anxious	-.218**	-.203**	-.185**

*Note:* BIDR= Balanced Inventory of Desirable Responding; SDE= Self-Deceptive Enhancement subscale  
IM= Impression Management subscale.  
\*p < .05. \*\*p<0.01. \*\*\*p < .001.

The majority of external scales correlated significantly with scales on the DIET. External Influence and Culture had the fewest significant correlations among the external scales. The majority of internal scales did not correlate significantly with the DIET. Conversely, the majority of internal scales were significantly correlated with the TFEQ. The exception was Health Behaviors, which had small correlations with the TFEQ. There were modest to strong correlations between Control and Weight Anxious and the TFEQ.

## Discussion

In the present study we explored attitudes that potentially influence eating behavior in a diverse community sample. Of particular interest was the ability to elucidate internal eating cognitions that potentially influence loss of control over eating. Our approach used a combination of community focus groups to elicit eating themes, and cluster analysis to derive relevant items. Reliability and validity of the preliminary and final versions of the measure were evaluated using online samples.

### Internal Consistency

Ten scales were created, reflective of a variety of eating influences found in the literature, with the majority of internal consistencies ranging from .812 to .612 (the Hunger scale was omitted from further analysis due to low internal consistency). Cronbach's alpha increased for Internal Influence (.648 to .757), Cost (.555 to .697), and Culture (.401 to .812). The internal consistency of External Influence was likely affected by the variety of behaviors assessed (e.g., eating with family or eating at a buffet). However, the correlation with the Exercise subscale of the DIET suggests that the items are assessing external behaviors.

### Convergent and Divergent Validity

#### Intra-scale correlations.

The absence of significant correlations between the majority of external and internal scales suggests some differentiation between external and internal attitudes, confirming findings by other researchers who have also found a distinction between responses to external and internal measures (Czyzewska & Graham, 2008; Hoefling & Strack, 2008). The exceptions were relationships between Internal Influence, and Weight Anxious and Control, which likely reflects the shared emotional



component of those factors. Further discussion of the relationship between these variables can be found in the section on validity.

All of the internal scales correlated with one another. A discussion of the strong correlation between Weight Anxious and Control is below.

The fact that a number of the external scales did not correlate with one another is likely due to the variety of behaviors assessed by these scales. There were, however, some exceptions. Participants who indicated that they made use of their nutrition knowledge and were more willing to spend time preparing healthy meals were also more likely to report buying expensive food items (expensive foods tend to be healthier choices such as fresh produce and low fat proteins like fish). In addition, they were less likely to report emotional influences on food choice. This association of healthy behaviors is supported by the inverse relationship of BMI to both Healthy Meal Prep and Nutrition Knowledge, indicating that those who engage in these health behaviors likely have a lower BMI.

#### **Inter-scale correlations: internal scales.**

Moderate correlations between the scores of the Control and Weight Anxious scales and the subscales of the TFEQ suggest that the Control and Weight scales reflect internal attitudes related to loss of control over eating.

As is found in the literature concepts of Resisting Temptation, Food Choice, Overeating, and Negative Emotional Eating are influenced by internal cognitions related to perceived control over food intake (Bublitz, Peracchio, & Block, 2010; Macht, 2008).

Yeomans and Coughlin (2009) discuss conflicting study outcomes arising from using the Revised Restraint Scale (RRS; Herman & Polivy, 1980), the TFEQ or the Dutch Eating Behavior Questionnaire (DEBQ; Van Strein, Frijters, Bergers, & Defares, 1986) to classify participants as restrained eaters. Studies have demonstrated that when restrained eaters find their resolve

weakened, such as when negative emotions are induced, they consequently overeat. Thus, these particular restrained eaters exhibit perceived restraint and disinhibition. In contrast, there are studies that have demonstrated that there are others, who can also be characterized as restrained eaters, who do not overeat when experiencing negative emotions; this group exhibits true restraint without disinhibition. In other words, the former group consists of unsuccessful dieters while the latter group consists of successful dieters or people not necessarily preoccupied with topics of weight control. Yeomans and Coughlin (2009) explain that because the TFEQ and the DEBQ measure restraint regardless of weight fluctuation, unlike the RRS, these measures do not adequately assess restraint in relation to successful or unsuccessful weight reduction. Consequently, groups with restrained eaters, as classified by the TFEQ or the DEBQ, may actually contain both successful and unsuccessful dieters; restraint scores are being taken into account to the exclusion of its relationship with disinhibition scores.

In this study there were significant relationships that suggest a similar pattern to that discussed above. Weight Anxious and Negative Emotional Eating were negatively related, which reflects the negative emotional valence of weight anxiety and its influence on eating behaviors (Macht, 2008); participants who reported greater weight anxiety were less likely to report making healthy eating choices when experiencing negative emotions. Furthermore, there were also positive relationships between BMI, Control (somewhat similar to restraint), and Weight Anxious; unhealthy eating behaviors lead to increased intake and increased BMI. Post hoc analyses (Tukey's HSD and Games-Howell) showed significant differences on Control between participants characterized as high restraint/ high disinhibition and those who were high restraint/low disinhibition (using scores on the TFEQ). Similar differences were found between these same groups on Weight Anxious. The high restraint/high disinhibition group reported the highest levels of both Control and Weight Anxiety.

Health Behaviors touches on a variety of aspects of health (food, medical condition, etc.) there is no expectation that this scale would correlate with the multiple dimensions of the DIET or the TFEQ.

### **External scales.**

The significant correlations between the majority of the external scales and the DIET suggest that the external scales reflect dimensions of eating that are influenced by environmental factors.

Strong correlations between Nutrition Knowledge and Healthy Meal Prep, and Food Choice and Exercise largely reflect that general knowledge of nutrition is related to knowledge of other similar health behaviors.

Neither the TFEQ nor the DIET externally measure cultural influences on food intake, so the absence of significant relationships with the Culture scale are to be expected.

Possible limitations of the present study include sampling bias due to an online sample. It was once thought that people with access to a computer were of a higher SES than people without access to one. This, however, has changed since computers have become more accessible. In addition, many people on Amazon Turk complete listed tasks to supplement their income. In some cases it is their sole source of income. Thus, compared to a university sample the online sample was more diverse. There may have been differences between the Amazon Turk sample and the ResearchMatch sample since ResearchMatch focuses on recruiting people who are interested in participating in research studies. The monetary focus of the Turk participants may have created differences between the groups. Two-sample t-tests revealed a significant effect for age,  $t(187) = 3.72$ ,  $p < .001$ , and BMI,  $t(169) = 4.41$ ,  $p < .001$ , with ResearchMatch participants being older and heavier. The Amazon Turk and ResearchMatch samples were compared on the 9 revised scale scores using t-tests. There were significant effects for Internal Influence,  $t(212) = 4.16$ ,  $p < .001$ , Culture,  $t(207) = 3.50$ ,  $p < .001$ , and Health Behaviors  $t(212) = 2.48$ ,  $p < .05$ . ResearchMatch

participants had higher scores on Internal Influence and Amazon Turk participants had higher scores on Culture and Health Behaviors. Effect sizes, based on Eta squared statistic, for the significant differences were .076, .051, .028 respectively.

As mentioned previously the focus group sample was exclusively African-American. Despite this, there were no differences found between themes elicited from the focus groups and the literature. Post hoc tests revealed no significant differences between African-Americans and Caucasians on the ten revised scales. There were significant differences between males and females for Internal Influence  $t(207) = 2.49, p < .05$ , External Influence  $t(212) = 2.36, p < .05$ , and Culture  $t(151) = 1.98, p = .05$ . While there were differences between the two samples, the differences were neither large nor striking.

Our criteria for a diverse sample could have been more inclusive of groups that have been shown to differ on internal eating attitudes (Yeomans & Coughlan, 2009). By extension, even more diverse items could have been included to capture the differences in attitudes between groups that exhibit the multiple combinations of restraint and disinhibition. Comparisons with macro and micronutrient intake will allow for a greater understanding of the relationship between cognitions and food intake. Test-retest reliability will allow us to establish the stability of our measure. Using a larger sample and factor analysis can confirm the clusters.

Despite these limitations, our measure assesses diverse domains in a compact and easily accessible format. Future studies should focus on distinguishing between cognitions that encourage food intake and cognitions that enable flexible control over food intake (Westenhoefer et al., 2013). Considering our current knowledge, the diversity of investigative approaches and eating behavior theories reviewed here, and the inconsistent study results perhaps individual differences not only stem from a difference in cognitions, but also a difference in preference for particular cognitive approaches. That is to say, it is possible that although humans in general employ automatic processing, some people may find more deliberative methods comfortable in certain situations. It may

be useful to test different eating theories in different groups. For example, it is easy to imagine that successful dieters probably use deliberative processes more often when choosing foods especially when they are first incorporating healthier eating habits. As they develop new, healthier, eating schemas their choices likely become more automatic. Even so, successful dieters probably draw on their nutrition knowledge more often and so their decision making processes will always have a greater degree of “deliberateness” than their unsuccessful counterparts. Successful dieters seem to be able to use both automatic and deliberative processes to their advantage, thus creating flexible control.

To understand the difficulties unsuccessful dieters have with developing flexible control it may be necessary to investigate general perceptions of healthy diets. People who maintain healthy eating habits tend to view healthy eating as a lifestyle change. For them, healthy eating is a series of guidelines to be integrated seamlessly into their daily lives. Unsuccessful dieters, however, perceive healthy eating choices as “diets” or strict routines outside of their usual eating habits. Once their dieting goal is achieved, the rules become obsolete. Thinking of healthy eating choices as discrete and finite leaves this group vulnerable to departures from healthy choices because the rules can be discarded at any time. Furthermore, the juxtaposition of usual and restricted eating causes undue tension. There is no long-term outlook that makes healthy eating indispensable and the frustration increases the chances of disinhibition.

To counteract this process that could lead to disinhibition, this instrument could be used to assess major problem areas in the high restraint/high disinhibition group. Interventions could then be tailored to address these problem areas. For example, scoring high on External Influences likely means that environmental factors, such as easily accessible foods in a time crunch (e.g., fast foods), likely trigger the “diet” schema. Interventions could improve self-management by integrating healthy habits into daily living, such as traveling with homemade meals. Since this group has been found to

be particularly vulnerable to negative emotional eating, the lifestyle approach will be helpful in reducing frustration and the resulting unhealthy food choices.

Assessing successful dieters as well can help us to understand empowering perceptions of food choice. A modified card sort could be used to investigate cognitions that help to maintain flexible control. High restraint/low disinhibition eaters could be asked to sort eating cognitions according to frequency of use. These piles could then be sorted by situational factors. The resulting piles would be a representation of salient cognitions used in a myriad of eating situations. This process could highlight which cognitions are used to produce flexible control over eating.

Attempting to pinpoint salient thoughts about food is a challenging task. Respondents may not be able to articulate which thoughts they find most helpful or harmful, or they may modify their responses to be socially desirable. Perhaps a task that involves a contextual cue may help to make the most salient eating thoughts even more accessible. For example, the exploration of eating cognitions could include one-on-one interviews where participants are given scenarios about eating behavior (e.g., eating at a party) and asked to share their responses to these scenarios. Interviewers could then probe for salient cognitions.

In summary, we created a new measure that assesses a variety of salient eating attitudes in a community sample. Use of this measure to pinpoint problematic eating can highlight problem areas and related cognitions for unsuccessful dieters, adding one more piece to the puzzle. Tailored interventions can then be created to reduce stress and increase the chances of success. Observation of these attempts can eventually shed light on cognitive processes and pave new ways for studying eating behavior.

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## Appendix A

Confidential

Page 1 of 17

# Eating Survey 2

The following questions ask about your eating preferences. Please complete each section.

Thank you!

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### DEMOGRAPHICS

What is your sex?

- Female  
 Male

How old are you?

\_\_\_\_\_

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### How tall are you?

Feet

\_\_\_\_\_

Inches

\_\_\_\_\_

How much do you weigh? (Pounds)

\_\_\_\_\_

How would you describe your ethnic or racial background? (Check all that apply)

- Black or African American  
 White or Caucasian  
 Hispanic or Latino  
 American Indian or Alaska Native  
 Asian  
 Pacific Islander  
 Other

What is the highest level of schooling that you have completed?

- Less than 8th grade  
 9th-11th grade  
 High School  
 GED  
 Some college  
 College degree  
 Graduate or professional degree

What is your employment status?

- Employed full time  
 Employed part time  
 Unemployed  
 Disabled or unable to work  
 Retired  
 Student  
 Homemaker  
 Other

What is your marital status?

- Married  
 Living with a partner  
 Divorced or separated  
 Widowed  
 Single/Never married

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**Typically, how often do you eat the following?:**

Breakfast?

- Never
- Less than once a month
- 1-3 times a month
- 1-2 days a week
- 3-4 days a week
- 5-6 days a week
- Once a day
- Twice a day
- Three or more times a day

Morning Snack?

- Never
- Less than once a month
- 1-3 times a month
- 1-2 days a week
- 3-4 days a week
- 5-6 days a week
- Once a day
- Twice a day
- Three or more times a day

Lunch?

- Never
- Less than once a month
- 1-3 times a month
- 1-2 days a week
- 3-4 days a week
- 5-6 days a week
- Once a day
- Twice a day
- Three or more times a day

Afternoon Snack?

- Never
- Less than once a month
- 1-3 times a month
- 1-2 days a week
- 3-4 days a week
- 5-6 days a week
- Once a day
- Twice a day
- Three or more times a day

Dinner?

- Never
- Less than once a month
- 1-3 times a month
- 1-2 days a week
- 3-4 days a week
- 5-6 days a week
- Once a day
- Twice a day
- Three or more times a day

Evening Snack?

- Never
- Less than once a month
- 1-3 times a month
- 1-2 days a week
- 3-4 days a week
- 5-6 days a week
- Once a day
- Twice a day
- Three or more times a day

Bedtime snack?

- Never
- Less than once a month
- 1-3 times a month
- 1-2 days a week
- 3-4 days a week
- 5-6 days a week
- Once a day
- Twice a day
- Three or more times a day

Middle of the night?

- Never
- Less than once a month
- 1-3 times a month
- 1-2 days a week
- 3-4 days a week
- 5-6 days a week
- Once a day
- Twice a day
- Three or more times a day

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**Please indicate the average number of servings per day of the following:**

On average, how many servings of fruit do you eat per day?

- None
- 1 serving
- 2 servings
- 3 servings
- 4 servings
- 5 or more servings

On average how many servings of vegetables do you eat per day?

- None
- 1 serving
- 2 servings
- 3 servings
- 4 servings
- 5 or more servings

On average how many servings of bread, rice, pasta, potatoes, grains, and cereal do you eat per day?

- None
- 1 serving
- 2 servings
- 3 servings
- 4 servings
- 5 or more servings

On average how many servings of desserts, candies, chips, and junk foods do you eat per day?

- None
- 1 serving
- 2 servings
- 3 servings
- 4 servings
- 5 or more servings

On average how many servings of soda and drinks sweetened with sugar or corn syrup do you drink?

- None
- 1 serving
- 2 servings
- 3 servings
- 4 servings
- 5 or more servings

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**Preferences**

I use the food pyramid to help me with my food choices.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

I know a lot about nutrition.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

I choose foods based on my nutrition knowledge.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

Learning what's healthy to eat is important to me.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

I follow my doctor's nutrition advice.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

I know how to calculate portion sizes.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

My medical condition determines WHAT I eat.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

My medical condition determines WHEN I eat.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

I eat plenty of leafy green vegetables.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

I eat lots of fried food.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree



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**CRAVINGS**

**When I have a food craving I eat...**

Vegetables

- Never
- Less than once a month
- 1-3 times a month
- 1-2 days a week
- 3-4 days a week
- 5-6 days a week
- Once a day
- Twice a day
- Three or more times a day

Fruits

- Never
- Less than once a month
- 1-3 times a month
- 1-2 days a week
- 3-4 days a week
- 5-6 days a week
- Once a day
- Twice a day
- Three or more times a day

Sweets (candy, cookies, cake, pastry)

- Never
- Less than once a month
- 1-3 times a month
- 1-2 days a week
- 3-4 days a week
- 5-6 days a week
- Once a day
- Twice a day
- Three or more times a day

Salty foods (chips, pretzels, cheetos, crackers)

- Never
- Less than once a month
- 1-3 times a month
- 1-2 days a week
- 3-4 days a week
- 5-6 days a week
- Once a day
- Twice a day
- Three or more times a day

Sugared drinks

- Never
- Less than once a month
- 1-3 times a month
- 1-2 days a week
- 3-4 days a week
- 5-6 days a week
- Once a day
- Twice a day
- Three or more times a day

Meats

- Never
- Less than once a month
- 1-3 times a month
- 1-2 days a week
- 3-4 days a week
- 5-6 days a week
- Once a day
- Twice a day
- Three or more times a day

- Cheese
- Never
  - Less than once a month
  - 1-3 times a month
  - 1-2 days a week
  - 3-4 days a week
  - 5-6 days a week
  - Once a day
  - Twice a day
  - Three or more times a day
- Bread
- Never
  - Less than once a month
  - 1-3 times a month
  - 1-2 days a week
  - 3-4 days a week
  - 5-6 days a week
  - Once a day
  - Twice a day
  - Three or more times a day
- Alcohol (beer, wine, liquor, mixed drinks)
- Never
  - Less than once a month
  - 1-3 times a month
  - 1-2 days a week
  - 3-4 days a week
  - 5-6 days a week
  - Once a day
  - Twice a day
  - Three or more times a day

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**I or someone I live with prepare the following meals at home...(Answer only if you eat this meal. If you don't eat this meal click Don't Eat This Meal)**

- Breakfast
- Never
  - Less than once a month
  - 1-3 times a month
  - 1-2 days a week
  - 3-4 days a week
  - 5-6 days a week
  - Once a day
  - Twice a day
  - Three or more times a day
  - Don't Eat This Meal
- Morning snack
- Never
  - Less than once a month
  - 1-3 times a month
  - 1-2 days a week
  - 3-4 days a week
  - 5-6 days a week
  - Once a day
  - Twice a day
  - Three or more times a day
  - Don't Eat This Meal

Lunch

- Never
- Less than once a month
- 1-3 times a month
- 1-2 days a week
- 3-4 days a week
- 5-6 days a week
- Once a day
- Twice a day
- Three or more times a day
- Don't Eat This Meal

Afternoon snack

- Never
- Less than once a month
- 1-3 times a month
- 1-2 days a week
- 3-4 days a week
- 5-6 days a week
- Once a day
- Twice a day
- Three or more times a day
- Don't Eat This Meal

Dinner

- Never
- Less than once a month
- 1-3 times a month
- 1-2 days a week
- 3-4 days a week
- 5-6 days a week
- Once a day
- Twice a day
- Three or more times a day
- Don't Eat This Meal

Evening snack

- Never
- Less than once a month
- 1-3 times a month
- 1-2 days a week
- 3-4 days a week
- 5-6 days a week
- Once a day
- Twice a day
- Three or more times a day
- Don't Eat This Meal

Bed time snack

- Never
- Less than once a month
- 1-3 times a month
- 1-2 days a week
- 3-4 days a week
- 5-6 days a week
- Once a day
- Twice a day
- Three or more times a day
- Don't Eat This Meal

Middle of the night

- Never
- Less than once a month
- 1-3 times a month
- 1-2 days a week
- 3-4 days a week
- 5-6 days a week
- Once a day
- Twice a day
- Three or more times a day
- Don't Eat This Meal

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**When I'm at home...**

I steam broil or bake my food.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

I prefer to cook from scratch.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

I eat whatever takes the least amount of time to prepare.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

If I'm short on time I eat out.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

Regardless of my schedule I prefer to eat out instead of cooking.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

I will go to different supermarkets to find the fruits or vegetables I want.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

If there are no vegetables in my refrigerator I do without them.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

I don't take time to find healthy foods.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

If there are no fruits in my refrigerator I immediately go and buy them.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

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**I usually eat the following meals at sit down restaurants (Not fast food)...**

Breakfast

- Never
- Less than once a month
- 1-3 times a month
- 1-2 days a week
- 3-4 days a week
- 5-6 days a week
- Once a day
- Twice a day
- Three or more times a day

Morning snack

- Never
- Less than once a month
- 1-3 times a month
- 1-2 days a week
- 3-4 days a week
- 5-6 days a week
- Once a day
- Twice a day
- Three or more times a day

Lunch

- Never
- Less than once a month
- 1-3 times a month
- 1-2 days a week
- 3-4 days a week
- 5-6 days a week
- Once a day
- Twice a day
- Three or more times a day

Afternoon snack

- Never
- Less than once a month
- 1-3 times a month
- 1-2 days a week
- 3-4 days a week
- 5-6 days a week
- Once a day
- Twice a day
- Three or more times a day

Dinner

- Never
- Less than once a month
- 1-3 times a month
- 1-2 days a week
- 3-4 days a week
- 5-6 days a week
- Once a day
- Twice a day
- Three or more times a day

Evening snack

- Never
- Less than once a month
- 1-3 times a month
- 1-2 days a week
- 3-4 days a week
- 5-6 days a week
- Once a day
- Twice a day
- Three or more times a day

Bedtime snack

- Never
- Less than once a month
- 1-3 times a month
- 1-2 days a week
- 3-4 days a week
- 5-6 days a week
- Once a day
- Twice a day
- Three or more times a day

Middle of the night

- Never
- Less than once a month
- 1-3 times a month
- 1-2 days a week
- 3-4 days a week
- 5-6 days a week
- Once a day
- Twice a day
- Three or more times a day

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**I usually eat FAST FOOD for the following meals...**

Breakfast

- Never
- Less than once a month
- 1-3 times a month
- 1-2 days a week
- 3-4 days a week
- 5-6 days a week
- Once a day
- Twice a day
- Three or more times a day

Morning snack

- Never
- Less than once a month
- 1-3 times a month
- 1-2 days a week
- 3-4 days a week
- 5-6 days a week
- Once a day
- Twice a day
- Three or more times a day

Lunch

- Never
- Less than once a month
- 1-3 times a month
- 1-2 days a week
- 3-4 days a week
- 5-6 days a week
- Once a day
- Twice a day
- Three or more times a day

Afternoon snack

- Never
- Less than once a month
- 1-3 times a month
- 1-2 days a week
- 3-4 days a week
- 5-6 days a week
- Once a day
- Twice a day
- Three or more times a day

- Dinner
- Never
  - Less than once a month
  - 1-3 times a month
  - 1-2 days a week
  - 3-4 days a week
  - 5-6 days a week
  - Once a day
  - Twice a day
  - Three or more times a day
- Evening snack
- Never
  - Less than once a month
  - 1-3 times a month
  - 1-2 days a week
  - 3-4 days a week
  - 5-6 days a week
  - Once a day
  - Twice a day
  - Three or more times a day
- Bedtime snack
- Never
  - Less than once a month
  - 1-3 times a month
  - 1-2 days a week
  - 3-4 days a week
  - 5-6 days a week
  - Once a day
  - Twice a day
  - Three or more times a day
- Middle of the night
- Never
  - Less than once a month
  - 1-3 times a month
  - 1-2 days a week
  - 3-4 days a week
  - 5-6 days a week
  - Once a day
  - Twice a day
  - Three or more times a day

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**I usually eat more/less when...**

- I'm feeling Happy
- A lot more
  - A bit more
  - The Same
  - A bit less
  - A lot less
- I'm feeling Sad
- A lot more
  - A bit more
  - The Same
  - A bit less
  - A lot less
- I'm feeling Angry
- A lot more
  - A bit more
  - The Same
  - A bit less
  - A lot less
- I'm feeling Tired
- A lot more
  - A bit more
  - The Same
  - A bit less
  - A lot less

I'm feeling Lonely

- A lot more
- A bit more
- The Same
- A bit less
- A lot less

I'm feeling Anxious

- A lot more
- A bit more
- The Same
- A bit less
- A lot less

I think about my body

- A lot more
- A bit more
- The Same
- A bit less
- A lot less

My mood doesn't affect WHAT I eat.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

My mood doesn't affect HOW MUCH I eat.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

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**I usually eat more/less when...**

I'm eating with friends

- A lot more
- A bit more
- The Same
- A bit less
- A lot less

I'm eating with family.

- A lot more
- A bit more
- The Same
- A bit less
- A lot less

I eat foods prepared when I was a child.

- A lot more
- A bit more
- The Same
- A bit less
- A lot less

I'm at a buffet.

- A lot more
- A bit more
- The Same
- A bit less
- A lot less

I'm at a party.

- A lot more
- A bit more
- The Same
- A bit less
- A lot less



I'm eating alone.

- A lot more
- A bit more
- The Same
- A bit less
- A lot less

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**Media**

I often eat foods advertised on television or in magazines.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

Regardless of what I see on television, I eat the same foods.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

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**COST**

I buy expensive food items.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

I pick food items that will keep my grocery bill low.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

I never pay attention to the cost of foods I really want to eat.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

I don't have enough money to buy healthy food.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

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**Culture**

Regardless of the ingredients I always eat foods that represent my culture (e.g., Italian, Mexican, African American, American South).

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

It's important for me to eat foods that represent my culture.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

The cultural origin of the food I eat isn't important.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

I eat cultural foods regularly.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

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## FOOD OPINIONS

I change my FOOD choice if I notice my clothes fitting tighter than before.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

I change my PORTION sizes if I notice my clothes fitting tighter than before.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

I have detailed rules about eating that I try to follow.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

I have a mental list of specific foods that I never eat.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

I have a mental list of specific foods that are okay to eat.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

I have a mental list of bad foods.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

I have a mental list of good foods.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

I avoid eating foods that are bad for me.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

I can't resist a food that I crave.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

My eating plan is ruined once I eat a bad food.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

I can only eat healthy foods.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

I sometimes overeat just because the food tastes good.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

Salad is a healthy food.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

Sometimes it feels good to eat bad foods like if it's been a tough day or week.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

If I start eating chips, I could easily eat the whole bag.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

If I'm dieting, I don't give myself much room to mess up.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

Some eating binges start out as just a craving for a certain food.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

If I've been eating badly, I feel angry at myself for not having willpower.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

Boredom can trigger overeating for me.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

I should keep my diet limitations in the back of my mind at all times.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

It's easier for me to diet if I don't give myself many choices.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

If I gain weight, it's because my eating habits are out of control.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

Removing myself from food makes it easier to resist eating foods I am trying to avoid.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

It's good to stop eating before I get full.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

When I eat bad foods, I feel like a failure.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

Cheating on my diet even just a little is bad.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

It is healthy to eat chicken or fish instead of beef.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

I should eat foods that are low in fat.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

It's very important for me to be thin for appearance reasons.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

When my weight goes up, I feel motivated to work out and diet.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

I should exercise a few days per week.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

I lose self-esteem when I gain weight.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

Gaining any amount of weight makes me feel depressed.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

To me, being overweight is a personal weakness.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

Gaining any amount of weight makes me feel anxious.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

Taste is the most important thing to me when choosing what to eat.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

I only feel satisfied if I am full at the end of a meal.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

I hate feeling hungry.

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

## Appendix B

	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
<b>Nutrition Knowledge</b>		
I use the food pyramid to help me with my food choices.	.380	.779
I know a lot about nutrition.	.484	.761
I choose foods based on my nutrition knowledge.	.677	.727
Learning what's healthy to eat is important to me.	.597	.745
I follow my doctor's nutrition advice.	.534	.751
I know how to estimate portion sizes.	.343	.781
I eat plenty of leafy green vegetables.	.546	.749
I eat lots of fried food.	.396	.775
<b>Internal Influence</b>		
I'm feeling Happy.	.263	.752
I'm feeling Sad	.621	.688
I'm feeling Angry	.500	.713
I'm feeling Tired	.331	.744
I'm feeling Lonely	.563	.701
I'm feeling Anxious	.479	.717

My mood influences WHAT I eat.	.370	.737
My mood influences HOW MUCH I eat.	.419	.728
Sometimes it feels good to eat bad foods.	.333	.750
External Influence		
I think about my body-reverse scored.	.290	.546
I'm eating with friends	.347	.532
I'm eating with family.	.305	.543
I eat foods prepared when I was a child.	.128	.591
I'm at a buffet.	.352	.525
I'm at a party.	.416	.503
I'm eating alone.	.213	.566
I often eat foods advertised on television or in magazines.	.195	.571
Regardless of what I see on television, I eat the same foods.	.194	.570
Cost		
I buy expensive food items.	.541	.600
I pick food items that will keep my grocery bill low.	.568	.598
I never pay attention to the cost of foods I really want to eat.	.462	.650

I don't have enough money to buy healthy food.	.404	.692
Culture		
Regardless of the ingredients I always eat foods that represent my culture (e.g., Italian, Mexican, African American, American South).	.658	.751
It's important for me to eat foods that represent my culture.	.737	.714
The cultural origin of the food I eat is important to me.	.735	.712
I eat cultural foods regularly.	.423	.862
Health Behaviors		
It is healthy to eat chicken or fish instead of beef.	.368	.561
I should eat foods that are low in fat.	.161	.632
I should exercise a few days per week.	.298	.588
Salad is a healthy food.	.317	.581
My medical condition determines WHAT I eat.	.457	.519
My medical condition determines WHEN I eat.	.501	.492
Control		



It's easier for me to diet if I don't give myself many choices.	.393	.774
If I gain weight, it's because my eating habits are out of control.	.477	.767
If I'm dieting, I don't give myself much room to mess up.	.375	.776
When I'm trying to avoid eating certain foods, removing myself from them is easier.	.235	.787
If I start eating chips, I could easily eat the whole bag.	.349	.780
I should keep my diet restrictions in my mind at all times.	.465	.768
I have a mental list of specific foods that are OKAY to eat.	.268	.785
If I've been eating badly, I feel angry at myself for not having willpower.	.574	.755
When I eat bad foods, I feel like a failure.	.593	.754
Some eating binges start out as just a craving for a certain food.	.501	.765
When my weight goes up, I feel	.249	.787

motivated to work out and diet.		
Boredom can trigger overeating for me.	.426	.771
I lose self-esteem when I gain weight.	.460	.768
Weight Anxious		
It's very important for me to be thin for appearance reasons.	.423	.838
Gaining any amount of weight makes me feel depressed.	.756	.679
Gaining any amount of weight makes me feel anxious.	.711	.705
To me, being overweight is a personal weakness.	.593	.763
Hunger*		
Cheating on my diet even just a little is bad.	.116	.491
I only feel satisfied if I am full at the end of a meal.	.338	.056
I hate feeling hungry.	.239	.271
Healthy Meal Prep		
I steam broil or bake my food.	.392	.755
I prefer to cook from scratch.	.413	.752
I eat whatever takes the least amount of time to prepare.	.599	.724
If I'm short on time I eat out.	.266	.775
Regardless of my schedule I prefer to eat out instead of cooking.	.373	.758
I will go to different supermarkets to find the fruits or vegetables I want.	.393	.757
If there are no vegetables in my	.530	.734

refrigerator I do without them.		
I take time to find healthy foods. If there are no fruits at home I make a special trip to buy them.	.635	.723