

## The Eating and Appraisal Due to Emotions and Stress (EADES) Questionnaire: Development and Validation

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### **Abstract:**

**Objective** To develop and validate the Eating and Appraisal Due to Emotions and Stress (EADES) Questionnaire that was created to measure how one uses food to cope with stress and emotions.

**Design** Data were collected from a cross-sectional study using the EADES Questionnaire.

**Subjects/setting** Convenience sample (response rate 22%) from a southeastern public university, including staff and faculty (n=854) with ages ranging from 18 to 83 years and a mean body mass index of  $27.3 \pm 6.4$ .

**Statistical analysis performed** Exploratory factor analysis was completed on 54 items that were originally meant to describe constructs from the Transactional Model of Stress and Coping. Reliability of scales was estimated using Cronbach's  $\alpha$ . Total sum scores were given to each factor. Pearson correlation coefficients assessed linear associations between factors.

**Results** Three factors accounting for 43.5% of the variance were retained with a total Cronbach's  $\alpha = .949$ . The factors did not represent the theoretical constructs from the Transactional Model of Stress and Coping as anticipated. A new model was created, including Emotion- and Stress-Related Eating, Appraisal of Resources and Ability to Cope, Appraisal of Outside Stressors and Influences with Cronbach's  $\alpha$  being .949, .869, and .652, respectively. These factors were significantly correlated with one another.

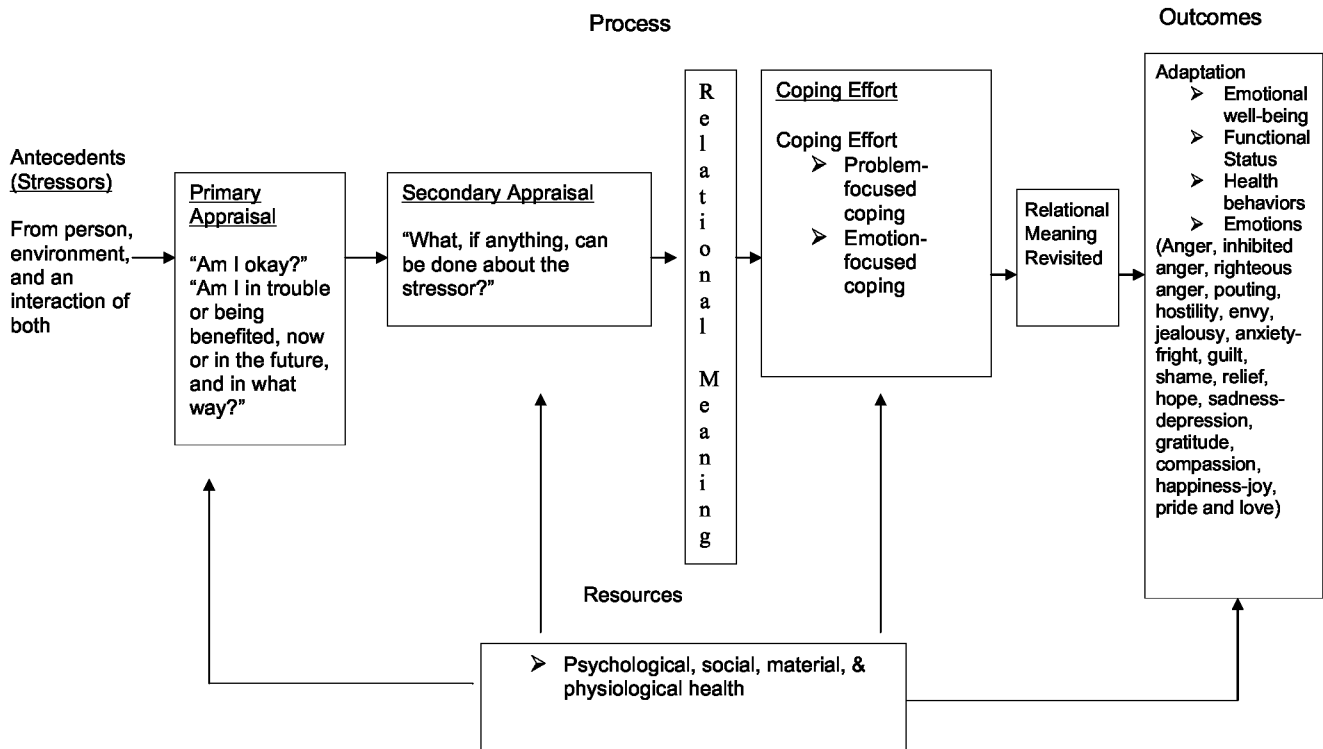
**Conclusions** The EADES model provides a viable conceptual model to help explain variables that may contribute to overeating, whereas the EADES Questionnaire provides a measurement tool for evaluating these variables that have not traditionally been explored in weight management efforts.

### **Article:**

The purpose of this study was to develop and validate the Eating and Appraisal Due to Emotions and Stress (EADES) Questionnaire that was created to measure how one uses food to cope with stress and emotions. Eating has been recognized as a coping mechanism for alleviating and dealing with stress and emotions (1-4) by either undereating or overeating (5). Coping is defined as cognitive and behavioral efforts to manage stress that are appraised as taxing one's resources (6). Eating can act as an attempt to modulate fluctuating mood states in the absence of more adaptive ways of coping with intense emotional states (7), either enhancing weight loss or maintenance or interfering with it (8). Overweight individuals, notably women, tend to overeat or binge eat for nonphysiological reasons particularly during negative emotional states (1,9-12). Furthermore, overweight individuals exhibit more compromised coping skills with greater severity of binge eating (9,13,14).

Additional research supports the hypothesis that there is a relationship between emotional eating and binge eating (15) and higher energy intake (16). This relationship with food/ eating can hinder weight-management efforts and affect mental health. Thus, exploring how individuals cope with stress and emotions using food is imperative in efforts to ameliorate the obesity epidemic. Emotions and emotional problems are presumed to be the result of stress (17) and emotions play a role in regulating how much one eats. Overeating or undereating as short-term methods for alleviation of stress contribute to ineffective weight management (18).

To better understand how one uses food to cope, concepts underlying this dynamic relationship must be measurable. Several instruments that measure various aspects of eating and dieting along with one's relationship with food are available with evidence of adequate reliability and validity (19-23). In addition, several theoretically driven questionnaires have been developed to assess coping efforts. The Ways of Coping Questionnaire (Revised) is a 66-item questionnaire containing a wide range of thoughts and acts that people use to deal with demands of specific stressful encounters (24) and was developed using the Transactional Model of Stress and Coping.



**Figure 1.** Diagram of Lazarus and Folkman's Transactional Model of Stress and Coping (6). The model used to create the Eating and Appraisal Due to Emotions and Stress Questionnaire was adapted from references 6, 17, and 25.

The questionnaire developed for this study was also based on the Transactional Model of Stress and Coping. This model provides a framework for evaluating the processes of coping with stress and emotions (see Figure 1) (25). Although certain situations and events produce stress in most people, differences exist in the degree and type of reaction produced. Sensitivity and vulnerability to certain types of events as well as interpretations and reactions can shape effective or ineffective coping responses. As an example, an individual may decrease food intake in response to stress whereas another may over-eat. The Transactional Model of Stress and Coping helps to explain why differences exist in the way stress affects different people (6).

Constructs of the model are presented in Figure 1 and include antecedents, primary appraisal, secondary appraisal, resources, coping effort, and adaptational outcomes. Antecedents are the stressors that precede the coping process. Appraisal is the cognitive process of categorizing an antecedent with respect to its significance for well-being (6) and mediates the transactional process along with social, cultural, and psychological resources available (26). Appraisal depends on the principle of relational meaning, defined as the level of significance of a stressor based on subjective evaluation of the event and its effect on the person's relationships with the environment (27). Primary appraisal is the evaluation of an antecedent to determine if what is happening is relevant to one's values, goal commitments, beliefs about self and work, and situational intentions (27). Based on the cognitive decision made from primary appraisal, secondary appraisal occurs. This is a cognitive-evaluative process that is focused on what can be done about a stressful relationship between the person and environment (28), especially when there has been a primary appraisal of harm, threat, or challenge (6). The results of secondary appraisal will frame coping efforts. Through the person's cognitive-evaluative

process, a decision is made about how to cope with the stressor. Ultimately, adaptational outcomes are produced that can be positive or negative to emotional well-being, functional status, and health behaviors.

Historically, the Transactional Model of Stress and Coping has been used to understand and improve coping and adaptation for many health problems (29-34). As an example (35), an antecedent would be considered a wife/ caregiver losing her husband with dementia as an active participant in household and financial decisions. Through primary appraisal, the wife would identify this loss as a threat to both her husband's and her own well-being. Through secondary appraisal, the wife would then attempt to identify how to deal with the stressor either through adaptive or maladaptive ways. A coping effort would be seeking financial advice from a financial expert (problem-focused coping) and/or asking family members (resources) to assist with household decisions or becoming depressed and immobilized due to the situation (emotion-focused coping). The results of this coping process are adaptational outcomes. In this instance, the adaptational outcome would be the caregiver's maintenance of quality of life or lack thereof.

This model appeared to be appropriate to scrutinize processes that occur when individuals overeat possibly as a result of stress and emotions, with the ultimate adaptational outcome being overweight. Although several instruments exist that assess the concepts of coping, stress and emotions, and individuals' relationship with food, the concepts have not been combined into one instrument using the Transactional Model of Stress and Coping as a framework. However, a number of authors have encouraged the exploration of incorporating stress, appraisal, and coping (which also encompasses identification of emotions attached to eating) components into weight-management practices (8,20,36-38). The constructs of the model are well suited for determining if stress, along with appraisal and coping, has an influence on obesity and an individual's relationship with food. Thus, the development of the EADES Questionnaire was guided by the constructs of the Transactional Model of Stress and Coping. The ultimate goal was to develop an instrument that could be used by food and nutrition professionals and by appropriate health professionals to measure individuals' use of food to cope with stress and emotions.

## **METHODS**

### ***Questionnaire Development***

Questionnaire development and the validation process occurred after approval from The University of Alabama's Institutional Review Board. The Institutional Review Board examined questionnaire content and the study's methodology to ensure the ethical treatment of the convenience sample. The five-stage process included initial questionnaire development, refinements based on focus group responses, refinements based on responses from an expert panel of researchers and practitioners, pilot test, and validation using a convenience sample of faculty and staff at a public university. During the initial questionnaire development, a careful review of the professional literature was conducted to determine if instruments existed that measured aspects of how individuals cope with stress and emotions using food. Although various instruments were identified, none had been developed using the Transactional Model of Stress and Coping to combine the concepts of eating and coping with stress and emotions. This report focuses on the validation process of the EADES Questionnaire. For a description of the first four development stages of the EADES Questionnaire that started with 84 questions and was finalized with 67 remaining questions, see [Figure 2](#).

### ***Data Collection***

In the final stage of this study, the EADES Questionnaire was sent to a convenience sample of 4,192 individuals at the University of Alabama both via campus mail and through a university e-mail distribution list. Individuals were eligible to participate in the study if they were faculty or staff. Participation was voluntary and signed consents were completed by all participants. Efforts to ensure an adequate sample size and response rate included reminders through the university's online newsletter, departmental meetings, personal calls, e-mail messages to various departments, and the use of incentives for participation that included being placed in a drawing where three people won a \$50 mall gift certificate for participation. A useable questionnaire was one where all questions based on the model were answered.

Stage	Reviewers	Purpose	Outcomes
Literature review		To identify instruments in the literature that measured variables related to eating, stress, emotions, and coping. To identify validated questions from other instruments that could be used in the EADES questionnaire.	A pool of 13 demographic, height and weight, and self-perception of health items were developed along with 71 Likert-type questions based on constructs from the Transactional Model of Stress and Coping. The Likert-type questions were developed on a 5-point scale that ranged from <i>Unlike Me</i> to <i>Like Me</i> . Both positively and negatively toned questions were used to reduce response set bias.
Focus group interviews	The questionnaire was administered to six focus groups comprised of 53 persons ages 20-72 years. Interviewees included weight support group members, church members, a professional woman's organization, and employees at a child-care subsidy program and staff at Early Head Start.	To evaluate the readability, intended meaning, phrasing, likely interpretation, formatting, length, and content of the instrument.	The 5-point Likert scale item anchors changed to <i>Strongly Disagree</i> to <i>Strongly Agree</i> . Major themes emerged from all focus groups about content and questions were added to reflect these themes. An example was "I overeat when I socialize." Questions that appeared redundant or were hard to understand were removed.
Expert panel review	The questionnaire was sent to a panel of 23 experts in the areas of stress and coping, nutrition, eating and obesity, and test construction. Follow-up phone calls were made to ensure evaluations were received and to encourage completion of the packet.	To evaluate content validity.	Fifteen experts responded. Questions were removed that attempted to measure the Antecedent construct as experts believed the magnitude of the construct was too vast to be measured. Each number on the 5-point Likert Scale was renamed, with 1 representing Strongly Disagree, 2 representing Disagree, 3 representing Neutral, 4 representing Strongly Agree, and 5 representing Strongly Agree. Duplicative questions that were thought to measure the same concept were deleted. Various questions were reworded. Additional demographic questions were added about household size. A total of 67 questions remained.
Pilot test	The questionnaire was pilot-tested both on a scantron form with paper and pencil and electronically with 20 university faculty and staff members.	Pilot-tested for formatting, computer navigation ease, readability, and ease of use.	Overall feedback was positive solidifying that the instrument was ready for the field test.

**Figure 2.** Eating and Appraisal Due to Emotions and Stress (EADES) Questionnaire development and preliminary validation process.

### Data Analysis

Data were analyzed using the Statistical Package for the Social Sciences (version 12.0 for Windows, 2003, SPSS Inc, Chicago, IL). Descriptive statistics were used to summarize demographic data. Exploratory factor analysis was completed on the 54 items originally meant to describe the constructs of primary appraisal, secondary appraisal, and coping effort from the Transactional Model of Stress and Coping. All items were subjected to a principal components analysis with varimax rotation. Internal consistency (reliability) of scales was estimated using Cronbach's  $\alpha$ . Total sum scores were given to each factor with negatively toned questions being reversed so that the lower the number, the more compromised the ability to cope with stress and emotions using food. Normality parameters were evaluated using the total sum scores' skewness and kurtosis. Pearson correlation coefficients were used to measure the linear association between variables.

## RESULTS

### Demographics

Of the completed questionnaires (n=936), 854 were deemed usable with 22% of the total population responding. The preferred method of completing the questionnaire was with the paper-and-pencil scantrons (n=685). Of the

854 participants who responded with usable questionnaires, a majority were women (73.4%), staff (68.6%), and white (86.4%). A majority of the annual household incomes from all sources was  $\geq$ \$50,000 (62.7%). The sample was similar to the university's population as a whole (39). The mean age for the entire sample was  $45.2 \pm 11.6$  years with a range of 18 to 83 years and the mean body mass index was  $27.3 \pm 6.4$  with a range of 16.4 to 51.5 (Table 1). Although a convenience sample was used for this study, the mean body mass index paralleled state and national data (40,41).

**Table 1.** Demographic characteristics and body mass indexes of respondents to the Eating and Appraisal Due to Emotions and Stress questionnaire (n=854)<sup>a</sup>

	n	%	Mean $\pm$ SD <sup>c</sup>	Range	UA <sup>b</sup> Population (n=4,093)	
					n	% <sup>d</sup>
<b>Sex (n=853)</b>						
Male	226	26.5	—	—	1,822	44.5
Female	627	73.4			2,271	55.5
<b>Race (n=854)</b>						
Minority	116	13.6			789	19.3
Nonminority	738	86.4	—	—	3,304	80.7
<b>Job category (n=854)</b>						
Faculty	253	29.6			1,122	27.4
Staff	586	68.6	—	—	2,971	72.6
Other	15	1.8				
<b>Income (n=840)</b>						
<\$10,000	9	1.1				
\$10,000-14,999	18	2.1				
\$15,000-19,999	32	3.7	—	—	Not available	
\$20,000-24,999	50	5.9				
\$25,000-34,999	74	8.7				
\$35,000-49,999	121	14.2				
\$50,000-74,999	206	24.1				
$\geq$ \$75,000	330	38.6				
<b>Life stage (age in y) (n=848)</b>						
18-30	118	13.8				
31-50	438	51.3	45.2 $\pm$ 11.6	18.0-83.0	Not available	
$\geq$ 51	292	34.2				
<b>BMI<sup>e</sup> (n=833)</b>						
Underweight	14	1.6				
Normal weight	345	40.4	27.3 $\pm$ 6.4	16.4-51.5	Not available	
Overweight	238	27.9				
Obese	236	27.6				

<sup>a</sup>Total returned questionnaires=936. However, total usable questionnaires (n=854) consisted of paper and pencil scantrons, n=683 (80%), and online questionnaires, n=171 (20%).  
<sup>b</sup>UA=The University of Alabama.  
<sup>c</sup>SD=standard deviation.  
<sup>d</sup>Percentages obtained from The UA 2004-2005 factbook (39).  
<sup>e</sup>BMI=body mass index; calculated as kg/m<sup>2</sup>.

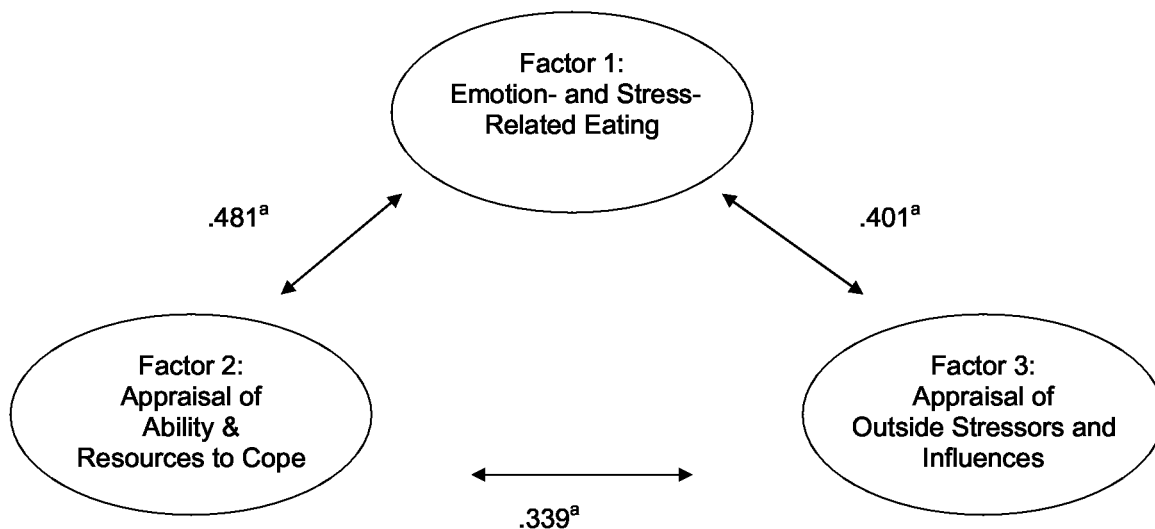
### Factor Analysis

Using varimax rotation, the principal components analysis, along with the scree plot, revealed three factors that accounted for 43.5% of the variance. This is comparable to results from other validation studies. For example, three subscales in the original validation study for the Emotional Eating Scale accounted for 42.6% (12) of the variance whereas eight subscales of the Ways of Coping scale accounted for 46.2% of the variance (42). A second principal component analysis was run retaining three factors along with eliminating questions that had low factor loadings. Each individual factor was computed to derive a total score (Factor 1=24 to 120, Factor 2=20 to 100, Factor 3 = 5 to 25). Total scores for each factor were found to have normal distributions. As can be seen in Figure 3, statistical significance was evident in correlations between factors. The greatest overlap in explained variance is between Factors 1 and 2 with a correlation of 0.481. Squaring this correlation indicates that each factor explains 23% of the variance in the other factor, leaving 77% uniquely explained by each factor. The final 49 questions that were retained demonstrated factor loadings of 0.400 and higher with a total Cronbach's  $\alpha$  reliability coefficient of .949 (Table 2).

A three-factor solution was extracted. However, the factors did not represent the theoretical constructs of the Transactional Model of Stress and Coping as anticipated, perhaps because this questionnaire was written directly to assess appraisal and coping in relation to eating. Items were written with the intention to directly measure primary appraisal, secondary appraisal, and coping effort. However, all items related to eating loaded on one factor. Similarly, items related to ability to cope with stress and resources to cope, including one's appraisal of his/her ability and resources to cope, loaded onto a second factor. The third factor contained items related to the influences of other people and external stressors and one's appraisal of these people/stressors. Thus, a new model was derived (Figure 3). Factor 1 was named Emotion- and Stress-Related Eating, and Factor 2 was named Appraisal of Ability and Resources to Cope. The choice to use the word *appraisal* parallels the Transactional Model of Stress and Coping in that appraisal is specific to an individual's well-being (6). Factor 3 was named Appraisal of Outside Stressors and Influences. Due to the fact that this is a correlational study, the arrows used in the model are bidirectional because temporality cannot be determined.

## DISCUSSION

This study was a first attempt to develop and test a theory-based questionnaire that assesses how individuals cope with stress using food. The study initially set out to measure the constructs within the framework of the Transactional Model of Stress and Coping. Three somewhat different factors emerged, including Factor 1: Emotion- and Stress-Related Eating, Factor 2: Appraisal of Ability and Resources to Cope, and Factor 3: Appraisal of Outside Influences and Stressors. However, within each of these new emerging factors remained concepts that paralleled the original model. Factor 1 questions encompassed coping effort and secondary appraisal, including self-efficacy. Questions loading on Factor 2 integrated primary and secondary appraisal while Factor 3 included questions largely addressing secondary appraisal. As can be seen in Figure 3, the bidirectional arrows indicate that each factor is low to moderately correlated with each other, suggesting that Emotion- and Stress-Related Eating, Appraisal of Ability and Resources to Cope, and Appraisal of Outside Stressors/ Influences factors affect each other. Thus, the emerging factors produced a new model that provides insight about influences on food-related behaviors.



**Figure 3.** The Eating and Appraisal Due to Emotions and Stress Model. <sup>a</sup>Correlation is significant at  $P=0.01$  (two-tailed).

Factor 1: Emotion- and Stress-Related Eating encompassed questions that identified eating as a result of an emotion or stressor representing a coping effort. Since the 1960s, there has been growing recognition that although stress is an inevitable aspect of the human condition, it is coping that influences adaptational outcomes (6). Emotions and emotional problems are presumed to be the result of stress (17) and emotions play a role in regulating how much one eats. Emotional eating has been loosely defined as food consumption that occurs in response to various emotional states or cues such as boredom, loneliness, or anxiety (4). Overeating, which can result from emotional eating, has been identified as a tension-releasing type of coping, which serves to modify an individual's distress (2). Research findings have suggested that the use of eating to moderate affective states

is a potential pathological coping style (43). Henderson and Huon (1) found that coping styles moderated the relationship between negative affect and binge-eating severity. Negative affect is thought to be a predictor of binge eating among overweight individuals (9), and overweight subjects tend to have a greater urge to eat in response to negative emotions and situations as compared to both the normal and underweight groups (5). Lastly, if an individual cannot meet his or her basic needs, he or she is more likely to engage in emotional eating (4). Thus, these findings (1,4,5,43) support the exploration of Factor 1: Emotion-and Stress-Related Eating as a variable that influences overeating.

Factor 1 also encompassed questions addressing self-efficacy, which is a construct related to secondary appraisal in the Transactional Model of Stress and Coping. Self-efficacy is the belief that behaviors can be performed successfully to produce certain outcomes (44) and is addressed by Lazarus (27) specifically as an assessment of coping potential. Self-efficacy may predict which dietary behaviors people believe they are capable of changing, how much effort they will expend while trying to adopt a new behavior, and how long they will persist in facing challenges (45). Questions loading on Factor 1 addressed self-efficacy toward control of emotional eating. Thus, Factor 1 may not only shed light on food-related behaviors related to emotions and stress, but also about one's confidence to use adaptive coping mechanisms when emotional. These are issues food and nutrition professionals need to be aware of before attempting to write goals and action plans with an individual. Care plans will need to address these concerns.

The second factor to surface through the factor analysis was Factor 2: Appraisal of Ability and Resources to Cope with stress and emotions. The perception of one's ability to change a situation, manage one's emotional reaction, or cope effectively can lead to successful coping and adaptation (6). In addition, the degree to which a person experiences psychological stress is determined by the relationship between the person and the environment in a specific encounter as it is defined both by the evaluation of what is at stake and the evaluation of coping resources and options (28). In one study, subjects scoring high on an instrument that measured levels of disordered eating appraised situations as more stressful than did controls (46). Crowther and colleagues (14) found that individuals who binge ate perceived daily hassles to be significantly more stressful than individuals who did not binge eat and suggested that an explanation of this finding was that the individual lacked the appropriate ability to cope.

In addition, the social environment may serve as a major source of stress, but can also provide resources for individuals to use in coping with stress and emotions. However, the effects of specific coping strategies on the emotional and functional outcomes of a stressor may depend on perceptions of support in the environment (25). Grissett and Norvell (47) found that women diagnosed with bulimia nervosa perceived much less social support than women not diagnosed with an eating disorder while Yacono, Freeman, and Gil (48) found that less social support was associated with a greater likelihood of same-day binge eating. People who provide informational, and/or tangible support can be a coping resource (6). These people can provide social support that acts as an immediate buffer to stress and its destructive somatic consequences, thus making harmful or threatening experiences seem less consequential, or provide valuable re-sources for coping when stress does occur (6). If an individual perceives to be unsupported and without adequate coping resources, dealing with stress and emotions may be compromised, resulting in a maladaptive coping effort. These findings (14,46-48) support the exploration of Factor 2: Appraisal of Ability and Resources to Cope as a variable that influences the coping process. Food and nutrition professionals need to be able to recognize when ability to cope is compromised, resources are lacking, and both of these are appraised as deficient.

<b>Table 2. Factor loadings and Cronbach's <math>\alpha</math> coefficients for the Eating and Appraisal Due to Emotions and Stress study questionnaire<sup>a</sup></b>	
<b>Factor and question number</b>	<b>Factor loadings</b>
<b>Factor 1: Emotion- and Stress-Related Eating<sup>b</sup></b>	
39. I use food to cope with my emotions.	0.806
14. I eat when I am upset with myself.	0.797
50. I eat when I am anxious.	0.783
30. I am confident I can control my eating when I am upset with myself.	0.773
34. I am confident I can control my eating when I feel upset.	0.772
13. I comfort myself with food.	0.770
36. I eat when I am frustrated.	0.768
45. I eat when I am sad.	0.767
38. I am confident I can control my eating when I am frustrated.	0.756
43. I eat when I am angry.	0.732
26. I am confident I can control my eating when I am sad.	0.740
4. I overeat when I am stressed.	0.738
47. I am confident I can control my eating when I am anxious.	0.734
21. I am confident I can control my eating when I am angry.	0.704
16. I am confident I can control my eating when I am tired.	0.701
35. I feel out of control when I eat.	0.681
41. I eat when I am tired.	0.650
23. It is hard for me to stop eating when I am full.	0.648
28. I eat to avoid dealing with problems.	0.646
54. I do NOT have control over how much I eat.	0.619
49. I am confident I can control my eating when I am relieved.	0.544
10. I overeat when I socialize.	0.508
52. I eat when I am relieved.	0.483
3. I am confident I can control my eating when I feel happy.	0.482
<b>Factor 2: Appraisal of Ability and Resources to Cope with Emotions and Stress<sup>c</sup></b>	
22. I am able to meet my emotional needs.	0.650
33. I try to resolve a problem when I know there is something wrong in my life.	0.618
5. I can usually work out a solution to my problems.	0.604
37. I am capable of dealing with stressful situations.	0.582
51. I have control over my life.	0.582
7. I do NOT feel secure in my life.	0.562
20. I feel sad often.	0.559
6. I am capable of handling my own problems.	0.554
46. When a problem arises, it is hard for me to make a plan of action and follow it.	0.542
27. I have control over my emotions.	0.531
25. I try to think positive when times are tough.	0.486
32. I deal with problems sooner rather than later.	0.485
11. I weigh the pros and cons of situations before I make decisions about what to do.	0.472
40. I am able to meet my spiritual needs.	0.460
18. My friends support me when I have problems.	0.451
24. I am able to say no when I need to.	0.439
53. I try to analyze a problem to better understand it.	0.438
2. My family supports me when I have problems.	0.422
29. I talk about my feelings.	0.413
8. I try to find alternative solutions to my problems.	0.400
<b>Factor 3: Appraisal of Outside Stressors/Influences<sup>d</sup></b>	
12. I worry about what people think of me.	0.616
31. Other people influence how I handle problems.	0.561
15. I feel the need to make others happy.	0.534
42. I do NOT allow people to change my mind.	0.484
48. I do NOT see challenges as stressful.	0.423
<sup>a</sup> Items that did not provide sufficient factor loadings greater than 0.400 on any of the subscales were dropped. These included questions 1,9,17,19, and 44. Total Cronbach's $\alpha$ = .949. Items 13 and 24 were modified from Jackson, Cooper, Mintz and Albino's Motivations to Eat Scale (20) and items 17, 46, and 53 were modified from Lazarus & Folkman's Ways of Coping Questionnaire (24). <sup>b</sup> Factor 1 Cronbach's $\alpha$ = .949. <sup>c</sup> Factor 2 Cronbach's $\alpha$ = .869. <sup>d</sup> Factor 3 Cronbach's $\alpha$ = .652.	

The third factor from the factor analysis was Factor 3: Appraisal of Outside Stressors and Influences. Stressors are conditions that trigger stress, resulting in distress expressed as negative mood states (6). Eating may be evoked in response to stressors and serve as a type of coping, or, as a behavioral or psychological measure to manage stress (3). Work, marital relationships, and conflict between family and work have been identified and examined as chronic stressor effects (49,50). Waller and Osman (43) found that subjects who scored higher on



an instrument that measured levels of disordered eating, appraised situations as more stressful than did controls. Using female undergraduate students, Hansel and Wittrock (51) found that a group who binge ate appraised stressors as more stressful than did controls. Also, the group who binge ate used more negative coping strategies in interpersonal stressful situations. Overall, individuals who binge ate appraised stressors as more stressful than normal eaters, suggesting cognitive distortion of stressful events (51). These findings (43,51) corroborate the themes found in the questions that loaded on Factor 3: Appraisal of Outside Stressors and Influences. A majority of these questions were related to internal perceptions of other people. Individuals who answered these questions affirmatively may be very cognizant of others and potential people pleasers. However, the appraisal that occurs with other people may be somewhat distorted causing one to perceive stressors differently, thus, interfering with confidence in food-related behaviors, or be the reason one eats out of emotion. This association can be seen in Figure 1, with Factor 1 and Factor 3 being moderately correlated.

The results of this initial study showed a three-factor solution that relates to the original Model that the questionnaire was derived from; that is, the Transactional Model of Stress and Coping. In addition, evolving research suggests that there is little or no difference in accuracy of reporting information from online questionnaires as compared with paper-and-pencil questionnaires (52,53). However, this research is not without limitations. First, because this was a preliminary attempt to develop and validate the EADES Questionnaire, a convenience sample of faculty and staff at the university were used and participation was voluntary. Thus, a respondent bias exists. The low response rate and the use of the university population as participants compromises the generalizability of these findings. This study served as a first attempt to lay a foundation for future studies and further refinements of the EADES Questionnaire. The questionnaire needs to be validated in a population outside of the university population to increase the generalizability of its use. Second, the sample consisted of individuals of all body shapes and sizes. Whether or not the relationships described in this research hold true for all weight categories of people has not been determined and should be the aim of future research. Lastly, Factor 3: Appraisal of Outside Stressors and Influences only contained five questions and produced the lowest measure of reliability (Cronbach's  $\alpha = .652$ ). To increase the reliability of this construct and perhaps provide more explained variance, additional questions need to be created and validated for this construct to be appropriately used.

Future studies should further validate the EADES Questionnaire in populations that were underrepresented in this study. Populations outside of the university community that should be targeted include the general population and those who are in weight-management programs, have binge eating disorder, and/or are overweight or obese. Incidentally, these populations may contain characteristics of the other as the incidence of binge eating disorder increases significantly for participants in weight management programs, with reports ranging from an occurrence of 7.5% to 45% (54-57). In addition, convergent and concurrent validity studies should be conducted to further strengthen the validity of the questionnaire. Exploration of other factors accounting for additional variance need to be studied and should include addressing how demographic factors influence eating, stress, appraisal, and coping.

The EADES Questionnaire provides a way for food and nutrition professionals to assess whether compromised appraisal and coping skills affect eating behaviors, thus affecting long-term weight management. This type of questionnaire can be used in initial assessments of patients/clients to identify targets of treatment/therapy. With each of the EADES factors containing a total sum score (Factor 1=24 to 120, Factor 2=20 to 100, Factor 3=5 to 25), interpretations can be made about compromised skills, cognitions, sources of stress, and/or resources. Traditionally, food and nutrition professionals focus on behavior aspects of lifestyle change; however, as shown in this research, assessment of cognitions should also be part of a comprehensive treatment plan.

With the importance of long-term weight management to health and prevention of weight gain, there is a need for theory-based research that examines predictors of behaviors, cognitions, and emotions that lead to maladaptive eating behaviors with the potential to affect weight. The traditional paradigm of weight management has not proven successful and other alternative paradigms need to be explored and executed with sound research and practice. Overeating to cope with stress and emotions has been recognized in the literature

for decades; however, the relationship between emotional eating and the obesity epidemic is not adequately operationalized by the traditional weight-management paradigm (2). The EADES Model provides a viable conceptual model to help explain variables that may contribute to overeating that traditionally have not been explored.

Building and enhancing skills that address these concepts in clients provides a nontraditional avenue to assist with dietary change. However, achieving this goal requires that food and nutrition professionals, along with other health care professionals, advance beyond the understanding of nutrition science to understanding human nature (58). Exploring eating triggers related to stress and emotions is vital so that the appropriate health care professional can address effective ways of coping rather than overeating. This, perhaps, is an avenue that will offer alternative methods for addressing the obesity epidemic.

## CONCLUSIONS

- The EADES Model provides a viable conceptual model to identify dimensions of eating behavior related to stress and appraisal.
- After further validation occurs, potential avenues for the use of the EADES Questionnaire are clinical and counseling settings. The EADES questionnaire can be used to identify individuals who cope with stress and emotions by overeating and who have compromised appraisal skills, identify appropriate interventions, and assess the need for referral to other providers to enhance coping and appraisal skills.
- Food and nutrition professionals designing weight-management interventions may use the EADES Questionnaire, along with other instruments, to assess the needs of target populations.

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