

Cross-cultural adaptation of the State and Trait Food Cravings Questionnaires (FCQ-S and FCQ-T) into Portuguese

Mariana Dimitrov Ulian¹
Priscila de Moraes Sato²
Fabiana Braga Benatti³
Patricia Lopes de Campos-Ferraz⁴
Odilon José Roble⁵
Ramiro Fernandez Unsain²
Bruno Gualano³
Fernanda Baeza Scagliusi¹

Abstract *This study aimed to present the cross-cultural adaptation of the State and Trait Food Cravings Questionnaires (FCQ-S and FCQ-T) into Portuguese. Tools were translated and back-translated, field experts evaluated the conceptual, operational and item-based equivalence and a sample of students assessed tools, evaluating the level of understanding and analyzing internal consistency through Cronbach's coefficient. In addition, the semantic equivalence was assessed through the intraclass correlation coefficient between the bilingual scores in each question of both versions (English and Portuguese). Tools were considered easy to understand (experts scored 95.4% and 97% for the FCQ-T and FCQ-S, respectively, and 81.8% of students considered them easy to understand), and showed satisfactory internal consistency values (FCQ-T ranged from 0.6 to 0.8 and FCQ-S ranged from 0.5 to 0.8). From the cross-cultural adaptation process, the satisfactory results enable the recommendation of the Brazilian version of FCQs.*

Key words *Cross-cultural adaptation, Food craving, Translation, Questionnaires*

¹ Faculdade de Saúde Pública, Departamento de Nutrição, Universidade de São Paulo (USP). Av. Dr. Arnaldo 715, Cerqueira Cezar. 01246-904 São Paulo SP Brasil.

m.dimitrov@usp.br

² Instituto de Saúde e Sociedade, Universidade Federal de São Paulo. São Paulo SP Brasil.

³ Escola de Educação Física e Esporte, USP. São Paulo SP Brasil.

⁴ Faculdade de Ciências Aplicadas, Universidade de Campinas (Unicamp). Limeira SP Brasil.

⁵ Faculdade de Educação Física, Unicamp. Campinas SP Brasil.

Introduction

In English, the term “food craving” refers to an intense desire or an urgency to eat certain food¹. What differentiates such desire from hunger is the intensity and specificity of the former. While food craving may be due to a biological stimulus, pleasurable sensations accompanying eating – such as relief from guilt and stress – can also trigger it². Although food cravings are often associated with overeating, they do not necessarily reflect a disturbed eating, nor are they synonymous of overeating². However, such behavior, if not occasional, can contribute to health problems. For example, food cravings are a striking feature of *bulimia nervosa*³, but they are also prevalent in unspecified eating disorders and obesity. These also appear to be associated with bouts of binge-eating³.

This scenario has been driving investigations into aspects that influence food cravings. Kemps and Tiggemann⁴ investigated whether stimulus or avoidance messages influenced women’s food intake. It was observed that obese women had a faster response than normal weight women to consume food when it was associated with the stimulus messages⁴.

In addition, Klatzkin et al.⁵ observed that obese women with binge-eating, when compared to obese women and normal weight women without binge-eating, had higher blood pressure, greater depressive and stress-related symptoms and a more conflicting relationship with food. Immediate response to external stimuli, as noted in the study by Kemps and Tiggemann⁴, can be particularly problematic in obesogenic environments found in most western countries, in which palatable foods are almost permanently accessible and available.

Food overexposure can lead to excessive consumption, and consequently lead to weight gain, especially among individuals who are more vulnerable to external stimuli. This scenario is especially alarming considering the current global attention on obesity and its consequences for health⁶. On a global scale, in 2014, more than 1.4 billion adults were overweight and of these, almost 200 million men and 300 million women were obese⁶. The current estimate is that 33% of the world population are obese⁶.

In Brazil, 12.4% of men and 16.9% of women are estimated to be obese⁷. According to data from the Chronic Diseases Risk and Protection Factors Surveillance System by Telephone Inquiry (VIG-ITEL), in the period from 2006 to 2012, obesi-

ty prevalence in the adult population increased from 11.6% to 17.4%⁸. Results of Klatzkin et al.⁵ are also relevant, since eating disorders also lead to significant physical, social, psychological and health diseases (e.g. coronary problems, growth problems, unregulated electrolyte balance) and can even lead to death⁹.

Binge-eating has been shown to be more prevalent in male adults, with worldwide estimates varying from 0.78% to 2.0% (values that are close to or equal for females)¹⁰. Regarding bulimia nervosa and anorexia nervosa, these estimates are more variable, ranging from 0.13% to 1.34% for the former and from 0.00% to 0.53% for the latter. On the other hand, unspecified eating disorders have global prevalence of 3.38%¹⁰. In Brazil, a study carried out with a population of adolescents with low socioeconomic level in Rio de Janeiro revealed that 37.3% had binge-eating symptoms¹¹. In a study conducted with female Porto Alegre dwellers, 16.5% evidenced eating disorders symptoms¹². Another study evaluated 1,807 children and adolescents living in Minas Gerais and found that 13.3% of the sample had eating disorders symptoms¹³. Studies conducted in the Brazilian Northeast also found data related to the prevalence of eating disorders. In a sample of 1,273 participants, it was found that the prevalence of periodic binge-eating disorder was 4.3% and the prevalence of bulimia nervosa was 1.0%¹⁴. A study conducted with schoolchildren identified that 23% of the participants had eating disorders symptoms¹⁵. Considering association between food cravings and obesity, eating disorders and health problems, detection and treatment of this behavior is fundamental.

Examples of tools developed to access food cravings-related aspects are the Attitudes to Chocolate Questionnaire (ACQ)¹⁶, the Orientation Towards Chocolate Questionnaire (OCQ)¹⁷ and The Food Craving Inventory (FCI)¹⁸. Each of these tools have a different approach to the construct in question and, while of great value and contribution, are limited to evaluating customary food-specific cravings (such as chocolate, for example) and associating more emphatically such cravings to feelings of guilt or ambivalent behavior. Such characteristics limit the range of tools to only a few food cravings dimensions.

In response to the dissatisfaction with the available tools related to this construct, Cepeda-Benito et al.¹⁹ developed and validated the Food Cravings Questionnaires (FCQs). Differently from tools highlighted above, FCQs were constructed to evaluate cravings for different

foods, without restricting them to specific categories. In addition, the questionnaires encompass eating-related behavioral, cognitive and psychological aspects, which makes them multidimensional tools¹⁹. FCQs combine two tools, which access different food craving aspects: Food Cravings Questionnaire-Trait (FCQ-T) and the Food Cravings Questionnaire-State (FCQ-S). In the FCQ-T, the respondent is asked to consider which foods he usually has cravings for; in FCQ-S, the respondent is asked to consider which specific foods he has cravings for at the time he/she answers the questionnaire.

The FCQ-T consists of 39 statements and was developed to access food cravings aspects over time and in various situations, considering them as a (usual) trait behavior of the respondent¹⁹. Higher scores in this questionnaire are related to a more exaggerated eating¹⁹.

The FCQ-S is composed of 15 statements and is a tool sensitive to changes in contextual, psychological and physiological states in response to specific situations (such as stressful events or food deprivation), considering the food craving as a (sporadic) state behavior of the respondent¹⁹. Higher scores in this questionnaire are associated with greater food deprivation, negative eating-related experiences and a greater susceptibility to triggers that lead to eating¹⁹. Totals of both tools for the full subscales and their dimensions are calculated by adding the corresponding scores of each statement¹⁹.

To the best of our knowledge, FCQs are the only published food cravings evaluation tools that have been validated psychometrically. Available versions include the original version, in English¹⁹, as well as in Spanish²⁰, Dutch²¹, Korean²² and German²³. Since there are no validated national food cravings investigation tools, this paper aimed to present the cross-cultural adaptation of the State and Trait Food Cravings Questionnaires (FQC-S and FQC-T) for use in Brazilian studies.

Methodology

The cross-cultural adaptation operationalization process was based on the procedures suggested by Reichenheim and Moraes²⁴, which include some stages. FCQs authors authorized their use for this process.

We emphasize that each of the questionnaires has particularities. In the FCQ-T, respondents should indicate on a 6-point scale (which varies

from never, rarely, sometimes, frequently, very frequently, always) how often each statement is true for them in each situation¹⁹. This questionnaire is composed of nine dimensions or subscales that evaluate: 1) the intention and the plans to eat; 2) anticipation of the positive reinforcement that can result from eating; 3) anticipation of relieving negative states and feelings because of eating; 4) the possible lack of control over eating; 5) thoughts or concerns about food; 6) food cravings as a physiological state (such as hunger); 7) possible emotions before or during food cravings; 8) triggers that can give rise to food cravings and; 9) guilt because of food cravings or of giving in to them¹⁹.

In the FCQ-T, respondents should indicate on a 5-point scale how much they currently agree with each statement at this very moment, ranging from: strongly disagree, disagree, neither agree nor disagree, agree, strongly agree. The FCQ-T consists of five dimensions or subscales that assess at the time of the interview: 1) food cravings; 2) anticipation of the positive reinforcement that can result from eating; 3) anticipation of relieving negative states and feelings as a result of eating; 4) lack of control over food and; 5) food cravings as a physiological state (such as hunger)¹⁹.

In a first step, in order to obtain the semantic, conceptual and item equivalence, the 39 and 15 statements, as well as the underlying subscales of the respective tools of the FCQs were translated from English to Portuguese. This step was conducted separately by two experienced and fluent English researchers, resulting in versions 1 and 2 of the instrument. The next step analyzed and compared these versions, which was carried out by a researcher who works with food practices. Version 3 of the tool was established based on the considerations of this professional.

The third step sought to evaluate the tool content validity. Thus, version 3 was submitted to 12 experts in the field of Nutrition (n = 9), Philosophy (n = 1), Psychology (n = 1) and Anthropology (n = 1) in order to clarify language and translation. To this end, we selected some statements of tool version 3 that were not entirely clear in terms of language and translation, and we asked specific questions through an online questionnaire with multiple-choice options on the *SurveyMonkey* secure site. A new version of the tool (version 4) was prepared from the feedback of these professionals.

Subsequently, we asked these professionals (9 respondents) to read the modified version of the tool in its entirety and to assess the clarity and

comprehension of each statement, responding to a 6-point scale with the following alternatives: “I did not understand”, “I understood a little”, “I more or less understood”, “I understood almost everything, but I had some doubts”, “I understood almost everything” and “I understood perfectly and I had no doubts”. If they did not understand a question or had trouble with language, we asked them to suggest changes and justify them. Criterion of sufficient understanding used answers “I understood almost everything” and “I understood perfectly and I had no doubts”. From this process, we adjusted the tool, which resulted in the preparation of a new version (version 5).

The fourth stage involved tools pre-testing. To participate in the pre-test, we invited third-year Nutrition undergraduate students and asked them to respond to the tools and record suggestions if they faced difficulties in understanding them. All students during class period ($n = 22$) agreed to voluntarily participate in the pre-test. All were females, with a mean age of 21.6 years ($SD = 1.7$ years, range from 20 to 24 years) and average Body Mass Index of 21.1 kg/m^2 ($SD = 2.2 \text{ kg/m}^2$ years, range from 17 kg/m^2 to 26 kg/m^2). There was no refusal and/or abandonment. This activity aimed to have a critical view regarding the content and comprehension of the questionnaire. The next step aimed to evaluate the semantic equivalence between the translated and original versions. To that end, we invited seven bilinguals to respond to version 5 and the original version of the tool, again through an online questionnaire on the “SurveyMonkey” secure survey site. They were randomly distributed in two groups: the former first answered the Portuguese language version and, after an interval of five days, answered the original English version. The converse was proposed for the second group. This version was later back-translated into English by a bilingual individual with fluency in Portuguese and English who had not participated in the earlier stages of cross-cultural adaptation.

Subsequently, we proceeded with the technical revision and the evaluation of the semantic equivalence between the original versions in English, Portuguese and the back-translation into English. This involved verifying the ability to transfer meanings from the concepts of the original instrument to the translated version. We sought to evaluate the impact that a specific term would have on the cultural context of the target population, as well as to evaluate the correspondence of perceptions and impacts of the tool in Portuguese on respondents, with a view

to ensuring a similar effect in the respondents of the two cultural worldviews. The following linguistic aspects were evaluated: 1) the equivalence between the original in English and the Portuguese version, with care as to the referential meanings of terms and words of the translated version in relation to the original version (such as ideas or objects which words referred to); and 2) the general meaning of each item of the tool, also contrasting both the original and the translated versions into Portuguese. If necessary, the tool could have some terms replaced to allow full recovery of the desired equivalence, in which case a corrected version of the tool would be drawn up.

A statistical analysis using Statistical Package for Social Sciences (SPSS) version 21.0 was performed. Data descriptive (mean, standard deviations-SD, minimum and maximum values) and inferential analyzes were developed. The semantic equivalence was evaluated by the intraclass correlation coefficient (ICC) between scores obtained by the bilingual subjects in each question of the English and Portuguese versions. The internal consistency of the questions was evaluated through Cronbach's Alpha coefficient analysis. The evaluation regarding content and comprehension of questionnaires was shown by means of percentages (%) and their respective SDs.

Tools pre-test participants completed the informed consent form. The study was approved by the Ethics Committee of the institution involved, under number 892.715.

Results

Translation and cross-cultural adaptation

Regarding the evaluation of the semantic equivalence, after comparing tools initial translations, feedback from the consultation with experts and back-translation, suggestions for altering terms and expressions were considered, revised and discussed, resulting in tools adjustments. This new discussion and redefinition of terms occurred due to expressions not easily translated into Portuguese or that were not commonly used in Portuguese. Adaptations made to statements can be seen in Chart 1.

In the FCQ-T, the expression of statement 5, “food cravings” was back-translated to “a food craving”. Thus, we decided to change the translation of “a food craving” (in Portuguese, *um desejo intenso*) to “food cravings” (in Portuguese, *desejos intensos*). Statement 6, *I feel like I have food on my*

Chart 1. Evaluation of semantic equivalence and changes made in the Portuguese version of the Food Cravings Questionnaires - elements that indicate a trait behavior or state of the respondent (FCQ-T and FCQ-S) - after consultation with experts (n = 9) and after tools back-translation.

| Tool | Original version | Translated version | Version after consulting with experts | Back-translated version | Final version |
|-------|---|--|---|--|---|
| FCQ-T | 1. Being with someone who is eating often makes me hungry. | 1. Estar na companhia de alguém que está comendo frequentemente me faz ficar com fome. | 1. Frequentemente, estar na companhia de alguém que está comendo me faz ficar com fome. | 1. Being with someone who is eating usually makes me feel hungry. | 1. Frequentemente, estar na companhia de alguém que está comendo me faz ficar com fome. |
| | 2. When I crave something, I know I won't be able to stop eating once I start. | 2. Quando eu tenho um desejo intenso por alguma comida, sei que quando eu começar a comer não vou conseguir mais parar. | 2. Quando eu tenho um desejo intenso por alguma comida, sei que quando eu começar a comer não vou mais conseguir parar. | 2. When I am craving for a specific food, I know that when I start eating it I will not be able to stop. | 2. Quando eu tenho um desejo intenso por alguma comida, sei que quando eu começar a comer não vou mais conseguir parar. |
| | 5. Food cravings invariably make me think of ways to get what I want to eat. | 5. Um desejo intenso de comer alguma comida me faz inevitavelmente pensar em maneiras de conseguir o que eu quero comer. | 5. Um desejo intenso de comer alguma comida me faz inevitavelmente pensar em como conseguir o que eu quero comer. | 5. A food craving inevitably makes me think about how to obtain the food I want. | 5. Desejos intensos de comer alguma comida me fazem inevitavelmente pensar em como conseguir o que eu quero comer. |
| | 15. Eating what I crave makes me feel better. | 15. Comer aquilo que eu desejo intensamente me faz sentir melhor. | 15. Comer aquilo que eu tenho um desejo intenso de comer me faz sentir melhor. | 15. Eating the food I crave makes me feel better. | 15. Comer aquilo que eu tenho um desejo intenso de comer me faz sentir melhor. |
| | 16. When I satisfy a craving I feel less depressed. | 16. Quando eu satisfaço meu desejo de comer aquilo que eu tenho um desejo intenso me sinto menos deprimido(a) | 16. Quando satisfaço meu desejo intenso de comer me sinto menos deprimido(a). | 16. When I eat what I crave I feel less depressed. | 16. Quando satisfaço meu desejo intenso de comer me sinto menos deprimido(a). |
| | 17. When I eat what I am craving I feel guilty about myself. | 17. Quando eu como aquilo que desejo intensamente comer me sinto culpado(a). | 17. Eu me sinto culpado(a) quando como aquilo que desejo intensamente comer. | 17. I feel guilty when I eat the food I have been craving. | 17. Eu me sinto culpado(a) quando como aquilo que desejo intensamente comer. |
| | 28. I spend a lot of time thinking about whatever it is I will eat next. | 28. Eu passo muito tempo pensando sobre qual vai ser a próxima comida que eu vou comer. | 28. Eu passo muito tempo pensando qual vai ser a próxima comida que eu vou comer. | 28. I spend a lot of time deciding which food I will eat next time. | 28. Eu passo muito tempo pensando em qual vai ser a próxima comida que eu vou comer. |
| | 32. Whenever I have a food craving, I keep on thinking about eating until I actually eat. | 32. Sempre que eu tenho um intenso desejo de comer determinada comida fico pensando sobre ela até de fato comê-la. | 32. Sempre que eu tenho um intenso desejo de comer determinada comida fico pensando nela até de fato comê-la. | 32. Whenever I crave for a food, I think about it until I really eat it. | 32. Sempre que eu tenho um intenso desejo de comer determinada comida fico pensando nela até de fato comê-la. |
| | 38. When I eat food, I feel comforted. | 38. Quando eu como, me sinto confortado(a)/acalentado(a) | 38. Quando eu como, me sinto confortado(a). | 38. Eating gives me comfort. | 38. Quando eu como, me sinto confortado(a). |

it continues

Chart 1. continuation

| Tool | Original version | Translated version | Version after consulting with experts | Back-translated version | Final version |
|-------|---|--|--|--|--|
| FCQ-S | 7. If I ate something, I wouldn't feel so sluggish and lethargic. | 7. Se eu comesse alguma coisa, não me sentiria tão letárgico e apático. | 7. Se eu comesse alguma coisa, não me sentiria tão lento e desanimado. | 7. If I eat something, I will not feel so slow and discouraged. | 7. Se eu comesse alguma coisa, não me sentiria tão lento, letárgico e desanimado. |
| | 8. Satisfying my craving would make me feel less grouchy and irritable. | 8. Satisfazer minha vontade daquilo que eu desejo intensamente comer faria com que eu me sentisse menos descontente e irritado(a). | 8. Satisfazer minha vontade de comer aquilo que eu desejo intensamente faria com que eu me sentisse menos descontente e irritado(a). | 8. Satisfying my cravings would make me feel less unhappy and angry. | 8. Satisfazer minha vontade de comer aquilo que eu desejo intensamente faria com que eu me sentisse menos descontente e irritado(a). |

mind all the time was back-translated to *I notice that I think about food all the time*. In this case, we decided to keep the first translation (in Portuguese, *Eu sinto que estou o tempo todo pensando em comida*), since if a literal translation of this statement were made, it would not make sense in the Brazilian cultural context. Thus, the change in relation to the original sentence was necessary, but its meaning was preserved. In statement 23, *When I crave certain foods, I usually try to eat them as soon as I can*, the word *usually* had been translated as *generally*. After consulting with experts, it was changed to *normally*. In this same item, the sentence *as soon as I can* was back-translated to *as fast as I can*. Thus, it was decided to change the translation from *as fast as I can* to *as soon as possible*. The expression of the statement *to eat appetizing foods that are in my reach* was back-translated into *to eat appetizing foods when these are within reach*. Thus, it was decided to change the translation of *It is difficult to resist the temptation to eat appetizing foods when they are within my reach* to *It is difficult to resist the temptation to eat appetizing foods that are within my reach* (In Portuguese, *É difícil resistir à tentação de comer comidas apetitosas quando elas estão ao meu alcance para É difícil resistir à tentação de comer comidas apetitosas que estão ao meu alcance*).

The FCQ-S tool has also undergone some modifications. The expression of statement 10

If I had was back-translated in the same way as proposed in the original tool. Thus, we chose to change the translation of *If I had access to one or more specific foods, I could not stop eating them* to *If I had one or more specific foods, I could not stop eating them*. Another example refers to statement 15, *I feel weak because of not eating*. The term *weak* has raised issues among specialists, and it may mean physical weakness (as in being without energy) or an emotional weakness (as in feeling morally unsuccessful). In order to make the meaning of the sentence clearer, we decided to include an observation in this item. These changes are common in the adaptation process and ensure both adequacy to the Brazilian culture and the original idea. The final Portuguese version of the tool appears in Chart 2 and 3.

Verbal comprehension

After evaluation of experts, the FCQ-T obtained a mean percentage of comprehension of 95.4% (SD = 7.5%) and the FCQ-S obtained a mean percentage of comprehension of 97% (SD = 6.6%). Of the 22 students who participated in the pre-test of the tool, 81.8% said tools were easy to understand; 9.1% said tools were repetitive and; 9.1% reported some difficulty in understanding used expressions (e.g. doubts regarding the meaning of term “comforted”).

Chart 2. Food cravings questionnaire – elements that indicate state behavior of the respondent – FCQ-S – and its respective scales, Portuguese version.

Instruções: neste questionário você deverá, por favor, ler cada afirmativa e indicar numa escala de 6 pontos (que varia de nunca, raramente, às vezes, frequentemente, muito frequentemente e sempre), de maneira geral, quão frequente cada afirmação é verdadeira para você em cada situação.

Subescala 1: Intenções e planos de consumir comida

5. Desejos intensos de comer alguma comida me fazem inevitavelmente pensar em como conseguir o que eu quero comer.

() Nunca. () Raramente. () Às vezes. () Frequentemente. () Muito frequentemente. () Sempre.

18. Sempre que eu tenho um desejo intenso por alguma comida me pego fazendo planos para comê-la.

() Nunca. () Raramente. () Às vezes. () Frequentemente. () Muito frequentemente. () Sempre.

23. Quando eu tenho um desejo intenso por alguma comida, eu normalmente tento comê-la o quanto antes.

() Nunca. () Raramente. () Às vezes. () Frequentemente. () Muito frequentemente. () Sempre.

Subescala 2: Antecipação do reforço positivo que pode resultar do comer

9. Eu como para me sentir melhor.

() Nunca. () Raramente. () Às vezes. () Frequentemente. () Muito frequentemente. () Sempre.

10. Às vezes comer faz as coisas parecerem perfeitas.

() Nunca. () Raramente. () Às vezes. () Frequentemente. () Muito frequentemente. () Sempre.

15. Comer aquilo que eu tenho um desejo intenso de comer me faz sentir melhor.

() Nunca. () Raramente. () Às vezes. () Frequentemente. () Muito frequentemente. () Sempre.

24. Quando eu como aquilo que desejo intensamente comer, me sinto ótimo(a).

() Nunca. () Raramente. () Às vezes. () Frequentemente. () Muito frequentemente. () Sempre.

38. Quando eu como, me sinto confortado(a).

() Nunca. () Raramente. () Às vezes. () Frequentemente. () Muito frequentemente. () Sempre.

Subescala 3: Antecipação do alívio de estados e sentimentos negativos como resultado do comer

16. Quando satisfaço meu desejo intenso de comer me sinto menos deprimido(a).

() Nunca. () Raramente. () Às vezes. () Frequentemente. () Muito frequentemente. () Sempre.

19. Comer me acalma.

() Nunca. () Raramente. () Às vezes. () Frequentemente. () Muito frequentemente. () Sempre.

21. Eu fico menos ansioso(a) depois que eu como.

() Nunca. () Raramente. () Às vezes. () Frequentemente. () Muito frequentemente. () Sempre.

Subescala 4: Falta de controle sobre o comer

2. Quando eu tenho um desejo intenso por alguma comida, sei que quando eu começar a comer não vou mais conseguir parar.

() Nunca. () Raramente. () Às vezes. () Frequentemente. () Muito frequentemente. () Sempre.

3. Se eu como uma comida que tenho um desejo intenso, frequentemente perco o controle e como demais.

() Nunca. () Raramente. () Às vezes. () Frequentemente. () Muito frequentemente. () Sempre.

22. Se eu tenho acesso a uma comida que tenho um desejo intenso de comer, não consigo parar de comê-la.

() Nunca. () Raramente. () Às vezes. () Frequentemente. () Muito frequentemente. () Sempre.

25. Eu não tenho força de vontade para resistir aos meus desejos intensos por comida.

() Nunca. () Raramente. () Às vezes. () Frequentemente. () Muito frequentemente. () Sempre.

26. Uma vez que eu começo a comer, tenho dificuldade para parar.

() Nunca. () Raramente. () Às vezes. () Frequentemente. () Muito frequentemente. () Sempre.

29. Se eu cedo ao meu desejo por comida, eu perco todo o controle.

() Nunca. () Raramente. () Às vezes. () Frequentemente. () Muito frequentemente. () Sempre.

it continues

Chart 2. continuation

Subescala 5: Pensamentos ou preocupações com a comida

6. Eu sinto que estou o tempo todo pensando em comida.
 Nunca. Raramente. Às vezes. Frequentemente. Muito frequentemente. Sempre.
8. Eu me pego preocupado(a) em relação à comida.
 Nunca. Raramente. Às vezes. Frequentemente. Muito frequentemente. Sempre.
27. Eu não consigo parar de pensar em comida, não importa o quanto eu tente.
 Nunca. Raramente. Às vezes. Frequentemente. Muito frequentemente. Sempre.
28. Eu passo muito tempo pensando em qual vai ser a próxima comida que eu vou comer.
 Nunca. Raramente. Às vezes. Frequentemente. Muito frequentemente. Sempre.
31. Eu sonho acordado(a) com comida.
 Nunca. Raramente. Às vezes. Frequentemente. Muito frequentemente. Sempre.
32. Sempre que eu tenho um intenso desejo de comer determinada comida fico pensando nela até de fato comê-la.
 Nunca. Raramente. Às vezes. Frequentemente. Muito frequentemente. Sempre.
33. Se eu estou com um intenso desejo de comer determinada comida, pensamentos sobre comê-la me consomem.
 Nunca. Raramente. Às vezes. Frequentemente. Muito frequentemente. Sempre.

Subescala 6: O desejo intenso por comida como um estado fisiológico

11. Pensar sobre minhas comidas preferidas me dá água na boca.
 Nunca. Raramente. Às vezes. Frequentemente. Muito frequentemente. Sempre.
12. Eu tenho desejos intensos por comida quando estou de estômago vazio.
 Nunca. Raramente. Às vezes. Frequentemente. Muito frequentemente. Sempre.
13. Eu sinto como se meu corpo pedisse por algumas comidas.
 Nunca. Raramente. Às vezes. Frequentemente. Muito frequentemente. Sempre.
14. Eu fico com tanta fome que meu estômago parece um saco sem fundo.
 Nunca. Raramente. Às vezes. Frequentemente. Muito frequentemente. Sempre.

Subescala 7: Emoções que podem estar presentes antes ou durante os desejos intensos por comidas

20. Eu tenho desejos intensos por comida quando me sinto entediado(a), bravo(a) ou triste.
 Nunca. Raramente. Às vezes. Frequentemente. Muito frequentemente. Sempre.
30. Quando eu estou estressado(a), tenho desejos intensos por comida.
 Nunca. Raramente. Às vezes. Frequentemente. Muito frequentemente. Sempre.
34. Minhas emoções frequentemente me fazem querer comer.
 Nunca. Raramente. Às vezes. Frequentemente. Muito frequentemente. Sempre.
39. Eu tenho desejos intensos por comida quando estou chateado(a).
 Nunca. Raramente. Às vezes. Frequentemente. Muito frequentemente. Sempre.

Subescala 8: Gatilhos que podem desencadear desejos intensos por comidas

1. Frequentemente, estar com alguém que está comendo me faz ficar com fome.
 Nunca. Raramente. Às vezes. Frequentemente. Muito frequentemente. Sempre.
35. Sempre que eu vou a um Buffet, acabo comendo mais do que eu precisava.
 Nunca. Raramente. Às vezes. Frequentemente. Muito frequentemente. Sempre.
36. É difícil resistir à tentação de comer comidas apetitosas que estão ao meu alcance.
 Nunca. Raramente. Às vezes. Frequentemente. Muito frequentemente. Sempre.
37. Quando estou com alguém que está comendo exageradamente, normalmente eu exagero também.
 Nunca. Raramente. Às vezes. Frequentemente. Muito frequentemente. Sempre.

Subescala 9: Culpa por causa dos desejos intensos por comidas ou por ter cedido aos mesmos

4. Eu odeio quando não resisto aos meus desejos intensos por comida.
 Nunca. Raramente. Às vezes. Frequentemente. Muito frequentemente. Sempre.
7. Eu normalmente me sinto culpado(a) por ter desejos intensos por alguma comida.
 Nunca. Raramente. Às vezes. Frequentemente. Muito frequentemente. Sempre.
17. Eu me sinto culpado(a) quando como aquilo que desejo intensamente comer.
 Nunca. Raramente. Às vezes. Frequentemente. Muito frequentemente. Sempre.

Chart 3. Food cravings questionnaire – elements that indicate state behavior of the respondent – FCQ-S – and its respective scales, Portuguese version.

Instruções: Neste questionário você deverá, por favor, ler cada afirmativa e indicar numa escala de 5 pontos (que varia de discordo fortemente, discordo, nem discordo nem concordo, concordo e concordo fortemente) o quanto você concorda com cada afirmação agora mesmo (neste exato momento):

Subescala 1: Um desejo intenso de comer

1. Eu tenho um desejo intenso de comer uma ou mais comidas específicas.
() Discordo fortemente. () Discordo. () Nem discordo nem concordo. () Concordo. () Concordo fortemente.
2. Eu estou com um desejo intenso de comer uma ou mais comidas específicas.
() Discordo fortemente. () Discordo. () Nem discordo nem concordo. () Concordo. () Concordo fortemente.
3. Eu anseio comer uma ou mais comidas específicas.
() Discordo fortemente. () Discordo. () Nem discordo nem concordo. () Concordo. () Concordo fortemente.

Subescala 2: Antecipação de reforço positivo que pode resultar do comer

4. Comer uma ou mais comidas específicas faria as coisas parecerem perfeitas.
() Discordo fortemente. () Discordo. () Nem discordo nem concordo. () Concordo. () Concordo fortemente.
5. Se eu comesse aquilo que eu estou com um desejo intenso de comer, tenho certeza que meu humor melhoraria.
() Discordo fortemente. () Discordo. () Nem discordo nem concordo. () Concordo. () Concordo fortemente.
6. Comer uma ou mais comidas específicas daria uma sensação maravilhosa.
() Discordo fortemente. () Discordo. () Nem discordo nem concordo. () Concordo. () Concordo fortemente.

Subescala 3: Antecipação de alívio de estados e sentimentos negativos como resultado do comer

7. Se eu comesse alguma coisa, não me sentiria tão letárgico e desanimado.
() Discordo fortemente. () Discordo. () Nem discordo nem concordo. () Concordo. () Concordo fortemente.
8. Satisfazer minha vontade de comer aquilo que eu desejo intensamente faria com que eu me sentisse menos descontente e irritado(a).
() Discordo fortemente. () Discordo. () Nem discordo nem concordo. () Concordo. () Concordo fortemente.
9. Eu me sentiria mais alerta se eu pudesse satisfazer minha vontade daquilo que eu desejo intensamente comer.
() Discordo fortemente. () Discordo. () Nem discordo nem concordo. () Concordo. () Concordo fortemente.

Subescala 4: Falta de controle sobre a alimentação

10. Se eu tivesse uma ou mais comidas específicas, eu não conseguiria parar de comê-la(s).
() Discordo fortemente. () Discordo. () Nem discordo nem concordo. () Concordo. () Concordo fortemente.
11. Meu desejo de comer uma ou mais comidas específicas parece incontrolável.
() Discordo fortemente. () Discordo. () Nem discordo nem concordo. () Concordo. () Concordo fortemente.
12. Eu sei que eu vou ficar pensando em uma ou mais comidas específicas até de fato tê-la(s).
() Discordo fortemente. () Discordo. () Nem discordo nem concordo. () Concordo. () Concordo fortemente.

Subescala 5: O desejo intenso por comida como estado fisiológico (como a fome, por exemplo)

13. Eu estou com fome.
() Discordo fortemente. () Discordo. () Nem discordo nem concordo. () Concordo. () Concordo fortemente.
14. Se eu comesse agora, não sentiria meu estômago tão vazio.
() Discordo fortemente. () Discordo. () Nem discordo nem concordo. () Concordo. () Concordo fortemente.
15. Eu me sinto fraco(a) por não comer (OBS: considerando fraqueza física).
() Discordo fortemente. () Discordo. () Nem discordo nem concordo. () Concordo. () Concordo fortemente.

Internal consistency

The tool showed satisfactory Cronbach's alpha coefficient values (Table 1). Regarding FCQ-T, values ranged from 0.6 to 0.8. Subscales S8, S5 and S2 recorded a coefficient of 0.8; subscales S4, S6 and S7 scored a coefficient of 0.7 and subscales S1, S3 and S9 achieved a coefficient of 0.6. As for the FCQ-S, values ranged from 0.5 to 0.8. Subscales S3 and S4 recorded a coefficient of 0.5; subscales S2 and S5 scored a coefficient of 0.8 and subscale S1 achieved a coefficient of 0.7. Table 1 also shows the results of mean values, SD and minimum and maximum values obtained by university students for FCQ-T and FCQ-S subscales.

Intraclass Correlation Coefficient

Tables 2 and 3 show the results of the ICC used to verify the conceptual, semantic and item equivalence for the pairs of each question in Portuguese and English and for the FCQ-T and FCQ-S subscales, respectively. Regarding answers in Portuguese and English, in the FCQ-T, ICC ranged from 0.70 to 0.99; as for the FCQ-S, this coefficient ranged from 0.52 to 1.00. As regards subscales, in the FCQ-T, the ICCs were higher than 0.80, varying from 0.87 to 1.00; in the

FCQ-S, this coefficient ranged from 0.77 to 0.96.

Discussion

This paper shows the initial stage of the cross-cultural adaptation process of the State and Trait Food Cravings Questionnaires (FCQ-S and FCQ-T). The questionnaires were translated and back-translated and were evaluated by experts from different areas and students. Five versions were developed before achieving the adapted final version.

In the translation and back-translation stage, in view of the concern to preserve contents of the original version within the Brazilian cultural context, some terms were not translated literally. In some cases, the literal correspondence of a term would have implied a different and decontextualized understanding of this culture. It is also important to be careful with the selection of easily understood and comprehensive expressions. One aspect that differs from the original version of the tools concerns their adaptation to the male population. The Portuguese gender identifier extension "(a)" was included in all questions to ensure understanding by both sexes. The assessment of verbal comprehension was excellent, considering that both the experts

Table 1. Descriptive and internal consistency analyzes about university students' evaluation of Trace or State Food Cravings Questionnaires (FCQ-T and FCQ-S) subscales (S).

| FCQ-T | Average | Standard Deviation | Minimum Values | Maximum Values | Cronbach's Alpha |
|--------------|---------|--------------------|----------------|----------------|------------------|
| S1 | 9.6 | 2.9 | 5.0 | 7.0 | 0.6 |
| S2 | 18.3 | 5.8 | 8.0 | 30.0 | 0.8 |
| S3 | 8.5 | 3.1 | 3.0 | 14.0 | 0.6 |
| S4 | 13.0 | 3.7 | 8.0 | 21.0 | 0.7 |
| S5 | 17.7 | 6.0 | 9.0 | 30.0 | 0.8 |
| S6 | 13.7 | 3.4 | 7.0 | 19.0 | 0.7 |
| S7 | 11.6 | 3.5 | 6.0 | 9.0 | 0.7 |
| S8 | 15.0 | 4.6 | 7.0 | 23.0 | 0.8 |
| S9 | 5.9 | 2.3 | 3.0 | 10.0 | 0.6 |
| FCQ-S | | | | | |
| S1 | 8.9 | 2.9 | 3.0 | 14.0 | 0.7 |
| S2 | 9.2 | 2.8 | 4.0 | 14.0 | 0.8 |
| S3 | 8.8 | 2.3 | 4.0 | 12.0 | 0.5 |
| S4 | 6.7 | 2.2 | 3.0 | 12.0 | 0.5 |
| S5 | 10.5 | 3.1 | 3.0 | 15.0 | 0.8 |

Note: S = subscale.

Table 2. Intraclass correlation coefficient (ICC) between English (e) and Portuguese (p) responses by bilinguals (n = 9) for each statement (S) of the Trait or State Food Cravings Questionnaires (FCQ-T and FCQ-S).

| FCQ-T | ICC | FCQ-T | ICC |
|---------|------|-----------|------|
| S1 (e) | | S21 (e) | 0.83 |
| S1 (p) | 0.70 | S21 (p) | |
| S2 (e) | | S22 (e) | 0.99 |
| S2 (p) | 0.95 | S22 (p) | |
| S3 (e) | | S23 (e) | 0.71 |
| S3 (p) | 0.97 | S23 (p) | |
| S4 (e) | | S24 (e) | 0.87 |
| S4 (p) | 0.93 | S24 (p) | |
| S5 (e) | | S25 (e) | 0.56 |
| S5 (p) | 0.88 | S25 (p) | |
| S6 (e) | | S26 (e) | 0.99 |
| S6 (p) | 0.90 | S26 (p) | |
| S7 (e) | | S27 (e) | 0.97 |
| S7 (p) | 0.88 | S27 (p) | |
| S8 (e) | | S28 (e) | 0.93 |
| S8 (p) | 0.99 | S28 (p) | |
| S9 (e) | | S29 (e) | 0.98 |
| S9 (p) | 0.90 | S29 (p) | |
| S10 (e) | | S30 (e) | 0.96 |
| S10 (p) | 0.86 | S30 (p) | |
| S11 (e) | | S31 (e) | 0.98 |
| S11 (p) | 0.95 | S31 (p) | |
| S12 (e) | | S32 (e) | 0.80 |
| S12 (p) | 0.93 | S32 (p) | |
| S13 (e) | | S33 (e) | 0.86 |
| S13 (p) | 0.86 | S33 (p) | |
| S14 (e) | | S34 (e) | 0.95 |
| S14 (p) | 0.95 | S34 (p) | |
| S15 (e) | | S35 (e) | 0.90 |
| S15 (p) | 0.71 | S35 (p) | |
| S16 (e) | | S36 (e) | 0.92 |
| S16 (p) | 0.89 | S36 (p) | |
| S17 (e) | | S37 (e) | 0.97 |
| S17 (p) | 0.89 | S37 (p) | |
| S18 (e) | | S38 (e) | 0.95 |
| S18 (p) | 0.85 | S38 (p) | |
| S19 (e) | | S39 (e) | 0.96 |
| S19 (p) | 0.94 | S39 (p) | |
| S20 (e) | | Total (e) | |
| S20 (p) | 0.68 | Total (p) | 1.00 |

it continues

Table 2. continuation

| FCQ-S | ICC |
|-----------|------|
| S1(e) | |
| S1 (p) | 0.77 |
| S2 (e) | |
| S2 (p) | 0.81 |
| S3 (e) | |
| S3 (p) | 0.74 |
| S4 (e) | |
| S4 (p) | 0.97 |
| S5 (e) | |
| S5 (p) | 0.70 |
| S6 (e) | |
| S6 (p) | 0.69 |
| S7 (e) | |
| S7 (p) | 0.52 |
| S8 (e) | |
| S8 (p) | 0.83 |
| S9(e) | |
| S9 (p) | 0.70 |
| S10(e) | |
| S10 (p) | 0.89 |
| S11(e) | |
| S11 (p) | 0.77 |
| S12(e) | |
| S12 (p) | 0.77 |
| S13(e) | |
| S13 (p) | 1.00 |
| S14(e) | |
| S14 (p) | 0.82 |
| S15(e) | |
| S15 (p) | 0.72 |
| Total (e) | |
| Total (p) | 0.98 |

Note: S = statement.

Table 3. Intraclass correlation coefficient (ICC)

between the English (e) and Portuguese (p) responses by bilinguals (n = 9) for each subscale (S) of the Trace or State Food Cravings Questionnaires (FCQ-T and FCQ-S) in English (e) and Portuguese (p).

| FCQ-T | ICC |
|--------------|------------|
| S1 (e) | |
| S1 (p) | 0.87 |
| S2 (e) | |
| S2 (p) | 0.93 |
| S3 (e) | |
| S3 (p) | 0.94 |
| S4 (e) | |
| S4 (p) | 1.00 |
| S5 (e) | |
| S5 (p) | 0.99 |
| S6 (e) | |
| S6 (p) | 0.97 |
| S7(e) | |
| S7(p) | 0.94 |
| S8(e) | |
| S8(p) | 0.97 |
| S9(e) | |
| S9(p) | 0.95 |
| FCQ-S | ICC |
| S1 (e) | |
| S1 (p) | 0.90 |
| S2 (e) | |
| S2 (p) | 0.92 |
| S3(e) | |
| S3 (p) | 0.96 |
| S4 (e) | |
| S4 (p) | 0.86 |
| S5 (e) | |
| S5 (p) | 0.77 |

Note: S = subscale.

consulted and students reported almost no difficulty in understanding the tools. Regarding the evaluation of the conceptual, semantic and item equivalence performed by bilinguals, moderate intra-class correlation coefficients were noted in some questions (FCQ-T: statement 25; FCQ-S: statement 7). This was probably because translation had not been entirely clear in relation to the original English version. These statements were reviewed and adjusted. In the final version of the tool, the Likert point scale was used to facilitate participants' understanding and data analysis, as well as the format and sequence of questions in the same way as in the original version. Among the limitations of this study is the fact that pre-test was limited to female participants of a small age group, of high schooling and in a single region of Brazil.

Regarding the internal consistency analysis, FCQ-T and FCQ-S showed total values equivalent to 0.93 and 0.86, respectively, similar to those found in the original version (0.97 and 0.94, respectively)¹⁶. Thus, we can affirm that the Portuguese version of the tool preserved the coherence and integration of their underlying items. While these tools seek to measure a phenomenon

strongly influenced by cultural aspects, the statistical analyzes proved the clarity and comprehension of the statements and their good internal relationship.

We can conclude that the Brazilian version of tools can be recommended for future applications. These tools will be useful for future psychometric analyzes and the implementation and evaluation of food cravings in different population groups and covering different behavioral (cognitive and psychological) aspects. They can be implemented, for example, to study obesity and eating disorders and to evaluate the impact of nutritional interventions.

In the case of eating disorders, one could observe how individual weight gain would influence the response profile of questionnaires; in the case of obesity, one could observe how behavioral changes would influence the response profile of the questionnaires. Considering increased obesity and overweight in recent years and the prevalence of food cravings in obese people, this research – currently scarce in Brazil – is very relevant. We emphasize the need for construct and factorial validation analyzes, as well as evaluation of their reproducibility.

Collaborations

MD Ulian, PM Sato and FB Scaglius worked on the paper's design and outline and data analysis and interpretation. FB Benatti, PL Campos-Feraz, OJ Roble, RF Unsain and B Gualano worked on data collection. All authors critically reviewed the paper and approved the version to be published.

References

1. Tiffany ST, Wray JM. The clinical significance of drug craving. *Ann N Y Acad Sci* 2012; 1248:1-17.
2. Meule A, Hermann T, Kübler A. A short version of the Food Cravings Questionnaire – Trait: The FCQ-T-reduced. *Front Psychol* 2014; 5:190.
3. Lee S, Kim KR, Ku J, Lee J, Namkoong K, Jung Y. Resting-state synchrony between anterior cingulate cortex and precuneus relates to body shape concern in anorexia nervosa and bulimia nervosa. *Psychiatry Res* 2014; 221(1):43-48.
4. Kemps E, Tiggemann M. Approach bias for food cues in obese individuals. *Psychology & Health* 2015; 30(3):370-380.
5. Klatzkin RR, Gaffney S, Cyrus K, Bigus E, Brownley KA. Binge eating disorder and obesity: Preliminary evidence for distinct cardiovascular and psychological phenotypes. *Physiol Behav* 2015; 142:20-27.
6. World Health Organization (WHO). *Obesity: preventing and managing the global epidemic: report of a WHO consultation*. Geneva: WHO; 2000. WHO Technical Report Series 894.
7. Instituto Brasileiro de Geografia e Estatística (IBGE). *Antropometria e estado nutricional de crianças, adolescentes e adultos no Brasil: Pesquisa de Orçamentos Familiares 2008-2009*. Rio de Janeiro: IBGE; 2010.
8. Brasil. Ministério da Saúde (MS). Secretaria de Vigilância em Saúde. *VIGITEL. Brasil 2012: Vigilância de fatores de risco e proteção para doenças crônicas por inquérito telefônico*. Brasília: MS; 2013.
9. Bamford B, Barras C, Sly R, Stiles-Shields C, Touyz S, Le Grange D, Hay P, Crosby R, Lacey H. Eating disorder symptoms and quality of life: Where should clinicians place their focus in severe and enduring anorexia nervosa? *Int J Eat Disord* 2015; 48(1):133-138.
10. Mitchison D, Mond J. Epidemiology of eating disorders, eating disordered behaviour, and body image disturbance in males: a narrative review. *Int J Eat Disord* 2015; 3:20.
11. Ferreira JES, Veiga GV. Eating disorder risk behavior in Brazilian adolescents from low socio-economic level. *Appetite* 2008; 51(2):249-255.
12. Nunes MA, Barros FC, Olinto MTA, Camey S, Mari JDJ. Prevalence of abnormal eating behaviors and inappropriate methods for weight control in young women from Brazil: a population – based study. *Eat Weight Disord* 2003; 8(2):100-106.
13. Vilella JEM, Lamounier JA, Dellaretti Filho MA, Neto JRB, Horta GM. Transtornos alimentares em escolares. *J Pediatr* 2004; 80(1):49-54.
14. Prisco APK, Araújo TM, Almeida MMG, Santos KOB. Prevalência de transtornos alimentares em trabalhadores urbanos de município do Nordeste do Brasil. *Cien Saude Colet* 2013; 18(4):1109-1118.
15. Alves TCHS, de Santana MLP, Silva RCR, Pinto EJ, Assis AMO. Fatores associados a sintomas de transtornos alimentares entre escolares da rede pública da cidade do Salvador, Bahia. *J Bras Psiquiatr* 2012; 61(2):55-63.
16. Benton D, Greenfield K, Morgan M. The development of the attitudes to chocolate questionnaire. *Pers Indiv Differ* 1998; 24(4):513-520.
17. Cartwright F, Stritzke WG. A multidimensional ambivalence model of chocolate craving: construct validity and associations with chocolate consumption and disordered eating. *Eat Behav* 2008; 9(1):1-12.
18. White MA, Whisenhunt BL, Williamson DA, Greenway, FL, Netemeyer RG. Development and validation of the Food-Craving Inventory. *Obes Res* 2002; 10(2):107-114.
19. Cepeda-Benito A, Gleaves DH, Williams TL, Erath S A. The development and validation of the State and Trait Food-Craving Questionnaires. *Behav Ther* 2000; 31(1):151-173.
20. Cepeda-Benito A, Gleaves DH, Fernandez MC, Vila J, Reynoso J. The development and validation of Spanish versions of the state and trait food cravings questionnaires. *Behav Res Ther* 2000; 38(11):1125-1138.
21. Franken IHA, Muris P. Individual differences in reward sensitivity are related to food craving and relative body weight in healthy women. *Appetite* 2005; 45(2):198-201.
22. Noh J, Kim JH, Nam H, Lim M, Lee D, Hong K. Validation of the Korean version of the General Food Cravings Questionnaire-Trait (G-FCQ-T). *Korean Journal of Clinical Psychology* 2008; 27:1039-1051.
23. Meule A, Lutz A, Vögele C, Kübler A. Food cravings discriminate differentially between successful and unsuccessful dieters and non-dieters. Validation of the Food Craving Questionnaires in German. *Appetite* 2012; 58(1):88-97.
24. Reichenheim ME, Moraes CL. Operacionalização de adaptação transcultural de instrumentos de aferição usados em epidemiologia. *Rev Saude Publica* 2007; 41(1):665-673.

Article submitted 22/05/2015

Approved 17/12/2015

Final version submitted 19/12/2015