

IV  
Congreso  
Internacional

Observatorio de la Alimentación  
& Fundación Alícia

Barcelona / 9 - 12 junio / 2015

OTRAS  
MANERAS  
DE COMER

elecciones / convicciones / restricciones



ISBN: 978-84-606-6842-8

# DEVELOPMENT AND VALIDATION OF AN EATING SELF-EFFICACY SCALE

Rui Póinhos (1,\*), Hugo Canelas (2), Bruno MPM Oliveira (1,3), Flora Correia (1,4,5)

(1) Faculdade de Ciências da Nutrição e Alimentação, Universidade do Porto, Porto, Portugal; (2) Nutricionist; Independent Researcher; (3) Laboratório de Inteligência Artificial e Apoio à Decisão, Instituto de Engenharia de Sistemas e Computadores – Tecnologia e Ciência, Porto, Portugal; (4) Centro Hospitalar de São João, E.P.E., Porto, Portugal (5) Unidade de Investigação e Desenvolvimento de Nefrologia, Faculdade de Medicina, Universidade do Porto, Porto, Portugal; (\*) ruipoinhos@fcna.up.pt

## 1. Introduction

Self-efficacy refers to the beliefs in the ability to organise and implement the action plans needed to achieve a certain result and the feeling of control over the behaviours and environment (Bandura, 1977, 1997). Therefore, it does not necessarily correspond to the person's real competences, but to its judgement on them and on the ability to overcome the difficulties inherent to the tasks (Bandura, 1989, 1997). Self-efficacy determines the initiation, maintenance and cessation of strategies or behaviours (Bandura, 1989, 2004; Lent & Maddux, 1997), being a good predictor of eating behaviour.

The definition of self-efficacy implies that it is a specific feature for each task (Bandura, 1989, 1997; Hofstetter et al., 1990), and so it's assessment should be task-specific (AbuSabha & Achterberg, 1997). Regarding eating self-efficacy, several scales have been proposed, but most of these instruments refer to particular clinical conditions and on the consumption of certain foods. Despite the specificity of self-efficacy, this construct has some degree of generalisation, namely when considering tasks or behaviours belonging to the same group, as in eating behaviour (AbuSabha & Achterberg, 1997). Moreover, the results from Glynn &

Ruderman (1986) suggest that people have difficulties discriminating the circumstances under which they have problems controlling their eating behaviour, or that those problems tend to be broad.

Self-efficacy is related to other constructs. Self-concept corresponds to the person's own image, while self-esteem is the evaluative component of self-concept, reflecting the individual's self-evaluation (Brown, 1998; Burns, 1986; Butler & Gasson, 2005; Faria & Fontaine, 1990). Locus of control refers to an allocation of responsibility or cause (internal or external) regarding a certain domain or behaviour (Rotter, 1966). Self-efficacy is mainly related with internal locus of control.

Despite its potential in terms of research, prognosis and evaluation of interventions, we are unaware of instruments to assess global features of food self-efficacy validated for the Portuguese population. The aim of this work was to develop and validate a scale to assess general features of food self-efficacy ("General Eating Self-Efficacy Scale"; "Escala de Auto-Eficácia Alimentar Global", in the original). A more broad and comprehensive description of the work in which this communication was based is contained in Póinhos et al. (2013).

## **2. Sample and methods**

This study was conducted on a convenience sample composed by higher education students. The inclusion criteria included being between 18 and 27 years old. Individuals with academic training in Nutrition or Dietetics were not included.

A total of 394 individuals were invited to participate, and the participation rate was 91.9%. Eighty-six participants (23.6%) were further excluded due to incompleteness of data; only 8 of these were excluded due to incomplete filling of the General Eating Self-Efficacy Scale. We analysed data from 276 participants (females), and the analysis was performed separately for the subsamples of females ( $n = 175$ ; age: mean = 20.0 years, SD = 1.7; BMI: mean = 21.1 kg/m<sup>2</sup>, SD = 3.3) and males ( $n = 101$ ; age: mean = 21.3 years, SD = 2.1; BMI: mean = 22.7 kg/m<sup>2</sup>, SD = 2.8).

The items were created through the adaptation of the six items of the self-efficacy subscale of the “Self-Concept Clinical Inventory” (ICAC, from the original “Inventário Clínico de Auto-Conceito”; Serra, 1986). ICAC is a Likert-like scale which assesses emotional and social self-concept features, composed by 20 items scored from 1 to 5. Each item is composed by a sentence that the respondent must classify from “Don’t agree” to “Agree a lot”. Besides its overall score, ICAC allows the valuation of 6 factors; factor 2 is composed by items related to the individual’s ability to face and solve problems and difficulties, being called “self-efficacy factor”. In each item, factor and overall score, higher scores correspond to higher self-concept. Each of the 6 items comprising ICAC’s self-efficacy factor was adapted in order to refer specifically to food and eating. As in ICAC, each item should be classified from “Don’t agree” to “Agree a lot”. We choose to score items from 0 to 4, with the answers “Agree a lot” receiving the highest score, except in items 1 and 5, scored reversely. The overall score is obtained by the sum of the scores in all items, and higher scores correspond to higher eating self-efficacy.

The study of the convergent and discriminant validity of the scale included its association with other constructs, namely several self-concept dimensions and health locus of control. ICAC was used to study both these types of validity. Due to the transversality of self-concept, positive associations with all ICAC scores were expected. The association with ICAC’s self-efficacy factor was expected to be the highest, but not with a determination coefficient above 50% ( $r < 0.707$ ), in order to assure a specific assessment of eating self-efficacy. The study of the discriminant validity also included the study of the associations with locus of control. Besides the conceptual discrepancy between self-efficacy and locus of control, this analysis supplies the need to assure that the use of control-related expressions in the items’ adaptation didn’t generate an excessive approximation to internal locus of control. The instrument used to assess locus of control was the Health Locus of Control Scale (Ribeiro, 1994), composed by 14 items with 7 alternative answers (from “totally disagree” to “totally agree”), scored 1 to 7. The overall score corresponds to the sum of the score in all items, and higher scores correspond to internal locus of control.

The internal consistency of the scale was assessed using Cronbach’s alpha. The scale was submitted to factorial analysis through principal component extraction. The factorial analysis models were analysed through the scree plots method (Cattell, 1966). Pearson’s correlation

coefficient was used to measure the association between pairs of variables. Results were considered statistically significant when  $p < 0.05$ .

### 3. Results

Initial Cronbach's alpha values were 0.871 and 0.793, respectively for the female and the male subsamples. The low correlations with the overall score ( $r = 0.104$ ) and the increase in the value of Cronbach's alpha (to 0.858) in the male subsample suggest the exclusion of item 5. Following the factorial analysis, the scree plots method suggests a one-factor solution in both subsamples. The associations between the items and the principal components extracted show that item 5 also presents a weaker correlation than the remaining items with the first component extracted; in the male subsample this item showed a higher association with the second component than with the first. Therefore, the factorial analysis also suggests the exclusion of item 5.

After exclusion of this item, the scale showed a unifactorial structure, and all items present an association above 0.5 with the principal component extracted. These components explain approximately two thirds of total variance (68.0% and 64.4%, respectively in the female and in the male subsamples. The scale showed good internal consistency (Cronbach's alpha of 0.879 and 0.858, respectively for females and males). The scoring of each item from 0 to 4 points led to a scale from 0 to 20 points. Females obtained a mean value of 12.4 points ( $SD = 4.0$ ), while men had a higher mean value (13.8 points,  $SD = 3.8$ ).

The final version of the scale presented positive associations with ICAC's overall score (females:  $r = 0.487$ ,  $p < 0.001$ ; males:  $r = 0.325$ ,  $p = 0.001$ ). The associations with the self-efficacy factor were higher than with any other factor (females:  $r = 0.511$ ,  $p < 0.001$ ; males:  $r = 0.468$ ,  $p < 0.001$ ). The determination coefficients of these correlations were, respectively, 26.1% and 21.9%, and thereby below the predefined criterion of  $r^2 < 50\%$ . The association with the Health Locus of Control Scale was not significant neither in females ( $r = 0.034$ ,  $p = 0.655$ ) nor in males ( $r = -0.023$ ,  $p = 0.819$ ).

## 4. Discussion

The “General Eating Self-Efficacy Scale” showed good psychometric properties in this sample. We highlight its good internal consistency and the fact that the associations with other measures allow noting its convergent and discriminant validity. The factorial analysis revealed that the scale has a unifactorial structure; given the theoretical and conceptual assumptions on which it was developed, this evidences its construct validity. We also highlight the high proportion of variance explained by the principal components extracted. The scale also showed to be easy and quick to apply; these features are evidenced by the small amount of time necessary to its completion (about one minute), the absence of doubts and a reduced rate of incompleteness (2.2%). The final version of this scale may be found in Poínhos et al. (2013).

This instrument may prove to be a useful tool for the prognosis and the evaluation of interventions related to the change in eating habits. Therefore, the study of its relations with different eating behaviour dimensions (in both clinical and non-clinical samples) will be relevant to the interpretation of the underlying processes of food selection and consumption among individuals and specific population groups.

## Funding

This work is part-funded by the ERDF – European Regional Development Fund through the COMPETE Programme (operational programme for competitiveness) and by National Funds through the FCT – Fundação para a Ciência e a Tecnologia (Portuguese Foundation for Science and Technology) within projects PTDC/MAT/121107/2010 and FCOMP - 01-0124-FEDER-037281.

## References

AbuSabha, R.; Achterberg, C. (1997) “Review of self-efficacy and locus of control for nutrition- and health-related behavior”, *Journal of the American Dietetic Association*, 97: 1122-1132.

Bandura, A. (1977) Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84: 191-215.

Bandura, A. (1989) "Human agency in social cognitive theory", *American Psychologist*, 44: 1175-1184.

Bandura, A. (1997) *Self-efficacy: The exercise of control*. New York: Freeman and Company.

Bandura, A. (2004) "Health promotion by social cognitive means", *Health Education and Behavior*, 31: 143-164.

Brown, J. D. (1998) *The self*. New York: McGraw-Hill.

Burns, R. (1986) *The self-concept: Theory, measurement, development and behaviour*. New York: Longman Group.

Butler, R. & Gasson, S. (2005) "Self esteem/self concept scales for children and adolescents: A review", *Child and Adolescent Mental Health*, 10: 190-201.

Cattell, R. B. (1966) "The scree test for the number of factors", *Multivariate Behavioral Research*, 1: 245-276.

Faria, L. & Fontaine, A. M. (1990) "Avaliação do conceito de si próprio de adolescentes: Adaptação do SDQ I de Marsh à população portuguesa", *Cadernos de Consulta Psicológica*, 6: 97-105.

Glynn, S. M. & Ruderman, A. J. (1986) "The development and validation of an eating self-efficacy scale", *Cognitive Therapy and Research*, 10: 403-420.

Hofstetter, C. R.; Sallis, J. F. & Hovell, M. F. (1990) "Some health dimensions of self-efficacy: Analysis of theoretical specificity", *Social Science and Medicine*, 31: 1051-1056.

Lent, R. W. & Maddux, J. E. (1997) "Building a socio cognitive bridge between social and counselling psychology", *The Counseling Psychologist*, 25: 240-255.

Póinhos, R.; Canelas, H.; Oliveira, B. M. P. M. & Correia, F. (2013) “Desenvolvimento e validação de uma escala de auto-eficácia alimentar”, *Alimentação Humana*, 19: 65-72.

Ribeiro, J. L. P. (1994) “Reconstrução de uma escala de locus-de-controlo de saúde”, *Psiquiatria Clínica*, 15: 207-214.

Rotter, B. (1966) “Generalised expectancies for internal and external control of reinforcement”, *Psychological Monographs: General and Applied*, 80: 1-28.

Serra, A. V. (1986) “O «Inventário Clínico de Auto-Conceito»”, *Psiquiatria Clínica*, 7: 67-84.