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How personality traits and intrinsic personal characteristics influence the consumer's choice of reduced-calorie food

E. Carrillo [a], V. Prado-Gascó [b], S. Fiszman [a], P. Varela [a,*]

[a] Instituto de Agroquímica y Tecnología de Alimentos (IATA), Consejo Superior de Investigaciones Científicas (CSIC), Avda. Agustín Escardino, 7, 46980 Paterna (Valencia), Spain
[b] Universidad de Valencia, Departamento de Psicología Social (Valencia), Spain

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ABSTRACT

Nowadays, the consumption of low-calorie foods is being taken into account as a tool for reducing the incidence of certain nutrition-related health disorders. In this context, several factors were used to model low-fat (LF), low-sugar (LS) and high-calorie (HC) food consumption behavior. These factors were: personality traits (neuroticism and conscientiousness), food choice motives (health and weight control) and intrinsic personal characteristics such as self-esteem and satisfaction with life. The results indicate a good fit for the proposed model. Weight control was the best predictor of consumption of this kind of product, and health was a less strong predictor. In addition, correlations between the constructs indicated that LF and LS had the strongest correlation with each other and with weight control ($p<0.01$). Surprisingly, the correlation between health and LF and LS product consumption was low. As regards differences in gender, women showed more concern about weight control, as expected.

1. Introduction

Reducing high-energy foods has been considered an important tool for lowering the risk of obesity and overweight, which are growing health problems worldwide (Drewnowski, 2003). Furthermore, imbalances between the recommended intake and consumption of calories – overconsumption – can also lead to diseases such as non-insulin dependent diabetes, hypertension, atherosclerotic cardiovascular disease, endometrial cancer and gall-stones (Frazao, 1999; Stein & Colditz, 2004). There is general agreement that cutting sugar and fat consumption is a way to reduce the risk of suffering from these diseases and to help body weight control (Trevison et al., 1990). Taking these facts into account, public health policies encourage lower consumption of these components. However, this is not so simple, as fats and sugars provide the most palatable foods, with the highest hedonic values, that are readily accessible and inexpensive. In fact, sweet and other high-energy food, such as foods with fatty textures, can improve moods and mitigate the effects of stress via brain opioidergic and dopaminergic neurotransmissions (Davis, Levitan, Smith, Tweed, & Curtis, 2006; Drewnowski, 2009; Gibson, 2006). In more concrete terms, a rise in obesity that appears to be unrelated to the human genome has been observed in the Spanish population.

Food choice has been described as a complex function of preferences for sensory characteristics combined with the influence of non-sensory factors (Prescott, Young, O'neill, Yau, & Stevens, 2002; Rozin, 1996). A previous work that studied the main factors underlying consumers' food choice in Spanish consumers (Carrillo, Varela, Salvador, & Fiszman, 2011) suggested that the principal factor in food choice is its sensory characteristics, although the health factor ranked sixth. Despite this result, health is considered an important factor nowadays and its role in the diet is inherent to wellbeing. To understand consumers' behavior better and be able to provide food that contributes to wellbeing, further studies on the role of health in the diet are required. Spanish consumer behavior is continually changing as Europeanization and globalization, mainly influencing the younger population, which bring about the adoption of new foods. To design nutritional campaigns, it is essential to discover reliable consumption patterns in young people; the consumers of the near future. In consequence, this study focused on people born in the 1980s and 1990s.

The structural equation modeling (SEM) technique makes it possible to use different variables to test for causal relations. In the present study, this method was used to model theoretical relationships in order to contribute to an understanding of some of the intrinsic characteristics of consumers that influence reduced-calorie food consumption. SEM uses latent variables (constructs), which are unobserved variables that correspond to theory-based concepts. A number of indicators (observed variables) are taken into account to create these constructs (Davis et al., 2006; Saba & Vassallo, 2002). Since few studies on this topic, to our knowledge, have modeled consumption behavior that could influence the consumption frequency of low-fat, low-sugar and high-calorie foods, the following theoretical hypotheses were established, taking the relationships between personality

* Corresponding author. Tel.: +34 963 900 022; fax: +34 963 636 301.
E-mail address: pvarela@iata.csic.es (P. Varela).

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traits, intrinsic characteristics, and food choice motives into account in order to model consumption behavior.

Hypothesis 1. Personality has a mediating effect between food choice motives (health and weight control) that influence the consumption of reduced-calorie or high-calorie food.

Nowadays, the link between health and diet is well known and consumers sometimes take health considerations into account to establish their food preferences and guide their food choice. Although weight control is related to a slim figure, it also has a part in wellness and healthiness considerations, so it is relevant in this respect.

It has been proposed that broad personality traits taken from the field of psychology, summarized into five categories called "The Big Five" personality dimensions (extraversion, neuroticism, conscientiousness, agreeableness and openness to experience) (Costa & McCrae, 1985; Goldberg, 1981; John & Srivastava, 1999), could be reliable predictors of health behavior patterns. Research has suggested that conscientiousness, neuroticism and agreeableness are the best personality predictors of health behavior (Booth-Kewley & Vickers, 1994). A neurotic person has been described as vulnerable to stress and experiencing negative emotions, and has been associated with harmful health practices and the absence of positive health behavior (Brook, Whiteman, Gordon, & Cohen, 1986; Coan, 1973; Mechanic & Cleary, 1980; Spielberger & Jacobs, 1982; Tappan & Weybrew, 1982). Conscientiousness is related to wellness behavior and has been found to be the best personality predictor of healthy behavior (Booth-Kewley & Vickers, 1994; Conway, Vickers, Wallston, & Costa, 1992; Wiebe & McCallum, 1986). Agreeable people tend to be tolerant; this personality factor may be related to better exercise habits, self-care, and better dietary control (Leiker & Hailey, 1988).

Based on these traits, the relationship between personality and health motives for choosing food has been considered to model low-calorie and high-calorie food selection behavior.

Hypothesis 2. Intrinsic characteristics such as self-esteem and satisfaction with life have a positive influence on the consumption of reduced-calorie or high-calorie food.

Currently, young people are bombarded with media messages that the ideal body is almost thin, especially for women and, in the case of men, that being athletic and having well-developed muscles is the ideal image for success. Furthermore, it has been suggested that obese people are more negatively stigmatized than almost any other social group, which affects self-esteem adversely, and are linked with a poor body image (Klaczynski, Goold, & Mudry, 2004; Schwartz & Brownell, 2004). Both characteristics (self-esteem and satisfaction with life or SWL) represent global life evaluations. The former is a judgment of oneself, and the latter a person's evaluation of their entire life (Diener & Diener, 2009).

A study of self-esteem has related it to wellbeing and has observed a causal relation between personality characteristics and the emotional gratification of eating (Barrón & Sánchez, 2003). As a result, it would be reasonable to think that self-esteem and SWL could play a part in the consumption of low-calorie foods. Consequently, these variables were introduced as constructs in the proposed model.

The objective of the present study was to analyze the influence of consumers' intrinsic characteristics and personality traits on their health concerns (food choice motives) and their consumption of low-sugar and low-fat products, through structural equation modeling based on these two hypotheses.

2. Material and methods

2.1. Participants

Three hundred and fifty-six (356) young people between 18 and 36 years old (mean = 24.42 years; SD = 5.05) participated in this study (Table 1). The participants were randomly recruited from an official consumers' association database and in university areas, based on their interest in participating. The questionnaire was self-administered and was completed via online forms and on paper.

2.2. Procedure

The data used in this study were collected from September to December 2011. Preliminary testing of the questionnaire obtained information regarding the time required to complete it and the participants' comprehension of all the questions.

The questionnaire was composed of 6 parts. In the first part, the participants answered socio-demographic questions about their age, sex and educational level. In the second part, they answered questions about the consumption frequency of some food items, with special emphasis on low-calorie and high-calorie foods. The low-calorie foods comprised low-sugar (LS) and low-fat (LF) items: low-sugar biscuits, yogurt and breakfast cereals, low-fat biscuits, and non-fat milk and yogurt. The high-calorie (HC) foods were composed only of high-fat items: whole milk, butter, and bakery goods. The HC items were introduced for comparison with the reduced-calorie foods and were limited to high-fat items because most reduced-calorie foods focus on reducing the fatty components. All these food products were chosen for their high consumption in Spain. The participants answered the question: "How often do you consume the following food?" by evaluating their frequency of consumption on a 5-point scale (1 = daily, 2 = most days, 3 = more than once a week, 4 = at times or seasonally, 5 = rarely or never).

For parts three through six of the questionnaire, four validated scales were used. These were adapted following the International Methodological Standards recommendations of the ITC (International Test Commission) for proper adaptation of an instrument to another linguistic context (Hambleton, 1994, 1996; Muñiz & Hambleton, 2000). They are described below.

2.2.1. Food choice

The Food Choice Questionnaire (FCQ) used was adapted from the one previously developed for English consumers by Steptoe, Pollard, and Wardle (1995), which involved nine motivational dimensions or factors regarding health and non-health considerations in food choice. Each of these motivational factors (health, mood, convenience, sensory appeal, natural content, price, weight control, familiarity and ethical concern) comprises three to six items. The participants answered the question: "It is important to me that the food I eat on a typical day…" using a seven-box scale ranging from 1 (strongly disagree) to 7 (strongly agree). The original four-box scale was replaced with a seven-box one to increase the questionnaire's ability to discriminate between food choice motives (Carrillo et al., 2011; Fotopoulos, Krystallis, Vasallo, & Pagiaslis, 2009; Pohjanheimo & Sandell, 2009). According to the original authors, the questionnaire presents adequate psychometric properties. In the present study, only the factors of health ($\alpha = 0.81$) and weight

Table 1
Summary of participants' demographic data.

Participants' data	Number of consumers	%
Sex		
Female	251	71
Male	105	29
Education level		
Primary	9	3
Secondary	213	60
University	80	22
Postgraduate	54	15