

Research Report

The modified Trait and State Food-Cravings Questionnaires: Development and validation of a general index of food craving

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Abstract

In the present study, the multidimensional Trait and State Food Cravings Questionnaires (FCQ-T and FCQ-S), as developed by Cepeda-Benito, Gleaves, Williams, and Erath, [2000. The development and validation of the State and Trait Food Cravings Questionnaires. *Behavior Therapy*, 31, 151–173], were modified in order to construct an index of *general* food craving instead of *specific* food craving. The factor structure, validity and reliability of the modified questionnaires, renamed as the Trait and State *General* Food Cravings Questionnaires (G-FCQ-T and G-FCQ-S), were investigated in three separate studies. Firstly, exploratory factor analyses were conducted, which yielded a G-FCQ-T with a four-factor structure, that was considerably shorter as compared to the original (nine-factor) FCQ-T, and a G-FCQ-S of which the factor structure was highly comparable to the original FCQ-S. Secondly, in an attempt to replicate the factor structures of the G-FCQ-T and the G-FCQ-S as found in Study 1, confirmative factor analyses were performed. Results indicated adequate fits for both questionnaires. In addition, the test–retest reliability of both versions was satisfactory and an analysis of the construct validity generally revealed the expected results. In Study 3, the validity of the state version of the G-FCQ was further investigated by relating scores on this questionnaire to indices of food deprivation and satiation. Results indicated that the G-FCQ-S indeed measures food craving as a variable state, which is influenced by situational and temporal variables. Altogether, it can be concluded that the G-FCQ-T and G-FCQ-S are both reliable and valid measures of general trait-like and state-dependent food craving.

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Introduction

Craving, a construct that is primarily known from addiction research, refers to a subjective motivational ('wanting') state promoting substance-seeking and ingestive behaviors. Drug craving is generally believed to contribute to the transition from casual to compulsive drug use, persistence of addictive behaviors, and relapse in substance-dependent patients who are abstinent from drugs of abuse (Robinson & Berridge, 1993). In the same vein, food craving is thought to mediate uncontrolled eating behavior, such as seen in obesity, binge eating disorder, and bulimia nervosa (Cepeda-Benito, Fernandez, & Moreno, 2003; Cepeda-Benito, Gleaves, Williams, & Erath, 2000; Gendall, Joyce, Sullivan, & Bulik, 1998;

Greeno, Wing, & Shiffman, 2000; Waters, Hill, & Waller, 2001; Weingarten & Elston, 1990). In overweight dieters, this craving for food is thought to be involved in the inability to comply with a low-calorie diet, resulting in relapse to initial over-eating patterns (Bjorvell, Ronnberg, & Rossner, 1985; Fedoroff, Polivy, & Herman, 2003; Sitton, 1991). In addition, in non-clinical samples, food craving has been found to be related to body weight, suggesting a ubiquitous role of craving in food consumption (Franken & Muris, 2005).

Food craving is generally defined as an intense desire to eat a specific food item (Weingarten & Elston, 1990). Different types of food cravings have been described, from craving for chocolate, being the most frequently craved food, to craving for all sorts of palatable, mostly sweet and/or high-fat foods (Hill, Weaver, & Blundell, 1991; Rogers & Smit, 2000; Weingarten & Elston, 1991). Although food craving is frequently observed in pathological states, it is an

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omnipresent phenomenon that is not necessarily pathological or maladaptive. For example, Pelchat (1997) found no less than 100% of young adult females and 70% of young adult males reporting to have experienced an “urge for a certain food” in the foregoing year. High prevalence rates have also been described by Weingarten and Elston (1991) who found 97% of female and 68% of male psychology students to ever have experienced a craving for a certain food item.

On the origin of and mechanisms behind food craving, several theories have been formulated (for reviews, see Cepeda-Benito, Gleaves, Williams et al., 2000; Pelchat, 2002; Rogers & Smit, 2000; Weingarten & Elston, 1990). Physiological theories underline the nutritional and energetic homeostatic role of food cravings (e.g., food cravings are suggested to appear more frequently in individuals who are food deprived; Wardle, 1987) or the psychoactive abilities of certain compounds of the craved foods (e.g., carbohydrate craving is suggested to be elicited as a ‘self-medication’ to relieve a central serotonin deficit; Wurtman & Wurtman, 1986). Psychological affect-based theories stress the role of negative emotional states, such as anger and boredom, as triggers for food cravings (e.g., Hill et al., 1991; Rogers, Anderson, Finch, Jas, & Gatenby, 1994; Schuman, Gitlin, & Fairbanks, 1987). Learning theories claim food cravings to be conditioned responses to sensory, situational, or interoceptive food-related cues and emphasize the expected rewarding, pleasurable consequences of consuming the craved food (Rozin, Levine, & Stoess, 1991). There is no general agreement on the exact mechanism regulating food craving. In fact, it appears that food craving is a complex, multidimensional phenomenon, that can be elicited and expressed in several physiological and psychological ways, both inter- and intra-individually (Cepeda-Benito, Gleaves, Williams et al., 2000; Pelchat, 1997).

In light of this multidimensionality of food craving, Cepeda-Benito, Gleaves, Williams et al. (2000) developed and validated two self-report food cravings questionnaires: the Food Cravings Questionnaire-Trait (FCQ-T) and the Food Cravings Questionnaire-State (FCQ-S). The FCQ-T aims to assess food cravings as stable traits and thus intends to measure features of food cravings that are stable across times and situations within specific populations or individuals. The FCQ-S assesses state-dependent cravings, i.e., assesses whether food cravings are experienced in response to specific, momentary situations or psychological and physiological states. Both food-craving scales and their respective subscales have been shown to possess good internal consistency, satisfactory test–retest stability and adequate construct and discriminant validity (Cepeda-Benito, Gleaves, Williams et al., 2000). Moreover, the multi-cultural applicability of the instruments was supported in a validation study in which the Spanish translations of the FCQ-T and FCQ-S were examined (Cepeda-Benito, Gleaves, Fernandez et al., 2000) and were also found to possess adequate psychometric qualities.

Thus, the FCQ-T and FCQ-S have been shown to be reliable and valid instruments for measuring food cravings, and this appears true for populations in various countries.

Both the FCQ-T and the FCQ-S were constructed to assess *specific* food cravings. That is, both FCQ versions contain the explicit instruction to ‘think of (generally or momentary) craved food(s), while completing the scales’ (Cepeda-Benito et al., 2003). This means that subjects fill in the questionnaires with one specific food item in mind. Although this approach is fruitful in studies concerned with cravings for specific foods (e.g., chocolate), the usefulness of the original FCQ scales for studies concerning the more *general* phenomenon and experience of food craving seems limited. Firstly, cravings for different foods may have different origins within one individual. For example, an individual’s carbohydrate cravings might be exclusively elicited by negative emotions, while social situations might solely trigger cravings for salty foods. Clearly, focusing on a specific food item while completing the FCQ scales might hinder the study of cravings for other types of food or food classes (such as carbohydrates). Secondly, inter-individual comparisons in cravings are hampered when focusing on specific foods. For example, scores on the FCQ scales in one subject might reflect his or her craving for chocolate, while in another subject craving for potato chips is measured. In sum, the interpretation of the original FCQ scales might be somewhat limited, since individuals frequently crave for various types of food items and food classes.

In the present study, we modified the FCQ-T and the FCQ-S in order to deal with these problems. In other words, Cepeda-Benito, Gleaves, Williams et al.’s (2000) FCQ scales were changed to construe questionnaires for measuring a general ‘desire for food’ or ‘desire to eat’ instead of a desire for a specific type of food. To emphasize the different purposes of the original FCQ and the modified FCQ scales, i.e., to assess ‘craving for specific food(s)’ and ‘craving for food in general’ respectively, we will further refer to the latter as the Trait and State *General* Food Cravings Questionnaires: G-FCQ-T and G-FCQ-S. The current investigation is a first attempt to examine the psychometric properties of the G-FCQ-T and G-FCQ-S. In Study 1, the structure of the G-FCQ-T and G-FCQ-S is investigated by means of exploratory factor analysis. Study 2 retests the factor structure of the scales, this time employing a confirmatory factor-analytic approach. In addition, this study examines the reliability and validity of the G-FCQ-T and G-FCQ-S. Finally, in Study 3 the construct validity of the G-FCQ-S is further explored.

Study 1: Test construction and exploratory factor analysis

The original FCQ-T and FCQ-S were both translated into the Dutch language by the present authors. Two modifications were made to the FCQ scales during translation. The first modification involved the translation of the word ‘craving’ into the Dutch language. Because no

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