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.

Keywords: Food craving; Food craving questionnaire; Reliability; Validity

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
omnipresent phenomenon that is not necessarily pathologica
l 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,
Physiological theories underline the nutritional and ener-
genic 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, Gittin, & Fairbanks, 1987). Learning theories
claim food cravings to be conditioned responses to sensory,
situational, or interoceptive food-related cues and empha-
size 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 phenom-
enon, that can be elicited and expressed in several physiologi-
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 sup-
pported 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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