



Research report

British English translation of the Food Craving Inventory (FCI-UK)[☆]Wendy Nicholls^{*}, Lee Hulbert-Williams

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ABSTRACT

There is evidence for cultural variation in the foods that may be craved. We have designed and tested, in a sample of 234 participants, a UK-specific version of the Food Craving Inventory. A four-factor structure comprising of sweet foods, fast foods, high fat, and complex carbohydrates was extracted. The final scale was analogous with the original US scale, and shared similar associations with external eating and dietary restraint, although no association was found with BMI. The measure has potential to contribute to the development of theoretical understanding of food craving, and to measuring outcomes in intervention studies and clinical samples.

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Introduction

Food cravings—intense desires for particular types of food that are difficult to resist—are a common experience amongst dieters (Hill, 2007) and also arise in absence of any eating-related pathology (Hill & Heaton-Brown, 1994). In the UK, food craving is reported in around 68% of non-dieters, and 92% of dieters (Massey & Hill, 2012). Cravings have been implicated as a leading cause of failure in weight-loss dieting (Meule, Westenhöfer, & Kübler, 2011) and have been shown to correlate with obesity (White, Whisenhunt, Williamson, Greenway, & Netemeyer, 2002) and binge eating (Meule, Lutz, Vögele, & Kübler, 2012). Food cravings are distinct from hunger as they tend to be food specific, are experienced as more intense (Hill, 2007; Shiffman, 2000), and are directed towards satisfying a sensory rather than a nutritional need (Pelchat & Schaefer, 2000). There is some evidence that for a subset of people who regularly experience food cravings, these experiences may be phenomenologically similar to substance addiction (Davis et al., 2011), and recent neuroanatomical evidence demonstrated that the same brain areas are implicated for both drug and food addiction (Pelchat, Johnson, Chan, Valdez, & Ragland, 2004). Since by ‘craving’ we mean a subjective psychological experience, attempts to quantify cravings by means other than self-report have usually failed (Shiffman, 2000), just as any attempt to observe independently an emotion such as guilt would fail.

A number of researchers have developed psychometric self-report scales for the experience of food cravings, and have taken different approaches to measure development. Researchers have developed scales to measure food cravings with respect to specific foods, for example, the Attitudes to Chocolate Questionnaire (Benton, Greenfield, & Morgan, 1998), and the Orientation towards Chocolate Questionnaire (Cartwright & Stritzke, 2008). Chocolate is most often used because it is reported to be the most-craved food (Rozin, Levine, & Stoess, 1991), but of course, it remains one of the principle drawbacks of such scales that the researcher or clinician must know in advance which food the participant or client might crave. In addition, food cravings may be culturally sensitive, so whilst chocolate is reportedly the most craved food in the UK (Massey & Hill, 2012), rice is more commonly craved for Japanese women (Komatsu, 2008). There is therefore a need for cultural specificity in these measures, which this study has attempted to address. In measuring food cravings more generically, three approaches have gained greatest acceptance.

The first approach is a diary method, such as the craving record (Hill & Heaton-Brown, 1994), which asks participants to document instances of craving over a set period of around a week. Participants record antecedents, difficulty of resisting craving, and subsequent behaviour as well as type of food craved, mood and hunger for before, and post-craving. Advantages of such diary methods are its thoroughness, and that it takes account of the difficulty of resisting a craving including whether participants give in, however completing a regular diary is an onerous task for participants, and because of this, diary studies tend to suffer a number of problems, including incomplete data (Morrison, Leigh, & Gillmore, 1999). In support, it has been noted that participants show a decline in the craving instances reported over the duration of the study (Massey

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& Hill, 2012), this could either be due to an effect of monitoring, or of fatigue. The recording of difficulty of resisting cravings has been adopted here. The new measure was designed therefore to take into account the frequency of individual foods craved, the difficulty of resisting a craving and the subsequent behaviour, that is how often participants gave in to their cravings. Other measures of food craving, tend to be cross-sectional.

The second approach is characterised by The Food Cravings Questionnaires (Cepeda-Benito, Gleaves, Williams, & Erath, 2000b; Cepeda-Benito et al., 2000a), which attempts to measure cravings as a broad category of experience with questions such as, “When I crave something, I know I won’t be able to stop eating once I start.” The authors have validated parallel English (Cepeda-Benito et al., 2000b) and Spanish (Cepeda-Benito et al., 2000a) versions. Good psychometric properties have been demonstrated in healthy participants (Cepeda-Benito, Fernandez, & Moreno, 2003; Cepeda-Benito et al., 2000a). The original English-language FCQs were found to factor into 14 factors, nine in the trait version, and five in the state version (Cepeda-Benito et al., 2000b). Subsequent factor analyses have failed adequately to replicate this factor structure, however (Meule et al., 2012; Vander Wal, Johnston, & Dhurandhar, 2007). Putative factors include lack of control over eating, anticipation of positive reinforcement, preoccupation with food, and cues that may trigger food cravings (Cepeda-Benito et al., 2000b). There is therefore a considerable conceptual overlap between the FCQ factors and other psychological constructs, such as emotional eating, disinhibition, perceived hunger, and external eating. Indeed, Cepeda-Benito et al. (2000) found that their trait craving measure (which includes lack of control) was correlated with other measures of disinhibition and hunger, somewhat calling into question the divergent validity of the FCQs.

The third major approach is that of the Food Craving Inventory (FCI) (White et al., 2002), which places the question about craving in the test rubric, “Over the past month, how often have you experienced a craving for the food?” and then assesses the participant on a number of specific foods. We believe this approach may have the advantage of reducing cognitive load experienced by the participant. In other areas of psychology, the provision of specific exemplars of the broad category of experience at issue has been found to produce a more valid assessment (e.g. Holmes & Rahe, 1967) and more accurate recall of health behaviours (e.g. Brauner-Otto, Yarger, & Abma, 2012; Klungel et al., 2000). It has been suggested that lists of specific instances help to overcome the difficulties participants otherwise encounter in recalling experiences that match the broad descriptor provided (Paykel, 2001).

White and colleagues factor analysed the food items that constitute the FCI and found evidence for four factors, high fat, high carbohydrate, sweet, and fast food, suggesting that their participants tended to have particular patterns of responding to food groups and did not simply crave all the listed foods equally (White et al., 2002). The subscales of the FCI have been shown to correlate well with controlled laboratory-based assessments of macronutrient consumption, bolstering the FCI’s claim to validity (Martin, O’Neil, Tollefson, Greenway, & White, 2008). Early data suggest that the factor structure of the FCI may prove useful in future theory development. For example, participants with binge eating disorder have been shown to crave sweets more than other foods (White & Grilo, 2005). In the original development of the FCI, White and colleagues (2002) included two response scales against which each food item was to be scored—how often did the participant experience a craving for the food and how often did the participant give in. The latter was intended as a measure of consumption, to establish the divergent validity of cravings compared to the frequency of consumption. Both the diary method used by Massey and Hill (2012) and The Conceptual Cravings Scale (Hill, Weaver, & Blundell, 1991) asked participants to rate the

difficulty they had in resisting their food cravings. We therefore added a response scale to ask participants how difficult they had found it to resist their cravings for each food item. This was intended to measure the extent to which participants felt they had to fight their cravings.

Though the FCI is a promising development in the psychometrics of food cravings, substantial cultural differences reduce the usefulness and applicability of the FCI in British populations. Food cravings are likely to be conditioned by the specific foods that are consumed within one’s culture (Gibson & Desmond, 1999; Zellner, Garriga-Trillo, Rohm, Centeno, & Parker, 1999). Chocolate is the most frequently craved food in the UK, closely followed by savoury foods such as crisps, bread, and cheese, then sweet foods such as biscuits, cake desserts, and sweets (Massey & Hill, 2012). In other countries, savoury foods are most commonly craved (e.g. Egypt; Parker, Kamel, & Zellner, 2003) and rice is commonly craved by women in Japan (Komatsu, 2008). Indeed, White and Grilo (2005) even found subtle differences in food cravings when comparing Northern and Southern USA samples. They suggested that further research was necessary to improve the FCI for use within varied cultural and geographical groups. Already, the FCI has been successfully adapted for use in Japan and demonstrated important cultural differences in types of food that are craved (Komatsu, 2008).

In our pilot study for a validation of the FCI in a UK sample, we asked participants for informal feedback on the original measure, with respect to language. Whilst there were no concerns over the language, participants expressed strong views that the foods listed were clearly North American and did not reflect a typical British diet. For example, corn bread and cinnamon rolls are not commonly eaten in the UK, chips are more usually referred to as ‘crisps’, candy as ‘sweets’, and cookies as ‘biscuits’. The current paper details the development of a new food list for the FCI, based on more culturally appropriate food item prompts. The collection of the present data have also given us the opportunity to attempt to replicate the factor structure of the original FCI and to develop the nature of the response scales.

In order to establish initial evidence for convergent and divergent validity, we included a number of other psychometric measures. We expected the presence or absence of correlations on the basis of existing evidence as follows. Hill et al. (1991) reported medium-size associations between external eating, emotional eating, and cravings, and we expected to find a similar pattern. There is very mixed evidence of any putative relationship between dietary restraint and food cravings (see Hill, 2007 for a review). Both White et al. (2002) and Komatsu (2008) used a measure of dietary restraint to indicate divergent validity, we therefore expected to find no sizeable association. Similarly, when an association between food cravings and BMI has been found (e.g. White et al., 2002), it has been of a very small effect size. A priori power analyses suggested we would have sufficient statistical power to detect the expected associations, except for the putative weak association involving emotional eating and BMI. Women usually score higher on measures of food craving (Meule et al., 2012). We therefore planned to run a parallel series of analyses with women only, and also to test for sex differences in craving.

Method

Development of the FCI-UK

In developing a British food list for the FCI, we created a super-set of 50 food items to include items from the original FCI, plus a further 24 foods thought to be typically British. With respect to the original FCI items, some steps were taken to modify the

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