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Sweet and fat taste preference in obesity have different associations with personality and eating behavior

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Abstract

The aim of this study was to test associations between self-reported attitudes of sweet and fat taste preferences and psychological constructs of eating behavior and personality in obesity. Sixty obese patients were included. The Three Factor Eating Questionnaire was used for the assessment of psychological constructs of eating behavior, and the Swedish universities Scales of Personality was used for measuring personality traits. A strong sweet taste preference was associated with more neurotic personality traits ($P=.003$), in particular lack of assertiveness ($P=.001$) and embitterment ($P=.002$). Strong fat taste preference was rather related to lower levels of the eating characteristic cognitive restraint ($P=.017$), implying less attempts to restrict and control food intake. Whereas strong sweet taste preference was linked to a personality style in obesity, strong fat preference could be more an aspect of eating behavior. A psychobiological stress model is discussed in relation to the results on sweet preference and hampered personality functioning.

Keywords: Taste preference; Sweet; Sugar; Fat; Personality; Psychology; Eating behavior

1. Introduction

Sweet and fat preference in relation to psychological constructs of eating behaviors and personality can illuminate who has a particular likeability for these tastes. Such information on individual patterns in taste preference has an obvious interest in obesity, as the taste preference for palatable foods contributes to the fast growing obesity epidemic [1].

The associations between taste preferences and psychological variables have not been well mapped. In one of the sparse studies on personality and taste preference that has been performed, a preference for salty as well as sweet taste was found in persons with higher neuroticism [2]. The literature search can be extended to a preference for more intense sweetness in experimental designs, as this measure has been suggested to be included in a construct of "sweet tooth" along with a more habitual liking of sweet foods [3]. Such a preference for more intense sweetness in experimental designs did not differ as a function of the psychological eating construct cognitive restraint [4] but was associated with a more outgoing personality style [5].

Genes mediating the consumption of sweet foods have been suggested [6] and sweet liking has also been linked to alcoholism and a genetic vulnerability to alcoholism [6–8] suggesting a link between sweet taste and the reward system.

We found no studies on fat preference and personality. Higher cognitive restraint has been associated with higher preference ratings for the various combinations of fat and salt in popcorns tested in an experimental design [9]. However, the results were interpreted as a result of the cognitive beliefs with popcorn being considered as a low-fat alternative and thus a less "forbidden" food for a restrained eater, and therefore preferred in its various appearances.

In research on biological links to fat preference, higher levels of the satiety hormone leptin have been associated with a lower preference for fat [10]. In line with this finding, higher levels of the hunger hormone galanin have been associated with a preference for fat [11] and food deprivation increased the preference for fatty flavor over sweet taste in animal studies [12]. According to a review, genetic factors in the preference for

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fat are suggested [6], but environmental factors apart from the genetic have also been demonstrated [13].

We were interested in evaluating the psychological patterns in subjective taste preferences for sweet and fat. The subjective and habitual taste preference concept that we used implied a "liking" as well as "wanting", as a drive for a specific substance can include both liking and wanting in a biopsychological theory [14]. According to this theory applied to drug craving a distinction between liking and wanting can also be considered, implying different actions of brain systems [15,16]. It is postulated that eventual sensitization of brain systems after repeated exposure will in particular mediate the subcomponent of reward that can be labeled as "wanting". This theory has also been applied to sweet taste [17], aside from drugs. This would mean that a substance such as sugar can be craved, wanted and sought out, even if it is not considered as pleasurable anymore. Normally, however, liking and wanting go together [14].

A common psychological measure of eating behavior in obesity that could be of interest in relation to taste preference is the Three Factor Eating Questionnaire (TFEQ) [18], which measures cognitive restraint, disinhibited eating and hunger experience. A personality inventory covering personality traits of relevance in healthy as well as more psychopathological samples is the Swedish universities Scales of Personality (SSP) [19]. In prior research using the SSP in relation in obesity, the personality trait lack of assertiveness characterized obese patients with more problematic eating behaviors such as disinhibited eating [20].

Testing the dual aspects of fat and sugar preference can provide differentiating information on these taste preferences. Unique psychological profiles in sweet and fat preference respectively could distinguish these taste preferences from a psychological style that is rather more generally associated with a high appreciation of palatable food. Since body weight as well as gender can imply variations in eating behaviors and food selection [21–23] we will also test these variables in relation to the taste preferences.

2. Methods

2.1. Participants

The participants were 60 patients at the Obesity Unit, Karolinska University Hospital, in Stockholm. There were 44 women and 16 men, with a mean age of 43.5 ± 12.3 years ($m \pm$SD), and an age range of 20 to 65 years. The mean Body Mass Index (BMI) was 40.1 ± 5.4 kg/m^2, and ranged from 30 to 57 kg/m^2. The patients were accepted for and awaiting treatment interventions at the unit. All assessments were performed before start of treatment. The local Ethics Committee at the Karolinska Institute approved the study and the patients gave their informed consent to participate.

2.2. Instruments

Sweet preference: The preference for the taste of sweet and fat foods was assessed in structured interviews. The preference for sweet taste was clarified by phrasings such as the taste of sweet being considered important and preferred, and implied a liking as well as wanting. The answers were categorized in the 3 answer alternatives: a strong preference for sweet taste, a more moderate liking of sweet taste and a dislike of sweet taste. A strong preference for sweet taste was usually accompanied by subjective experiences of a need for sweet foods in the daily life, and a sweet food "addiction" was often described. These patients typically reported need for sweets, chocolate, cookies, pastries, soft drinks etcetera. As only 4 patients reported dislike of sweet taste, the 3 answer alternatives were collapsed into the 2 categories: "a strong preference for sweet taste" and "no strong preference for sweet taste".

Fat preference: The preference for fat was assessed in a similar way with three corresponding answer alternatives. Patients with a strong preference for fat often described difficulties resisting from the intake of fat, cutting down cream and butter in cooking, and a strong liking of foods like fried foods, fast foods high in fat, cheese, and processed meat like sausages. Low fat alternatives were not considered as tasty alternatives but implied too strong sacrifice of the taste that was considered important. As with sweet preference, a dislike of fat taste was uncommon and reported by only 3 patients. These answer alternatives were therefore also collapsed into 2 categories: "a strong preference for fat taste" and "no strong preference for fat taste".

The Three Factor Eating Questionnaire (TFEQ) [18] was used to measure eating behavior. The TFEQ consists of 51 items that form the three subscales Cognitive restraint, Disinhibition and Hunger experience. Cognitive restraint over eating implies attempts to resist from eating by conscious determination in order to control body weight. Disinhibited eating shows difficulties in the regulation of food intake and Hunger experience measures the subjective experience of hunger. The psychometric properties including reliability and internal consistency for the TFEQ have been reported by Stunkard and Messick [18]. The TFEQ was completed by 48 of the patients in the prevailing sample. The reason for this data dropping was that the TFEQ was administered only to the patients assigned to a clinical trial.

The Swedish universities Scales of Personality (SSP) [19] was used to assess personality traits. The SSP is a revised and shortened version of the Karolinska Scales of Personality (KSP) [24] with improvements in psychometric quality such as face validity, internal consistency and response differentiation [19]. The SSP comprises 91 items that form 13 different personality scales. The 13 scales further cluster in three main trait factors: Neuroticism, Aggression and Extraversion, according to a factor analysis. The SSP scales constituting the Neuroticism factor are Somatic trait anxiety, Psychic trait anxiety, Stress susceptibility, Lack of assertiveness, Embitterment and Mistrust. The Extraversion factor consists of Impulsiveness, Adventure seeking and Detachment (reversed), and the Aggression factor of Social Desirability (reversed), Trait Irritability, Verbal Trait Aggression and Physical Trait Aggression.

2.3. Procedure

The patients accepted for treatment were invited to a psychological assessment starting with the structured interview containing the items on taste preference. The interviews were