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**The meaning of food (MOF):**

**The development of a new measurement tool**

**Jane Ogden, Efi Liakopoulou, George Antilliou, Gary Gough**

**Department of Psychology, University of Surrey, Guildford, Surrey**

Address for correspondence

Jane Ogden

Professor in Health Psychology

Department of Psychology

University of Surrey

Guildford

Surrey

GU2 7XH

UK

Tel: 01483 686929

Email: [J.Ogden@surrey.ac.uk](mailto:J.Ogden@surrey.ac.uk)

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MEANING OF FOOD SCALE

**Abstract**

This paper aimed to develop a reliable measurement tool to evaluate the meanings of food that could be used in both practice and research and to any gender differences.

A new meanings of food questionnaire (MOF) was refined across two studies (study 1, n=451; study 2, n=170). The final questionnaire consisted of 25 items and 8 reliable subscales: food and sex, emotional regulation, treat, guilt, social interaction, control over life, control over food, family. The new Meaning of Food (MOF) questionnaire could be used in both research and clinical practice to profile patients and explore predictors of eating behaviour.

Key words: meaning of food; emotional regulation; weight concern; roles; social eating.

## **Introduction**

Food has a complex array of meanings which have been described across a number of different disciplines (see Ogden, 2009 for a review). For example, one key meaning relates to emotional regulation and much research highlights the ways in which food plays a central role in people's emotional lives in terms of how they manage their emotions and how eating is moderated by their emotional state (Bruch 1985; Van Strien et al, 1986; Anschutz et al, 2009). Food also represents self control and at times generates a conflict between control and the lack of control. For example, Crisp (1984) compared the anorexic to the ascetic in terms of her 'discipline, frugality, abstinence and stifling of the passions' (p. 210) and Bruch described the anorexic as having an 'aura of special power and super human discipline' (1985). Research has also identified how although dieters intend to eat less they often show overeating in response to a range of factors including anxiety, alcohol, and eating something they feel they should not have (Herman and Mack, 1975; Boon et al, 2002). Studies from a more sociological perspective have explored the role of food within a family context and its use as a forum to communicate love and a sense of family unity (Charles and Kerr 1987; DeVault 1997). Finally, studies indicate how food is also linked with sex and sexuality. Following his anthropological analysis of food, Fiddes (1990) described how eating meat is considered to arouse sexual drives and he argued that sexual language describing women or sex is often derived from animals or foods (Fiddes, 1990). To date however, these meanings have not been operationalised in a quantifiable way. In line with this, the paper presents data from two studies to develop a new measurement tool using two populations who varied in terms of their approaches to food intake. Study 1 aimed to develop a preliminary questionnaire and

study 2 aimed to finalise the structure of this questionnaire. Both studies were approved by the University Ethics Committee.

## **Methods**

### **Study 1**

#### **Participants**

Dieters were recruited via an online advertisement on the official webpage for a slimming organisation. A total of 451 (6 males, 444 females) members replied. The majority of the participants were women, white (n=441 (98%), in full time work (n=273 (60.7%), married (n=276 (61,3%), with a mean age of 37.8 years (SD= 11.1). In terms of their BMI, 17.1% (n=77) were normal weight (BMI 18.9-24.9), 35.8% (n=161) were overweight (BMI25-29.9) and 47.1% (n=212) were obese (BMI>30).

#### **Measures**

##### **The meaning of food: preliminary questionnaire**

On the basis of existing literature and discussions with dieters in the University department a preliminary questionnaire was developed which consisted of 21 items relating to the seven identified meanings of food: emotional regulation, food and sex, family love, guilt, food as treat, self control, food and social interaction. Participants were asked to rate each statement using a 5 point likert scale ranging from 1 (totally disagree) to 5 (totally agree) following the statement 'to what extent do you agree with the following.... '. Participants also described their demographics.

### **Study 2**

#### **Participants**

Completed questionnaires were received from 170 University students who were recruited through lectures and seminars. This sample consisted of both men (n=84) and women (n=86) who ranged in age from 17-44 with a mean age of 20.1 yrs (SD 4.1). The majority described their ethnic group as white (n=135, 79.4%), a minority had part time jobs (n=42, 24.7%), the majority (n=161, 94.7%) were neither married nor co habiting, and the majority were undergraduate students (n=114, 67.1%).

## **Measures**

**Meaning of food:** The study used the same measurement tool as in study 2 to describe emotional regulation, food and sex, family love, guilt, food as treat, food and social interaction. However as the control item had proved most problematic 4 extra items relating to control were included. This resulted in 7 control items with 4 relating to control over life (Refusing to eat food can be used as a sign of control; If I could control what I ate I would feel better about myself; When I feel out of control of my life I control what I eat in order to feel better; What to choose to eat can be a way of controlling your life) and 3 relating to control over food (I sometimes feel out of control of what I eat; If I can control my eating I feel more in control of everything else; Controlling my food intake is sometimes hard). The final questionnaire consisted of 25 items.

## **Results**

### **Study 1**

The data were analysed to assess the psychometric properties of the scale using principal components analysis and reliability analysis with Cronbach's alphas.

### **i) Principal components analysis**

A principal components analysis with oblimin rotation was carried out and produced a 5 factor solution which converged after 14 iterations. The factors accounted for 28.1%, 14.1%, 7.9%, 5.9% and 5.5% of the variance respectively. The results are shown in table 1.

-insert table 1 about here -

The results showed that factor 1 consisted of all 3 sex items (sex1, sex2, sex3) and all 3 family love items (family1, family2, family3), factor 2 consisted of all 3 guilt items (guilt1, guilt2, guilt3), 1 emotional regulation item (emot3) and 1 control item (control 1), factor 3 consisted of all three social interaction items (social1, social2, social3), Factor 4 consisted of all three treat items (treat1, treat2, treat3) and all three emotional regulation items (emot1, emot2, emot3) and factor 5 consisted of all three control items (control1, control2, control3). As control2 loaded onto 2 factors it was deemed to belong to factor 5 as this made more sense. Similarly although emot3 loaded onto 2 factors it was deemed to belong to factor 4. The 5 factors therefore seemed to reflect sex and family love, guilt, social interaction, treat and emotional regulation, control.

### **ii) Reliability analysis**

Although the principal components analysis produced 5 factors, 2 of these (factors 1 and 4) consisted of two sets of items which appeared conceptually discrete.

Cronbach's alphas were therefore calculated for 7 factors. The results were as follows: sex: alpha=0.7; control: alpha=0.5; family love: alpha=0.9; food as treat: alpha=0.8; emotional regulation: alpha=0.8; guilt: alpha=0.8; social interaction: alpha=0.7. The control subscale remained below the 0.6 recommended cut off.

Study 1 therefore resulted in a measure of the meanings of food which consisted of 7 constructs. Although these constructs were not entirely statistically discrete factors they were considered to have face validity and to show an acceptable level of reliability. The one factor that remained problematic was that relating to control as its reliability was below the 0.6 recommended cut off point. This was further developed in study 2 which also aimed to include a sample of men to assess whether the questionnaire was appropriate for a mixed gender group.

## **Study 2**

### **Data analysis**

The results from study 2 were analysed to assess the psychometric properties of the scale using principal components analysis and reliability analysis with Cronbach's alphas.

#### **i)Principal components analysis**

The principal components analysis with oblimin rotation produced a 6 factor solution with eigen values greater than 1 that accounted for 28.2%, 12.3%, 7.9%, 6.0%, 5.7% and 4.2% of the variance respectively. This analysis is shown in table 2.

-insert table 2 about here -

The results showed that factor 1 consisted of all 6 control items and all 3 guilt items; factor 2 consisted of all 3 family items, factor 3 consisted of 2 treat and 2 emotional regulation items, factor 4 consisted of 2 social items, factor 5 consisted of 3 sex items, and factor 6 consisted of 3 guilt items and 1 social item.

## **ii) Reliability analysis**

Cronbach's alphas were computed for each of the subscales and were as follows: sex: 0.6; control over life: 0.8; control over food: 0.8; family life: 0.8; treat: 0.7; emotional regulation: 0.7; guilt: 0.9; social interaction: 0.6. The reliability of each subscale is now satisfactory.

The results from study 2 confirm the findings of study 1 and show that although the subscales are not entirely discrete they have good reliability. In addition, the inclusion of the extra items relating to control produced 2 reliable subscales. Furthermore, the study illustrates that the scale is relevant for mixed gender populations.

## **Discussion**

Overall, the two studies produced a new measurement tool to assess the meanings of food consisting of 25 items. This has been called the MOF. The analysis resulted in eight subscales describing eight different meanings of food as follows: food and sex; control over life; control over food; food and family; food as a treat, food and emotional regulation, food and guilt and food and social interaction. These eight subscales have good reliability and show some statistical discreteness. This tool could be used in future research to assess people's beliefs about food and the role that it plays in their lives. It could also be used to evaluate the effectiveness of interventions designed to change some of these factors or in a clinical setting to help health professional's explore clients' relationships with food.



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**Table 1: Principal components analysis (study 1; n=451).**

ITEMS					
	1	2	3	4	5
If I were trying to impress someone I was attracted to, I would cook nice food (sex1).	<b>0.54</b>	-0.14	0.08	-0.14	-0.15
If someone invited me for a special meal I would think they were attracted to me (sex 2)	<b>0.76</b>	0.13	-0.13	-0.05	-0.02
You can make someone realize you are attracted to them, by preparing them a nice meal (sex3).	<b>0.78</b>	0.09	-0.11	-0.05	-0.03
If I could control what I ate I would feel better about myself (cont1)	0.04	<b>0.58</b>	0.09	0.01	<b>0.39</b>
When I feel out of control of my life I control what I eat in order to feel better (cont2).	-0.04	-0.01	0.01	-0.07	<b>0.77</b>
What you choose to eat can be a way of controlling your life (cont3)	0.15	0.12	-0.05	-0.07	<b>0.72</b>
Preparing food for family is a sign of love (fam1)	<b>0.62</b>	-0.03	0.33	0.03	0.17
When children eat their mother's food, it makes them feel loved. (fam2)	<b>0.64</b>	-0.04	0.19	-0.02	0.26
Cooking food for others can be a sign of love.(fam3)	<b>0.72</b>	-0.09	0.21	-0.01	0.11
A nice meal is a good way to celebrate a special occasion (treat1).	0.13	-0.06	0.17	<b>-0.59</b>	-0.22
Eating nice food can make people feel special (treat2)	0.36	-0.05	0.01	<b>-0.62</b>	0.03
People can treat themselves by eating nice food (treat3)	0.23	0.03	-0.01	<b>-0.69</b>	-0.08
Food can make me feel less miserable (emot1)	-0.22	0.11	0.02	<b>-0.72</b>	0.26
Nice food can make me feel better about myself (emot2)	0.02	0.05	-0.01	<b>-0.68</b>	0.31
I eat food if I am bored (emot3)	-0.24	<b>0.54</b>	0.12	<b>-0.39</b>	-0.15
Eating some foods can make me feel guilty (guilt1)	0.02	<b>0.81</b>	0.07	-0.08	-0.04
Eating some foods can make me feel bad about myself (guilt2)	0.07	<b>0.91</b>	-0.06	0.06	0.01
Eating some foods make me feel shame (guilt3)	0.14	<b>0.86</b>	-0.09	0.13	0.05
Food is central to my social life (social1)	0.03	0.26	<b>0.41</b>	-0.13	0.02
Meal times are a good opportunity for talking to friends (social2)	0.03	-0.03	<b>0.89</b>	0.02	-0.02
Meal times are a good way of getting people together (social3).	0.01	-0.01	<b>0.87</b>	0.01	-0.03

Bold denotes factor loadings > 0.4

**Table 2: Principal components analysis (study 2, n=170)**

If I were trying to impress someone I was attracted to, I would cook nice food (sex 1)	-.072	.199	.016	.057	<b>.466</b>	-.051
If someone invited me for a special meal I would think they were attracted to me (sex 2)	.060	-.153	.035	.052	<b>.857</b>	.169
You can make someone realise you are attracted to them, by preparing them a nice meal (sex 3)	-.093	.245	-.105	-.223	<b>.714</b>	-.162
Refusing to eat food can be used as a sign of control (control life 1)	<b>.630</b>	-.007	.157	<b>.461</b>	.020	-.018
If I could control what I ate I would feel better about myself (control life 2)	<b>.830</b>	.041	.023	.074	-.097	-.041
When I feel out of control of my life I control what I eat in order to feel better (control life 3)	<b>.782</b>	.043	-.088	-.123	.049	-.141
What to choose to eat can be a way of controlling your life (control life 4)	<b>.741</b>	.015	.057	.257	.069	-.204
I sometimes feel out of control of what I eat? (contfd5)	<b>.705</b>	.042	-.016	.025	-.017	.216
If I can control my eating I feel more in control of everything else? (contfd6)	<b>.803</b>	.148	-.129	-.209	-.106	-.094
Controlling my food intake is sometimes hard? (contfd7)	<b>.576</b>	-.057	-.305	-.072	-.112	.186
Preparing food for family is a sign of love (fam 1)	.059	<b>.734</b>	-.023	.040	.089	.062
When children eat their mother's food, it makes them feel loved (fam2)	.101	<b>.845</b>	.008	.050	.009	.044
Cooking food for others can be a sign of love (fam3)	.052	<b>.739</b>	-.028	.068	.094	.030
A nice meal is a good way to celebrate a special occasion (treat 1)	-.053	-.009	-.282	.068	.094	.030
Eating nice food can make people feel special (treat2)	.214	.284	<b>-.600</b>	.032	-.019	-.199
People can treat themselves by eating nice food (treat3)	.004	-.040	<b>-.821</b>	.091	.118	-.178
Food can make me feel less miserable (emot 1)	.136	-.009	<b>-.744</b>	.029	-.053	.187
Nice food can make me feel better about myself (emot2)	-.150	.014	<b>-.771</b>	.160	-.045	.161
I eat food if I am bored (emot 3)	.195	-.231	-.342	.025	.010	.389
Eating some foods can make me feel guilty (guilt1)	<b>.573</b>	-.135	-.202	.040	.118	<b>.416</b>
Eating some foods can make me feel bad about myself (guilt 2)	<b>.641</b>	-.107	-.093	.042	.153	<b>.479</b>
Eating some foods make me feel shame (guilt 3)	<b>.564</b>	-.009	-.003	.048	.003	<b>.510</b>
Food is central to my social life (soc 1)	-.183	<b>.439</b>	-.025	.001	-.115	<b>.648</b>
Meal times are a good opportunity for talking to friends (soc 2)	-.126	.110	-.218	<b>.717</b>	-.137	.046
Meal times are a good way of getting people together (soc3)	.097	.092	.023	<b>.786</b>	.000	.003

Bold denotes factor loadings > 0.4