# Study 3: Social facilitation and longer-term energy intake (compensation study)

# 1. Aim

The primary aim of this lab-based study to establish the extent to which social facilitation effects on eating are compensated for by eating less across subsequent meals. We examined the amount of food that participants ate during a lunch meal which was consumed in the lab either with two friends (social condition) or alone (alone condition). Participants then completed food diaries for the remainder of that day (day 1) and across the following 3 days (days 2-4). We predicted that participants in the social condition would eat more during the lab session than participants in the alone condition, and this difference in intake would not be compensated for by eating less at subsequent meals. Hence we predicted that greater intake in the social meal group compared with the alone group would be observed *in total* at the end of Day 1 and across all four days.

# 2. Design

A between-subjects design was used in which participants were randomly allocated to either the ‘alone’ or ‘social’ condition **[Condition]**; those in the ‘alone’ condition ate the buffet lunch alone, while those in the ‘social’ condition ate with the two friends (also participants) with whom they had signed up to the study.

# 3. Measures

* Participants completed the following questionnaire measures:
* Appetite and liking ratings***.***Assessments of hunger, fullness, and “liking” for the test foods were taken using 100-mm Visual Analogue Scales (VAS) with anchors *Not at all* on the left and *Extremely* on the right. A composite ‘appetite’ score was calculated by taking the mean rating assigned to the ‘hunger’ VAS and the inverse rating assigned to the ‘fullness’ VAS (100-fullness) [**Before meal: Pre\_meal\_appetite; After meal: Post\_meal\_appetite**]. The liking VAS was anchored by *Didn’t like it at all* and *Liked it a lot* to the left and right of the scale, respectively. Liking ratings were averaged across all foods consumed during the lab session [**Mean\_Liking**].
* Overall meal enjoyment. A single item was used to assess how much participants enjoyed the overall meal experience (“how much did you enjoy the overall meal experience?”) with responses provided on a 100mm VAS scale ranging from ‘Not at all’ on the left to ‘Extremely’ on the right [**Overall].**
* Three-Factor Eating Questionnaire-18***.***The Three-Factor Eating Questionnaire Revised 18-item version (TFEQ-18, Karlsson, Persson, Sjöström, & Sullivan, 2000) was included to assess dietary restraint [**TFEQ\_Cognitive\_Restraint**], uncontrolled eating [**TFEQ\_Uncontrolled\_Eating**], and emotional eating [**TFEQ\_Emotional\_eating**]. Scores for each subscale were centred to enable us to explore whether TFEQ scores moderated effects of condition on food intake during the lab session [**Restraint\_centered, Uncontrolled\_centered, Emotional\_centered].**
* ***Food cravings***. Food cravings were assessed using the State General Food Cravings Questionnaire (G-FCQ-S, Nijs, Franken, Muris, 2007). Individuals are asked to indicate on a 5-point Likert scale (1=strongly disagree, 5=strongly agree) the extent to which they agree with each item “*right now, at this very moment*”. The G-FCQ-S assesses the following five factors: 1) desire to eat [**G\_FCQ\_S\_Desire**]; 2) anticipation of positive reinforcement [**G\_FCQ\_S\_positive**]; 3) anticipation of relief from negative states [**G\_FCQ\_S\_relief**]; 4) preoccupation with food or lack of control over eating [**G\_FCQ\_S\_preocc**]; and 5) physiological craving. A total craving score for each participant (i.e. summed across all five subscales) was also calculated [**G\_FCQ\_S\_TOTAL**].
* ***Friendship ‘closeness’.*** A measure of friendship closeness was taken before and after the lunch meal, using a 100mm Visual Analogue Scale in which participants were asked to draw a vertical line through the scale to indicate how close they feel to the two friends that they are taking part with. Participants were instructed to draw one line for each of their two friends that they were taking part with and these were averaged to provide a single closeness score. Closeness score ratings were taken before and after the meal [**Closeness\_pre\_av; Closeness\_post\_av**]. The change in closeness rating from before to after the meal was also calculated [**Closeness\_change**].
* ***Demand awareness***: participants were asked to write down what they thought were the aims of the study [**Aims**].
* ***Friend familiarity***: Participants were asked to write down how long they have known each of their friends with whom they had participated. Friendship duration (in months) was averaged across the two friends [**Average\_Friend\_Length**]. Participants also rated well they feel they know each friend (1-10 scale). These ratings were averaged across both friends [**Friend\_familiarity\_av**]. Friendship familiarity (i.e. average ‘how well’ ratings) was mean-centered to examine whether ratings moderated effects of condition on food intake during the lab session [**Familiarity\_cent**].
* **Mood.** Consistent with the cover story, mood assessments were taken using 100mm Visual Analogue Scales (VAS). Each scale was anchored with ‘Not at all’ on the left and ‘Extremely’ on the right [**Happy, Excited, Sociable, Anxious, Bored, Guilty**].
* **Demographics:** Age [**Age**], ethnicity [**Ethnicity**], Body mass index [**BMI].**

Food

Participants were provided with a buffet lunch comprising 1952 calories and 85g fat. Table 1 provides a full list of foods provided to each participant. Total calories consumed in the lab was calculated [**Lab\_kcals**]. The amount consumed (in grams) of each food was also recorded [**Quiche\_weight; Crisps\_weight;Chocolate\_weight; Pizza\_weight; Brownies\_weight\_Flapjacks\_weight**], and the total weight of food consumed in the lab was calculated [**Lab\_weight\_total**].

Table 1. *Foods provided during the buffet lunch (per participant).*

|  |  |  |  |
| --- | --- | --- | --- |
|  | Portion size | Calories (per 100g) | Fat (per 100g) |
| Tesco cheese & onion quiche | 200g | 262 | 17.4g |
| Tesco salted crisps | 25g | 544 | 33.2g |
| Cadburys dairy milk chocolate buttons | 60g | 535 | 30.0g |
| Tesco stuffed crust cheese pizza | 215g | 256 | 8.7g |
| Brownies | 50g | 394 | 15.0g |
| Flapjacks | 50g | 449 | 22.1g |

*Food diary*

Participants recorded everything that they ate and drank for the 4 days following their initial lab session, using MyFood24 software (version 1.0, 2016, University of Leeds, Leeds, UK). Due to high alcohol intake within student populations, calories consumed from alcohol were not included in the main analyses. However, the data includes daily calorie intake *including* and *excluding* calories from alcohol [**Day1\_Food\_diary\_kcals\_noalc; Day2\_Food\_diary\_kcals\_noalc; Day3\_Food\_diary\_kcals\_noalc; Day4\_food\_diary\_kcals\_noalc; Day1\_Food\_diary\_kcals; Day2\_Food\_diary\_kcals; Day3\_Food\_diary\_kcals; Day4\_food\_diary\_kcals**]. Total food diary calorie intake (excluding alcohol) was calculated [**Totalfooddiaryintake\_noalc**].

The data provides the total calories consumed at day 1 (i.e. calories consumed in the lab and day 1 food diary calories) excluding alcohol [**Day1\_TOTAL\_kcals\_noalc**], and at the end of the four days [**Total\_intake\_noalc**]. Total calorie intake *including* alcohol are also included for Day 1 only [**Day1\_TOTAL]** and across all four days [**Total\_intake**]. Two participants were identified as outliers having consumed over 1837 kcals on day 1 (excluding calories consumed within the lab) **[Outliers]**. These participants were *not* included in the main analyses.

After participants had submitted their food diary, they were automatically directed to a follow-up questionnaire in which they were asked to record how many people they ate with during each meal or snack. The total number of social meals and snacks consumed across all four days were calculated to examine whether participants differed, between conditions, with regards to the number of meals they ate socially following the lab session [**Total\_Social\_Meals**].

# 4. Procedure

Participants attended the lab between 12-2pm, to coincide with normal lunch hours, and were instructed to refrain from eating or drinking any calorie-containing drinks for at least three hours before the start of their session. Participants were randomly allocated to either the ‘alone’ or ‘social’ condition; those in the ‘alone’ condition ate the buffet lunch alone, while those in the ‘social’ condition ate with the two friends with whom they had signed up to the study.

Before the meal, participants completed VAS measures of hunger, fullness, and friendship ‘closeness’, and completed the G-FCQ-S. They were then provided with the buffet lunch and instructed to eat as much as they wished. Meal duration [**Meal duration**] was covertly recorded by the researcher, and foods were covertly weighed before and after eating to determine food intake. Following the meal, participants completed VAS measures of appetite, food liking, mood, overall meal enjoyment, and friendship closeness. All participants were seated in separate rooms, away from their friends, to complete the questionnaires. Following this, participants were shown how to record their food intake using the MyFood24 software. They were instructed to record everything that they ate and drank for the remainder of that day (i.e. day 1), and for the following 3 days (i.e. days 2-4).

At least four days following the first lab session, participants returned to the lab to complete the following assessments: 1) Demand characteristics. Participants wrote down what they thought the aims of the study were; 2) Dietary restraint, uncontrolled eating, and emotional eating, assessed using the TFEQ-18 (Karlsson et al., 2000); 3) Friendship familiarity. Participants were asked to write down how long they have known each of their friends with whom they had participated (open ended question), and how well they feel they know these friends (1-10 scale); 4) Other demographics: Age, ethnicity. Height, and weight was then taken by the researcher to calculate BMI, and participants were fully debriefed as to the true aims of the study.