Reasons for eating 'unhealthy' snacks in overweight and obese males and females.

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Abstract

Background: Snack foods are often high in fat and sugar. Thus reducing snack consumption may be a useful weight management strategy. However, individuals may snack for a variety of reasons with different implications for intervention. The current study examines perceived reasons for eating main meals, 'unhealthy' snacks (i.e. snacks high in fat or sugar) and 'healthy' snacks in overweight and obese participants.

Method: Over a period of 5 days, 28 males and 27 females completed a food diary every time they ate. As well as providing details about the type of eating episode and food eaten, they also rated their agreement with 13 different reasons for eating (identified from relevant literature and a pilot study).

Results: Across a total of 1084 eating episodes, 358 were coded as snacks, 79% of which were high in either fat or sugar. Results showed that hunger and temptation (external eating) were reported as a reason for eating unhealthy snacks in 49% and 55% of all episodes respectively. Eating because the individual was feeling fed up, bored or stressed (emotional eating) was given as a reason in 26% of episodes

Conclusion: These findings point to the potential utility of intervention strategies that target cravings, enhance self-control or promote stimulus control.

1. Introduction

Snack consumption has increased significantly in recent years (Zizza, Siega-Riz & Popkin, 2001). Given that snack foods tend to be high in fat and sugar this has implications for weight gain and obesity (Bes-Rastrollo et al., 2010). Cutting back on snacks may therefore help with weight loss. However, if we are to encourage reduced snacking as a weight loss strategy it is important to understand overweight and obese individuals' reasons for snacking. Superficially it might seem that the most likely reason for snacking is hunger. However, research indicates that eating is not always preceded by hunger. For example, Tuomisto, Tuomisto, Hetherington and Lappalainen (1998) employed a diary methodology to examine reasons for eating among 114 male and female obese participants. The diary contained 26 different reasons to start eating and participants were asked to mark the primary reason for each eating episode over a 24-hour period. The results showed that hunger was selected in just 21% of cases. In contrast, time of day, or habitual patterns was the most common reason, cited in 46% of episodes. That eating often occurs for reasons of habit is also supported by other studies conducted with both female undergraduate students (Adriaanse, de Ridder & Evers, 2011) and a community sample (Verhoeven, Adriaanse, Evers & de Ridder, 2012).

Other frequently cited reasons for eating in the literature include external eating (eating in response to food cues) and emotional eating (eating in response to stress and other negative emotions). In the study conducted by Tuomisto et al., (1998), external eating accounted for approximately 10% of eating episodes. Emotion-related reasons were cited as the primary reason for eating in just over 2% of episodes. However, other research suggests that emotional eating may be more common than this. For example, both laboratory and diary studies have shown that stress and other negative moods can increase the desire to eat (Kubiak, Vogele, Siering, Schiel & Weber, 2008; Hill, Weaver & Blundell, 1991; Macht & Simons, 2000) and the amount eaten (O'Conner, Jones, Ferguson, Conner & McMillan, 2008; Greeno & Wing, 1994; Zellner et al., 2006) as well as ones preference for less healthy foods (Greeno & Wing, 1994; O'Conner et al., 2008; Oliver & Wardle, 1999; Oliver, Wardle & Gibson, 2000; Zellner et al., 2006). There is also evidence to suggest that females and individuals who are obese are more prone to eating unhealthy snacks in response to stress (O'Conner et al., 2008; Zellner, Saito & Gonzalez, 2007). Additionally, questionnaire measures of emotional eating tend to correlate with BMI and weight gain (Blair, Lewis & Booth, 1990; Delahanty, Williamson, Meigs, Nathan & Hayden, 2002; Hays et al., 2002; Koenders & Van Strien,

2011). However, recent research suggests that such self-report measures may reflect an individual's concerns over their eating rather than be an accurate reflection of emotional eating per se (Adriaanse et al., 2011; Evers, de Ridder & Adriaanse, 2009; Jansen et al., 2011). Thus although people do seem to eat in response to stress and other negative emotions, the extent to which they do so relative to other reasons in unclear. Finally, there is evidence to suggest that individuals also eat for social reasons such as wanting to be polite, or simply wanting to be sociable. Tuomisto et al. (1998) noted such reasons were cited as the primary reason for eating in approximately 4% of cases.

Any research examining reasons for eating also needs to consider sex differences since there is evidence to suggest that males and females may eat for different reasons. In particular males report more environmental reasons, as well as bodily sensations and hunger, and females report more thoughts, cognitions and social reasons for initiating eating (Tuomisto et al., 1998) as well as higher levels of emotional eating (Conner et al., 1999; Larsen et al., 2006, though see also Adriaanse et al., 2011; Evers, de Ridder & Adriaanse, 2009; Jansen et al., 2011).

In terms of weight loss intervention, it is important to establish the relative frequency of these different reasons for eating, amongst both males and females, since they will have different implications for strategies that are employed. For example, strategies that may be effective for altering non-habitual behaviours are unlikely to work if applied to habits, and vice versa (van't Riet, Sijtsema, Dagevos & De Brujin, 2011). In order to devise effective interventions we need to ensure that the strategies employed are appropriate to overweight and obese individuals' reasons for eating.

However, we also need to ensure we are targeting eating behaviours that are relevant to weight loss. For example, the study conducted by Tuomisto et al. (1998) did not distinguish between 'healthy' versus 'unhealthy' foods. Reasons for eating foods such as fruit may be quite different from reasons for eating foods such as chocolate, and clearly, from a weight loss perspective, it would be more important to try to reduce consumption of the latter. Tuomisto et al. (1998) also failed to distinguish between meals and snacks. Again this is important since arguably reasons such as habit may be more likely to apply to mealtimes than to between-meal snacks and whilst a reduction in snacking might be an appropriate weight loss strategy it is less likely that one would want to promote meal skipping. The study population is also relevant. Many studies examining predictors of unhealthy snacking have included participants of normal weight (e.g. Adriaanse et al., 2011;

Verhoeven et al., 2012). However, reasons for eating amongst those of normal weight may be quite different from reasons amongst those who are overweight, and again, from an intervention perspective, the latter will be most important.

The current study aimed to address these gaps in the literature by examining the relative frequency of different perceived reasons for eating main meals, 'healthy' snacks and 'unhealthy' snacks amongst overweight and obese males and females. It also explored potential sex differences. Thus in contrast to previous studies, the data obtained in the present study should be more directly applicable to weight loss intervention.

2. Method

2.1 Participants

Participants were recruited from staff and students at two UK higher education colleges and consisted of 28 males and 27 females aged 25 to 64 years (M=41.65, SD=11.30) with BMIs of between 25 and 41 (M=29.05, SD=3.48). Nineteen participants (35%; 5 males and 14 females) were attempting to lose weight. All had English as a first language and were free from medical or physical conditions (including pregnancy) that might affect what they ate. Participants were informed that the study aimed to examine people's different reasons for eating. As an incentive to take part, at the end of the study participants were entered into a prize draw to win £100 worth of vouchers and also received an 'eating behaviour profile' which gave a brief summary of the individual data they had provided. Informed consent was obtained from all participants and the study was approved by the Swansea University Psychology Department Ethics Committee.

2.2 Diary measure

Participants completed a paper and pencil food diary every time they ate for a period of 5 days (three weekdays and two weekend days). They were asked to keep the diary with them at all times and to record details of what they had eaten immediately after each eating episode. Initial questions for each eating episode asked participants to record time of day, time started eating, time finished eating, location, what was eaten, and type of eating episode (e.g., breakfast). Participants were then provided with 13 reasons for eating (see Table 2) and were asked to rate the extent to which they agreed or disagreed with each of these reasons, on a 5-point scale. Participants also recorded

additional information in the diary, not analysed in the current study. The reasons were drawn from relevant literature (e.g., Geliebter and Aversa, 2003; Mela, 2001; Nguyen-Rodriguez et al., 2008; Spoor et al., 2007; Tomiyama, Mann and Comer, 2009; Tuomisto et al., 1998; Young et al., 2009), together with the results of a pilot study in which 23 participants (15 female and 8 male) kept a 24-hour food diary and recorded open-ended reasons for each eating episode.

2.3 Procedure

At their first appointment participants provided some background information, had their weight and height measured and were given the food diary along with written and verbal instructions on how to complete it. Half the participants completed the diary Saturday to Wednesday, and the other half Wednesday to Sunday. After completing the diary participants returned to the laboratory where they completed a battery of questionnaires including the Eating Disorder Examination Questionnaire (EDE-Q; Fairburn and Cooper, 1993) and the Binge Eating Scale (BES; Gormally, Black, Daston and Rardin, 1982). All data were analysed using IBM SPSS Statistics 19.0 and 20.0.

2.4 Data screening and coding

Participants were screened for eating disorders using the EDE-Q and the BES. There were no participants who scored within the clinically disordered eating range on the EDE-Q or showed more than a low-moderate level of severity of binge eating on the BES. As such no participants were excluded on this basis.

Of the 55 participants that were included in the analysis, one participant completed the diary for only four of the five days. The 55 participants provided data for a total of 1084 eating episodes. In 23% of these eating episodes participants had recorded the details immediately, in 9% they recorded them within the first 5 minutes, in 22% within 30 minutes, in 10% within 1 hour, and in 18% over 1 hour. In 18% of episodes participants failed to record time of diary completion.

Snacks were defined as in-between meal food items or snacking during food preparation. For each eating episode participants recorded whether it was a snack or a main meal (i.e. breakfast, lunch or dinner/tea). Eating episodes categorised by participants as snacks were coded as ‘unhealthy’ where they were high in either fat and/or sugar. Since fat and sugar are high in calories, such snacks are likely to contribute to weight gain and obesity (Zizza, Siega-Riz & Popkin, 2001). Levels of fat and

sugar for each snack food item were determined using McCance and Widdowson's Composition of Foods Atlas (Food Standards Agency, 2002), or relevant brand and supermarket websites. An online database (http://nutritiondata.self.com) was also consulted where necessary. In line with Food Standards Agency guidance (http://www.eatwellscotland.org/healthydiet/fss/index.html) high fat foods were defined as those that contained more than 20 g of fat per 100 g and high sugar foods were defined as those that contained more than 15 g of sugar per 100 g. Where an eating episode consisted of more than one food item, each item was coded separately with the coding for the eating episode being determined by the food that was highest in fat/sugar. Following coding of data by the first observer, 10% of data were randomly selected for independent coding by a second observer. Inter-observer agreement showed a Cohen's Kappa coefficient of 0.97.

3. Results

3.1 Description of eating episodes

Of the 1084 eating episodes recorded, 67% were main meals and 33% were snacks. Of these snacks, 79% were coded as 'unhealthy' (i.e. high in fat and/or sugar) and 21% as 'healthy' (i.e. not high in fat or sugar). These proportions were similar for both males and females. Four hundred and seventy-seven unhealthy snacks were reported. Of these, 35% were biscuits, 14% were chocolate sweets, 9% were crisps, 8% cake, 4% chocolate bars, 3% nuts, 3% chunks of cheese, 2% pork pies and 1% packets of sweets. The remaining 14% included items such as pizza, sandwiches, pastries and ice cream. Of the healthy snacks, 85 food items were reported, 46% of which were fruit. Examination of the mean number of main meals and snacks per day showed that for all participants, across the 5 days, 52 episodes of breakfast were either skipped or not recorded, 38 episodes of lunch and 21 episodes of tea/dinner. Eight episodes were not categorised. Put another way, 27 participants skipped/did not record at least one episode of breakfast over the 5 days, 19 participants skipped/did not record at least one episode of lunch and 17 skipped/did not record at least one episode of tea/dinner. Over the 5 days the mean number of unhealthy snacks consumed was 4.63 (SD=3.51) for males and 6.19 (SD=2.83) for females, for healthy snacks it was 1.84 (SD=1.07) for

males and 2.28 (SD=1.56) for females, and for main meals it was 13.18 (SD=2.06) for males and 13.22 (SD=1.93) for females.

In terms of location, the majority of main meals were consumed either at home (65%) or work (9%), with the remainder being eaten at a restaurant, café or pub (9%), at another's home (6%), en route (2%) or elsewhere. The majority of snacks were also eaten either at home (55%), or at work (21%) with the remainder being eaten en route (7%), at a restaurant or café (5%), at another's home (4%) or elsewhere. These figures were similar regardless of whether the snack was healthy or unhealthy. Again, the proportions (for both main meals and snacks) were similar for males and females.

3.2 Sample descriptives

Demographic and questionnaire data for males and females are displayed in Table 1. Compared to males, females reported significantly higher levels of binge eating, food cravings, perceived stress and DEBQ reported levels of emotional eating, external eating and restraint. There were no sex differences in age, BMI or total leisure time activity.

3.3 Perceived reasons for eating main meals and snacks

Data for each of the reasons for eating were re-coded so that ratings that represented disagreement and neutral responses (i.e. ratings 1-3) became '0' and ratings that represented agreement became '1'. Table 2 shows the percentage of main meals, healthy snacks and unhealthy snacks for which participants agreed with each of the 13 reasons for eating. As shown in Table 2, the most common single reason given for eating unhealthy snacks (55%) was because they looked or smelt so tempting. Hunger was also cited in nearly half of all episodes (49%), and wanting to avoid being hungry later in 22% of episodes. Similarly, eating because the individual felt they needed energy was reported in 23% of episodes. Reasons that suggest eating out of habit (time of day and not recalling deciding to eat) were reported in 18% and 9% of episodes respectively. Emotional eating, i.e. eating in response to feeling fed up, bored or stressed, was reported in 10-19% of episodes. Eating for social reasons (to keep others company or out of obligation) were reported in 19% and 5% of episodes respectively. Finally, in 8% of episodes participants said they ate because they wanted to avoid food going to waste and in 19% of episodes they said they couldn't stop thinking about food.

Reasons cited for eating healthy snacks were similar, though with reasons relating to hunger being cited slightly more often (60% compared to 49% respectively for feeling hungry and 32% compared to 22% respectively for avoiding hunger). Unsurprisingly, external eating was cited less frequently as a reason (45% compared to 55%).

In contrast, perceived reasons for eating main meals were quite different from reasons for eating unhealthy snacks. Reasons relating to hunger and time of the day were cited in greater proportions of main meal episodes compared to unhealthy snack episodes (e.g., 'feeling hungry' was cited as a reason in 79% of main meal eating occasions compared to 49% of unhealthy snack eating occasions. Likewise, time of the day was cited as a reason in 75% of main meal eating occasions but only 18% of unhealthy snack occasions). Interestingly, participants were less likely to report eating automatically in response for main meals compared to unhealthy snacks (1% compared to 9%). Eating for social reasons were also slightly higher for main meals compared to snacks (e.g., 13% compared to 5% respectively for feeling obliged to eat). In contrast, participants were less likely to report reasons relating to external eating or emotional eating for main meals compared to unhealthy snacks (e.g., 39% compared to 55% respectively for external eating, 6% compared to 19% respectively for 'feeling fed up').

In order to explore sex differences in perceived reasons for eating unhealthy snacks, mean ratings for each reason were first computed for each individual. (Two individuals consumed no unhealthy snacks over the 5-day period and were therefore excluded from this analysis). Overall mean ratings were then computed for males and females separately, and t-tests were used to explore differences. Table 3 shows that compared to males, females gave significantly higher ratings for eating unhealthy snacks for social reasons (to keep others company, 2.06 compared to 1.42; out of obligation, 1.50 compared to 1.19, for females versus males respectively) and in response to stress (1.71 compared to 1.26 for females versus males respectively). There were no other significant differences between males and females.

4. Discussion

In line with previous research (Ovaskainen et al., 2006) our results showed that the majority of snacks (79%) were high in either fat or sugar. This confirms the importance of targeting snacking behaviours in weight loss intervention.

The most common perceived reason for eating unhealthy snacks, cited in over half of all instances, was 'because the food looked or smelt so tempting'. This figure is considerably higher than the 10% reported by Tuomisto et al., (1998). However, as noted previously, the data analysed by Tuomisto et al. correspond to primary reasons provided by participants (i.e. one reason per eating episode) whereas in the current study participants were asked to record all reasons (i.e. multiple reasons per eating episode). The high proportion of episodes for which external eating was reported as a reason in the current study points to the potential utility of intervention strategies that target cravings (e.g., Andrade, Pears, May & Kavanagh, 2012), enhance self-control (e.g., Muraven, 2010; Stadler, Oettingen & Gollwitzer, 2012; see also Johnson, Pratt & Wardle, 2012) or promote stimulus control (e.g., Sun, Prochaska, Velicer & Laforge, 2007, though see van't Riet et al., 2011).

The next single most commonly cited reason for eating unhealthy snacks was hunger, reported as a reason in 49% of cases. Again, this is considerably higher than the 21% reported by Tuomisto et al., (1998) so it is important to note that although our data indicate that hunger was a reason for unhealthy snack intake in nearly half of all episodes, it was not necessarily the primary reason.

Nevertheless, from an intervention perspective these results suggest that weight loss programmes that help limit hunger (e.g. see Jakubowicz, Froy, Wainstein & Boaz, 2012; Touyarou, Sulmont-Rosse, Gagnaire, Issanchou & Brondel, 2012) may be successful at reducing consumption of unhealthy snacks.

Tuomisto et al., (1998) found that the most frequently given reasons for eating (being cited in 46% of episodes) related to time of day (it being a mealtime, or 'because of a regular lifestyle', p.215). In the current study, according to participants, only 18% of unhealthy snacks were eaten because the individual usually ate at that time. This is in contrast to the fact that time of day was a reason in 75% of main meal episodes. These figures show that unlike main meals, unhealthy snacks are less likely to be part of the individual's regular eating routine. Since repetition in stable contexts (Verplanken & Orbell, 2003; Wood & Neal, 2007) is a characteristic of habitual behaviour we might conclude that whilst main meals are eaten out of habit, unhealthy snacks are not. However, frequent repetition does not always mean a behaviour is habitual (Verplanken, 2006). An important characteristic of habits is that they are carried out automatically, with little cognitive awareness. We explored automaticity with the item 'I don't recall deciding to eat – I just found myself eating'. This statement was true for only 1% of main meals episodes, suggesting that despite their regularity it is possible that they were not carried out automatically. Indeed, this figure was higher for episodes of unhealthy snacking, with this being given as a reason in 9% of episodes. These results provide some support for research showing habit to be a predictor of unhealthy snacking (Adriaanse et al., 2011; Verhoeven et al., 2012). However it should be noted that these studies have relied on a measure of habit that includes items that assess repetition as well as automaticity and the relative contribution of each is unclear. Equally, the single item employed in our study to assess automaticity is unlikely to perfectly capture what is arguably a very complex construct. As such, the extent to which eating is truly habitual is unclear. Although many eating episodes may be repeated in stable contexts, it is possible that the decision to initiate eating is rarely automatic. Given its implications for intervention (van't Riet et al., 2011) it is important that future research address this issue.

Compared to Tuomisto et al. (1998) we found more evidence for eating in response to negative emotions (10-19% for unhealthy snacks in our study compared to 2% according to Tuomisto et al.). These differences are probably partly due to the different items used to assess emotional eating ('I

wanted to relax' and 'I had problems' in Tuomisto et al., p.215, versus items relating to feeling fed up, bored and stressed in the current study). They are probably also due to the fact that Tuomisto et al. did not distinguish between different types of eating episodes. Since the present study indicated that 67% of all eating episodes were main meals, it is likely that the majority of episodes in the study conducted by Tuomisto et al. also related to main meals. Our data indicate that emotional eating was less likely for main meals (3-6%) compared to unhealthy snacks (10-19%) and supports other studies that have shown that negative moods can increase the desire to eat (Kubial et al., 2008; Hill et al., 1991; Macht & Simons, 2000) as well as preference for unhealthy foods (Greeno & Wing, 1994; O'Conner et al., 2008; Oliver & Wardle, 1999; Oliver et al., 2000; Zellner et al., 2006). Given the reasonably high levels of emotional eating for unhealthy snacks (26% overall), interventions that address these reasons (e.g., Tapper et al., 2009) may be helpful for weight management.

According to our results, in a significant proportion of episodes of unhealthy snack consumption (19%), participants reported eating to keep others company, and in smaller proportion (5%) because they felt obliged to eat. Again, these figures are higher than the 4% reported by Tuomisto et al., likely due to the fact that participants in the current study were able to cite multiple causes rather than just one. Our figures highlight the fact that eating is often a social act. In this respect, weight management interventions that provide individuals with strategies to employ in social situations may be helpful.

Finally, in a proportion of episodes of unhealthy snack consumption (8%), participants cited not wanting food to go to waste as a reason. In a larger proportion (19%), participants reported eating because they could not stop thinking about food. This latter figure suggests that preoccupation with food was an important factor for our participants and is consistent with previous research showing associations between dieting status and food preoccupation (Tapper & Pothos, 2010). Interventions that attempt to break links between food-related thoughts and behaviours may therefore be helpful (e.g., Tapper et al., 2009; Jenkins & Tapper, 2013).

As well as providing data on reasons for eating unhealthy snacks, the study also examined reasons for eating healthy snacks (Table 2). Although fewer healthy compared to unhealthy snacks were consumed (75 compared to 283), interestingly the reasons for eating were very similar. This raises

the possibility that when it comes to eating behaviours, type of eating episode may be a more important correlate of perceived reasons for eating than type of food consumed.

Our results showed that compared to males, females were more likely to report eating unhealthy snacks because they were feeling stressed. This is in line with data from the DEBQ questionnaire that showed higher levels of emotional eating amongst females compared to males (see Table 1) as well as with results of previous studies (Pine, 1985; Van Strien et al., 1986; Wardle, 1987; Grunberg & Straub, 1992; Conner et al., 1999; Oliver & Wardle, 1999; Larsen et al., 2006; Burton et al., 2007; O'Connor et al., 2008). Females were also more likely to report eating unhealthy snacks because they were feeling fed up or bored, but these differences failed to reach statistical significance. Women were significantly more likely to report eating for social reasons compared to men. However, it should be noted that in only one of the 13 reasons provided did males give higher ratings than females ('…because I usually eat at this time') suggesting that overall females may have more insight into their reasons for eating, or are simply more likely to report a wider range of reasons for eating. This is consistent with the fact that females scored significantly higher than males on all eating-related questionnaire measures (see Table 1). Given evidence to indicate that self-report of emotional eating may be a reflection of concerns over eating behaviour (Adriaanse et al., 2011; Evers, de Ridder & Adriaanse, 2009; Jansen et al., 2011) it is possible that these sex differences represent differences in attitudes towards eating rather than real differences in causal factors.

It is important to acknowledge the limitations of the present study. Given that the data were all based on self-report, they may not always reflect the true reasons if participants lacked insight into these. For example, Tuomisto et al. (1998) have argued that where a number of cues other than hunger have preceded meals and mealtimes, these may become associated with hunger, leading people to believe that the reason they are eating after exposure to these cues is actually due to hunger. Similarly, given that in the present study females tended to report higher levels for all reasons for eating compared to males (see also Table 1), it seems likely that there are sex differences in the ways in which males and females report their reasons for eating. Nevertheless, these limitations need to be balanced by the high level of ecological validity. Indeed, it would be difficult to examine the relative frequencies of different reasons for eating without the use of self-report data.

With regard to those meals that were not recorded in the diary, it is unclear whether participants skipped these meals or simply forgot to record them. If participants forgot to record eating episodes, it is possible that they differed in some way to those they did record. In particular, they may have been eating episodes that were more habitual. As such, the results of this study may underestimate the degree to which individuals eat for reasons of habit. Future research would benefit from detailed questioning of participants on the return of the diaries.

4.1 Conclusion

To conclude, understanding the perceived reasons for unhealthy snacking in overweight/obese individuals is essential for the development of weight loss and weight maintenance interventions. Since individuals may not necessarily have a clear insight into the reasons for their behaviours, self-report data will always need to be treated with caution. Equally however, data collected in the laboratory will be unable to inform us about the relative frequency of different types of behaviours in the real world. In this study we used a diary methodology to enable participants to report on their reasons for eating as close as possible in time to the actual eating occasion in attempt to enhance the accuracy of the data and provide some initial evidence on the relative frequencies of different types of eating. Our results highlight the importance of hunger and temptation (external eating) as the most common causal factors in unhealthy snack consumption for both men and women, pointing to the potential utility of intervention strategies that target cravings (e.g., Andrade, Pears, May & Kavanagh, 2012), enhance self-control (e.g., Muraven, 2010; Stadler, Oettingen & Gollwitzer, 2012) or promote stimulus control (e.g., Sun, Prochaska, Velicer & Laforge, 2007).

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Conflict of Interest

All authors declare they have no conflict of interest.

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Table 1. Means (SDs) for male and female demographic and questionnaire data together with results from independent t-tests.

Characteristic	Male (n=28)	Female (n=27)	t-value
Age	41.14 (11.72)	42.19 (11.04)	0.34 (ns)
BMI	29.17 (3.61)	28.93 (3.4)	0.25 (ns)
Binge Eating Scale (BES)	7.71 (5.42)	12.30 (5.18)	3.20*s
Food Cravings – Trait Questionnaire (FCQ-T)	44.18 (15.83)	65.04 (19.03)	4.43*
Perceived Stress Scale (PSS)	36.14 (6.82)	40.78 (8.51)	2.23*
DEBQ Emotional Eating	1.93 (0.68)	2.96 (0.69)	5.58*
DEBQ External Eating	2.99 (0.57)	3.40 (0.57)	2.69*
DEBQ Restraint	2.53 (0.77)	2.92 (0.62)	2.07*
Total Leisure Time Activity	38.44 (30.36)	28.50 (16.36)	1.48 (ns)

* $p < .05$

Table 2. Percentage of main meals, 'healthy' snacks and 'unhealthy' snacks for which participants agreed with each of the reasons for eating.

Reason: I decided to eat…	Main meals (n=726)	'Healthy' snacks (N=75)	'Unhealthy' snacks (N=283)
Hunger / energy			
…because I was feeling hungry	79	60	49
…to avoid being hungry later	60	32	22
…because I felt I needed the energy	48	19	23
Habit			
…because I usually eat at this time	75	24	18
I don't recall deciding to eat – I just found myself eating	1	5	9
External eating			
…because the food looked/smelt so tempting	39	45	55
Emotional eating			
…because I was feeling fed up	6	17	19
…because I was feeling bored	3	16	15
…because I was stressed	4	7	10
Social			
…to keep somebody else/other people company	26	11	19
…because I felt obliged to	13	4	5
Other			
…because I wanted to avoid food going to waste	11	11	8
…because I couldn't stop thinking about food	14	24	19

Table 3. Mean (SD) agreement ratings on a scale of 1-5 (1= disagree a lot, 5=agree a lot) of different reasons for eating 'unhealthy' snacks among males and females.

Reason: I decided to eat…	Males (n=27)		Females (n=26)		t-value
	Mean	SD	Mean	SD	
Hunger / energy					
…because I was feeling hungry	2.86	1.44	3.01	(1.13)	0.44 (ns)
…to avoid being hungry later	1.86	1.15	2.20	(0.93)	1.18 (ns)
…because I felt I needed the energy	2.10	0.97	2.12	(1.01)	0.08 (ns)
Habit					
…because I usually eat at this time	1.81	1.17	1.78	(0.69)	0.12 (ns)
I don't recall deciding to eat – I just found myself eating.	1.25	0.63	1.62	(0.85)	1.81 (ns)
External eating					
…because the food looked/smelt so tempting	3.10	1.14	3.43	(0.82)	1.24 (ns)
Emotional eating					
…because I was feeling fed up	1.63	0.88	1.97	(1.05)	1.28 (ns)
…because I was feeling bored	1.70	0.91	1.91	(0.86)	0.86 (ns)
…because I was stressed	1.26	0.52	1.71	(0.93)	2.19[a]
Social					
…to keep somebody else/other people company	1.42	0.67	2.06	(1.03)	2.65[b]
…because I felt obliged to	1.19	0.39	1.50	(0.70)	1.96[a]
Other					
…because I couldn't stop thinking about food	1.52	0.88	1.92	(1.11)	1.45 (ns)
…because I wanted to avoid food going to waste	1.33	0.62	1.48	(0.67)	0.83 (ns)

[a] $p < 0.05$

[b] $p < 0.01$