How Do Different Types of Food Affect Positive Mood in the Workplace?

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Introduction

The importance of studying the effect of different types of food on mood, especially at work, has become greatly needed over recent years; this is in great part due to the link between positive mood and different types of organisational spontaneity (giving help to other colleagues, keeping an eye on the organisation's safety, making valuable propositions, developing one's own performance, and fostering goodwill) (e.g., Tugade & Fredrickson, 2007).

Food can be divided into three main food groups: carbohydrates, fats, and proteins (McCrory et al., 1999). There are various forms of carbohydrates: complex carbohydrates (also known as polysaccharides; poly= many and saccharide= sugar) like potato and bread, simple carbohydrates (also known as monosaccharide; mono= one and saccharide= sugar) like candies, and fibers like wholemeal cereals. Fats are made of essential fatty acids like omega-3, omega-6, linoleic and α-linolenic, and sources of fatty acids include fish such as Atlantic mackerel and shrimps. Finally, proteins contain essential nutrients for the body, and sources of protein include milk and cheese (Dunne, 2012).

Some researchers suggest that mood affect food choices (Gardner, Wansink, Kim, & Park, 2014; Macht, 2008), however there is an overall consensus amongst researchers that food precedes mood in the chronological order of the food–mood liaison (Carr, Bozonet, Pullar, & Vissers, 2013; Gardner et al., 2014; Hendy, 2012; Meyer et al., 2013). Mood is defined as the current psychosomatic state (persistent or short-term) (Hakkarainen et al., 2004) or as the prolonged emotion that affects a person's awareness, reasoning, and judgment (Nowlis, 1965). Research suggests that positive and negative moods not only bias a person's perceptions of the world and the environment, but they can also influence a person's behaviour as a result of these perceptions.

Objectives

It is surprising to note that, despite the recognised effects that different types of food have on mood in general, and despite the substantial evidence demonstrating the effect of mood on productivity and organisational spontaneity, little research has been dedicated to study the effect of food on employees' mood in the setting of work. The investigation of the effect of food on mood, specifically at work, is therefore greatly needed to enhance our academic understanding of how food affects mood and hence affects employees' productivity in the workplace; and to give recommendations to business owners on the types of food that should be offered in the workplace to enhance mood and optimise employees' work performance .

The present study aims to address this need, by investigating whether consuming carb-based foods, protein-based foods, fat-based foods, and not consuming any food have different effects on the mood of working individuals. Previous investigations have examined the effect of beverage consumption on mood in the workplace (Bryan et al., 2012) and the effect of food on mood in an experimental laboratory (Benton, 2014; Benton & Brock, 2009; Benton, Slater, & Donohoe, 2010; Carr et al., 2013; Gardner et al., 2014; Grose & Altman, 2010; Pouwer et al., 2005). Most of the studies looking at the relationship between food and other emotional outcomes have applied the "short-term laboratory-based intervention" method. Even though the results of such studies have high internal reliability, whether or not their findings can be generalised to the more complicated psychological needs of daily life remains uncertain. This is the first study to look at the effect of food on mood in the naturalistic context of work..

Methods

Since the present study drew on a quantitative research design, the best option was the use of a probability sampling technique like the simple random sampling, as this technique permits the researcher to make statistical inferences (i.e., generalisations) from the chosen sample (Berger & Zhang, 2005). Over 300 employees were randomly selected and they were asked to fill out a food survey during midday (12 pm to 1:30 pm). 246 employees out of the 300 chosen were interested in the study and filled the survey (82% response rate). Out of the 246 employees subjects, 28 participants' answers were excluded. These participants have completed the study before 12 pm or after 1:30 pm and thus did not meet to the time-frame requirement which could have biased the results. The final sample included 218 subjects (age: 43 ± 9 (mean $\pm$ SD), range: 18-61; gender: 108 females, 110 males; nationality: 80 Lebanese, 50 UK, 35 English, 20 Polish, 10 American, 10 Jordanian, 8 Danish, and 5 Spanish).

Different assessment tools included in the survey were used to collect the data. All measures were taken during midday (from 12 pm to 1:30 pm):

Food Intake (IV, independent variable): Subjects were required to write down everything they ate from the morning until midday. Using the Food Pyramid guide, the food they consumed was later divided into 4 categories: "no food", "high-in carbohydrates foods", "high-in protein foods", and "high-in fat foods" (USDA, 2005).

Mood (DV, dependent variable): the *BMIS Mood Introspection Scale (pleasant-unpleasant)*, a 16-item factor-valid scale, was used. Participants were given a list of 16 terms which described their current mood (*lively, happy ¸ sad, tired, caring, content, gloomy , jittery(anxious), drowsy, grouchy , peppy, active, fed up, loving, calm, and nervous*) and they were asked to circle the number that reflected how they felt right at that moment (i.e., midday) *(XX= definitely do not feel, X= do not feel, V=slightly feel, VV= definitely feel)*. The scale used has high internal validity (Cronbach's α ranged from 0.76 to 0.83) (Mayer & Gaschke, 1988).

Fatigue/Exhaustion (CV, Confounding Variable): Fatigue and exhaustion levels were assessed via the 8-item measure created by van Gelderen, Heuven, van Veldhoven, Zeelenberg, and Croon (2007). Subjects rated the extent to which different statements were true for them, on a scale of 1 = "Yes, that is true" to 7 = "No, that is not true". Participants had to rate 8 items: "*I feel tired*", "*physically, I feel exhausted*", "*I feel fit*", "*I feel powerless*", "*I am rested*", "*physically, I feel I am in bad form*", "*I get tired easily*", and "*physically, I feel I am in an excellent condition*"). Potential scores ranged from 8–26 (normal), 27-35 (elevated) and 36-56 (severe), with higher scores reflecting advanced levels of fatigue. This scale also has high internal validity (Cronbach's α = .68) (Bryan et al., 2012).

Caffeinated-Beverage Consumption (CV, Confounding Variable): Participants were asked to answer a *one-item general self-rating question*: "have you had any tea, coffee, energy drink, hot chocolate, or soft drink from the time you woke-up till midday (now)?" (Bryan et al., 2012).

Results

A one-way analysis of covariance (ANCOVA) was administered for this research. The independent variable, food, included four levels: no food, carb-based food, protein-based food, and fat-based food. The dependent variable was employees' mood and the covariates were fatigue levels and caffeine consumption. ANCOVA was found to be significant: $F(3, 212) = 15.223$, $p < .001$. The measure of association $\omega^2 = 0.15$, meaning that the four different groups of food (IV) explained about 15% of the total variance in workers' mood (DV), after adjusting for the effect of their fatigue levels and caffeine intake on mood.

Follow-up tests were conducted to assess pairwise differences among the adjusted mood means (means after controlling for the covariates' effect). The results showed that employees who didn't have any food had better overall mood than those who had carbs ($M = 9.41$, $p <.001$, 95% CI [4.04, 14.78]) and those who had proteins ($M= 12.98$, $p <.001$, 95% CI [7.58, 18.38]), after controlling for the effect of caffeine and fatigue. Those who had carbs reported a significantly better mood than those who had proteins ($M = 3.57$, $p =.04$, 95% CI [5.85, 10.71]). Finally, those who had fats reported a significantly better mood than those who had proteins ($M = 7.83$, $p= .001$, 95% CI [2.36, 13.29]), controlling for the effects of the covariates (caffeine and fatigue) on employees' mood. The effects sizes for these significant adjusted mean differences were .90 (no food-carbs; large effect size), 1.25 (no food-protein; large effect size), .34 (carbs- protein; medium effect size), and .75 (fat-protein; large effect size), respectively. No significant differences were found between no food and fat-based food on employees' mood ($p=.084 >.05$) and between carb-based food and fat-based food on mood ($p=.21> .05$), controlling for the effects of caffeine consumption and levels of fatigue on mood.

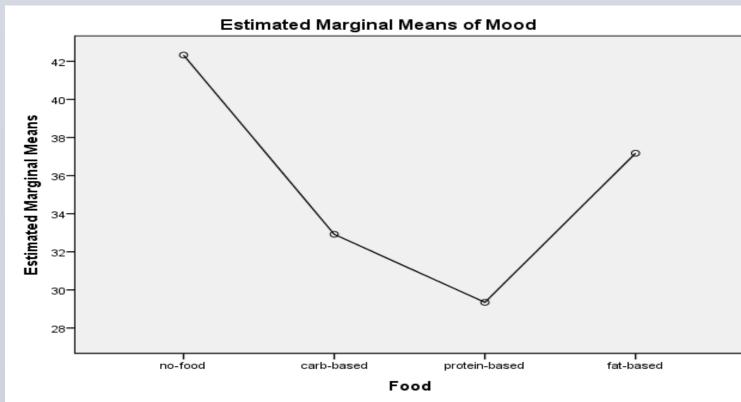| Pairwise Comparisons						
Dependent Variable: Mood						
(I) Food	(J) Food	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
no food	carb-based	9.408[*]	2.017	.000	4.035	14.781
	protein-based	12.979[*]	2.028	.000	7.579	18.380
	fat-based	5.151	2.078	.084	-.384	10.687
carb-based	no food	-9.408[*]	2.017	.000	-14.781	-4.035
	protein-based	3.571[*]	1.983	.039	10.710	5.852
	fat-based	-4.257	1.998	.206	-9.578	1.064
protein-based	no food	-12.979[*]	2.028	.000	-18.380	-7.579
	carb-based	-3.571[*]	1.983	.039	5.852	10.710
	fat-based	-7.828[*]	2.052	.001	-13.293	-2.363
fat-based	no food	-5.151	2.078	.084	-10.687	-.384
	carb-based	4.257	1.998	.206	-1.064	9.578
	protein-based	7.828[*]	2.052	.001	2.363	13.293

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

Table 4: A comparison between the effects of every two types of food on mood.

The Profile Plot gave a visual picture of the results of the study. This graph showed that no food results in the best mood ($M=42.33$), followed by fat-based foods ($M=37.17$), and carb-based foods ($M=32.92$), with the foods that resulted in the worst reported mood being the protein-based foods ($M=29.35$). Covariates appearing in the graph were assessed at the following values: caffeinated beverages=.76 and fatigue 25.86.

Estimated Marginal Means of Mood

Covariates appearing in the model are evaluated at the following values: Caffeinated_beverages = .76 , Fatigue = 25.86

Conclusion

The current study was the first to examine the possible effects of the consumption of 4 different food groups on an employee's mood in the workplace (naturalistic setting), controlling for the effects of caffeine and fatigue on mood. The study's results showed that consuming carbohydrates, compared to protein, can and does enhance employees' mood. Two possible explanations for this finding were given. The first was that carbs, compared to proteins, can activate the discharge of serotonin in the brain. This discharge can lead to less stress being perceived, and thus can increase positive mood in stress-prone subjects. The second was that there is a strong association between positive mood and high blood glucose levels, and hence, carbohydrates which contain more glucose (sugar) can be associated with an increase in the overall mood. Fat resulted in an overall good mood. This can be due to the fact that the ingestion of lipids leads to a boost in cholecystokinin (CCK) concentrations in the body. Cholecystokinin can control satiety and relaxation via the regulation of serotonin activity in the brain, and hence can increase overall mood. The most surprising result was that the "no food" group reported the best mood compared to the "carb" group and the "protein" group. This result is inconsistent with most of the research in the literature which suggest that omitting breakfast induces metabolic stress, and therefore leads to a decrease in overall mood. Different explanations were given: breakfast might indeed be related to a better overall mood, but its effect on mood might be larger shortly after the meal has been ingested; and/or breakfast consumption may selectively help mood when the baseline mood is low (the present study's baseline mood could've been already high); and/or skipping breakfast for one time only might not have a significant effect on mood, but the habit of always skipping meals and the gradual build-up of nutritional deficiency might then have a negative effect on mood.

In summary, no food resulted in the best mood, followed by fat-based foods and carb-based foods, with protein-based foods resulting in the worst reported mood. To enhance different types of organisational spontaneity, business owners are advised to offer fat-based foods (walnuts, peanuts, and olives) or carb-based foods (cake, bread, and fruits) for breakfast and to avoid offering protein-based foods (eggs, milk, and bacon) at work.

Key References

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