Reviewer’s report

Title: The effect of a portion size intervention on French fries consumption, plate waste, satiety and compensatory caloric intake: an on-campus restaurant experiment

Version: 0 Date: 18 Jan 2018

Reviewer: Valerie Broers

Reviewer's report:

This pre-post, non-randomized, non-controlled field study takes place in on-campus university setting. It manages to reduce French fries intake by 9.1% and plate waste by 66.4% by reducing the portion size of French fries by 20% and changing from porcelain bowls to paper bags. The restaurant serves about 1200 to 1300 meals per day to both university students and employees. A subsample of all clients (final sample: 33, experimental condition: 19, control: 14) was asked to report their level of satiety at lunchtime and four hours later while also reporting their subsequent caloric intake. There were no differences found between the baseline and intervention week. 28 customers of the same subsample were interviewed post-intervention and 86% noticed the reduction, 68% reported that the reduced portion was sufficient in size and 32% agreed to a permanent implementation. Overall, the study is very interesting and adds to the existing literature because I agree that more European studies are necessary in this field since US food behavior does not always apply in Europe. The effects of changing portion-size have not been well-established so new research of high quality is very welcome. The additional measures that assess satiety, dietary compensational behavior and consumers' perceptions are especially interesting because it gives more insight into the process of food behavior. It is impossible to control all variables in a field-experiment but it seems that the authors did their best to take variables into account that might interfere with the results so this adds to the quality of the study (e.g. matching of menus in both weeks). I would like to congratulate the authors with this interesting paper but I do have some suggestions to further improve the article: Title: - I would suggest including plate waste in the title because this is one of the strongest effects that you find. - "Caloric intake" could be mistakenly interpreted as the caloric intake at the restaurant, so I would suggest "compensatory caloric intake" or "subsequent caloric intake". Abstract:- The mean of the meals served per day and sample sizes for the other analyses should be added.- Isn't the comparison between baseline and intervention week in the experimental group regarding satiety and caloric intake more important than the comparison between intervention and control group? Introduction:- Line 53-56: "recently" should probably be "recent"? This sentence is not really clear.- Overall, I notice that you do not use the words "nudging" or "choice architecture" in the introduction although these are other words for the techniques that you are using. You could shortly refer to these concepts to make sure that your research will not be missed in literature reviews on these topics. Methods:- I think you should explain why you decided to use paper bags for the reduced portion and not smaller porcelain bowls. Other variables like attractiveness could have played a role in the effectiveness of your intervention so this should be discussed. In the research of Freedman and Brochado (2010) it seems they introduced the paper bags before the data collection. I think this is a better method to ensure that you are measuring the effectiveness of reducing portion-size and not a mix of two methods. A picture of the bowl/bag with fries in the supplementary materials would also help for
readers to have a better view on the difference between the conditions. - Paper bags are also less environmentally friendly in comparison to porcelain bowls because it creates more waste so this should also be a discussion point. Are the paper bags being recycled for instance? I think this is important here because you mention that reducing food waste is positive for the sustainability of the planet.- Table 1: It would be informative to mention the number of people that you are comparing at baseline and intervention. ResultsConsumption and plate wastel think it would be informative to add an effect size like odds ratio.Satiety and Caloric intake- Regarding the analysis on satiety and subsequent caloric intake in the subsample of 33 (experimental/control) and 14 customers (baseline/intervention), the drop out rate is unfortunately really high. I understand that you performed you analyses anyway but I really think you should put more emphasis on the fact that this is a really small sample size and does not really allow for strong conclusions. You mention this already briefly but this could be underlined. Did you perform a power-analysis? I would suggest to do this otherwise, to ensure that you have had enough power to find significant results. You could also add an effect-size. - I am also wondering why you chose customers that did not consume French fries at both weeks to be the control group? It seems a bit strange because they voluntarily never consume the target product so they could have very different characteristics compared to people in the experimental group.DiscussionPerception of portion size reduction- I think it would be useful to discuss why 86% of the people noticed the smaller portion size in your study compared to 30% in the original study of Freedman and Brochado. This could be due to the change of container at the same time of the portion-size reduction or the fact that this sample was participating in an additional study during the intervention. The questions about satiety and caloric intake might have made customers more aware of the intervention.

Level of interest
Please indicate how interesting you found the manuscript:

An article of importance in its field

Quality of written English
Please indicate the quality of language in the manuscript:

Acceptable

Declaration of competing interests
Please complete a declaration of competing interests, considering the following questions:

1. Have you in the past five years received reimbursements, fees, funding, or salary from an organisation that may in any way gain or lose financially from the publication of this manuscript, either now or in the future?

2. Do you hold any stocks or shares in an organisation that may in any way gain or lose financially from the publication of this manuscript, either now or in the future?

3. Do you hold or are you currently applying for any patents relating to the content of the manuscript?
4. Have you received reimbursements, fees, funding, or salary from an organization that holds or has applied for patents relating to the content of the manuscript?

5. Do you have any other financial competing interests?

6. Do you have any non-financial competing interests in relation to this paper?

If you can answer no to all of the above, write 'I declare that I have no competing interests' below. If your reply is yes to any, please give details below.

'I declare that I have no competing interests'

I agree to the open peer review policy of the journal. I understand that my name will be included on my report to the authors and, if the manuscript is accepted for publication, my named report including any attachments I upload will be posted on the website along with the authors' responses. I agree for my report to be made available under an Open Access Creative Commons CC-BY license (http://creativecommons.org/licenses/by/4.0/). I understand that any comments which I do not wish to be included in my named report can be included as confidential comments to the editors, which will not be published.

I agree to the open peer review policy of the journal