Author's response to reviews

Title: The effect of glass shape on alcohol consumption in a naturalistic setting: a feasibility study

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Author's response to reviews: see over
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Dear Dr Lancaster,

Please find enclosed our revised manuscript, “The effect of glass shape on alcohol consumption in a naturalistic setting: a feasibility study” by David Troy et al. I have revised the manuscript in light of the reviewers’ comments and made required changes to the format of the paper which are detailed below.

Reviewer: 1

I do not feel that the methods are described in enough detail to allow others to replicate the work. For example, how were the pubs (and brewer) approached? Was participation voluntary?

The owner of Dawkins Ales was identified as running several local pubs, and the purpose of the study was explained to him. He agreed to introduce the study team to public houses that formed part of the Dawkins Ales group, and encourage them to support the study. Through this introduction, the study team explained the study to individual landlords, who made the final decision whether or not to participate. All landlords approached agreed for their public house to participate in the study. They agreed to stock the required glasses on two consecutive weekends and serve beer/cider in these glasses. They agreed to provide monetary takings for these weekends. All parties were informed of an unrelated experiment investigating the effects of drinking alcohol on ratings of attractiveness that the experimenters wanted to carry out in their public houses a month after the feasibility study. This would be publicized attracting extra patrons into their public houses. All parties agreed to this request. This information will be added to the methods.

Additionally, on page 8 the authors mention another study that this feasibility study was tagged on to. What is this other study?

The other study was an unrelated experiment investigating the effects of alcohol consumption on ratings of attractiveness. This experiment was run in the same establishments, but was conducted one month later. Critically, the feasibility study was not publicised, so as not to distort the behavior of customers at the participating public houses. We have clarified the relationship between the feasibility study and this other study in the acceptability subsection of the results and discussion section.

How might the support of landlords differ in the absence of this ‘other study’ that included some free publicity for them?
It is the opinion of the author that the landlords/brewer would have been less keen to participate if there was no publicity for their pubs. The incentive of free publicity may need to be replaced to encourage participation from pubs. The incentive structure could include financial compensation for any lost profits during a trial and new glassware free of charge. Their participation could be publicised via blogs and press releases after data collection has concluded. The optimal method of compensation should be discussed with landlords. We have clarified this further in the acceptability subsection of the results and discussion section.

*I am concerned that, at the end of the methods, the authors describe using informal interviews to garner feedback on the effectiveness of the study… 1) it would be useful to have more detail on how these were carried out, by who, was data audio recorded, etc…? and 2) in-depth interviews cannot elicit data on the effectiveness of the study – the authors need to be clearer about what they used the qualitative data for in the context of this study.*

Informal feedback from the brewer and landlords was obtained by two experimenters after the study’s completion. It was a face-to-face discussion, rather than a formal qualitative interview and was not audio recorded; however, notes were taken. Specific questions were asked of all landlords regarding the study logistics and how these could have been improved, the suitability of the incentive structure, what would encourage them to participate in future studies, and the experience of customers during the trial. After these topics were covered, there was a free-form discussion. The feedback supplemented what we learned from the rest of the trial and gave us the landlord’s perspective. We have provided more information regarding these informal discussions in the methods section. What we learned from these interactions with landlords are included in the acceptability, demand and practicality subsections of the results and discussion section.

*It would be useful to summarise what appeared to work well and what challenges were encountered at the start of the results and discussion section. At present, it is difficult to appreciate how successful the feasibility study was because problems encountered are scattered throughout the paper. For example, on page 7 it is mentioned that one public house could not accept the curved glasses because they would not fit in the dishwasher, and later in ‘Future studies’ it is mentioned that 2 pubs did not use the curved glasses provided. Why did this second pub not use the glasses?*

We thank the reviewer for this suggestion. The manuscript has been restructured to clarify the challenges met and what worked well during the study. The second public house did not use the glasses because the landlord felt the study was too much of a disruption to his normal business and did not see value in continuing the study. There was a failure of communication between the experimenters, brewer and the landlord on this point. More information on difficulties encountered during the study has been inserted into the results and discussion section in a more logical order.

*There is a lack of critical reflection on what worked well/or not and why in the discussion. What are the limitations of this feasibility study? For example, the study only worked with 3 pubs from 1 brewer. How much can this tell you about how feasible such a study would be in a larger organisation/multiple organisations?*

Limitations of the study and difficulties envisioned in scaling up the study have been expanded upon in the expansion subsection of the results and discussion section, including issues regarding the changes needed to the study design in order to deal with larger organisations.
On page 10 (paragraph 3), the authors state ‘the findings are consistent with the possibility that the shape of the glass that alcohol is served in can have an effect on takings’. The authors should reconsider the appropriateness of making any statements about the effect of the intervention on alcohol consumption (see page 5, paragraph 3) based on the research described (e.g. only 3 pubs, 2 did not fully comply with the intervention).

The above statement has been removed to keep the focus of the study on the feasibility of running a randomised controlled trial of this nature in a naturalistic environment.

The research is focused on how feasible it is to examine the impact of glass shape on alcohol consumption in a pub setting. This is clear in the abstract but less clear in the Introduction of the paper. Given that the authors focus on a few specific aspects of feasibility (e.g. logistical considerations and compliance), it would be useful to more clearly define the specific objectives of the research following the research aim in the Introduction.

We thank the reviewer for bringing this to our attention. The objectives of the study have been more clearly defined in the introduction.

The Introduction provides a sound overview of the background research and justifies why this research is needed. However, where the authors state ‘To date, however, choice architecture interventions…’ at the end of paragraph 2, it would be useful to say more about the focus/context/findings of the ‘limited number of studies’ that are focused on changing alcohol use. This would make it clearer for the reader exactly what has been done before.

We thank the reviewer for bringing this oversight to our attention. The cited choice architecture studies involving alcohol have now been covered in more detail in the introduction.

The authors state that monetary takings were an acceptable proxy for alcohol consumption (page 9, paragraph 2). This statement needs referencing.

We have validated this measure by acquiring till data from one of our industry partners and analysed the correlation between monetary takings and units of alcohol sold. We have added these data to the practicality subsection of the results and discussion section.

I am unclear as to what happened regarding the glass exchange (again this could be made explicit in the methods). In particular, on page 7 (paragraph 2) the storage of glasses during the study period is highlighted as a potential logistical issue. On page 8 (paragraph 2) the authors discuss providing no reimbursement except being supplied with new glasses at the end of the study. 1) Isn’t providing new glasses a form of reimbursement? And 2) why is storage of old glasses (page 7) an issue if they get new glasses at the end of the study?

The exchange of glassware with the public houses was made the week before the first weekend and midweek between weekends. Glassware was therefore stored off-site when pubs could not accommodate two stocks of glasses. This has been made more explicit in the results section. New glasses are a form of reimbursement; however, in this study, new glasses were not offered to the participating pubs. Offering new glassware as an incentive was a suggestion made by landlords during
post-study feedback. We appreciate this was not made clear in the text and have attempted to clarify this further in the methods section.

*The phrase ‘counterbalanced’ is used to describe how the types of glass used were changed between the pubs during the study. What does this actually mean? Did all 3 pubs start with one type and then switch?*

The following tables show the planned and actual breakdown of glasses used.

Table 1. Planned and actual glass conditions in the three public houses over both study weekends.

<table>
<thead>
<tr>
<th></th>
<th>Weekend 1</th>
<th>Weekend 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Planned</td>
<td>Actual</td>
</tr>
<tr>
<td>Pub 1</td>
<td>Curved</td>
<td>Normal glass range*</td>
</tr>
<tr>
<td>Pub 2</td>
<td>Curved</td>
<td>Curved</td>
</tr>
<tr>
<td>Pub 3</td>
<td>Straight</td>
<td>Straight</td>
</tr>
</tbody>
</table>

Curved and straight refer to the shape of experimenter supplied glassware. Where the public house used their normal range of glassware, this is also indicated.

This information has been added to the methods.

**Reviewer: 2**

*The use of monetary takings as the surrogate outcome measure needs to be validated, possibly through calibration against a gold standard measure, such as direct observation, in order to be able to claim it is measuring slower rates of consumption and, presumably lower consumption.*

As described above, we have validated this measure by acquiring till data from one of our industry partners and analysed the correlation between monetary takings and units of alcohol sold. This information has been added practicality subsection of the results and discussion section.

*In this report, monetary taken amounts were not broken down into beverages that would be served with the new glassware, so it is unclear to what extent the reported decrease in revenue was directly related to the intervention. The reported results must be attributable to the intervention.*

When intervention (straight) glasses were used, the vast majority of ales/beers/ciders were served in them. A few customers demanded their drink from their usual curved glass as reported by landlords during feedback. Pubs were limited in the amount of detailed sales data they could give us without the use of a modern till system. Tills that have the capability to break down purchases by beverage type would be required to get a detailed look at takings for type and amount of alcohol consumed. This limitation will be expanded upon in the implementation subsection of the results and discussion section.

*The reported results were pooled across the three participating public houses, even though two public house did not use the provided glassware.*
Curved glasses were used as a control condition to compare to the treatment condition (i.e., straight glass). The experimenters’ curved glasses were not used in two pubs. Instead, landlords used their standard glass range, the majority of which are curved in nature. Importantly, the intervention (straight) glasses were used by all three pubs. The comparison between straight glasses and the landlord’s standard glass range was deemed valid, if not optimal, for the purposes of the feasibility study. The limitation of not having all experimenter’s curved glassware present is included in the acceptability subsection of the results and discussion section.

Additional descriptive results need to be reported to capture the impact of the intervention at the public house level. Differences in revenue by public house are a reasonable compromise to keeping the revenue totals private, but there is no information on whether the two weekends of the study are representative of usual business.

Thank you for this comment. We did not collect data on the usual business of the pubs, and we have added this as a limitation in the updated manuscript. Equally we have no reason to think the weekends when the study took place were not representative of normal business. We now include this point in the practicality subsection of the results and discussion section.

Lastly, since this study was run in conjunction with another one that included publicity to increase patronage at these public houses during the glassware experiment, confounding is very likely. New patrons may behave differently than usual ones, including drinking more slowly or drinking less. With the extremely limited reported results, to what extend can the authors definitely attribute the reduced monetary takings to only the intervention?

As described above the other study referred to in the paper was an unrelated experiment investigating the effects of drinking alcohol on ratings of attractiveness. This experiment was run in the same establishments, but was conducted one month after the feasibility study, so the publicity for this later study would not have affected this feasibility study. The relationship between the feasibility study and the other study has been clarified in the acceptability subsection of the results and discussion section.

The manuscript would benefit from more clearly spelling out the focus areas for the feasibility study, perhaps using the structure suggested by Bowen et al., for instance (Am J Prev Med. 2009 May; 36(5): 452–457. doi:10.1). The areas of focus of this manuscript using the above named structure seem to be on Implementation, Practicality, Integration and Limited Efficacy. Some additional areas not considered in the manuscript but are relevant include more details on Expansion challenges that could be encountered in an extended or expanded intervention, as well as Acceptability over the long-term. Should public houses experience a noticeable and sustained decrease in sales, this could substantially reduce future participation rates that a single supply of new glassware will not overcome.

We thank the reviewer for bringing this paper to our attention. We have restructured the manuscript to more closely mirror the areas mentioned in the above paper and further expanded our discussions within these areas.

Ethics approval for conducting the feasibility study was not indicated within the manuscript. If this is not a requirement, this should be stated.
Ethics approval was obtained and details have now been included in the methods.

*Excessive alcohol use is not defined.*

This has been defined in the introduction.

*Additional study limitations that need to be included are the impact at the population level on alcohol misuse for this choice architecture intervention. Since there is an increasing trend to more consumption at home in the UK (Reference 1, BMA, Alcohol misuse: Tackling the UK epidemic, 2008), groups that tend to drink at home (within and outside of the UK) or directly from the beverage containers are not likely to benefit.*

The intervention tested in this feasibility study may have relevance to drinking in the home. If straight glasses were used more widely by home drinkers, consumption rates may fall also. This would need to be tested specifically. The limited scope of this study with regard to changing alcohol use in the population will be included as a limitation in the demand subsection of the results and discussion section.

*The cited literature reports on a reduction in rate of alcohol consumption but the link to a reduction in overall alcohol consumption is not made.*

Slowing of drinking rate is likely to have two effects: reduced intoxication and reduced consumption overall. This comment has been included in the introduction. The possibility that straight glasses could cause customers to take their custom elsewhere needs to be considered. This would appear to be reducing consumption in a trial but would in fact not be reducing individual’s overall drinking on any given night. Discussion on this point has been added to the demand subsection of the results and discussion section.

*Glassware labelling is an important architectural factor that is not discussed.*

Glassware supplied by experimenters did not have any branding or volume labeling. As the intervention glassware was not used on two of the weekends, it is possible that these aesthetic factors may have influenced alcohol consumption, rather than the structural properties of the glass. This possibility is included in the integration subsection of the results and discussion section.

*The statistical method used to calculate the 95% confidence interval for the average percentage reduction in monetary takings is not given. In particular, whether the pairwise nature of the data is taken into account is not specified. The wide confidence interval for the mean percentage difference that includes zero is not discussed. The sample size estimation method is not mentioned in the Future Studies section.*

We now include this information. Unfortunately there was an error in my calculation of the point estimate and 95% Confidence Intervals. The corrected values have now been inserted into the manuscript along with details of the statistical test used. The sample size estimation method is now mentioned in the expansion subsection.

*Percentage change in takings is one way to provide confidentiality to individual drinking establishments, but aggregation of results is another one.*

Dawkins Ales, which owns all three public houses, requested that monetary takings not be made public; therefore, reporting aggregated results was not possible. We have discussed this as a limitation in our discussion. However, if there was a larger
number of participating public houses involved this may have been possible, because it would be harder to infer the takings of individual public houses in this situation. We have added a comment to this effect in the practicality subsection of the results and discussion section.

Challenges to conducting future studies where stakeholders are likely to experience long-term financial loss should public policy be implemented to reduce alcohol rates of consumption or consumption are not adequately described. Co-operation with stakeholders is likely to be drastically reduced, especially as short-term incentives may no longer be relevant.

We thank the reviewer for highlighting these challenges. It should be noted that not all establishments are primarily concerned with having a high volume of patrons and high sales. Some landlords value a pleasant drinking environment which they believe gives them a greater share of the local consumer market. These types of pubs may be more receptive to public health research in their premises.

Financial compensation for decreased revenue and free glassware could make up an incentive structure that would be appealing to public houses. Their participation could also be publicised via blogs and press releases after data collection has concluded. The good working relationship established with the public houses during the feasibility study shows that given an appropriate incentive structure; brewers/landlords will allow public health researchers run studies in their establishments. However, attrition should be expected in research of this nature and contingencies should be put in place to deal with this. Further reflection on this issue has been added to the acceptability subsection of the results and discussion section.

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Yours sincerely,
David Troy