Reviewer’s report

Title: “Free won't” after a beer or two: Chronic and acute effects of alcohol on neural and behavioral indices of intentional inhibition

Version: 0 Date: 26 Aug 2019

Reviewer: Janette Smith

Reviewer's report:

The manuscript presents two studies; the first, examining whether performance on two types of inhibitory tasks is associated with chronic alcohol use, and the second examining whether performance and brain electrical activity during one type of inhibitory task differs under acute alcohol administration.

The authors are to be commended for tackling the issue of the real-world significance of inhibitory problems associated with alcohol use - the link between performance on inhibitory tasks in the lab, and risky drinking in the real world, is not always clear, and the Chasing Memo task is a nice attempt to operationalise intentional inhibition. The manuscript is generally well written, and my comments are mostly minor suggestions.

p5: the reference to Bo and Landro (2017) here is incorrect; they in fact found drinkers as a whole had *shorter* SSRT than teetotallers, with no further differences associated with units of alcohol/week

p6: please specify whether the exclusion criterion for depression was current, former, or both

p6: it is not clear whether participants completed Study 1 in a laboratory or online; how were the problems associated with refresh rate detected, and what was the decision rule to exclude these participants?

p7: please clarify the time frame for "successful tracking" - was tracking a failure the moment the cursor moved beyond the 2cm radius? Was it successful the moment it moved back, or was there a minimum time before accumulation began again? Please can you provide some measure of task difficulty (e.g., the average percentage of time that a participant was accumulating points)?

p7: I could not find any analysis of the counter in the cued condition - is it only included to be similar to the free condition? How similar was the actual count to participant's reported counts (and if quite different, how does this affect estimation of the W-moment)? Is this value affected by alcohol (whether chronic or acute use)?

p12: were the authors expecting to observe no correlation between the two types of inhibition in experiment 1 - i.e., the SSRT and the disengage RT?
p16: there is no report of a manipulation check for the placebo vs. alcohol condition (e.g., participants had to guess which condition they did each day, with correct guesses at chance levels). Although a second experimenter prepared the drinks and measured the breath alcohol concentration, it is possible that they interacted with the participant differently in the two conditions. Further, participants were required to stay until their breath alcohol concentration was under 0.02%, providing a further clue as to which drink had been given.

p17: 'v.v.' is not a common abbreviation for (presumably) 'vice-versa'; please spell it out.

p20: I am surprised that the alcohol-related difference visible in Figure 3 is not significant, since it looks quite large. Please could the authors report an effect size for this comparison; it is possible that a true effect has been missed due to low power from the small sample size.

p23: please briefly describe the Marble Task - what does the participant see/hear/do? what psychological processes does it tap? Why is the Chasing Memo task better?

Figure 1: Please add a display of the digits within the circle, which participants had to note and enter at the end of each trial. I initially misread the methods and thought this number was in the bottom right, which would cause issues with eye movement activity to the bottom right corner coincident with the W-moment. As it is, this is not an issue after all, because the counter was actually presented very close to where the participant would likely be looking. But to save others making the same mistake, please add a display of the counter within the circle as it appeared to the participant.

**Are the methods appropriate and well described?**
If not, please specify what is required in your comments to the authors.

Yes

**Does the work include the necessary controls?**
If not, please specify which controls are required in your comments to the authors.

No

**Are the conclusions drawn adequately supported by the data shown?**
If not, please explain in your comments to the authors.

Yes

**Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?**
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

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