Response to Review Round 2 for Stage 1 RR: https://osf.io/74gcn

Anoushirvan Zahedi, PhD: Recommender, Peer Community in Registered Reports, Universität Münster:

I thank the authors for the revision. Both reviewers were happy regarding the changes that the authors made. However, there is still a significant concern regarding the discrepancies between the instructions that the control versus treatment group receive, which I encourage the authors to consider thoroughly.

Thank you for the reviews. We have updated the experiment scripts in-line with the suggestion.

Further, both reviewers suggested several minor points that the authors need to consider as well.

We have adopted the minor corrections and have responded to the other minor concerns.

Review by Zoltan Kekecs, 03 May 2024 15:13:

I really appreciate the authors thorough response to the comments by the editor, the other reviewer, and me.

I am happy with almost all responses by the authors. I only have two comments. The first is more significant, while the second is minor:

- *Now the intervention and control groups are getting better matched, which is a good thing. Nevertheless, there are still important differences that I don't see the reason of between the protocols for the control and the intervention group.*

Difference 1: The Treatment group has Step 1 and Step 2 in the instructions, where in Step 1 they do a voluntary version of the task. This means that the Treatment group closes their eyes (relaxes?), and does the behavior twice as many times as the Control group. I don't see a good rationale for this discrepancy between the two groups.

Difference 2: The Treatment group is explicitly told right BEFORE the involuntariness rating that: "What we're aiming for is for that to feel completely involuntary, as if it was happening all by itself and that you aren't involved in the process." While the control group is only reminded of this AFTER the involuntariness scoring: "Now, the idea is that we're going to try to make that feel involuntary" I don't see a good reason for this difference in the scoring protocol.

Difference 3: The Treatment group gets more nudge to practice than the Control group. The Control group hears: "Now, the idea is that we're going to try to make that feel involuntary. Do you think that you could make that feel more involuntary if you gave it another try?" while the Treatment group hears: "Is there anything you could also imagine, anything at all, that might make that feel more involuntary if you gave it another try? For example, some people imagine someone pushing their head forwards and backwards. Others imagine that they won't be aware of their thoughts or feelings related to it". A matching encouragement would be better.

I suggest simply taking the Treatment group protocol word for word, and slightly adjusting it in a way that all instructions for explicitly imagining involuntariness is replaced with matched instructions and encouragement. I see that the authors did not implement my suggestion for matching instructions for imagination. If imagination is too close to the intervention, it could be replaced by "repetition".

For example this could be the Training suggestion 1 step for the control group:

Head Nod (Crossed out sections are removed from the Treatment group protocol, bolded sections are replacements.) I don't expect this to be implemented exactly, just giving an example of how such close matching could be achieved.

Step 1

Now, please relax as you sit there. Please close your eyes and nod your head forwards and backwards for a few seconds. Please do that now. Allow 5 seconds. Great, thanks you can open your eyes and relax again. I imagine that you knew you were making that movement voluntarily.

Step 2

Now, the idea is that we're going to try to make that feel involuntary through ***repetition*** ~~*the use of imagination*~~*. So, I'd like you to do it again, when I indicate, but this time I'd like* ~~*you to also imagine that you're not involved in the process at all, as if your head is moving*~~ ***your head to move all by itself***. ~~*Please also imagine whatever you think might make it*~~ ***It will*** *feel more involuntary.* ~~*Please also imagine that you won't be aware of any thoughts or feelings that would contradict that.*~~

Okay, please close your eyes and do that now: ~~*relax and nod your head while imagining all of those things. Allow 5 seconds. Please open your eyes and relax again.*~~

Now please relax as you sit there. I want you to think about your head nodding, as if in agreement, entirely automatically. Simply sitting there quietly and relaxed, your head will begin to nod. All by itself. Allow your head to nod. At first it will be small, almost imperceptible, movements. Forwards and backwards. Head nodding. All by itself. Each nod slightly more significant than the one before. Each nod more obvious. Nod after nod after nod.

What we're aiming for is for that to feel completely involuntary, as if it was happening all by itself and that you aren't involved in the process. Please indicate below how involuntary the experience felt, where zero means entirely voluntary and five means entirely involuntary. If the score is five, move to the next exercise.

Is there anything you could also ~~imagine~~ ***do****, anything at all, that might make that feel more involuntary if you gave it another try? For example, some people* ***say that repeating the exercise multiple times makes it more feel automatic.*** *~~imagine someone pushing their head forwards and backwards. Others imagine that they won't be aware of their thoughts or feelings related to it~~*

If no, move to the next exercise.

Now I'd like you to attempt the same exercise again, but this time ~~imagine~~ it ***will*** *feel more involuntary. ~~Please imagine that it is~~ as involuntary as it could be.*

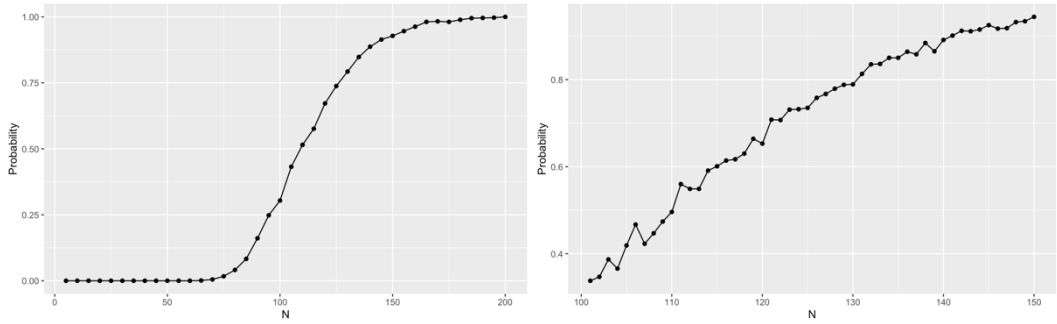
…

Thank you for the detailed suggestion. We agree, with hindsight, that the two conditions could have been more closely aligned. We have amended the manuscript as proposed.

- *This simulation result feels strange: "For testing the null hypothesis, 120 participants achieved 98% probability for the subjective measure B < 1/3, but only 67% for the involuntariness measure B < 1/3. Increasing to 130 participants increased the probability to 81% for B < 1/3. We have therefore increased the upper limit to 130 to accommodate these calculations." It is very uncommon that adding 10 participants to the sample size would increase expected power by 14% at these sample sizes. The code runs as intended, and it does produce the number indicated by the authors, however, I did not check the code in detail to fully understand it. I would just like to encourage the authors to double check this part of their work to make sure that the numbers reported in the text are all accurate.*

We agree that it is uncommon. We have double-checked the code and its output reported in the manuscript. In addition, the simulations were checked for reproducibility by an independent statistician (https://osf.io/v3bme). The following text has been added to Appendix M:

> Using the same models, we recalculated the numbers of participants required to achieve a probability of 50% for the involuntariness scores (as these dictate *N*) for the Bayes factor thresholds. We found that for H_1 B>5, N=63 would be required compared to N=64 in the original calculations (which used the pilot *SE* instead of sampling it). For H_0 B<1/3, N=111 would be required compared to N=112 in the original calculations. In addition, the simulations showed that the original calculation result N=64 for H_1 B>5 actually results in a probability of 59%, and N=112 for H_0 B<1/3 results in a probability of 55%. We have plotted the probability against the number of participants using the simulation (the second graph showing more detail around the area of interest):



> The deviations from a fitted curve are possibly artifacts of only using 1000 iterations, as a trade-off for speed. Even so, the increase in probability of 14% for an increase in N from 120 to 130 does not look out of place, given that it occurs at almost the steepest part of the curve.

Review by DR. Sophie Siestrup, 30 Apr 2024 13:37:

I compliment the authors for doing a great job on improving clarity in the introduction and methods sections. I think the experimental protocol is now suited to target their research question. Three minor suggestions below which the authors could implement if they wish:

Abstract

-page 2: "If that study is successful, we will repeat but […]" – maybe "[…] repeat it […]"? otherwise the sentence sound incomplete to me

Thank you. Manuscript updated.

Introduction

-page 4: I appreciate that the authors changed "successful participants" to "participants who were successfully responding" on page 5 – but now they added the same expression with their new text on page 4. Maybe use "participants who were successfully responding" and subsequently switch to "successful participants"?

Thank you. The manuscript has been updated to change the text on page four as indicated.

Methods

-Do specific regulations apply to participants who might still be 17? Can they sign an informed consent themselves or do they need parental approval?

In the UK, it is presumed that the principle of Gillick competence applies to young people aged between 16 and 18 years, with regards to participation in psychology experiments (see https://www.ukri.org/wp-content/uploads/2022/03/MRC-010322-MRCESRCJointGuidanceInvolvingChildrenResearch.pdf page 7, and https://www.hra.nhs.uk/planning-and-improving-research/policies-standards-legislation/research-involving-children/). It is assumed that students enrolled on a psychology undergraduate degree course meet the bar for Gillick competence (for example, the entry requirements for the course alone imply the capacity to understand the nature of a psychology experiment). As such, there are no

specific regulations applied to participants who are 17 years old, and they are permitted to sign informed consent themselves without needing parental approval.