

HABIT—Replication of the behavioral study in Tricomi et al. (2009)_Schwabe (#6358)

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1) Have any data been collected for this study already?

It's complicated. We have already collected some data but explain in Question 8 why readers may consider this a valid pre-registration nevertheless.

2) What's the main question being asked or hypothesis being tested in this study?

This pre-registration document is an amendment to the pre-registration protocol "HABIT – Replication of the behavioral study in Tricomi et al., (2009)". Based on some unanticipated problems with the recruitment procedure and exclusion criteria of the original protocol discovered during the data collection of the first group to collect data on the protocol, our lab updated the experimental protocol to avoid these potential problems. The question remains the same: testing whether overtraining instrumental responding in human participants can render the responding habitual, thereby becoming insensitive to outcome devaluation.

3) Describe the key dependent variable(s) specifying how they will be measured.

The experimental procedure will be the same as in the pre-registered protocol "HABIT – Replication of the behavioral study in Tricomi et al., (2009)".

4) How many and which conditions will participants be assigned to?

The conditions will be the same as in the pre-registered protocol "HABIT – Replication of the behavioral study in Tricomi et al., (2009)".

5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.

The analysis to examine the main question will be the same as in the pre-registered protocol "HABIT – Replication of the behavioral study in Tricomi et al., (2009)".

6) Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.

To investigate the role of inter-individual differences on habit formation, we added the following questionnaires.

The participants will be asked to fulfill the state trait anxiety inventory, a brief stress screening, the Trier inventory for chronic stress, the Barratt impulsivity scale (BIS-15) and the Beck depression inventory.

7) How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.

The sample will be determined as in the pre-registered protocol "HABIT – Replication of the behavioral study in Tricomi et al., (2009)".

8) Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)

We recruit participants who report that they like to snack, have no food allergies, are not currently dieting and that are willing not to eat for 6 hours prior to each day of the experiment; not complying with these instructions will be used as an exclusion criterion.

We include the 26-item eating attitudes questionnaire (EAT-26): a cut-off of 20 will be used as an exclusion criterion to control for eating disorders.

In the demographic questionnaire, we will ask for weight and height, to account for the participants' body mass index (BMI).

Based on our experience from the first group that collected data using the same experimental procedure, we updated the screening procedure and manipulation checks in two ways:

First, prior to recruitment, participants are asked to evaluate how much they like each snack option on a pleasantness scale (-5, very unpleasant; 5, very pleasant). Participants are invited to participate only if the highest rating assigned to each of the salty and sweet options is larger than +1 on the 10 point pleasantness scale, and only if the pleasantness ratings assigned to the chosen salty and sweet options do not differ by more than 3 rating points.

Second, it is critical that the overtraining procedure is successful for both the instrumental action reinforced with the sweet snack and the instrumental action reinforced with the salty snack. The mean response rates for the instrumental action reinforced with the sweet snack and the mean response rates for the instrumental action reinforced with the salty snack should not differ by more than 2 standard deviations during the training procedure.

As explained in question 1, this pre-registration document is an amendment to the pre-registration protocol "HABIT – Replication of the behavioral study in Tricomi et al., (2009)", based on some unanticipated issues with the original protocol's recruitment procedure that arose during the first group's data collection. During the course of the first preregistration protocol, we started our data collection with the previously described updates.