Revisiting the unawareness of the AMP effect: Experiment 6

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*Pre-registration*

**Author note**

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**Background and rationale**

Across five previous experiments, we demonstrated that AMP effects increase in accordance with rates of influence-awareness, that influence-awareness rates of participants correlate highly across different (unrelated) AMPs, and that manipulations to the AMP procedure do not reduce the extent to which AMP effects are predicted by influence-awareness rates. In these experiments, we calculated influence-awareness rates by requiring participants to rate whether their evaluation of the target was influenced by the prime stimulus *after* they had emitted the target evaluation. We employed this method to avoid the possibility of post-hoc confabulation (i.e., that participants would firstly observe that they had a general tendency to evaluate stimuli as positive/negative congruent to the prime stimulus, and then post-hoc infer the reason for this effect). However, the possibility for confabulation is still present (albeit reduced) in our current method: because the evaluation precedes the judgement of prime influence, participants may still be confabulating their influence-awareness responses post-hoc.

In order to rule out the possibility of confabulation in explaining these effects, we propose to conduct an exact replication of our second experiment, but with one critical change: participants will now provide an influence-awareness response *before* providing their evaluative response. In this way, participants’ influence awareness responses should not be influenced by confabulation, since participants at this point have yet to illicit the evaluative response towards the target. Like our fifth experiment, this experiment will attempt to replicate the first two hypotheses of our second experiment. Our first hypothesis is divided into two subcomponents. The first component, H1a, suggests that at the trial-level of analysis, the influence of prime stimuli on evaluations of the target stimuli in the IA-AMP will be moderated by whether participants prospectively reported that they would be influenced by the prime or not. The second component, H1b, is the hypothesis that at the subject-level of analysis, the rate of (prospective) influence reported by participants in the IA-AMP will be predictive of the corresponding effect sizes in that IA-AMP. Our second hypothesis H2 states that the prospective influence-awareness rate of a participant on the IA-AMP will predict scores on a previously-completed standard AMP.

**Method**

**Sample**

Data will be collected online via the Prolific Academic website. Based on an expected mean duration of 20 minutes, participants will be paid £1.66.

***Planned sample size & stopping rules***

Power analyses for interactions in mixed-effects models are relatively difficult to conduct due to the large number of parameters to be estimated, therefore no power analysis was conducted for analyses using mixed models. Due to the greater number of data points being employed (i.e., less information loss to the AMP scoring metric), the power of mixed models analyses will typically be better than those done on traditional fixed effects only models, for which power calculations are relatively easier. For our analysis in H1b, we determined on the basis of previous studies to power our analysis to detect a medium Pearson’s r effect size (i.e., 0.30). Using the pwr package in R, we computed the number of participants required to detect this medium effect size in a regression analysis with a single IV, at the conventional alpha level (.05) and at 95% power. Given these criteria, 138 participants would be required. The aforementioned power analysis is also applicable for our third analysis. Thus, based on these analyses and our available resources, we will collect data from 150 participants.

**Inclusion criteria*.*** Age 18-65, fluent English, Prolific rating >= 90%, no participation in similar studies by our research group.

**Exclusion criteria.**Completion time on Prolific < 3 minutes, and partial data on the demographics questionnaire or either AMP.

**Design**

Two within-participants factors, each with two levels, are manipulated by the experimental design: the type of AMP completed (standard AMP vs. the influence-awareness (IA)-AMP), and the valence of the prime stimulus (positive vs negative primes) that precedes the presentation of a target stimulus (Chinese character) within each AMP.

**IVs.**

1. Valence of the prime stimuli used in the AMP (positive vs. negative).
2. The type of AMP (standard vs. influence-awareness).

3. In the IA-AMP, subjective ratings for each trial of whether evaluation of the target stimulus will be influenced by the prime stimulus or not. A Go/No-Go response format is employed: press spacebar if influenced, do not press if not influenced.

**DV.** Evaluations within the AMP as pleasant or unpleasant.

**Variables used for methodological counterbalancing (not analyzed).** Questions 3 and 4 in the self-report measures will be presented in a counterbalanced order.

**Self-report measures*.*** We will ask several exploratory questions after the IA-AMP, and specify that participants should answer them in relation to the IA-AMP only:

1. Influence awareness:

“Think back to the task you just completed. On how many trials was a valenced picture presented before the Chinese character? It is important that you are honest here.”

[1 = None, 2 = A few, 3 = less than half, 4 = About half, 5= More than half, 6 = Most, 7 = All]

1. General influence:

“To what extent were your ratings of the Chinese symbols influenced by the pictures that appeared immediately before those symbols?”

[1 = Never, 2 = Very rarely, 3 = Somewhat rarely, 4 = Sometimes, 5 = Somewhat often, 6 = Very often, 7 = Almost always]

1. Intentional influence:

“How often did you *intentionally* base your rating of the Chinese symbol on the image that immediately appeared before it?”

[1 = Never, 2 = Very rarely, 3 = Somewhat rarely, 4 = Sometimes, 5 = Somewhat often, 6 = Very often, 7 = Almost always]

1. Unintentional influence:

“How often do you think that your rating of the Chinese symbol was *unintentionally* influenced by the pictures that appeared immediately before those symbols?”

[1 = Never, 2 = Very rarely, 3 = Somewhat rarely, 4 = Sometimes, 5 = Somewhat often, 6 = Very often, 7 = Almost always]

1. Self-exclusion:

“In your honest opinion, do you think should we use your data in our analysis?

There are many reasons why you might feel that we should exclude your data, such as a computer malfunction or a distraction at an important moment during the experiment.

Note, however, that being influenced by the pictures that came before the Chinese characters is NOT a reason to self-exclude from the study.

Your responses on this question will NOT affect your payment. However, if you choose 'No, exclude my data', please fill in the accompanying text box to let us know why.”

**Procedure**

Participants will complete the demographics questionnaire, the standard AMP, the IA-AMP, and then the self-report measures.

**Measures**

A standard Affect Misattribution Procedure (AMP; Payne et al., 2005) with the following parameters: 10 practice trials, 72 main trials, 12 positive and 12 negative valence images, and 72 Chinese characters. As well as this, a modified version of the Affect Misattribution Procedure (the IA-AMP from experiment 1 of the current project; see <https://osf.io/uqs2d/>) with the same parameters, and the following addition: after the presentation of the target stimulus, but before emitting the evaluative response, participants are given the opportunity to press the spacebar to indicate if they believe their response to the target *will be influenced* by the prime. This is achieved through the presentation of a cue to “Press spacebar if the picture will influence your response to the Chinese symbol” for a fixed 2000ms interval. The above sentence is removed from the screen following a response (although the response window was fixed regardless of whether a response was emitted or not).

**Hypotheses**

**M1 (manipulation check).** An AMP effect will be demonstrated for both the standard AMP and the IA-AMP. The target stimuli will be differentially evaluated based on the source stimuli that preceded them, such that targets preceded by negative primes will be rated more negatively than those preceded by positive primes.

**H1.** For the modified IA-AMP, the influence of prime valence on the valence rating of the targets will be moderated by influence awareness (whether between trials [H1a] or between participants using proportion of influenced trials [H1b]).

**H2.** The rate of influence in the IA-AMP will predict the magnitude of AMP effect in the standard AMP.

**Results**

**Analytic strategy**

**Manipulation & hypothesis tests.** Using the R package *lme4*, we will construct two frequentist logistic mixed-effects model to assess the evidence for the main effect of prime valence in both the standard-AMP and the IA-AMP (M1). The model will include participant ID as a random intercept to acknowledge the non-independence of the multiple ratings provided by each participant. The Wilkinson notation for both models will be:

valence\_rating ~ prime\_valence + (1 | participant)

We will also construct a frequentist logistic mixed-effects model to quantify the interaction between prime valence and influence ratings in the IA-AMP (H1a). The model will also include participant ID as a random intercept. In-line with best practices for such analyses, we will use effect coding for the IVs, rescaling each to -.5 and .5. The Wilkinson notation for the model is as follows:

valence\_rating ~ prime\_valence \* reported\_influence + (1 | participant)

If no interaction effect is found, Bayesian analyses may be used may be used to quantify the evidence for the null hypothesis using the R package *brms*. This would likely employ default priors that are designed to be uninformative (i.e., Students t distribution [students\_t(3, 0, 10)] placed on all parameters).

We will also construct a standard regression model to assess whether a greater number of influenced awareness trials predicts a greater AMP effect size in the IA-AMP (H1b). For this, we will compute an AMP effect size for each participant by subtracting the number of ‘pleasant’ responses when the target was preceded by a positive prime from the number of ‘pleasant’ responses when the target was preceded by a negative prime. We will also compute the proportion of influence awareness trials to non-influence aware trials for each participant, and standardize and recentre this value. The Wilkinson notation for this model is:

IA\_AMP\_effect\_positive\_negative ~ influence\_rate

In order to assess H2, we will construct a similar regression model to that of H1b, with the exception being that AMP\_effect\_size will now refer to the AMP effect from the first completed AMP (i.e., proportion of trials rated as positive that include the positive prime minus that which included the negative prime).

AMP\_effect\_positive\_negative ~ influence\_rate