Revisiting awareness of influence and its relation to the AMP effect: Experiment 7

Jamie Cummins, Ian Hussey, & Sean Hughes

*Ghent University, Belgium*

*Pre-registration*

**Author note**

JC, IH, and SH, Department of Experimental Clinical and Health Psychology, Ghent University. This research was conducted with the support of Grant BOF16/MET\_V/002 to Jan De Houwer and Ghent University postdoctoral fellowship 01P05517 to IH. Correspondence concerning this article should be sent to [jamie.cummins@UGent.be](mailto:jamie.cummins@UGent.be), [ian.hussey@ugent.be](mailto:ian.hussey@ugent.be), or sean.hughes@ugent.be.

**Background and rationale**

In five previous experiments, we demonstrated that AMP effects are systematically related to the rate at which participants are aware of the influence of the prime stimuli on their target evaluations. Specifically, participants were required, after each time they evaluated a target during the AMP, to indicate whether their evaluation of the target stimulus was influenced by the prime stimulus which came before it. In an attempt to rule out the possibility that our effects can be attributed to post-hoc confabulation on the part of participants, we recently conducted a sixth experiment wherein we asked participants to indicate their awareness of prime influence on their target evaluations *before* they emitted their target evaluative response. Past work always probed for prime influence after the target evaluation was emitted: either at the end of the study (see REF), or immediately after the target evaluative response was emitted (as in our Experiments 1-5). In contrast Experiment 6 probed for awareness of prime influence before the target evaluative response was emitted, thus eliminating the possibility that confabulation drove the moderation of AMP effects. The results of Experiment 6 were consistent with Experiments 1-5: the extent to which participants were aware of the primes influence on their target evaluations predicted AMP effects, both within the IA-AMP, as well as a previously-completed standard AMP.

Upon reflection, however, one might contend that post-hoc confabulation could still explain the effects obtained in Experiment 6. Specifically, although the judgement of influence-awareness was made prior to the overt target evaluative response was emitted, it is still possible that participants’ *covert* evaluation of the target is influenced by the prime (i.e., the prime’s valence is misattributed to the target stimulus, and although the overt response to the target stimulus had not been emitted, a covert target evaluation was already formed and biasing performance on the influence awareness task).In this sense, the assessment of influence-awareness may still be confounded by post-hoc confabulation (now post hoc in the sense of covert target evaluation formation rather than overt target evaluative response emission).

In order to address this possibility, we will conduct an exact replication of Experiment 6, but with a manipulation of when influence-awareness is assessed. Specifically, we will now assess for influence-awareness on each trial *before the target stimulus is ever presented*. In this sense, the participant at this point has not yet been able to form even a covert evaluation of the target stimulus, as the participant has never seen the target. If the participant reports that their evaluation of the (as yet unseen) target will be influenced by the prime stimulus in this case, it is impossible that the participant could be confabulating this influence-awareness response on the basis of their (purportedly misattributed) evaluation of the target.

This experiment will replicate the hypotheses of our previous 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***

The power analyses from our previous experiment are equally applicable for the current experiment. The text of the power analyses from our previous experiment is as follows:

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 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 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 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) will be completed consisting of 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/>) will be completed consisting of the same parameters, and the following addition: after the presentation of the prime stimulus, but before presentation of the target stimulus, and thus emitting a target evaluative response, participants are given the opportunity to press the spacebar to indicate if they believe their evaluation of 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 next image” 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