September XXth, 2023

Bernard Hommel, PhD

Action Editor

*Psychological Research*

Dear Dr. Hommel:

We have submitted a revised version of our manuscript PRPF-D-21-00324 “Item-Specific and Relational Encoding are Effective at Reducing the Illusion of Competence.” Once again, we are encouraged by the feedback provided by our reviewers, particularly that Reviewer 3 deemed the manuscript ready for publication in its present form. Below, we provide point-by-point responses to each of Reviewer 2’s comments. Consistent with the previous revision, all major modifications to the manuscript have been made using blue font. We appreciate you inviting a further revision and hope that our manuscript is now suitable for publication in *Psychological Research*.

Sincerely,

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**Reviewer 2**  
  
**Major comments:**  
  
**Comment 1:** The authors should consider discussing the two types of JOL accuracy (i.e., calibration and resolution) earlier in the intro and the authors should be specific regarding which type of accuracy they are referring to throughout the paper.

***Response:*** We appreciate you taking the time to review our manuscript. In our revision, we have taken care to clarify the specific type of JOL accuracy to which we are referring. For example, on page 2 of the Introduction, we now specifically note that comparisons of JOLs to mean recall reflect changes in calibration, rather than accuracy in general. Additionally, we now include a footnote in this paragraph noting that while we focus on calibration, changes in JOL accuracy can also be expressed in terms of resolution.  
  
**Comment 2:** On page 4 the authors state: “In the present study, we further assess the relationship between associative direction and JOL accuracy by testing whether encoding tasks which emphasize shared or distinctive characteristics of cue-target pairs (i.e., item-specific and relational encoding, respectively) can improve the predictive accuracy of JOLs.” However, it’s not clear why they authors did the study. Just because something hasn’t been done isn’t sufficient motivation for a study (this is mentioned as motivation on page 9). Perhaps the authors could better motivate the present research question.

***Response:*** We were specifically interested in whether deep encoding manipulations that facilitate recall could reduce the illusion of competence by improving calibration via increased recall performance. Given our inclusion of both related and unrelated pair types, we were especially interested in whether item-specific and relational strategies would differentially improve calibration of backward and unrelated cue-target pair types, respectively. Our motivation therefore was to assess the efficacy of these tasks on improving the correspondence between JOLS and recall for backward, symmetrical, and unrelated cue-target pairs given each of these types have been shown to produce an illusion of competence pattern. Additionally, because few studies have had participants engage in item-specific and relational encoding strategies alongside making JOLs, it was unclear whether these strategies would additionally affect the magnitude of participants JOLs, which would additionally influence calibration. We have updated the appropriate sections on page 4 and page 9 to further clarify these points.  
  
**Comment 3:** What is the need for the term “illusion of competence”? How is this different from overconfidence? What makes this an illusion rather than just reduced JOL accuracy due to lower memory performance?

***Response:*** As noted in the Introduction, the term “illusion of competence” refers to a specific pattern of JOL overestimation that was first reported by Koriat and Bjork (2005) as we reference. This pattern is specifically marked by JOL overestimations as a function of perceived cue-target relations. We utilize this term throughout the manuscript rather than using more general terms such as “overestimation” or “overconfidence”. Note also that several other paradigms can also produce overestimation patterns in metacognitive judgments (which are often referred to as “metacognitive illusions”; see Bjork, Dunlosky, & Kornell, 2013 for review), including inflated JOLs via font-size (Rhodes & Castel, 2008) or inflated source-monitoring judgments due to item typicality effects (Schaper, Bayen, & Hey, 2023). Thus, our use of this term throughout the manuscript provides a more precise way of describing any observed JOL overestimation patterns that is consistent with the literature.  
  
**Comment 4:** The present study “focuses specifically on changes in calibration, as previous illusion of competence studies often frame this effect as arising due to a miscalibration between JOLs and recall”. However, as a metacognition researcher myself, I find calibration far less informative than resolution. My suggestion would be to make resolution a central part of the manuscript as well as calibration. This is an area where an expansion of the results may be able to provide novel theoretical insights.

***Response:*** We elected to focus our manuscript specifically on changes in calibration, given that the illusion of competence is often framed as a question of JOL calibration rather than resolution. As a result, previous research on this topic has primarily assessed JOL accuracy in terms of calibration (see Koriat & Bjork, 2005; 2006; Maxwell & Huff, 2021). Given the potential importance of resolution, our initial submission also included analyses of resolution as well as a discussion of these findings. However, the resolution analysis were relegated to the Appendix during a previous revision, given both concerns regarding both the length of the manuscript and to provide a more streamlined results section. As such, we have elected to maintain our focus our on changes in calibration, though we note that analyses of resolution are still available in the Appendix.  
  
**Comment 5:** Similarly, I feel like the authors left a lot of meat on the bone here. They have a rich data set which I think we could learn more from. For example, have the authors looked at the forward and backward association scores as a continuous variable? It would be interesting to see how forward and backward relatedness predicts JOLs as a function of group. This is just one example of many possibilities. Consider adding multilevel models on the item level data using JOLs, encoding condition, and relatedness as predictors of memory (or something to that effect).

***Response:*** This is an interesting comment, and we agree that it would potentially be informative to assess the effects of relatedness as a continuous variable on JOL calibration. However, in the present study, we deliberately selected associative pairs that were high in associative strength. As a result, our related pairs lack sufficient variability in associative strength that would be needed to be a quality predictor. However, this is certainly an avenue for future research, and we believe that such analyses could be insightful for understanding potential changes in JOL calibration as functions of a priori cue-target relations.

**Comment 6:** The General Discussion includes very little discussion of how the present study contributes to the literature. From a theoretical and mechanistic perspective, what did we learn about metacognition? Why is this important? For example, what do the results say about Koriat’s (1997) cue-utilization theory?

***Response:*** In our previous submission, we discussed how our findings relate to Koriat’s (1997) cue-utilization theory on pg. 32 of the General Discussion. In our revised manuscript, we have taken care to clarify our interpretation of our findings and expand on them.  
  
**Comment 7:** The present results, while interesting, offer little advancement to the literature (in their current form, though there is potential to increase the impact of this work). It was discussed that some prior work has already shown that methods of increasing memory performance reduce the illusion of competence. The authors basically did the same thing here, just using a different method of increasing memory (unless I’m missing something). So, what is the advancement offered beyond showing that techniques that enhance memory reduce the illusion of competence? I think the authors have a really rich data set that could be analyzed much further (e.g., look at resolution, relatedness on a continuous scale, etc.) to make a more substantial contribution to the literature.  
  
***Response:*** Please see our response to Comment 5 regarding the potential for additional analyses as associative strength was truncated in our materials. Further, we already report resolution in our Appendix to make a more substantial contribution. Additionally, as noted in the Introduction (pg. 7), previous research seeking to reduce the illusion of competence has often focused on factors to mitigate this effect by reducing JOLs to match recall performance rather than by improving recall to match JOLs as we do in the present study. We now expand on this point in the General Discussion (pg. 28)

**Minor comments:**  
  
**Comment 8:** I suggest ending the abstract with some important take-home messages (e.g., theoretical advancement, implications, etc.).

***Response:*** We have updated the abstract accordingly.  
  
**Comment 9:** Page 4: the authors should elaborate on how/why the relatedness of a word pair influences the accuracy of JOLs. I would discuss Koriat’s (1997) cue-utilization theory earlier in the intro and better set up what informs learners’ JOLs.

***Response:*** We now include a brief discussion of Koriat’s (1997) cue-utilization theory in the Introduction (pg. 9). Additionally, we also discuss this theory in more detail in the General Discussion (pg. 32; see our response to Comment 6).

**Comment 10:** Even though it’s explained on page 5, I still don’t follow the difference between a priori associations and a posteriori associations. How are free-association norms different from perceived relatedness? Wouldn’t free-association norms be based on perceived relatedness?

***Response:*** You are correct that free-association norms capture perceived relatedness, given that these norms are generated by having participants list one or multiple associates for each item. However, because these associations specifically reflect response probabilities, they primarily capture *common* relations, rather than all potential pairings that could still be perceived as related at encoding. Thus, it is possible to have pairs in which items are perceived as being related yet the target item is not a common response to the cue (see Koriat & Bjork, 2005; Experiment 3, for examples). As noted in the present study, backward associates are a prime example of this phenomena. For example, *Card* is a common response to the word *Credit,* yet *Credit* is not a common response to *Card*. Thus the forward associate pair *Credit-Card* reflects an asymmetrical association, as based on free-association norms, the inverse (or backward associate pair) is not a common pairing. However, because backward pairs are still thematically related, participants often perceive them as being strong associates at encoding, even though the target is not a common response to the cue. Thus, backward pairs receive JOLs which approximate those given to forward pairs, though recall of backward pairs is generally lower than that of forward pairs.

**Comment 11:** What are the “useful relatedness cues at retrieval” (page 6)? Why would “credit” help recall “card” but not vice versa?

***Response:*** Please see our response to Comment 10. This is because based on free-association norms, *Card* is a highly probable response to *Credit*. However, when the pair is reversed, *Credit* is not a common response to *Card*. Because cued-recall testing generally taps into associative processes, forward associates are generally recalled with greater ease compared to unrelated and backward associates.   
  
**Comment 12:** I’m not sure including generation and production (page 7) are relevant to the levels of processing framework. Deep processing involves thinking about the information in a semantically meaningful way. Generation and production enhance memory but not because of deep processing in my opinion.

***Response:*** We disagree. By definition, deep processing involves elaborative encoding of study materials which could involve a multitude of different processes including enhancing distinctiveness of the materials and/or semantic meaning. No task is process pure and indeed, our prior work (Huff & Bodner, 2013) demonstrated that the type of processing that tasks such as generation produce depends upon how the task is completed, not just completing the task itself. Describing generation and production broadly as deep processing tasks is most appropriate given they reliably enhance memory relative to more shallow tasks such as silent reading/intentional encoding and other shallow tasks. The important contribution of our study is that by comparing item-specific and relational processing tasks, we are able to examine more specific processing types.