

Dear Editor:

We would like to resubmit our manuscript entitled “The specificity of sequential Statistical Learning: Statistical Learning accumulates predictive information from unstructured input but is dissociable from (declarative) memory.” The material contained in the manuscript has not been published and is not under consideration for publication elsewhere. Data and analysis scripts are available at <https://figshare.com/s/034ffd692a26bbf91024>. (The link will be changed to DOI 10.25383/city.15066468 should the manuscript be accepted.)

This manuscript has previously been submitted as XGE-2021-3907. The previous editor rejected an earlier version of the manuscript, but, given the end of his tenure, encouraged us to resubmit a revision as a new manuscript, which is now enclosed here. As we explain in our reply to the action letter and the reviewers, we substantially rewrote the manuscript in response to the editorial and reviewer comments, which, we believe, strengthened our manuscript considerably. It would be great if the manuscript could be sent to the same reviewers again.

Statistical Learning mechanisms allow humans and other animals to link together regular co-occurring elements in many domains. In humans, such mechanisms may support many cognitive processes, especially language acquisition. Ever since Saffran et al.’s (1996, *Science*) seminal paper, it has been generally assumed that such Statistical Learning mechanisms allow learners to learn and remember words from fluent speech, but this assumption has never been tested.

Here we test this assumption by exposing participants to continuous speech streams (as in earlier Statistical Learning tasks), but then simply ask them to repeat back the words they remember. We find no memory for words whatsoever under the conditions used in all previous verbal Statistical Learning tasks even when participants demonstrably learn the statistical structure of the speech streams. In contrast, we find reliable memories for words if the speech stream is pre-segmented, mimicking prosodic structure in language, but do not observe any Statistical Learning under these conditions. This double dissociation between Statistical Learning and (declarative) memory suggests that, in contrast to long-standing assumptions, Statistical Learning is dissociable from the declarative memory mechanisms required to acquire words, but might have other specialized functions during language acquisition, for example to facilitate predictive processing. These results also add to a growing literature suggesting that Statistical Learning abilities might be specialized and tuned to specific learning situations.

We believe that these results will be of great interest for scholars in a wide range of fields, from cognitive and developmental psychology to education to neuroscience and evolutionary psychology. We thus believe that this manuscript will be exciting news for the readership of the *Journal of Experimental Psychology:General*, and we hope that you agree.

Sincerely,

Ansgar Endress & Maureen de Seyssel