Protocol changes for an experimental study of iterated learning and language evolution

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Abstract

This protocol revision describes changes to our main protocol found at Houghton et al. (2025).

Introduction

On 2025-08-04 our experiment was run according to our original protocol. One participant in the first chain used English. In response the relevant instructions were changed to:

Don't worry if you feel you have not yet mastered the language! The most important thing is to maintain good relations with the aliens and give it your best shot.

Always give an answer but do not write in English.

If you make an attempt the aliens will know you are trying and they will be happy. They will go out of their way to try to understand everything you say, and they are very patient. However, writing in English will annoy them!

In addition, a small coding error in the set up of one of the experiments meant that the chain did not grow but repeatedly built on the first, random, language. This was fixed.

With both these changes the experiments was run again on 2025-08-05 and 2025-08-06 so that five chains were collected. However, it was realised at that point that there was a subtle mistake in the experiments. Our bottleneck set is selected at random, taking nine images out of 27, each with its paired word. These images have three attributes, colour, motion and shape, each with three values. We did not impose any further constraint on the selection, in fact, with nine images out of 27, there is an almost 0.1 chance that the set of nine will not represent at least one of the nine properties, the different values of the three attributes. Given that each chain contains ten participants this seems to high a probability that the bottleneck set will not represent all nine properties.

Given this, we decided to stop the experiment after five chains. Examining the 15 chains we collected, the languages do not seem to have developed a compositional structure. For this reason we have decided to change the structure in other ways, the biggest change, support by a pilot, is that we have moved from words to phrases. Rather than making words out of two, three or four syllables, we pick phrases composed of two, three or four words selected from

dreff, plone, skerm, tulve, frast, quemp, vorn, sproth, glape

In the first set of experiments the syllables were selected with replacement, this does not appear to match what happened in the original experiments reported in Kirby et al. (2008); in the proposed experiments the words are selected without replacement.

We have also decided to change the structure of EXPERIMENT 3, in the notation used in the main protocol

- EXPERIMENT 3: $B_9 B_9 \, TC_4 \, B_9 B_9 \, (TC_4)^2 \, F$

Otherwise, the experiments will run as for the main protocol.

References

Houghton, C., Bullock, S., and Lee, H. (2025). An online experiment to study the evolution of structure in human language. *OSF registries*, doi.org/10.17605/OSF.IO/ZNKAH.

Kirby, S., Cornish, H., and Smith, K. (2008). Cumulative cultural evolution in the laboratory: An experimental approach to the origins of structure in human language. *Proceedings of the National Academy of Sciences*, 105(31):10681–10686.