Simulating Language
Assessment 2

Deadline: 12 noon, 13th April
Marks returned: 5th May
Feedback: brief comments on work

By submitting this work you are agreeing that you understand the plagiarism rules and that this assessment is entirely your work alone. Group work on this assessment is not permitted.

Submit electronically, via TurnItIn. Please remember to number your answers. For questions with word limits, please make sure you **include the word count with your answer**. Word count does not include any python code, or graphs etc. Please note that we are using Python 2 in this course, rather than Python 3.

ANY ANSWER THAT GOES OVER LENGTH WILL RECEIVE A MARK OF ZERO!

IMPORTANT:

For every question I expect concise answers plus, where appropriate, the use of simulation results to illustrate key points.

Credit will be given particularly for **clarity, brevity and precision** in writing plus **convincing use of simulations** in support of your argument.

Kenny will be on holiday from 4th April to 13th April, and will therefore not respond to any questions about the assignment during that time - if you have clarification questions, ask them early.

Answer **TWO** of the following questions

1. We looked at separate models designed to explore the biological evolution of signaling systems under natural selection for communication, and the cultural evolution of signaling systems driven by the biases of learners. Combine these two models somehow, and show if and how biological and cultural evolution interact to shape signaling systems. **[word limit 600]**

2. How do the different population update methods outlined by Mesoudi and Whiten (2008) affect the evolution of linguistic systems? Illustrate with examples using EITHER Smith's (2002) model of signaling systems, OR one of the Bayesian models of iterated learning covered in the course. **[word limit 600]**

3. How does Bayesian learning capture the interplay between linguistic data and prior bias of learners? Illustrate with examples from Reali & Griffiths's (2009) model of frequency learning and Culbertson's model of Universal 18. **[word limit 600]**

4. An implicit assumption in much of linguistics suggests that language universals are a close reflection of features of the language faculty. How do the various results from iterated Bayesian learning cast light on this assumption? **[word limit 600]**

References

Mesoudi, A., & Whiten, A. (2008). The multiple roles of cultural transmission experiments in understanding human cultural evolution. *Philosophical Transactions of the Royal Society, 363,* 3489-3501.

Reali, F., Griffiths, T. L. (2009). The evolution of frequency distributions: Relating regularization to inductive biases through iterated learning. *Cognition, 111,* 317–328.

Smith, K. (2002). The cultural evolution of communication in a population of neural networks. *Connection Science, 14*, 65-84.