7 March 2016

Dear Prof. Cooper,

Please find attached a copy of a manuscript entitled "*When extremists win: Cultural transmission via iterated learning when priors are heterogeneous*", co-authored with Amy Perfors, Arthur Kary, Scott Brown and Chris Donkin, which we would like and submit for possible publication in *Cognitive Science.*

Our paper focuses on the "iterated learning" paradigm commonly used to study linguistic and cultural evolution, and has more recently been used as a methodological tool for revealing inductive biases. In particular, we examine how iterated learning chains behave when individual learners can have different inductive biases to one another. We demonstrate that this kind of "heterogeneity" has systematic effects: iterated learning chains are disproportionately influenced by the *most* biased learners in the population. In such situations, there is no guarantee that an iterated learning chain reveals the inductive biases present in the population in any meaningful sense.

We present three simulation studies highlighting this behaviour, relating to language evolution, decision making and categorisation, as well as one experiment showing that this distortion is applicable to empirical situations. Additionally, in one simple case we present a formal proof of the convergence behaviour of heterogenous chains. Taken as a whole, the work provides a natural counterpoint to existing work on iterated learning - when individual differences are present, the behaviour of these systems can be very different to how they behave in a more homogenous setting, which has implications both for the study of cultural evolution and the use of iterated learning as a tool for revealing inductive bias.

We think the paper would be of interest to a wide audience, and the topic is inherently multidisciplinary (pertaining to psychology and linguistics, and perhaps other disciplines). As such we believe it would be a good fit for *Cognitive Science*. As the paper focuses on iterated learning, good choice of reviewer would be anyone who has worked extensively with these methods, including Kenny Smith, Simon Kirby, Mike Kalish and Tom Griffiths, but we have no objection to any reviewer.

Thank you for your consideration.

Kind regards,

Dan Navarro
(and on behalf of Amy Perfors, Arthur Kary, Scott Brown & Chris Donkin)