

25 October, 2017

Report on the PhD thesis “Epidemiology of Representations: An Empirical Approach” by Sébastien Lerique.

Overall assessment

This is an excellent thesis. It is an impressive mix of theory, sophisticated computational methodology and novel empirical research. Some of the findings have already been published in a top international journal and, consistent with open science best practice, the software and analyses are freely available on github. Bravo!

Chapter one.

This chapter reviews the current state of the field of cultural evolution. It contrasts the approach taken by Standard Cultural Evolution model that Sterleny has dubbed the “Californian school” with that adopted by proponents of Cultural Attraction Theory (the “Paris school”). It displays both a good understanding of the historical development of the field and provides an accurate account of current debates (although comparative studies of cultural macroevolution are not covered at all). However, with this minor exception it sets the stage nicely for the empirical focus on cultural attractors in the thesis. If I were to be a little critical, I would note that some of the key concepts such as culture, cultural information and representation are not that clearly defined. More significantly, Cultural Attraction Theory is presented very uncritically. Many cultural evolutionists regard the debate between the Californian and Paris schools as a largely semantic dispute. Whether one describes the process of cultural transmission as involving replication or reconstruction might depend on the granularity of the description rather than any fundamental difference in the process. One person’s content bias is another person’s cultural attractor. Others claim the notion of a cultural attractor is often defined in a circular manner – it is a descriptive concept of little explanatory value. Perhaps at the defense the candidate might be asked to clarify his position on these issues. He could also be pushed on what the distinction between a meme and a differential representation really is, especially if one takes an informational notion of a meme.

Chapter two

I note that most of the work reported in this chapter has been published in a top international. Excellent! The chapter is an elegant empirical study of changes that take place in quotations when they are copied online. I really like the way the author honed in on six word-level features to make the question about the role of cognitive biases tractable. The methodology used is sophisticated and the findings credible and interesting. There are two things I would like to discuss at the defense. First, were predictions made about the role of specific psycholinguistic biases made in advance of the empirical study (and if so were these registered)? One of the common critiques of Cultural Attraction Theory is that it only offers a post hoc explanation of results. It strikes me that

it should have been possible to make prior predictions in this case. The second issue I would like to raise concerns the effect size of cognitive biases. Heinrich and others have argued that when processes of selection and attraction interact, selection will always overrule attraction. While one can argue about the details of Heinrich's models of these processes, I wonder if it would be possible to quantify the relative effect of cognitive biases on changes to quotations in blogspace? I couldn't find a clear statement on this in the thesis although I note that the author points out that,

"we have a great number of different cases (one case per cluster in which substitutions are found, i.e. 698 cases), with very few measures on each of them (average 9, median 5). This rendered the prediction of individual words impractical: if we cannot compute a percentage of explained data for a given case, any approximate prediction will be heavily underestimated."

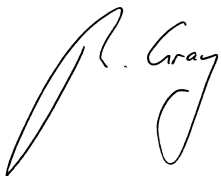
Does this mean that we can't say if the cognitive biases explain 1% or 90% of the changes?

Chapter three

Chapter three is a nice compliment to chapter two. Instead of studying changes to quotations in the wild (blogspace), it moves the focus to a controlled setting with experiments using an online transmission chain platform. The chapter begins with an insightful analysis of the limitations of previous work on transmission chains and then outlines how these might be overcome by using a combination of an online transmission study, the Levenshtein distance measure and alignment algorithms. I liked that fact that the candidate didn't hide the fact that there were considerable teething problems with getting high quality data from the online application. The results of the three experiments provide a detailed quantification of the changes. Again the methodology is sophisticated and the results carefully analysed. While many of the results are not particularly surprising (i.e. trends for reduced utterance length, increased transmissibility, and increased variability), I did find the analysis and discussion of bursts of change quite insightful.

Chapter four

This chapter discusses the importance of utterance meaning in language transformations. It outlines the problems strong pragmatics create for characterizing semantic cultural attractors and then examines how Relevance Theory and the Enactive approach might help solve this problem. The author doesn't take sides on whether cognition is best viewed from an information processing or an embodied perspective, but instead embraces a healthy pluralism. I really liked the fact that the discussion didn't end with some purely philosophical considerations. Instead we get a series of interesting proposals for future empirical work. This reinforces the view that the author is someone who can skillfully weave together philosophy, computational methodology and experimentation.



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