

The Influence of Competition on Language Evolution

Supervisor:

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Overview

Crowding in information markets should lead to adaptive changes in signal encoding. This project would simulate adaptive signal encoding in the face of competition and compare this with language evolution over the last 200 years using corpora of English.

Background:

Recent trends in communication indicate massive increases in the amount of information we must process on a daily basis. Borrowing from the idea of an attention economy, this leads to potential crowding in the language market. This is likely to lead to competition among message producers. Similar to a global cocktail party problem, crowding and the resultant attention economies of information markets mimic the inclusion of noise in information theoretic accounts of signal transduction.

In recent work we observe systematic changes in language over the last 200 years in relation to how concrete vs. abstract words are. This project would attempt to take a more statistical approach to language evolution and combine this with mathematical models of communication competition.

Prerequisites and Future Prospects

Students interested in this project should have a command of computer programming and be interested in learning about statistical analyses of large data sets. This work has broad implications for understanding language evolution and how to construct messages that best communicate information. This should be highly viable in relation to future Ph.D. work.

References:

- Altmann, E. G., Pierrhumbert, J. B., & Motter, A. E. (2009). Beyond word frequency: bursts, lulls, and scaling in the temporal distribution of words. *PLoS One*, 4, e7678.
- Hills, T. & Adelman, J. (In review). Global cocktail parties and in the influence of crowding on language evolution. *Proceedings of the Annual Conference of the Cognitive Science Society*.