

Language games and cultural evolution – LING 2190

INSTRUCTOR Gareth Roberts

OFFICE HOURS By appointment

E-MAIL gareth.roberts@ling.upenn.edu

PREREQUISITES None

COURSE DESCRIPTION This is a course about how language and communication can be thought of—and investigated—as games. When people use language to communicate with each other, they are following rules to perform actions that have an effect on the world, including other people. These actions might achieve goals, and they might prompt further actions, and so on. Over time, these linguistic actions can lead to changes in the environment and even the rules of the game itself! In other words, the playing field changes dynamically as a result of the actions performed on it.

This way of looking at language is not new, and this is also a course about how thinking about language this way can inspire (and has inspired) models and laboratory experiments that help us to understand how language works and how it evolves. In covering this we will also touch on how the same approach has shed light on cultural evolution beyond language and communication alone. Finally, we will also discuss the limitations (and even potential dangers) of conceptualizing language, or anything else, in game-like terms.

OBJECTIVES The primary objective of the course is to gain an understanding of the following:

- What it means to think of language (and other cultural behavior) as a game
- Fundamental principles of cultural evolution
- Game-theoretic models of language and communication
- Experimental language games

YOUR GRADE Your grade will be composed as follows:

Homework assignments 50%
Final essay/project 50%

HOMEWORK ASSIGNMENTS Homework assignments will involve tasks such as responding to specific readings (1–2 pages each) or completing exercises. In some cases homework assignments may be collaborative.

FINAL ESSAY/PROJECT Your project could be an essay (typically one that takes a position on a particular controversy in the field) or something more practical, such as a detailed experimental design, or an analysis of real data. You will start planning for this early in the semester.

EXTRA CREDIT Up to three points towards the final grade can be obtained either by taking part in experiments via the Psychology subject pool (1 point per credit hour) or by writing short summaries of experimental papers (1 point per paper). Both experiments and papers should be related to language or communication where possible. Papers for summary must be sent to me for approval before being eligible.

LATE WORK You have the option of submitting one assignment (of your choice) two days late without penalty. If for some reason you cannot make that later deadline, or cannot make the standard deadline for another assignment, it is important that you **contact me immediately**. Otherwise you may lose points for late submission.

TOPICS AND
READINGS

The course will cover the following topics, most of which will be accompanied by readings and associated with an assignment. For each topic below I have listed one or two potential example readings.

- What is a game?
 - Chapter 1 of Nguyen, C. T. (2020) *Games: Agency as Art* (Oxford University Press)
- Introduction to game theory
 - Selected readings from Steven Tadelis's (2013) *Game theory: An Introduction* (Princeton University Press)
- Signaling games
 - Further readings from Tadelis (2013)
 - Selected readings from Clark, R. (2011) *Meaningful Games*. (MIT Press)
 - Huttegger, S., Skyrms, B., Tarres, P., & Wagner, E. (2014). Some dynamics of signaling games. *Proceedings of the National Academy of Sciences*, 111(Supplement 3), 10873-10880.
- Introduction to cultural evolution
 - Selected readings from Mark Ridley's (2013) *Evolution* (Blackwell)
 - Selected readings from Alex Mesoudi's (2013) *Cultural Evolution: How Darwinian Theory Can Explain Human Culture and Synthesize the Social Sciences* (University of Chicago Press)
- Formal games and language change
 - Ahern, C., & Clark, R. (2017). Conflict, cheap talk, and Jespersen's cycle. *Semantics and Pragmatics*, 10(11).
- Basics of experimentation and analysis
 - Selected readings from Bodo Winter's (2019) *Statistics for linguists: An introduction using R*. (Routledge)
- Behavioral economic games
 - Selten, R. and Warglien, M. (2007). The emergence of simple languages in an experimental coordination game. *Proceedings of the National Academy of Sciences*, 104(18), 7361-7366.
- Introduction to experimental semiotics
 - Galantucci, B., Garrod, S., & Roberts, G. (2012). Experimental semiotics. *Language and Linguistics Compass*, 6(8), 477-493.
 - Roberts, G. and Sneller, B. (2020). Empirical foundations for an integrated study of language evolution. *Language Dynamics and Change*, 10(2), 188-229.
- Coordination games
 - Galantucci, B. (2005). An experimental study of the emergence of human communication systems. *Cognitive Science*, 29(5), 737-767.
- Referential games
 - Stevens, J. S. and Roberts, G. (2019). Noise, economy, and the emergence of information structure in a laboratory language. *Cognitive Science*, 43(2), e12717.
 - Raviv, L., Meyer, A., & Lev-Ari, S. (2019). Larger communities create more systematic languages. *Proceedings of the Royal Society B*, 286(1907), 20191262.
- Social group games
 - Sneller, B. and Roberts, G. (2018). Why some behaviors spread while others don't: A laboratory simulation of dialect contact. *Cognition*, 170, 298-311.
- Learning vs. interaction
 - Kirby, S., Tamariz, M., Cornish, H., & Smith, K. (2015). Compression and communication in the cultural evolution of linguistic structure. *Cognition*, 141, 87-102.