

Games and Signals
Ling 495
TTh: 10:30-12:00

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course page: <http://web.sas.upenn.edu/robinclark/ling-495-games-and-signals/>

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Textbook: Stephen Schecter & Herbert Gintis (2016). *Game Theory in Action: An Introduction to Classical and Evolutionary Models*. Princeton University Press.

Theories of linguistic meaning have generally assumed that the speaker and the hearer can coordinate their behavior on the basis of common interest. In the real world, of course, interests rarely align perfectly; rather, our interests are often only partially aligned and sometimes are in opposition. Games of incomplete information provide an interesting framework for modeling partially aligned interests. In these games, the signaler and the receiver are not sure which game is being played, but, rather, must update their beliefs based on the signals they send and receive. These games provide an interesting model of speech acts and information transmission, one that allows us to investigate models of pragmatic behavior.

In this class, we will develop tools Game Theory, Behavioral Economics and Population Biology that will permit us to investigate, via precise models, of communicative behavior. We will analyze linguistic signaling in terms of Games of Incomplete Information and show that the resulting framework does not require perfect alignment of interests for information to flow.

We will then turn to evolutionary forces that might influence signaling behavior, in particular forces which could promote deception. We will develop a model of the evolution of signaling systems. These systems favors truth, but allow for a certain level of deception. To test our theory, we will consider criminal communication, where the agents are almost certainly not honest, but where the consequences of dishonesty can be particularly dire. Along the way, we will lay the foundations for a treatment of signaling in terms of Evolutionary Game Theory.

Grading: Grading in the class will be done on the basis of 5 homework assignments, and class participation:

Table 1: Course Grading

Homework	90%
Class Participation	10%

Readings: You should order Schecter & Gintis from your favorite source; additional readings will be distributed via the course page.

In addition, the course will make extensive use of Jupyter notebooks. We will, as part of the course, show how to construct and run these notebooks. The notebooks will be distributed via the course homepage, but can also be found on Github.