Models of Language Evolution
Session 9: Students Presentations Part I

Roland Mühlenbernd

2015/01/07
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<td>Kameliya Hristova</td>
<td>Culture: Copying, Compression, and Conventionality (Tamariz, Kirby 2014)</td>
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<td>Franziska Koesling</td>
<td>Talking to Neighbors: The Evolution of Regional Meaning (Zollman 2005)</td>
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<td>Carina Rüdinger</td>
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<td>Vanessa Nadler</td>
<td>Signalling Games: Evolutionary Convergence on Optimality (Lentz, Blutner 2009)</td>
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<td>Language Structure: Psychological and Social Constraints (Jäger, van Roiij 2007)</td>
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<td>Clara Baumgärtner</td>
<td>Integrating the Horizontal &amp; Vertical Cultural Transmission of Novel Communication Systems (Theisen-White, Kirby, Oberlander 2014)</td>
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<td>Marcel Binz</td>
<td><strong>project topic:</strong> signaling &amp; the game of life (Mühlenbernd, Schulz 2014)</td>
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<td>Sabrina Selck</td>
<td><strong>project topic:</strong> evolution of the lexicon (Steels 1995)</td>
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<td>Pink Powerangers</td>
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<td>Vivian Fresen</td>
<td><strong>project topic:</strong> evolution of human vowel systems (de Boer 2002)</td>
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<td>Team 1</td>
<td><strong>project topic:</strong> evolution of compositionality in signaling games</td>
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<td>Team Nash</td>
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“...we urgently need a better general understanding of how cultural transmission and social coordination shape language if we are to achieve a complete picture of the evolution of language.”

(Scott-Phillips and Kirby, 2010: 110)
Language Evolution in the Laboratory

From: Language Evolution in the Lab (Scott-Phillips and Kirby 2010)
Language Evolution in the Laboratory

Recent Trend:

▶ the development of experimental approaches that use human participants to observe the emergence of symbolic communication systems
▶ some studies have been explicitly based on and/or inspired by previous computational work

Questions

▶ How do these various studies relate to earlier computational work and to other approaches to language evolution?
▶ How do they relate to each other?
▶ What do they tell us about language evolution?
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Types of Experiments:

▶ Meaning Negotiation Game (plus compositionality)
▶ Graphical Communications Tasks (similarity with verbal communication, possibility for innovation, Pictionary-style games)
▶ Iterated Learning Experiments: an artificial languages, consisting of meanings (pictures) and expressions (strings of syllables), is learned and transmitted repeatedly in a chain of participants
▶ Iterated Learning with interaction transmission (vertical and horizontal transmission): vertical transmission requires a learnable system, horizontal transmission a expressive system
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Questions for future research:

- What are the prerequisites for recognition of communicative intent?
- More generally, what cognitive mechanisms are necessary for inferential communication, and how did they evolve?
- Do the results obtained so far scale up to larger populations with more complex dynamics?
- Do different population structures influence the way in which language is transmitted? If so, how, and how does this affect linguistic structure?
- How do experimental studies in the laboratory relate to studies of language emergence in real human populations?
- What is the relative contribution of feedback, interaction and cultural inheritance (and indeed other forms of information transmission) to the form of the final communication system?
- Can the results from experimental approaches be used to develop better computational models of language evolution?
Studies of Today

1. Kameliya Hristova
   - Topic: *Culture: Copying, Compression, and Conventionality* (Tamariz, Kirby 2014)
   - Background: *Language Evolution in the Lab* (Scott-Phillips and Kirby 2010)
   - Category: Experimental study of vertical transmission

2. Franziska Koesling
   - Background: Game Theory, Signaling Games, Stag Hunt Game
   - Category: Computational study of horizontal transmission