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**Northwestern Institute on Complex Systems
invites you to its
Weekly Seminar**

- Speaker:** Robert Daland & Andrea D. Sims, Linguistics Department,
Northwestern University
- Title:** Much Ado About Nothing: A Social Network Model of Russian
Paradigmatic Gaps
- When:** Wednesday, June 6, 2007
- Where:** Chambers Hall, 600 Foster Street, Lower Classroom Level
- Time:** 12:00 – 1:00

NICO Coffee Hour will follow for questions, networking, and collaboration

Abstract

When presented with a novel word (e.g., *wug*), speakers produce other forms of the same word easily (e.g., *wugs*). However, real words sometimes have missing forms – gaps. These facts are seemingly contradictory, creating a challenge to theories of word structure and language learning.

We explored the conditions under which gaps persist and spread using a multi-agent model with Bayesian learning. We ran three simulations: no grammar learning, learning with arbitrary analogical pressure, and analogical learning weighted by a word form similarity measure. We seeded our model with a representative sample of Russian verbs.

We show that gaps can be modeled as a balance between forces determining a word's form, and those determining frequency of usage. A group of words which share an element of form and have a low probability of use will pressure words with similar form to be used less, creating a new gap. Our results parallel the historical development of gaps among Russian verbs.

Previous accounts of gaps focused exclusively on speakers' knowledge of word forms. By contrast, we argue that elements of word form and word usage interact to perpetuate gaps, and the apparent contradiction to productivity is actually an illusion created by this interaction. Basing our account on word usage also allows us to more accurately predict real world behavior.