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# Psychocomputational Models of Human Language Acquisition (PsychoCompLA-2007)

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**Keywords:** language acquisition; syntax acquisition; language learning; language change; computational; linguistics; psycholinguistics; psychology; statistical; innateness.

## Workshop Topic and History

The workshop is devoted to psychocomputational models of language acquisition. By *psychocomputational*, we mean computational models that are compatible with research in psycholinguistics, developmental psychology and/or linguistics.

This is the third meeting of the Psychocomputational Models of Human Language Acquisition workshop following PsychoCompLA-2004, held in Geneva, Switzerland as part of the 20th International Conference on Computational Linguistics (COLING 2004) and PsychoCompLA-2005 as part of the 43rd Annual Meeting of the Association for Computational Linguistics (ACL-2005) held in Ann Arbor, Michigan where the workshop shared a joint session with the Ninth Conference on Computational Natural Language Learning (CoNLL-2005).

## Workshop Description

The workshop will present research and foster discussion centered around psychologically-motivated computational models of language acquisition, with an emphasis on the acquisition of syntax. In recent decades there has been a thriving research agenda that applies computational learning techniques to emerging natural language technologies and many meetings, conferences and workshops in which to present such research. However, there have been only a few (but growing number of) venues in which psychocomputational models of how humans acquire their native language(s) are the primary focus.

Psychocomputational models of language acquisition are of particular interest in light of recent results in developmental psychology that suggest that very young infants are adept at detecting statistical patterns in an audible input stream. Though, how children might plausibly apply statistical 'machinery' to the task of grammar acquisition, with or without an innate language component, remains an open and

important question. One effective line of investigation is to computationally model the acquisition process and determine interrelationships between a model and linguistic or psycholinguistic theory, and/or correlations between a model's performance and data from linguistic environments that children are exposed to.

Although there has been a significant amount of presented research targeted at modeling the acquisition of word categories, morphology and phonology, research aimed at modeling syntax acquisition has just begun to emerge.

## Invited Presentations

*Statistical language learning:*

*Computational and maturational constraints*

Elissa Newport, University of Rochester, USA

*The next challenges in unsupervised language acquisition:*

*Dependencies and complex sentences*

Shimon Edelman, Cornell University, USA

*Learnable representations of languages:*

*Something old and something new*

Alex Clark, Royal Holloway University of London, UK

*Indirect evidence and the poverty of the stimulus*

Terry Regier, University of Chicago, USA

*Lexical learning and lexical diffusion*

Charles D. Yang, University of Pennsylvania, USA

*Bootstrapping bootstrapping*

Damir Cavar, Zadar University, Croatia and University of Indiana, USA

*Transformational networks*

Bob Frank, John Hopkins University, USA

*The great (Penn Treebank) robbery:*

*When statistics is not enough*

Sandiway Fong, University of Arizona, USA, and

Robert C. Berwick, MIT, USA

(joint work with Partha Niyogi, University of Chicago, USA)

## Submissions

Abstracts of research on the following topics were invited for submission and review:

- Models that address the acquisition of word-order;
- Models that combine parsing and learning;
- Formal learning-theoretic and grammar induction models that incorporate psychologically plausible constraints;
- Comparative surveys that critique previously reported studies;
- Models that have a cross-linguistic or bilingual perspective;
- Models that address learning bias in terms of innate linguistic knowledge versus statistical regularity in the input;
- Models that employ language modeling techniques from corpus linguistics;
- Models that employ techniques from machine learning;
- Models of language change and its effect on language acquisition or vice versa.
- Models that employ statistical/probabilistic grammars;
- Computational models that can be used to evaluate existing linguistic or developmental theories (e.g., principles & parameters, optimality theory, construction grammar, etc.)
- Empirical models that make use of child-directed corpora such as CHILDES.

## Audience

This workshop brings together researchers from cognitive psychology, computational linguistics, other computer/mathematical sciences, linguistics and psycholinguistics working on language acquisition from a wide variety of perspectives. Diversity and cross-fertilization of ideas is the central goal.

## On the Web

Abstracts and some full papers are available on the internet at: <http://www.colag.cs.hunter.cuny.edu/psychocomp>