

"EVOLUTION AND LEARNING OF LANGUAGE"

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I will give an overview of the recent work that has been done in an attempt to create a mathematical formulation of the evolution of language. I will discuss the key notions of “language”, “grammar” and “learning” and formulate the “paradox of language acquisition”. I will discuss some, more or less, relevant learning algorithms, and then go on to introduce the notion of “group learning” as opposed to the classical “individual learning”. It turns out that methods of evolutionary biology can be applied to describe the dynamics of language. In a sense, languages evolve like individuals in a population: the fittest ones survive and spread, the less fit ones get eliminated. The two driving forces of evolution, selection and mutation (i.e. the mistakes when learning a language), can be incorporated into a system of equations called the evolutionary equations. One of the questions we can ask is how accurately children have to learn the language of their parents in order for the population to be able to maintain a coherent language? Another one is what are the evolutionary forces that shape the Chomskian Universal Grammar?