

## Dynamic Approaches to Language Processing

NARAYANAN SRINIVASAN

*Centre for Behavioural and Cognitive Sciences, India*

### ABSTRACT

*Symbolic rule-based approaches have been a preferred way to study language and cognition. Dissatisfaction with rule-based approaches in the 1980s led to alternative approaches to study language, the most notable being the dynamic approaches to language processing. Dynamic approaches provide a significant alternative by not being rule-based and address performance/implementation issues in language processing. They also incorporate the temporal dimension into modelling and explaining language. Connectionist models which are a subset of dynamical models of cognition have become very popular with work spanning language acquisition, comprehension and production. For example, connectionist models have been proposed for learning past tense of verbs and generation of sentences. Researchers trying to incorporate dynamics have based arguments ranging from temporal phenomena, non-discreteness of phonemes and statistical information available in input data for opting for a dynamic approach. Valuable criticisms against connectionist and other dynamic approaches emphasize the need for further studies focusing on the fundamental challenges facing these approaches. While dynamical models show promise, further work is needed on new mathematical techniques in dynamical systems and application of those techniques to understand language.*

### 1. INTRODUCTION

Approaches to language have always differed on the role of innateness or learning in language acquisition and the rules (or the non-rule mechanisms) governing language processing. Early behaviouristic approaches argued that language is acquired purely by learning and such learning is based on conditioning and reinforcement. The responses to behaviourism led to the development of the “cognitive revolution” in psychology with Chomsky’s research focusing on language. Chomsky has argued that we have innate knowledge of possible rules of language. Acquisition of language involves creation of hypotheses by children on the application of these rules to the language