

Studying Second Language Development from a Complex Dynamic Systems Perspective

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Abstract : This paper discusses the application of complex dynamic system theory (DST) to the study of individual differences in second language development. This transdisciplinary framework allows researchers to view the trajectory of language development as a dynamic, non-linear process. A DST approach views language as multi-componential, consisting of multiple complex systems and nested layers. These multiple components and systems continuously interact and influence each other at both the macro- and micro-level. Dynamic systems theory aims to explain and describe the development of the language system, rather than make predictions about its trajectory. Such a holistic and ecological approach to second language development allows researchers to include various research methods from neurological, cognitive, and social perspectives. A DST perspective would involve in-depth analyses as well as mixed methods research. To illustrate, a neurobiological approach to second language development could include non-invasive neuroimaging techniques such as electroencephalography (EEG) and functional magnetic resonance imaging (fMRI) to investigate areas of brain activation during language-related tasks. A cognitive framework would further include behavioural research methods to assess the influence of intelligence and personality traits, as well as individual differences in foreign language aptitude, such as phonetic coding ability and working memory capacity. Exploring second language development from a DST approach would also benefit from including perspectives from the field of applied linguistics, regarding the teaching context, second language input, and the role of affective factors such as motivation. In this way, applying mixed research methods from neurobiological, cognitive, and social approaches would enable researchers to have a more holistic view of the dynamic and complex processes of second language development.

Keywords : dynamic systems theory, mixed methods, research design, second language development

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