

The analysis of Second Language Development as a dynamic system: the emergence of a second language lexicon

Following the theoretically-based arguments for considering both first and second language development as usage-based dynamic systems (see, for instance, Ellis & Robinson 2008), there is a growing need for empirical studies that would corroborate these assumptions. Detailed variability analyses have shown how linguistic variables interact over time and how these interactions contribute to the development of language as a dynamical system. In this contribution we will show how outcomes of variability analyses can be interpreted and extended into a simulation of complex interaction that explains and predicts linguistic growth.

DST aims to describe and explain the ways in which complex systems change over time as resulting from processes of self-organization in these systems. Systemic growth is conceived of as an iterative process, which means that a current developmental level depends critically on preceding levels (van Geert 1994). Growth is maintained by a flux of energy (motivation and intention to learn) and constrained by limited resources (such as memory, attention and motivation, but also, invariably, by input frequency) and by the carrying capacity of a given linguistic component, which is its maximal attainable level within a given time frame, for instance the number of words that can be learned within a single lesson, given optimal conditions. The dynamic approach provides constructs that demonstrate how various variables within a system interact over time, thereby accounting for the non-linear nature of development. Within language, these ever-changing interactions reflect the effort spent on maintenance versus acquisition, given the limited cognitive resources available for each purpose (Herdina & Jessner, 2002; Verspoor, Author & van Dijk, year)

The current study focuses on written L2 vocabulary. In this area, it has been noted that receptive, “theoretical” knowledge develops at a different rate than productive ability, and often fails to fully transfer into production (Schmitt & Meara, 1997; Laufer & Paribakht, 1998). This discrepancy is the main interest of the study. It concentrates on the acquisition of academic English (L2) vocabulary, as defined by the University and Academic Word lists (Xue & Nation 1984; Coxhead 2002, respectively). Within this framework, the study focuses on knowledge across four vocabulary levels on a receptive-productive continuum. It applies two complimentary techniques to longitudinal data from a case study of 9 months’ acquisition in an English-speaking academic setting of immersion. The first is variability analysis aimed at revealing underlying patterns of interaction between these levels, and the second is a configuration of this interaction into an empirical computerized model. By presenting some results obtained by this methodology, we hope to illustrate the applicability of DST to language development, both as reinforcing or supplementing existing theory, and as an explanatory and predictive tool in its own right.

Reference List

Ellis N.C. and Robinson P. (2008). An introduction to Cognitive Linguistics, Second Language Acquisition, and language instruction. In Robinson P. and Ellis, N.C. (Eds.) *Handbook of Cognitive Linguistics and Second Language Acquisition* (pp. 3-24). New York and London: Routledge.

Herdina, P. & Jessner, U. (2002). *A dynamic model of multilingualism*. Clevedon: Multilingual Matters.

Laufer, B. and Paribakht, T. S. (1998). The relationship between passive and active vocabularies: Effects of language learning context. *Language learning*, 48, 365-391.

Schmitt, N. and Meara, P. (1997). Researching vocabulary through a word knowledge framework. *Studies in second language acquisition*, 19, 17-36.

van Geert, P. and Steenbeek, H. (2008). A complexity and dynamic systems approach to development: measurement, modeling and change. *In progress*.

Verspoor, M. H., Author, and van Dijk, M. (year). Variability in second language development from a dynamic systems perspective. *The modern language journal*, 92, 214-231.