Bilingualism: Language and Cognition

cambridge.org/bil

From fuzzy to fine-grained representations in the developing lexicon

Isabelle Darcy

Indiana University, Bloomington, USA.

Peer Commentaries

Cite this article: Darcy I (2022). From fuzzy to fine-grained representations in the developing lexicon. *Bilingualism: Language and Cognition* **25**, 206–207. https://doi.org/10.1017/S1366728921000572

Received: 9 July 2021
Revised: 27 July 2021
Accepted: 28 July 2021
First published online: 26 August 2021

Keywords:
fuzzy lexical representations; bilingual mental lexicon; L2 learners

Address for correspondence:
Isabelle Darcy,
E-mail: idarcy@indiana.edu

The Ontogenesis Model of the L2 lexical representation by Bordag, Gor and Opitz (2021) is a rich conceptual framework of the way words are stored (i.e., what a lexical representation consists of) and learned (i.e., how the representation changes over time) in the L2 mental lexicon. It models the development of three dimensions of a lexical representation: a) three major linguistic domains of knowledge about the word, b) the mappings between these domains, and c) the network in which this multidimensional representation is embedded. The model's holistic focus on the word – that is, on the multidimensionality of the lexical representation itself – connects several approaches that are often limited to one modality (e.g., reading), or one domain of knowledge (e.g., meaning), underscoring the confluence of factors that impact word learning.

Understanding the internal structure of the L2 lexical representation is an essential component of advancing knowledge about how L2 learners succeed in creating accurate and elaborate lexical entries over time. The exact mechanisms by which this happens are still open – and could involve updating initial representations or removing inaccurate ones. In turn, understanding what L2 representations are like, and how they change, matters because of the key role they play in recognizing spoken words in a conversation. In L1, lexical representations for well-known words contain various types of information – they are elaborate (e.g., Hulstijn, 2001, p. 259); they are specific and stable; and they are deeply interconnected into larger networks. Their phonological form is precise, or fine-grained, allowing for efficient activation and recognition. Words are accessed quickly and accurately, even with incomplete acoustic information (e.g., Otake & Cutler, 1999), and listeners are exquisitely sensitive to phonetic mismatches (e.g., Dupoux Sebastián-Gallés, Navarrete & Peperkamp, 2008). In L2, many lexical representations are initially fragmentary, ambiguous, and their phonological form shaped by L1 phonology. As a result, they are more difficult to access with precision and ease (Cook & Gor, 2015).

Herein lies also the import of Bordag and colleagues' framework (and of the research it will generate) for language instruction, faced with the question of how to help learners establish fine-grained lexical representations. Ultimately, understanding which factors facilitate this development will inform instruction – for instance, by outlining when to provide explicit pronunciation support; or which types of words to learn together or separately (see Dobel, Lagemann & Zwitserlood, 2009; Pajak, Creel & Levy, 2016) – in order to effectively refine these words' representations. The unifying force of the model highlights the importance of integrating the various domains of knowledge into vocabulary teaching.

Going forward, one of the challenges for research will be to further define 'fuzziness'. Bordag and colleagues view it as a central property of the L2 lexicon and define it as inexact or ambiguous encoding of some components or dimensions of the lexical representation. Of note, fuzziness could be viewed as a property of DEVELOPING lexicons rather than of L2 lexicons only, in continuity with L1 (Gierut, 2016; Lahiri & Reetz, 2002; Pajak et al., 2016; Stoel-Gammon, 2011; White, Yee, Blumstein & Morgan, 2013). However, it is possible that the NATURE of this fuzziness differs in L1 and L2. Research is just beginning to uncover the various ways by which L2 representations can be fuzzy, ranging from uncertainty about one feature, an entire syllable (Darcy & Thomas, 2019), to a more global form fuzziness (Cook & Gor, 2015). The nature of the fuzziness could also evolve over time for the same word: a word may first be encoded with inexact specifications (not target-like, e.g., the wrong vowel is stored), then be ambiguous (one or more features of the vowel are left underspecified), and finally become accurate. This may lead to varying slopes towards fine-grained optima, within each domain.

The model is certain to also stimulate exciting research on the SOURCE of imprecise representations: for instance, the way the word was learned (demanding vs. easy, similar vs. different words, etc., Dobel et al., 2009) vs. a processing limitation due to L1 influence resulting in a particular phonological dimension not being encoded in words (Dupoux et al., 2008). Eventually it will also become possible to characterize the CONSEQUENCES of fuzziness, i.e., patterns of mutual influence among lexical representations, how neighboring as well as more distant words influence the content and the development of a given entry and how representations shift from fuzzy to fine-grained throughout the whole mental lexicon.

© The Author(s), 2021. Published by Cambridge University Press

CAMBRIDGE UNIVERSITY PRESS

References

Bordag D, Gor K and Opitz A (2021) Ontogenesis model of the L2 lexical representation. *Bilingualism: Language and Cognition*. https://doi.org/10.1017/S1366728921000250

Cook SV and Gor K (2015) Lexical access in L2: Representational deficit or processing constraint? *The Mental Lexicon* **10**, 247–270. doi:10.1075/ml.10.2.04coo

Darcy I and Thomas T (2019) When blue is a disyllabic word: Perceptual epenthesis in the mental lexicon of second language learners. *Bilingualism: Language and Cognition*, **22**, 1141–1159. doi:10.1017/S1366728918001050

Dobel C, Lagemann L and Zwitserlood P (2009) Non-native phonemes in adult word learning: evidence from the N400 m. *Philosophical transactions of the Royal Society of London* **364**, 3697–3709. doi:10.1098/rstb.2009.0158

Dupoux E, Sebastián-Gallés N, Navarrete E and Peperkamp S (2008) Persistent stress 'deafness': The case of French learners of Spanish. *Cognition* **106**, 682–706.

Gierut JA (2016) Nexus to Lexis: Phonological Disorders in Children. *Seminars in speech and language* **37**, 280–290. https://doi.org/10.1055/s-0036-1587704

Hulstijn J (2001) Intentional and incidental second-language vocabulary learning. In Robinson P (ed), *Cognition and Second Language Instruction*. Cambridge: Cambridge University Press, pp. 258–286.

Lahiri A and Reetz H (2002) Underspecified recognition. In Gussenhoven C and Warner N (eds), *Laboratory Phonology 7*. New York, Berlin: Mouton De Gruyter, pp. 636–675.

Otake T and Cutler A (1999) Perception of suprasegmental structure in a non-native dialect. *Journal of Phonetics* **27**, 229–253.

Pajak B, Creel SC and Levy R (2016) Difficulty in learning similar-sounding words: A developmental stage or a general property of learning? *Journal of Experimental Psychology: Learning, Memory, and Cognition* **42**, 1377–1399. doi:10.1037/xlm0000247

Stoel-Gammon C (2011) Relationships between lexical and phonological development in young children. *Journal of Child Language* **38**, 1–34. https://doi.org/10.1017/s0305000910000425

White KS, Yee E, Blumstein SE and Morgan JL (2013) Adults show less sensitivity to phonetic detail in unfamiliar words, too. *Journal of Memory and Language* **68**, 362–378. doi: https://doi.org/10.1016/j.jml.2013.01.003.

https://doi.org/10.1017/S1366728921000572 Published online by Cambridge University Press