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# Editorial: Fuzzy lexical representations in the nonnative mental lexicon

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## Editorial on the Research Topic

### Fuzzy lexical representations in the nonnative mental lexicon

The call for contributions to the Research Topic “*Fuzzy lexical representations in the nonnative mental lexicon*” proposed that fuzziness, i.e., imprecise encoding of the word form and/or meaning that may lead to weak lexical competition and lexical confusion, is a pervasive property of the nonnative (L2) lexicon. The 12 publications that have appeared in the Research Topic have addressed and developed different aspects of fuzzy lexical representations (FLRs).

The article by Gor et al. introduces the fuzzy lexical representations hypothesis (FLRH) and identifies the causes of fuzziness in L2 LRs and its consequences for L2 word recognition and lexical processing, in general. It reviews a number of studies that show how imprecise and ambiguous (i.e., fuzzy) phonolexical encoding, or phonological encoding of lexical units leads to weak form-meaning connections and sometimes incorrect form-meaning mappings. As a result, fuzziness produces spurious semantic associations in L2 and weakened lexical competition. According to FLRH, if fuzziness applies to the phonological encoding of difficult L2 contrasts, it may never get resolved even despite significant amounts of input. Furthermore, phonolexical encoding of less familiar L2 words may be fuzzy even if no particularly problematic L2 phonemes or phonological contrasts are involved. This type of initial fuzziness may decrease with L2 input and growing proficiency. The article suggests that L2 models of auditory word recognition should account for the interaction of input with FLRs to be more realistic. Another theoretical contribution by Kapnoula discusses the sources of lexical inhibition and facilitation in lexical competition, as they are represented in L1 and L2-based models of lexical access. This paper argues that the L1-based approach focusing on inter-lexical connections (i.e., inhibition arising from lexical competition) and the FLR approach focusing on intra-lexical fuzziness are compatible with each other.

Three contributions address different aspects of fuzziness in L2 phonological encoding. The study by [Llompert](#) focuses on asymmetries in perceptually confusable L2 phonemes—both in accuracy and in the contribution of lexical and acoustic-phonetic factors—in auditory word recognition using a lexical decision task (LDT). The encoding of the dominant L2 category that has a counterpart in L1 is not strongly constrained by lexical frequency or phonological neighborhood density; at the same time, it has more clearly defined (i.e., less fuzzy) acoustic-phonetic properties. In contrast, the encoding of the non-dominant category is influenced by the lexical factors. Another study by [Daidone and Darcy](#) uses a LDT to investigate the role of individual differences in the quality of L2 phonological encoding with a set of nonnative phonological contrasts. The study reveals that independently measured vocabulary size of individual participants is by far the best predictor of accuracy in the LDT—the bigger the vocabulary size, the higher the accuracy, i.e., the smaller the fuzziness effects on L2 lexical encoding. Phonological short-term memory is another factor that affects the quality of phonological encoding of two L2 phonemes that do not have counterparts in L1. The article by [Barrios and Hayes-Harb](#) explores the possibilities and limitations of a LDT in establishing the locus of learner difficulty in lexical processing. It contrasts two cases—when the locus of learners' difficulty is phonological encoding vs. phonological encoding. Specifically, the study looks at the scenarios when the phonological contrast in question is neutralized, the non-dominant phoneme is substituted by the dominant (or native) phoneme, or the non-dominant phoneme is distinct from the dominant, but is yet non-target-like. This approach offers concrete ways to operationalize the varying types of phonological and phonological fuzziness.

Two articles broaden the scope of FLRH by addressing the L2 lexical encoding that goes beyond phonemic contrasts. The contribution by [Pelzl et al.](#) extends the predictions of FLRH to the domain of suprasegmental features. Using a picture-phonology matching task with concurrent event-related potentials (ERP) recordings, the authors examine whether L2 learners experience encoding or retrieval problems with lexical tones in Mandarin Chinese. The results demonstrate that L2 tone recognition falls under the umbrella of fuzziness in that sometimes despite having correct metalinguistic knowledge of tones, L2 listeners nevertheless experience difficulties with tone recognition. The authors argue that these differences reflect problems both at the encoding and the retrieval levels. In another study, [Frederiksen](#) investigates placement descriptions (e.g., “she put the cup on the table”) of hearing L2 learners of American Sign Language (ASL). Results suggest that fuzzy semantic boundaries occur in cross-modal L2 acquisition as well, as indicated by the observation that L2 signers use a wider range of handshapes and use them less appropriately than native ASL controls. However, L2 signers' placement descriptions look

much more similar to those of native ASL controls than expected based on the findings for written and spoken modalities. The high degree of iconicity and transparency of placement distinctions in the visual modality may facilitate L2 acquisition and reduce fuzziness.

The study by [Baxter et al.](#) addresses the crucial question of how to improve the quality of lexical encoding of novel L2 words, i.e., to reduce their fuzziness. An L2 vocabulary training experiment with children aged 9–10 demonstrates that orthographic and semantic confusability of novel words is reduced when orthographically and semantically similar words are contrasted during word learning. While the learning challenge in contrastive training is increased, the outcomes of contrastive training are improved compared to non-contrastive training.

Three articles are devoted to the grammatical encoding of L2 words. The contribution by [Bordag and Opitz](#) extends the construct of fuzziness to the encoding of grammatical properties of lexical representations. The study compares the reading speed for newly introduced lexical items to test how L1 and L2 readers establish mental representations of new words that belong to different grammatical categories while having the same orthographic form. As predicted, new lexical representations in L2 encode the grammatical information less precisely than in L1. In an eye-tracking-in-reading study, [Nakamura et al.](#) examine strategies in the online use of information about a verb's argument structure by L2 learners. They report that both L2 participants and L1 controls access subcategorization information to guide initial syntactic analysis. While the authors argue that their results support the hypothesis of a more general parsing strategy in both L1 and L2, i.e., the intransitivity overriding hypothesis, their results do not allow for more precise conclusions about the quality of lexical representations in L1 vs. L2. Whether the quality of lexical representations differs in L1 and L2 with respect to syntactic information, e.g., argument structure, remains one of the areas to be explored in future research. The visual priming study with present and past-tense verb forms by [Wanner-Kawahara et al.](#) provides evidence that L2 learners can develop connections in terms of morphological relationships that are similar to those of L1 while having fuzzy representations of L2 orthographic forms.

Finally, the article by [Zhao and Li](#) compares the results of a computational simulation model of a developing bilingual lexicon with an analysis of error patterns in real second language learners to establish the role of the age of onset of L2 learning in developing lexical representations. It shows that the early learning of L2 compared to L1 leads to the establishment of functionally distinct lexical representations. Conversely, when the learning of L2 occurs significantly later compared to L1, fuzzy L2 representations may be established. Because of the L1 structural primacy, L2 lexical units are forced to compete for space, and as a result, form dense

overlapping representations with fuzzy boundaries between the entries.

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## Conflict of interest

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