

Perception and production of English nuclear accent placement in Spanish L1 learners: The role of language aptitude and musical ability

Despite sustained interest in the perception–production interface in second language (L2) phonological development, suprasegmental phenomena - particularly nuclear accent (NA) placement - remain under-researched relative to segmental contrasts, especially in Romance–Germanic language pairings (Mennen, 2015; Landblom & Ionin, 2022; Nagle & Baese-Berk, 2022). This study addresses this gap by examining the perception and production of English nuclear accent placement in Chilean Spanish L1 learners, while simultaneously investigating the contribution of two underexplored individual differences, namely foreign language aptitude and musical ability.

Drawing on models of L2 speech learning that challenge strictly linear perception-before-production accounts (Flege & Bohn, 2021; Nagle, 2018; Melnik-Leroy et al., 2022), the study adopts an interdisciplinary perspective integrating phonological theory, prosodic typology, and cognitive aptitude research. English and Spanish differ markedly in how focus is realised prosodically, with English relying more heavily on prosodic marking under conditions of syntactic rigidity, whereas Spanish frequently exploits syntactic reordering (Zubizarreta & Nava, 2011; Prieto & Roseano, 2019). In English, some grammatical constructions favour early nuclear accent placement. For instance, in *wh*-questions ending in a verb, the default accentuation pattern - whereby the nuclear accent falls on the final lexical item (LLI) - does not apply, as illustrated by *Where's the MOney I lent you?* This contrasts with Spanish *¿Dónde está el dinero que te prestÉ?*, where the LLI is preferred. These cross-linguistic asymmetries pose persistent challenges for Spanish learners acquiring English NA placement, particularly in marked broad-focus contexts (del Saz & Grau, 2022).

New empirical data were collected from 53 advanced Chilean university learners of English who completed controlled perception and production tasks targeting both unmarked and marked NA contexts. In addition, participants completed two standardised measures: the Modern Language Aptitude Test (MLAT; Carroll & Sapon, 1959) and the Musical Ear Test (MET; Wallentin et al., 2010), allowing for a fine-grained analysis of aptitude- and music-related effects on suprasegmental performance. This design responds directly to calls for multidimensional approaches to individual differences in L2 phonological acquisition (Slevc, 2012; Wen et al., 2017; Jansen et al., 2023).

Participants completed two researcher-designed behavioural tasks assessing English nuclear accent placement: a 35-item elicited production task, administered first to minimise perceptual priming, and a 35-item forced-choice perception task. L2 aptitude was assessed through MLAT Parts I–II, targeting sound-related aptitude components, while musical ability was measured through MET same/different judgements on melodic and rhythmic stimulus pairs

Results indicate a robust asymmetry between perception and production, with learners demonstrating higher accuracy in production than in perception across sentence types. Crucially, language aptitude - as operationalised by the MLAT - did not emerge as a significant predictor of NA perception or production. By contrast, musical ability, and rhythm sensitivity in particular, significantly predicted NA perception accuracy, with effects further mediated by overall L2 proficiency. These findings align with recent evidence linking musical rhythm processing to prosodic sensitivity in L2 speech (Bidelman et al., 2013; Thompson et al., 2025).

The study contributes novel evidence to ongoing debates on the perception-production relationship in L2 prosody and underscores the pedagogical value of integrating prosodic and rhythm-based training in advanced L2 pronunciation instruction.

Keywords: Nuclear accent placement; L2 prosody; Perception–production interface; Musical ability; Individual differences

Word count: 515