

A pedagogical note on teaching L2 prosody and speech sounds using hand gestures

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This paper reports the pedagogical decisions in Li et al. (2023) “The effectiveness of embodied prosodic training in L2 accentedness and vowel accuracy” published in *Second Language Research*. The study revealed that embodied prosodic training improved the overall pronunciation skills of Catalan-speaking learners of French and the pronunciation accuracy of front rounded vowels more than training without hand gestures. Three main pedagogical innovations were key in obtaining the positive results. First, the hand gestures performed by the instructor closely mimicked the prosodic structure (i.e., the melodic and rhythmic features) of the target sentences. Second, the sentences used for training were embedded in meaningful communicative dialogues. Third, the challenging L2 sounds were embedded in multiple occasions and in various prosodic positions. Therefore, in the hope of encouraging L2 teachers to incorporate such techniques in teaching practice, we provide a full description of the materials and procedures in Li et al. (2023).

Keywords: Prosodic training, vowel, hand gesture, accentedness, second language, pedagogy

Background

Embodied prosodic training is useful to boost both overall pronunciation and the production of speech segments for several reasons. First, empirical evidence supports the positive role of embodied L2 pronunciation training. For instance, hand movements have been successfully used to mark speech prominence (Gluhareva & Prieto, 2017), illustrate vowel length (Li et al., 2020), graphically depict pitch



contours (Baills et al., 2019, 2022; Yuan et al., 2019), or mimic segmental features (Li et al., 2021; Xi et al., 2020) in L2 phonetic training.

Second, a widely used pronunciation teaching method, the verbotonal method (VTM) (Guberina, 2013), underscores the importance of prosody as a fundamental structure for pronunciation development. For instance, instructors can use logatomes (nonsense syllable sequences like “dadada”) complemented by hand gestures to replicate prosodic patterns (Billières, 2002). The incorporation of logatomes enables students to concentrate on the prosody of target sentences without simultaneously addressing challenges related to segmental pronunciation or semantic processing.

Moreover, VTM employs prosody as a tool to assist students in direct segmental phonetic corrections. Given that prosody coordinates speech segments, segmental characteristics are influenced by their specific prosodic positions. For example, a vowel sound at a particular prosodic position, such as the end of a prosodic phrase, may show an expanded vowel space and longer duration (Hay et al., 2006). Teachers can manipulate the position of the target vowels to adjust the learner’s vowel production. Notably, in accordance with VTM principles, the optimal prosodic position for a difficult L2 sound within the prosodic structure depends on the student’s specific pronunciation error type (Guberina, 2013). Consequently, as it may not always be feasible to predict the error type, particularly in group training settings, it is advisable to include diverse prosodic structures and positions in the instructional materials (Guberina, 2013).

Recently, Baills et al. (2022) examined the impact of embodied pronunciation training using logatomes on the pronunciation skills of Catalan learners of French. The instructors substituted the actual syllables of the L2 sentence with the logatomes “dadada” and synchronized the logatome with hand movements to replicate the pitch contours and rhythm of the spoken phrase, as illustrated in Figure 1. Participants were prompted to echo both the logatomes and the accompanying gesture. Following this, instructors articulated the authentic target sentence, and participants were instructed to repeat it. This method was found to be effective in reducing participants’ accentedness and enhancing their suprasegmental attributes during a read-aloud task.

Following up on Baills et al. (2022); Li et al. (2023) tested whether embodied prosodic training would improve overall L2 pronunciation skills and the pronunciation of challenging L2 sounds. To accomplish this, the study focused on the French front rounded vowels /y, ø, œ/ as the target sounds since they do not belong to the Catalan phonological inventory. Typically, Catalan learners of French tend to assimilate front rounded vowels to their back vowel counterparts, such as substituting /y/ with /u/, /ø/ with /o/, and /œ/ with /ɔ/.

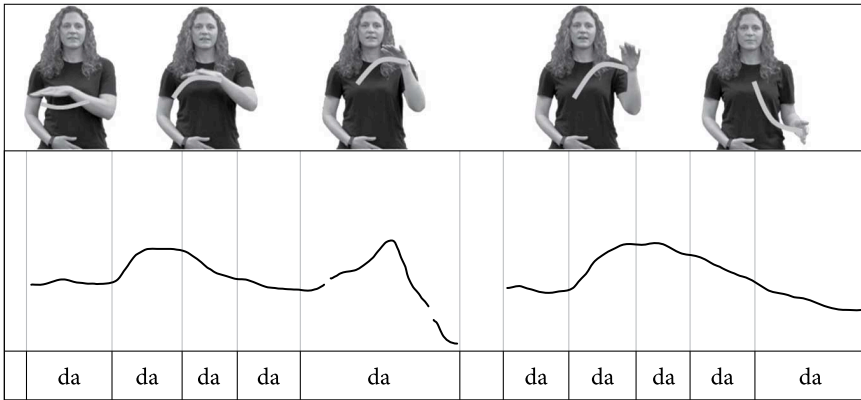


Figure 1. Illustration of an instructor's prosodic hand gesture mimicking the target intonation of a meaningless logatome sequence (Baills et al., 2022)

We expected to replicate Baills et al.'s (2022) findings with a novel approach. That is, utilizing real sentences integrated into meaningful discourse as the training material. Furthermore, to facilitate the acquisition of the challenging French vowels /y, ø, œ/, two measures were implemented: (a) we modified the dialogues to increase the frequency of the front rounded vowels, and (b) strategically placed the target vowels in diverse prosodic positions. For example, *Juste un peu mal au cœur*. 'Just a bit heartsick.' contains a variety of front rounded vowels in different prosodic contexts, namely /y/ in *juste* 'just' in sentence-initial position with a possible high or rising pitch, /ø/ in *peu* 'bit' in a prominent position with a high pitch, and /œ/ in *cœur* 'heart' in nuclear position with a low pitch accent and final lengthening.

Figure 2 illustrates the specific prosodic hand gestures employed in Li et al. (2023). Similar to the gestures in Baills et al. (2022), the instructors moved their hands to trace the pitch contour along the sentence and extended their hand movement horizontally to convey durational information, such as phrase-final lengthening.

Li et al.'s (2023) study: Central pedagogical approach and methods

Participants and settings

The participants ($N=57$) were pursuing BA degrees in Translation and Interpreting or Applied Linguistics at the Universitat Pompeu Fabra in Barcelona. These students were either in their first or second year of the French course, which required elementary to intermediate French proficiency. While the participants

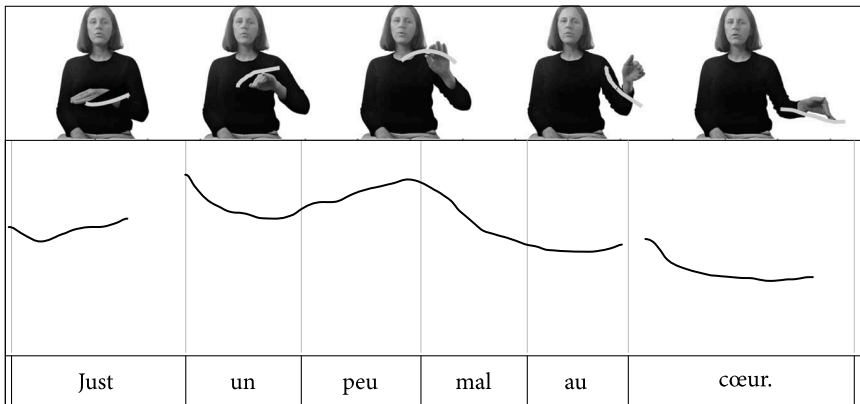


Figure 2. Stills from the training videos showing the instructor making hand gestures to mimic the target intonation as she utters the French sentence *Juste un peu mal au cœur* ‘Just a bit heartsick’ (Li et al., 2023)

had not received formal phonetic training prior to this experiment, they had a basic understanding of French pronunciation rules.

The students attended two weekly French classes, a 90-minute lecture and a 60-minute seminar for practice. Both were conducted by experienced French instructors. The pronunciation practice sessions were conducted over three consecutive weeks as part of their coursework. The students were divided into two separate seminar groups, which allowed us to establish our experimental and control groups. Consequently, one seminar served as the control group ($n=29$), while the other served as the experimental group ($n=28$).

Due to the outbreak of COVID19 pandemic, all teaching activities were conducted online, and each student participated in French classes remotely from home. Training materials were distributed to the students in the form of video recordings. They watched these training videos and carried out the training exercises during the scheduled times.

Materials

The training materials comprised three engaging dialogues, each depicting a lively and enjoyable scenario, one for each of the training sessions. These materials were selected from a French pronunciation textbook *Phonétique en Dialogues* (Martinie & Wachs, 2006), which proposes a variety of dialogues aimed at training the pronunciation of difficult sounds (e.g., /y/ vs. /u/, /b/ vs. /v/) or suprasegmental features (e.g., rhythmic grouping, intonation). Two of these dialogues were originally intended to focus on the vowel pairs of /y-u/, /ø-o/, and

/œ-ɔ/. Additionally, a third dialogue was chosen, which, although not specifically designed for training vowel pairs in the textbook, contained numerous instances of /ø/ and /œ/. These target dialogues were adjusted to cater to learners with low to intermediate proficiency in French. As previously mentioned, the dialogue texts were modified to increase the frequency of the front rounded vowels. For instance, we replaced *un brave vagabond* “a brave wanderer” with *une pauvre misérable* “a poor destitute” so that /œ/ is embedded in *misérable*. The materials are available at: [10.17605/OSF.IO/6YGSU](https://doi.org/10.17605/OSF.IO/6YGSU) and the training videos are available upon request.

To ensure that the training remained enjoyable and meaningful, as the dialogues were lighthearted short stories, we recruited French-speaking amateur actors to perform the dialogues. This approach provided students with a model of the prosodic patterns and target sounds within the context of the dialogues. The enacted dialogues were viewed by students at the start and conclusion of each training session. Consequently, the explicit emphasis on pronunciation of the target sentences was integrated into a meaningful discourse context. Embedding the training of target sentences in meaningful dialogues has been proven to be effective in previous studies (Baills et al., 2022; Gluhareva & Prieto, 2017). The target sentences from the dialogues were recorded by two native French teachers with prosodic hand gestures (experimental group) or without hand gestures (control group) to make the training video.

Overall teaching plan

The training sessions occurred once a week for a duration of three weeks, with each training session lasting approximately 15 minutes and centering on one specific dialogue. These training sessions were integrated into the in-class activities of the online French language course. Ahead of each training session, online training videos were distributed to the students.

Figure 3 illustrates the step-by-step procedure used for each dialogue (or training session) in the embodied condition, using screenshots from the actual activities, as follows:

Step 1. Warm-up

- Watching the enactment of the training dialogue (45 s).
- Reading aloud the script of the dialogue (90 s).

Step 2. Sentence-by-sentence phonetic training

- Block 1. In this block, each sentence was spoken twice by the instructor and students had to orally repeat the sentence after the instructor.

- Block 2. In this block, the instructor only spoke the sentences once and students had also to repeat the sentences orally. We recommend gradually increasing the phonetic training difficulty by reducing the times of repetition in teaching practice.

Step 3. Wrap-up

- Watching the enactment of the training dialogue for the second time (45 s).
- Orally reading the script of the dialogue for the second time (90 s).

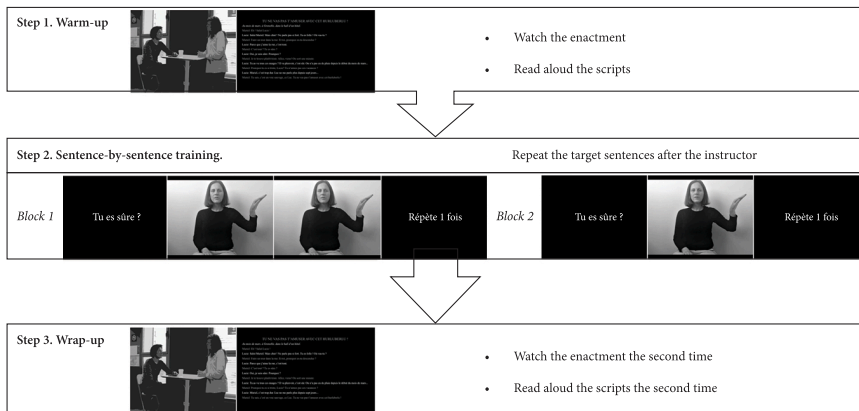


Figure 3. Screenshots from a training video for members of the experimental group (embodied condition), together with instructions

Our study yielded positive outcomes for this training approach. The experimental group who received prosodic training with hand gestures demonstrated continuous improvements in terms of reduced accentedness. These findings were consistent to those of Baills et al. (2022). Furthermore, an acoustic analysis revealed that only the experimental group exhibited increased F2 values, while the control group did not show significant improvement in this regard.

Interestingly, a brief post-training narrative survey administered to several participants indicated a general satisfaction with the training program and a positive attitude towards phonetic training. Participants in the experimental group provided comments such as: “The [hand] movements help a lot. They make us focus more on the intonation when repeating the phrases. As for teaching, I think the use [of gesture] is a very good asset, even though it is not an essential part.” Another participant added, “Yes, hand gestures were helpful, as I had both the auditory reference, the spoken phrase, and the visual reference.”

In addition to the positive feedback regarding the use of hand gestures, participants in both groups displayed favorable attitudes towards training through dialogues. One participant articulated, “I think that the phonetic training sessions help improve the language a lot, but not only in terms of pronunciation. They also helped me with oral comprehension, which challenged me a bit, and with those exercises I’ve improved a lot.”

Conclusion and practical recommendations for teachers

Our results show that hand gestures highlighting prosodic structures not only improved overall pronunciation skills, but also helped improve the pronunciation of challenging L2 front rounded vowels, which were intentionally made to appear in high concentrations in the training materials. The positive findings in Li et al. (2023) lead us to make the following recommendations regarding the teaching of L2 pronunciation.

First, L2 pronunciation training is notably more effective when conducted within a meaningful context and when it encompasses both prosodic and segmental L2 features. The use of dialogues can be successful in simulating genuine communication, rendering the learning experience more engaging and pertinent. Second, body movements like hand gestures representing or imitating prosodic features are useful in L2 pronunciation training. Such embodied training techniques do not require special equipment and can be easily performed by both teachers and students in the classroom. Third, the study underscores the benefit of short, consecutive training sessions. Our study and many others (Li et al., 2020; Ozakin et al., 2023; Xi et al., 2023) have demonstrated that short sessions focusing on specific L2 segmental or suprasegmental features are effective. This finding has practical value, as in practice, long phonetic training sessions may be unwieldy or difficult to fit into the syllabus. We also suggest that the level of phonetic training difficulty in training materials should be gradually ratcheted up by reducing the number of times a stimulus is presented before it is repeated by the trainee, as we did here.

That said, our experience suggests that the classroom implementation of embodied phonetic training could be improved in the following ways. First, due to our need to strictly control for other factors, in this study no actual interaction took place between the instructor and the learners during the training sessions. In VTM, phonetic corrections are often performed by the teacher immediately after detecting a specific pronunciation error. Incorporating this sort of direct person-to-person interaction between teacher and learners during embodied prosodic training will likely increase learner involvement in the task. Interaction will also








allow for immediate teacher feedback to help correct an individual learner's difficulties, yielding even greater benefits. Secondly, our study involved three training sessions with three dialogues. For longer-lasting improvement, short training of this sort could be incorporated into classroom practice on a regular basis over many months. Presumably this would yield a more robust gain in L2 pronunciation, although this hypothesis merits testing in future research.






To conclude, the results of our pronunciation training study provide further evidence that embodying prosody with hand gestures can help not only overall L2 pronunciation but also particularly challenging sounds. We thus encourage teachers to apply these embodied techniques, bearing in mind the pedagogical recommendations we have made, to help learners understand the prosodic structure of the foreign language they are learning and improve their pronunciation.

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References

-  Baills, F., Alazard-Guiu, C., & Prieto, P. (2022). Embodied prosodic training enhances L2 read speech pronunciation. *Applied Linguistics*, 43(4), 766–804.
-  Baills, F., Suárez-González, N., González-Fuente, S., & Prieto, P. (2019). Observing and producing pitch gestures facilitates the learning of Mandarin Chinese tones and words. *Studies in Second Language Acquisition*, 41(1), 33–58.
-  Billières, M. (2002). Le corps en phonétique corrective. In R. Renard (Ed.), *Apprentissage d'une Langue Étrangère/Seconde Vol.2 La Phonétique Verbo-tonale* (pp. 38–70). De Boeck Université.
-  Gluhareva, D., & Prieto, P. (2017). Training with rhythmic beat gestures benefits L2 pronunciation in discourse-demanding situations. *Language Teaching Research*, 21(5), 609–631.
- Guberina, P. (2013). *The Verbotonal Method* (C. Roberge, Ed.). Artresor Naklada.
-  Hay, J.F., Sato, M., Coren, A.E., Moran, C.L., & Diehl, R.L. (2006). Enhanced contrast for vowels in utterance focus: A cross-language study. *The Journal of the Acoustical Society of America*, 119(5), 3022–3033.
-  Li, P., Baills, F., Baqué, L., & Prieto, P. (2023). The effectiveness of embodied prosodic training in L2 accentedness and vowel accuracy. *Second Language Research*, 39(4), 1077–1105.
-  Li, P., Baills, F., & Prieto, P. (2020). Observing and producing durational hand gestures facilitates the pronunciation of novel vowel-length contrasts. *Studies in Second Language Acquisition*, 42(5), 1015–1039.

-  Li, P., Xi, X., Baills, F., & Prieto, P. (2021). Training non-native aspirated plosives with hand gestures: Learners' gesture performance matters. *Language, Cognition and Neuroscience*, 36(10), 1313–1328.
- Martinie, B., & Wachs, S. (2006). *Phonétique en Dialogues*. CLE International SEJER.
-  Ozakin, A. S., Xi, X., Li, P., & Prieto, P. (2023). Thanks or tanks: Training with tactile cues improves learners' accuracy of English interdental consonants in an oral reading task. *Language Learning and Development*, 19(4), 404–419.
-  Xi, X., Li, P., Baills, F., & Prieto, P. (2020). Hand gestures facilitate the acquisition of novel phonemic contrasts when they appropriately mimic target phonetic features. *Journal of Speech, Language, and Hearing Research*, 63(11), 3571–3585.
-  Xi, X., Li, P., & Prieto, P. (2023). Reducing acoustic overlap of L2 English vowels through gestures encoding lip aperture. In A. Kirkova-Naskova & A. Henderson (Eds.), *Proceedings of the 7th International Conference on English Pronunciation: Issues and Practices* (pp. 261–270). Université Grenoble-Alpes.
-  Yuan, C., González-Fuente, S., Baills, F., & Prieto, P. (2019). Observing pitch gestures favors the learning of Spanish intonation by Mandarin speakers. *Studies in Second Language Acquisition*, 41(1), 5–32.

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