



Article

Prosodic Cues and Intercultural Communication Competence in English and French

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Abstract: This paper aims at discussing the influence of prosodic factors in the perception of English and French. Two experimental studies were conducted at doctoral level in order to investigate how prosody can influence perception and comprehension in foreign languages. To achieve the goals, perception tests were applied. The first study investigated the perception of English cognate words lexical stress by Brazilian Portuguese (hereinafter BP) native speakers who learn English as a second language (hereafter L2). The second study investigated the participation of prosodic clues as disambiguating elements of utterances spoken in French. The results showed that a set of prosodic clues were related to the perception of English and French, suggesting that prosody interacts with other linguistic levels, playing an important role in the perception and comprehension of linguistic information. The findings may be of interest and also contribute to intercultural communication (IC) studies that focus on L2 teaching.

Keywords: prosody; speech perception in L2; acoustic cues

1. Introduction

Intercultural communication (IC) is a current issue in L2 teaching because distinct languages involve distinct cultural backgrounds that need to be focused so that L2 learners develop intercultural awareness and sensitivity. Teaching communication in L2 between individuals of distinct cultural backgrounds, regarding all the cultural representations, encompasses different linguistic systems, with lexical, syntactic, phonological, semantic and pragmatic specifications. Therefore, the intercultural communicative competence (ICC), proposed by Byram (1997, 2021), addresses the need to raise awareness about its importance in L2 research. McConachy et al. (2022) also point out the importance of “(...) *systematically incorporating intercultural dimensions into language teaching, assessment, and curricula*”.

Prosody can be defined as “*the study of the tune and rhythm of speech and how these features contribute to meaning*” (Mannell, 2007). It has been a promising field for L2 investigation because of its relevance in communication as a whole since prosodic factors play an essential role in the perception of second languages (L2). Therefore, prosody is a linguistic factor that can be investigated in order to determine its influence in terms of intelligibility and comprehensibility, affecting communication in L2. In order to study the main mechanisms used in decoding the acoustic signal of foreign language speech, considering vowel, consonant, and prosodic specificities, this article presents the results of two experimental studies. The first study investigated the perception of English cognate words lexical stress by Brazilian Portuguese (hereinafter BP) speakers (Polaczek, 2019). The second study investigated the participation of prosodic clues as disambiguating elements of utterances spoken in French (Serra, 2021). Both studies were conducted at LIAAC (Integrated Laboratory for Acoustic Analysis and Cognition), which has national and international recognition in the field of Speech Studies and is linked to the Graduate Program in LAEL (Applied Linguistics and Language Studies) at the Pontifical Catholic University of São Paulo, Brazil. The



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two pieces of research were both conducted as part of a larger project which aims to discuss theoretical and methodological issues related to speech production and perception based on findings from experimental research that use perception tests, techniques, and methods of acoustic and image analysis. The objects of study are phonic segments, prosodic elements, and voice quality. Key themes include L2 pronunciation teaching, the prosody of Romance languages, the prosody of the English language, the use of technological resources for L2 pronunciation teaching, bilingualism, L2 sound acquisition, forensic phonetics, and speech disorders.

2. The Perception of English Cognate Words Lexical Stress as L2

Lexical stress is a prominence that occurs at word level. The acoustic cues for identifying the lexical stress vary from language to language (Laver, 1994; Ladefoged, 2003). From the listener's point of view, the most salient characteristics are the longer vowel duration in the stressed syllable, as well as the higher pitch. The reduction of vowels in unstressed syllables is a notable aspect in English, where many unstressed syllables are produced as schwa [ə] (Liberman et al., 1967; Cruttenden, 1997; Celce-Murcia et al., 1996).

The Portuguese stress serves to distinguish words and word classes, and can distinguish, for instance, the noun from the verb, as in the pair Fábrica (factory) and faBRica (manufacture) (Brawerman-Albini, 2012). The main correlates of Portuguese stress are duration, intensity, and vowel quality. Thus, stressed syllables are longer and more intense (Barbosa, 2000; Migliorini & Massini-Cagliari, 2010).

The act of perceiving speech is a complex task directly linked to linguistic experience. Speech perception can be defined as the process of imposing a meaningful perceptual experience on an otherwise meaningless speech input (Best, 1995; Diehl et al., 2004; Massaro, 2001; Kuhl, 2000, 2004). The Speech Learning Model (SLM), developed by Flege (2003, 2005), suggests the need to deepen the understanding of how a non-native speaker manages to process the acoustic signals of speech in L2 beyond the segmental detail in order to understand it.

The hypothesis that guided the first study was that there are stress and syllabic patterns in English that can influence the perception of BP speakers, relying not only on acoustic cues but also on sound patterns from their native language.

2.1. Methodology

The first study relied on an experimental methodology, which uses instruments to develop perception tests and phonetic-acoustic analysis. An identification test was elaborated in TP (available at http://www.worken.com.br/tp_regfree.php, accessed on 20 June 2026), a free software, developed by Rauber et al. (2010) for speech perception experiments. The identification test, applied to 30 native Brazilian Portuguese speakers, was a perception test in which a single stimulus was presented (in this case, an English cognate word audio) and the informants (judges) had to identify the stressed syllable. A native American English speaker recorded the stimuli that formed the *corpus*, which was edited using Praat (www.fon.hum.uva.nl/praat, accessed on 30 June, 2026), a free software for acoustic analysis. The 30 native Brazilian Portuguese speakers, selected to take the perception test, obtained scores between 24 and 25 points in an online English test (<http://www.Cambridgeenglish.Org/test-your-english/>, accessed on 20 June 2026), which corresponded to the CPE (Cambridge Proficiency Examination).

2.2. Corpus

The *corpus* was composed of 80 English cognate words (Chosen from the most common cognates in the business area, available at www.cognates.org, accessed on 20 June 2026) with 2, 3, 4 and 5 syllables, recorded in studio with soundproof booth, inserted in a carrier sentence (Spell...back) and edited in Praat (Boersma & Weenink, 2005). Table 1, below, summarizes the overall results, showing that the majority of the participants (25) were able to identify the stress patterns correctly (60–78 right answers):

Table 1. Overall results.

Participants	Answers	Scores	Percentage (%)
05 judges	Right answers	36–51	45% and 96%
25 judges	Right answers	60–78	
Total	Right answers	2084	86.8%
	Wrong answers	316	13.2%

2.3. Results and Discussion

In general, native BP speakers were able to address the specificities of the English phonological system as an L2, suggesting that L1 acquisition mechanisms are available for L2 acquisition (Flege, 1995, 2005). The results demonstrated flexibility in perception mechanisms, characterized as a malleable, dynamic, and active process (Beddor, 2017). Linguistic experience with variable-stress languages represented, in most cases, a perceptual advantage (Dupoux & Peperkamp, 2002; Altmann, 2006). The relationship between L1 and L2 was established indirectly, that is, inferred from the responses given in the perception test.

Concerning the acoustic analysis (Figure 1), it showed that, in terms of average duration and intensity values, syllables with primary (A) and secondary (S) stress differ from those without (N). The error rate was higher in syllables with secondary (S) stress.

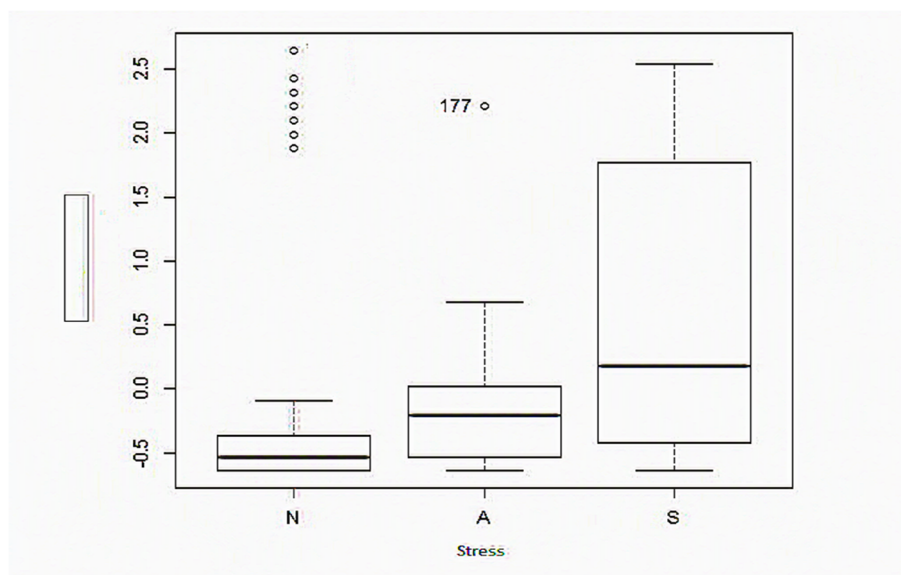


Figure 1. Error rate in syllables with secondary (S) stress.

Duration and stress were acoustic parameters associated with perception. However, the fact that secondary stress in English is characterized by a predominance of full vowels, interfered in the perception of lexical stress, as it can be seen on the table below that shows the answers (R = Right or W = Wrong) according to the stress type, that is, paroxytone (PARO), a word where the second-to-last (penultimate) syllable is stressed and proparoxytone (PROP), a word where the third-to-last (antepenultimate) syllable is stressed. The transcriptions (taken from <https://www.merriam-webster.com>, accessed on 20 June 2026) show the stress patterns for standard American English. As it can be seen (Table 2), words with a greater number of syllables (4 or 5), with word-initial stress, with secondary stress, and with proparoxytones were more prone to errors.

Table 2. Answers for words with secondary stress.

Stimuli	Stress Type	Number of Syllables						Secondary Stress
ASpect	PARO	2	21 R	9 W				\ 'as-,pekt \
opeRAtion	PARO	4	10 W	2 W	18 R	0 W		\ ,ä-pə-'rā-shən \
coopeRAtion	PARO	5	0 W	7 W	3 W	20 R	0 W	\ ,kō-,ä-pə-'rā-shən \
determiNAtion	PARO	5	0 W	6 W	0 W	22 R	2 W	\ di-,tər-mə'nā shən \
Immigrate	PROP	3	21 R	3 W	6 W			\ 'i-mə,grāt \
INdustry	PROP	3	21 R	7 W	2 W			\ 'in-(,)də-strē \
PRImary	PROP	3	22 R	8 W	0 W			\ 'prī-,merē, 'prī-mə-rē \
REStaurant	PROP	3	22 R	7 W	1 W			\ 're-stə rənt, -,rənt \
TOURism	PROP	3	20 R	8 W	2 W			\ 'tūr-,i-zəm \
INfrastructure	PROP	4	4 R	4 W	22 W	0 W		\ 'in-frə-,strək-chər \
SUpermarket	PROP	4	19 R	2 W	9 W	0 W		\ 'sü-pər-,mār-kət \
cafeTERia	PROP	5	7 W	1 W	20 R	2 W	0 W	\ ,ka-fə-'tīr-ē-ə \
docuMENTary	PROP	5	28 W	1 W	0 R	1 W	0 W	\ ,dä-kyə-'men-tə-rē \

PARO = Paroxytone, PROP = Proparoxytone; R = Right, W = Wrong.

While the first study focused on lexical stress perception in English, the second study shifts the focus to French, examining how prosodic cues function as carriers of meaning in the disambiguation of spoken utterances. Together, these studies highlight the central role of prosody in intercultural communicative competence and in the perception of foreign languages by Brazilian learners.

3. The Role of Prosody in the Disambiguation of Statements in French

Following the transition from the English study, the second investigation focused on French, examining how prosodic cues contribute to the disambiguation of spoken utterances. This study originated in the French as a Foreign Language (FLE) classroom, where recurring difficulties were observed in students' interpretation of isolated utterances. In collaborative reflections with a colleague who also teaches French, we noted that learners often relied primarily on lexical and syntactic cues, showing uncertainty when meaning depended on prosodic organization. These observations led us to investigate the role of prosody as a guide to interpretation.

We hypothesized that prosodic elements play a preponderant role in the disambiguation of spoken statements when they are presented out of context. Within this perspective, ambiguity is understood as a phenomenon in which a single linguistic form corresponds to multiple meanings (Fuchs, 1996), while prosody encompasses suprasegmental features such as intonation, rhythm, duration, pauses, and intensity, which structure spoken language and guide interpretation (Di Cristo, 2013).

Ambiguous utterances therefore allow multiple interpretations depending on prosodic organization. Prosodic grouping, pitch movement, and pauses may highlight different constituents, leading listeners toward distinct meanings and influencing how information is processed in the absence of contextual cues.

Table 3 illustrates how the prosodic grouping influences syntactic attachment and leads to different interpretations of the same utterance.

Table 3. Prosodic grouping and syntactic attachment (Example: Il a appelé la police de Lyon).

Prosodic Grouping	Interpretation
Il a appelé la police de Lyon	He called the police from Lyon
Il a appelé la police de Lyon	He called the Lyon police

Table 4 presents examples of focus marking and illustrates how prosodic prominence affects interpretation.

Table 4. Focus marking and interpretation (Example: C'est le fils du patron qui parle).

Prosodic Focus	Interpretation
C'est LE FILS du patron qui parle	The son is speaking
C'est le fils DU PATRON QUI PARLE	The boss is speaking

3.1. Methodology

An experimental perception test was designed. Four French speakers recorded ambiguous sentences in two prosodic versions, and thirty judges listened to the recordings and selected the meaning they understood. The recordings were conducted at the Integrated Laboratory of Acoustic Analysis and Cognition (LIAAC) at the Pontifical Catholic University of São Paulo and subsequently analyzed using PRAAT. The perception test was created using Google Forms.

3.2. Corpus

The corpus consisted of eight ambiguous sentences selected from pedagogical materials and French textbooks. Each sentence was recorded in two prosodic versions without contextual cues.

3.3. Results and Discussion

Clear prosodic cues led to more homogeneous interpretations, while the absence of prosodic marking increased variation in responses. Prosodic grouping and pitch accents guided interpretation decisively, although semantic plausibility and syntactic expectations also influenced processing.

Among the stimuli, several statements achieved over 80% accuracy; two representative examples are presented below, illustrating how specific prosodic cues shape interpretation. Figures 2 and 3 present the waveform, spectrogram with F0 contour, intonational groupings, and prominent words.

- Le policier regardait l'espion avec des jumelles—the prosodic boundary after *espion*, together with prominence on *espion* and *jumelles*, led listeners to interpret *avec des jumelles* as modifying the police officer, indicating that he was using binoculars rather than the spy.
- J'ai rencontré l'enseignante de littérature italienne—the prosodic boundary after *enseignante*, combined with prominence on *littérature*, guided listeners to interpret *de littérature italienne* as modifying the subject area rather than the teacher, leading to the interpretation that the literature was Italian.

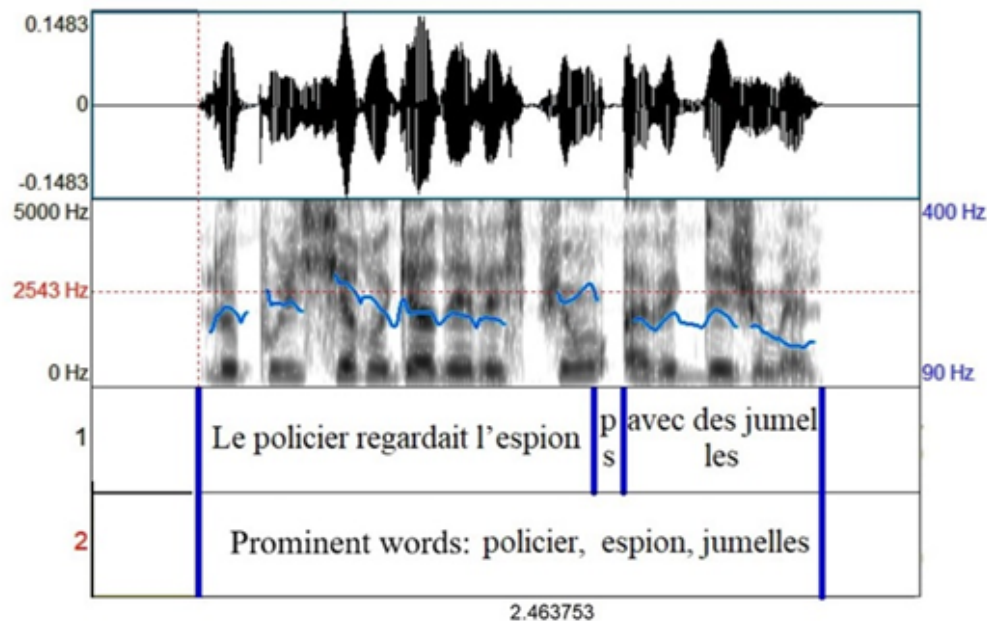


Figure 2. Waveform and spectrogram (with F0 contour) of *Le policier regardait l'espion avec des jumelles*.

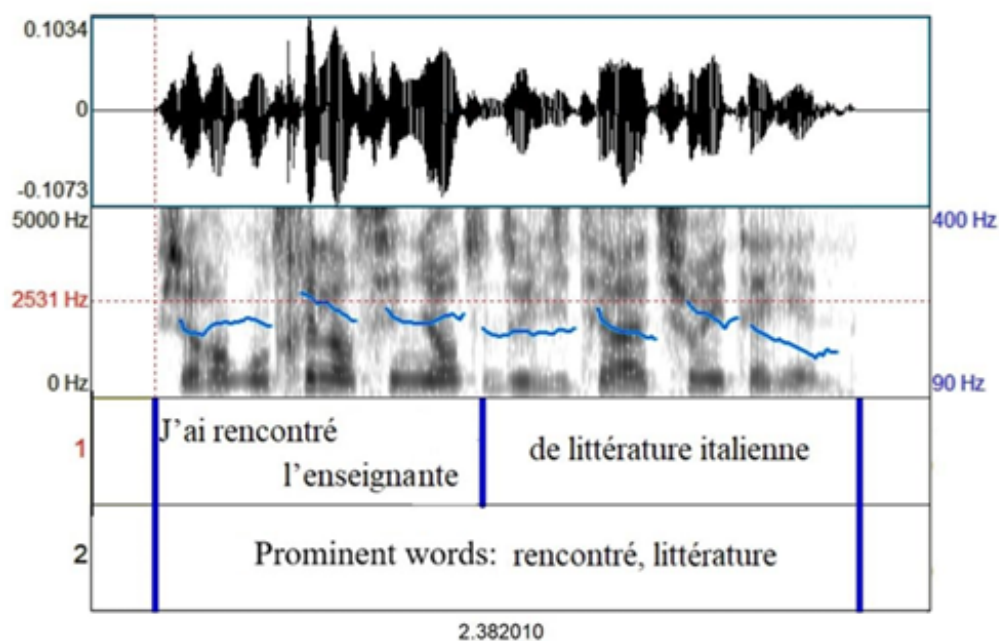


Figure 3. Waveform and spectrogram (with F0 contour) of *J'ai rencontré l'enseignante de littérature italienne*.

3.4. Final Remarks on the French Study

These findings confirm that prosody plays a decisive role in French, particularly when lexical and syntactic information are insufficient for disambiguation. Interpretation emerges as a multidimensional process in which prosodic organization interacts dynamically with syntax, semantics, and contextual expectations.

The results also indicate that semantic plausibility and syntactic configurations influence interpretation. Highly frequent or conventional combinations tend to bias processing, even when prosodic cues suggest alternative readings. This effect was observed in constructions such as *un verre de thé vert* (“a glass of green tea”), in which semantic expectations strongly constrain interpretation.

Similarly, syntax played an inductive role in the judges’ understanding of the statements. Privileged syntagmatic configurations guided expectations and sometimes overrode prosodic cues, as seen in expressions such as *un vendeur d’horloges suisses*, which tends to be interpreted as “a Swiss watch salesman”, rather than alternative structural readings.

Pauses, melodic contours, and pitch accents that delimit prosodic groups and give prominence to words contribute significantly to listeners’ understanding of ambiguous statements.

From a pedagogical perspective, these results support the integration of prosody into the teaching of French as a foreign language through contrastive listening activities, analysis of ambiguous utterances, prosodic reading exercises, and awareness-raising tasks, fostering greater sensitivity to prosodic cues in spoken language.

These observations, while grounded in the French data, resonate with the findings of the English study and point toward a broader role of prosody in foreign language perception.

4. General Conclusions

This article examined the role of prosody in the perception of English and French by Brazilian learners, drawing on two experimental studies conducted at doctoral level. The findings demonstrate that prosodic cues significantly influence interpretation in both languages, although they operate at distinct linguistic levels.

In English, lexical stress guided word recognition and revealed the interaction between acoustic cues and native-language stress patterns. Brazilian Portuguese speakers showed perceptual flexibility, while difficulties with secondary stress and longer word structures highlighted the role of duration and intensity in stress perception.

In French, prosodic organization guided the interpretation of ambiguous utterances presented without contextual support. Prosodic grouping, pauses, and melodic contours directed listeners’ interpretations, while semantic plausibility and syntactic configurations interacted with prosodic cues.

Taken together, the two studies show that prosody operates as an interface across linguistic levels, linking lexical prominence to discourse interpretation. Rather than a peripheral feature, prosody emerges as a central component of foreign language perception and intercultural communicative competence, enabling learners to navigate ambiguity and interpret meaning more effectively.

From a teaching-learning perspective, these findings highlight the importance of integrating prosodic awareness into foreign language teaching. Instruction that emphasizes stress patterns, intonational contours, and prosodic grouping may enhance listening comprehension and interpretive skills, with a positive outcome in comprehension and communication in L2.

Future research may investigate how explicit prosody instruction influences perceptual strategies across proficiency levels and linguistic backgrounds, as well as its impact on communication in multilingual contexts. Although the original focus of both studies was not directly related to IC, the influence of prosodic cues presents opportunities for further studies that incorporate the investigation of intercultural dimensions in order to improve communication in L2 between individuals of distinct cultural backgrounds. The specific cultural representations that prosody may pose is a promising field of research to be explored in future research.

Author contributions

D.S. contributed to the conceptualization, methodology, data curation, writing—original draft preparation; investigation; writing—reviewing and editing—the study of prosodic clues as disambiguating elements of utterances spoken in French. M.P. contributed to the conceptualization, methodology, data curation, writing—original draft preparation; investigation; writing—reviewing and editing—the study of perception of English cognate words lexical stress by Brazilian Portuguese speakers. All authors have read and agreed to the published version of the manuscript.

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Data Availability Statement

Data is available upon request. Please contact the corresponding author for any additional information on data access or usage.

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Conflicts of Interest

The authors declare no conflict of interest.

Use of AI and AI-Assisted Technologies

During the preparation of this manuscript, Author 1 used ChatGPT for copy-editing and language revision. The AI tool was not used for data collection, data analysis, interpretation of results, or scientific conclusions. After using this tool, Author 1 reviewed and edited all AI-assisted content and takes full responsibility for the final published version.

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