Isogloss
Open Journal of Romance Linguistics

Received: 14-01-2026
Accepted: 13-04-2026
Published: 04-05-2026

Prosodic and intonational patterns in Mirandese: An instrumental analysis of a minority language in Portugal

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How to cite: Oliveira, Pedro Guedes de & Elisa Fernández Rei. 2026. Prosodic and intonational patterns in Mirandese: An instrumental analysis of a minority language in Portugal. *Isogloss. Open Journal of Romance Linguistics* 12(1)/8: 1–43.
DOI: https://doi.org/10.5565/rev/isogloss.643

Abstract

This study examines the phonological and intonational patterns of Mirandese, a minority Astur-Leonese language spoken in northeastern Portugal. Despite increasing research interest, intonation in Mirandese remains understudied. Drawing on the Autosegmental-Metrical framework and using ToBI-based annotation, this research presents an instrumental phonetic analysis of intonation contours across sentence types in two Mirandese varieties (central and frontier). Data were collected through a Discourse Completion Task (DCT) and analysed acoustically with Praat. The results reveal both convergent and divergent prosodic strategies between the varieties, with specific nuclear contours employed to distinguish focus types, question modalities, and pragmatic meanings. Mirandese aligns with broader Romance intonational patterns but also exhibits unique configurations influenced by language contact and internal variation. These findings contribute to the typology of Romance intonation and underscore the importance of documenting endangered linguistic systems.

Keywords: Mirandese, minority languages, intonation, phonology.

1. Introduction

The study of the Mirandese language dates to the late 19th century. Since then, various studies have addressed Mirandese, treating it either as a dialect or a vernacular, given that it does not belong to the Galician-Portuguese language family. As a language with an oral tradition, its first orthographic convention was only established in 1999 to standardize its writing. Although scholarly interest has grown, linguistic studies on Mirandese have mostly focused on its lexicon and segmental phonology, while research on prosodic and intonational phonology remains limited. Only recently, within the AMPER (Atlas Multimédia Prosodique de l'Espace Roman) project (Contini *et al*. 2002), designed to map and compare prosodic variations across Romance languages, have Mirandese intonational patterns begun to be analysed through fundamental frequency phonetic analysis.

While these previous studies have provided valuable phonetic descriptions, this study aims to fill a gap in the understanding of Mirandese intonational phonology by investigating its prosodic patterns. Specifically, this investigation adopts the Autosegmental-Metric (AM) model, developed from the principles of Pierrehumbert (1980) and refined over the years (Gussenhoven 2004, Jun 2005, 2014). Furthermore, to systematically transcribe these intonational and prosodic features, the ToBI (Tones and Break Indices) system was applied, largely based on the AM model (Beckman & Ayers-Elam 1997).

Therefore, in this study, we address the following research questions: (1) What is the inventory of pitch accents and boundary tones in Mirandese? and (2) Does Mirandese align more closely with European Portuguese or with northwestern Iberian languages and varieties, such as Galician and Astur-Leonese? By establishing this phonological inventory, this approach is not only innovative for studies on minority languages in the Iberian Peninsula, but it also provides a clearer picture of how Mirandese fits into both the local northwestern linguistic continuum and the broader context of Romance languages.

2. Background

2.1. Historical and linguistic contextualisation of the Mirandese language

Mirandese is a Romance language belonging to the Astur-Leonese linguistic group, which evolved from Vulgar Latin in the historical region of *Tierra de Miranda*, located in northeastern Portugal (Vasconcellos 1900, Quarteu & Frías Conde 2002). Documented since the medieval period, this linguistic area includes the contemporary municipalities of Miranda do Douro, Vimioso, Mogadouro, and some villages of Bragança (Vasconcellos 1900: 36-58, Vasconcellos 1901: 9-10). It emerged as part of the linguistic continuum that originated in the Kingdom of Asturias (718 - 924) and later the Kingdom of León, amid the broader development of Iberian Romance languages after the fall of the Roman Empire. The Christian Reconquest contributed to the southward expansion of the Astur-Leonese area, bringing Leonese-speaking settlers into Portuguese territory - an expansion facilitated by the Diocese of Astorga and the actions of monastic and military orders during the 13th century (Carvalho 2015 [1952]).

Within the Portuguese geographical context, Mirandese established itself as a peripheral variety of Astur-Leonese, shaped by geographic isolation and extended Leonese settlement. From the 15th century onward, the increasing dominance of Portuguese resulted in the progressive marginalization of Mirandese. Despite these pressures, speakers have maintained a strong sense of linguistic and cultural distinctiveness. Nonetheless, considerable internal variation remains, partly due to the long absence of a standardized written norm (only implemented in 1999) and the enduring diglossic environment in which the language exists (Ferreira 2011, Rodrigues & Ferreira 2011).

From a dialectological perspective, Mirandese represents a western variety of the Astur-Leonese group and retains several conservative features that differentiate it from Portuguese. These features include the preservation of Latin intervocalic consonants /l/ and /n/, palatalization of initial /l/ to /ʎ/ (as in *lhana* [wool]), and the transformation of Latin consonant clusters (pl-, fl-, cl-) into the affricate [tʃ], exemplified by *chorar* [to cry], *chama* [flame], and *chamar* [to call]. The phonological and morphosyntactic diversity observed within Mirandese reflects both historical isolation and contact-induced change. Varieties such as Central Mirandese, which forms the basis for the standardized orthography, Raiano, and Sendinês display distinct phonetic, lexical, and grammatical characteristics. These differences encompass diphthongization patterns, article usage, nasalization, and syntactic constructions (Menéndez Pidal 1906, Baldinger 1972, Merlan 2007, Ferreira 2011).

Mirandese also shares significant affinities with other western Astur-Leonese varieties, notably the Sanabrian dialect. Shared features include the retention of Latin consonants (-d-, -ll- and -nn-), absence of voiced sibilants, and similar processes of diphthongization. However, prolonged contact with Portuguese has introduced specific innovations, such as, nasal vowels, the use of inflected infinitives, and Portuguese-influenced lexicon - which underline the transitional nature of the variety and highlight the complex interplay between linguistic conservation and change (Frías Conde 2001, Quarteu & Frías Conde 2002).

From a sociolinguistic point of view, Mirandese exemplifies the precarious situation of minority languages in centralized nation-states. Although recognized as a regional language by the Portuguese state under Law 7/99, Mirandese remains seriously endangered. While Merlan (2009) estimated the community at approximately 5000 speakers based on 2001 data, recent surveys reveal a sharp decline. According to Costas (2022), there are currently only about 3500 active speakers, with regular users potentially being even fewer. The data from the sociolinguistic surveys of Costa (2022) show that most fluent speakers are elderly, and the intergenerational transmission of the language has declined markedly. Among younger speakers, Mirandese is used almost exclusively in informal or domestic contexts, if at all (Costas 2022).

Several sociohistorical factors have contributed to this decline. The centralization of administrative, educational, and media systems around standard Portuguese has reduced the domains in which Mirandese is viable. Furthermore, social stigmatization – where Mirandese is perceived as rural, unrefined, or "incorrect" – has accelerated the language shift, especially among younger and urbanized generations. Nonetheless, there remains a broadly positive attitude toward the language within the community, with many supporting its preservation and inclusion in formal education (Martins 1994, 1997, Quarteu & Frías Conde 2002, Costas 2022).

Considering UNESCO's framework for assessing language vitality, the current vitality level of the Mirandese language can be described as critical (UNESCO 2003, Oliveira 2024). The language scores low in key areas such as intergenerational transmission, media presence, use in new domains, and availability of teaching materials. However, it fares better in terms of community attitudes and some institutional support, particularly at the municipal level. Importantly, Mirandese continues to exist in a state of diglossia, where Portuguese dominates official and public spheres, while Mirandese remains largely confined to the private domain.

Despite these challenges, grassroots initiatives - such as optional Mirandese instruction in schools, cultural associations, and regional publications - have attempted to revitalize its use. These efforts are necessary but insufficient without broader policy support and integration into national strategies for linguistic diversity and cultural heritage.

Crucially for the aims of the present study, this pervasive diglossic environment and the increasing dominance of European Portuguese have significant implications for Mirandese prosodic phonology. In situations of intense language contact and language shift, prosody, in particularly intonation, is often one of the most permeable linguistic subsystems (Matras, 2009: 231). The fact that Mirandese is predominantly used in restricted and informal domains by a bilingual population raises a fundamental question about prosodic transfer and convergence. Therefore, the sociolinguistic and historical reality described above directly motivates our core research aims: by analyzing the intonational phonology of Mirandese, we can determine whether the language still retains the conservative prosodic features characteristic of the Astur-Leonese and northwestern Iberian continuum, or whether centuries of diglossia and intense contact have led to an intonational alignment with the dominant European Portuguese.

2.2. Intonational grammar in the northwest of the Iberian Peninsula

The northwestern region of the Iberian Peninsula presents a rich linguistic landscape where Peninsular Spanish, European Portuguese, Galician, and Astur-Leonese coexist and interact. Understanding the intonational grammar of these languages is crucial, not only for their individual characterization but also for comparative and language contact studies. Modern analysis of intonation in this region predominantly relies on the Autosegmental-Metrical model and employs annotation systems like ToBI, adapted for each language (Frota, Oliveira, Cruz & Vigário 2015, Muñiz Cachón & Roseano 2022, Aguilar, Prieto, Vanrell & Roseano 2024, among others). To properly contextualize Mirandese within this complex landscape, it will be evaluated against these neighbouring languages along three main typological axes: (i) prosodic domains and boundary marking; (ii) the inventory of tonal morphemes; and (iii) the specific intonational contours used across different sentence types.

Regarding prosodic structure, these languages share similar prosodic constituents, including the prosodic word, the phonological phrase, and the intonational phrase (IP). Each language, however, has some unique features. For example, there is evidence for an intermediate phrase level in Spanish and Astur-Leonese (Sosa 1999, Muñiz Cachón & Roseano 2022), whereas European Portuguese may exhibit a prosodic word group and compound domains at the IP level (Frota 2000, Vigário 2010). All these languages also differ on how to mark the intonational

boundaries: Peninsular Spanish and Astur-Leonese marking intermediate boundaries, unlike European Portuguese and Galician (Frota 2000, Fernández Rei 2002), which tend to mark only the final IP boundary.

The tonal inventories, comprising pitch accents and boundary tones, reveal significant similarities and differences. All four languages use monotonal (L and H) and bitonal (HL and LH) pitch accents, although the specific inventory and frequency of each vary. Peninsular Spanish is notable for featuring a three-level height contrast (L, H and ¡H). Comparatively, European Portuguese and Peninsular Spanish has five nuclear accents documented in P-ToBI and Sp_ToBI (with variations), Astur-Leonese three, and Galician appears to have a more reduced inventory, although research is less extensive or uses different methodologies (Frota *et al*. 2015, Hualde & Prieto 2015, Fernández Rei 1997, Fernández Rei & Escourido 2008, Alvarellos *et al*. 2011, Muñiz Cachón & Roseano 2022). Despite the differences, the L* (representing a low pitch target) and H+L* (representing a falling pitch movement) nuclear accents are common to all four languages. Boundary tones also vary in number and complexity: six configurations in Peninsular Spanish (L%, H%, !H%, LH%, HL%, L!H%), five in European Portuguese (L%, H%, !H%, LH%, HL%), two configurations in Astur-Leonese (L%, HL%) and one configuration in Galician (L%).

Regarding prominence, the four languages tend to locate the main nuclear accent towards the right edge, at the final boundary of the intonational phrase. However, tonal density seems to differ: it is described that Peninsular Spanish has a higher density, tending to assign an accent to each prosodic word, whereas (standard) European Portuguese shows a sparser distribution, with the IP being the domain of assignment (Frota & Prieto 2015: 397). The patterns for Galician and Astur-Leonese are less clear, although recent data suggest a tendency for the prosodic word to be the domain in Astur-Leonese (Muñiz Cachón & Roseano 2022).

The realization of different sentence types reveals patterns of convergence and divergence. Neutral declarative sentences exhibit relative cohesion across the Romance space, with dominant H+L* L% and L* L% contours. In the Iberian Northwest, H+L* L% appears to be the most common pattern in European Portuguese, Galician, and Astur-Leonese, while Peninsular Spanish frequently uses L* L%. Yes/no questions consistently represent the area of greatest variation. Spanish typically features a rising ending (e.g., L* HH%). Regarding Northern European Portuguese varieties[1], a great variation is reported in the literature: (i) Vigário & Frota (2003: 124) describe a low pitch accent aligned with the stressed syllable, followed by an H boundary tone on the post-nuclear syllable and a final low when segmental string provides it for Braga; (ii) Cruz *et al*. (2017: 85) reports a low pitch accent aligned with the stressed syllable, followed by a LH for Braga and a rising pitch accent aligned with the stressed syllable followed by a H boundary tone in Oporto; (iii) Cruz *et al*. (2022) reports a rising contour for Braga (H+)L* H% and for Oporto L*+H H%. In standard European Portuguese presents a falling-rising pattern (H+L* LH%), Galician can have falling (H+L* L%) or rising-falling (L+H* L%) patterns depending on the variety, and Astur-Leonese also shows internal variation with falling patterns (H+L* L% or ¡H* L%). This variation has allowed for the mapping of distinct geoprosodic areas in the western Peninsula (Fernández Rei 2019). Wh-questions are often less marked

[1] Following the standard nomenclature in the literature, the term Northern European Portuguese (NEP) refers here to the varieties of Braga and Oporto.

intonationally, potentially displaying falling contours similar to declaratives (e.g., H+L* L% or L* L%) in several of these languages, although Peninsular Spanish and Portuguese also permit a rising pattern with a nuance of politeness (Hualde & Prieto 2015: 381, Frota *et al*. 2015: 266). Imperative sentences (orders vs. requests) and vocatives (neutral vs. insistent calls) also exhibit distinct intonational strategies in each language to convey pragmatic nuances, employing specific combinations of nuclear accents and boundary tones (Estebas-Vilaplana & Prieto 2010, Hualde & Prieto 2015, Frota *et al*. 2015, Cruz *et al*. 2017, Fernández Rei 1997, Fernández Rei & Escourido 2008, Fernández Rei 2016, Rodríguez Vázquez 2019, Alvarellos *et al*. 2011, Fernández Planas *et al*. 2020, Muñiz Cachón & Roseano 2022). A summary of these sentence types and their respective nuclear configurations is presented in Table 1 below.

Within this context, the intonational analysis of Mirandese becomes particularly relevant. Preliminary studies, mainly within the AMPER-MIR project, indicate patterns such as falling contours for neutral declaratives and rising-falling contours for yes/no questions with variations depending on word stress locus and variety (Bautista & Moutinho 2019), suggesting possible influences from Portuguese (Moutinho, Coimbra & Vaz 2011).

However, while AMPER-MIR provided an invaluable macroscopic view of phonetic fundamental frequency (*f*0) curves, it inherently lacked a phonological categorization of these contours into discrete, language-specific units. In other words, AMPER-MIR mapped phonetic variation but did not identify the specific intonational morphemes that form the linguistic system. Therefore, further in-depth analysis must be conducted regarding the intonational morphemes forming the basis of the Mirandese intonational lexicon. This research aims to contextualize Mirandese, on the one hand, relative to the northeastern linguistic sphere (and its associated influence) and, on the other hand, within the Romance language family by evaluating it against the specific typological axes and intonational patterns described above.

Table 1. Comparative intonational patterns in Northern Portuguese, Galician, Astur-Leonese, and Spanish

Sentence type	Standard European Portuguese	Standard Peninsular Spanish	Galician	Astur-Leonese
Neutral declarative	H+L* L%	L* L%	H+L* L%	H+L* L%
Yes/no questions	H+L* LH%	L* HH%	H+L* L% or L+H* L%	H+L* L% or ¡H* L%
Wh-questions	H+L* L%	L* L% or L* HH%	L* L%	--
Imperatives (orders vs. requests)	H*+L L% vs. L* L%	L* HL% vs. L+H* M%	--	H+L* L% vs. L+H* L%
Vocatives (vocatives vs. calling)	L+)H* !H% vs. L+)H* L%	L+H* M% vs. L+H* HL%	--	H+L* L% vs. H+L* L-[%LH] H+L* L%

3. Materials and Methods

The methodological approach is primarily grounded in established practices for intonational research within Romance languages, drawing upon frameworks like AMPER, InAPoP (Interactive Atlas of the Prosody of Portuguese) project (Frota & Cruz 2012-2015), designed to systematically investigate prosodic and rhythmic variation in Portuguese, and IARI (Interactive Atlas of Romance Intonation) project (Prieto, Borràs-Comes & Roseano 2010-2014), which offers an interactive, map-based interface spanning Romance languages spoken in Europe and America, while adapting procedures to the specific sociolinguistic context of Mirandese. Given the critically endangered status of Mirandese and the extreme difficulty in finding fluent, elderly native speakers who actively maintain the conservative vernacular, the participant pool is inherently small (n=5). Consequently, this research is explicitly framed as an exploratory phonological study aiming to map the intonational inventory of the language, rather than a statistical acoustic analysis where inter-speaker variability could distort inferential numbers in a small sample.

Data elicitation for this study used a questionnaire from the version developed by Prieto & Roseano (2010) for Romance languages. Specific modifications were implemented for the Mirandese language to ensure that the target lexicon sounded natural (Appendix I). This methodological approach is based on the Discourse Completion Task (DCT), as established by Blum-Kulka *et al*. (1989). The DCT is a recognized technique within pragmatic and sociolinguistic research (e.g. Billmyer & Varghese 2000, Félix-Brasdefer 2010). The questionnaire comprised specific discourse contexts and participant instructions designed to elicit a wide range of predetermined pragmatic meanings. As indicated by recent sociolinguistic data, older generations of Mirandese speakers have high illiteracy rates (Costas 2022). Therefore, a reading task would have been impossible for some or would have induced an unnatural reading prosody. By applying the DCT orally, we successfully elicited targeted pragmatic contours while ensuring the speakers felt comfortable. The DCT consisted of 35 distinct situations describing everyday contexts. These scenarios were designed to elicit a range of sentence types and pragmatic functions, including neutral and non-neutral statements and questions, commands and requests, and vocatives.

The whole set of target utterances was presented twice to ensure that the elderly participants fully comprehended the specific pragmatic contexts, and to provide a second elicitation opportunity if the first response did not semantically match the target context. Any potential accommodation effects from repetition were mitigated by presenting the stimuli in different orders. A total of five interviews were conducted in loco by the authors in collaboration with local native speakers, ensuring that context presentation and data elicitation remained authentic. We collected data from two different varieties: three speakers in Cércio and Vale de Mira (central variety), and two in Cicouro and Constantim (frontier variety). Despite the asymmetrical number of speakers - a common constraint in fieldwork involving minoritized languages - the extracted datasets remain comparable. A total of 262 utterances were analyzed (statements: n=106, questions: n=123, imperatives: n=18 and vocatives: n=15).

Participant selection was guided by a sociolinguistic questionnaire (Appendix II) designed to ascertain linguistic background, linguistic use patterns, proficiency, and attitudes. Key inclusion criteria comprised birth and continuous residence in *Tierra de Miranda*, self-identification with the Mirandese and frequent use of Mirandese.

Regarding linguistic use, attitude, and identity (Groups III and IV of the questionnaire), the data for Mirandese participants reveal a robust and consistent identification with Mirandese across all surveyed dimensions. These participants identified Mirandese as their primary language, the language in which they habitually think, and the variety used by previous generations, thereby demonstrating strong intergenerational continuity. In terms of usage frequency, all participants reported using the language 'always' or 'every day.' Furthermore, a clear functional dichotomy in language acquisition was observed: while Portuguese was predominantly acquired in a formal school environment, Mirandese was consistently reported as having been learned at home. This linguistic profile is further reinforced by their reported identity within *Tierra de Miranda*, where the participants uniformly identify as Mirandese speakers.

The sample consisted exclusively of female speakers. This methodological decision was driven by the greater pitch variability typically observed in female voices compared to male ones (Simpson 2009). In an exploratory intonational study of a minority language, this greater dynamic range facilitates the clear acoustic identification and phonological extraction of intonational contours. Furthermore, restricting the sample to a single gender effectively eliminates the confounding variable of cross-gender physiological fundamental frequency (*f*0) differences within a reduced dataset.

To prioritize ecological validity, recordings were conducted in the participants' familiar, informal environments (homes or outdoors). Consequently, the environment was not acoustically isolated, but background noise was controlled as much as logistically possible. Recordings were captured using a Victure V6 HD 8GB digital voice recorder equipped with an external microphone. The high-quality audio files were saved in mono .wav format with a sampling rate of 22.05 kHz. As previously mentioned, most of the recordings did not take place in a closed and a noise-controlled environment. Therefore, whenever necessary, Audacity software (version 2.3.3) was used to reduce background noise, ensuring that this process did not compromise the subsequent acoustic analysis.

For each target utterance, a spectrogram, waveform and the pitch contour were generated. Utterances images were created automatically using two dedicated scripts (from Pauline Welby[2] and Wendy Elvira-García[3]). The *f*0 alignment was annotated using Praat software (Boersma & Weenink 2020). The speech data were orthographically transcribed and prosodically analysed according to the AM model (Pierrehumbert 1980, Gussenhoven 2004, Jun 2005, 2014) and all figures are based on the authors' recordings. The annotation of tonal events (pre-nuclear accents, nuclear accents, boundary tones) followed the conventions established for Portuguese ToBI (P_ToBI) system (Frota, Oliveira, Cruz & Vigário 2015). Manual annotation was conducted by a single trained annotator and revised by a second annotator. Additionally, for the narrow-focus statements (Section 4.1.2), specific labels were adopted to distinguish the nuclear prominence position within Utterance, following the conventions established in the ToBI framework (Beckman, Hirschberg & Shattuck-

[2] Script draw-waveform-sgram-f0.praat available at https://www.uvic.ca/humanities/sllc/_assets/docs/praat/draw-waveform-sgram-f0.praat

[3] Script create_pictures-with-tiers.praat available at https://github.com/wendyelviragarcia/create_pictures/blob/master/create_pictures.praat

Hufnagel 2005). Specifically, 'ef' for contours in non-final IP position and 'lf' for those in final IP position within Utterance (Figures 5, 6 and 7).

4. Results

As outlined in the methodology, the descriptive findings presented in this section stem from an exploratory phonological mapping of Mirandese. Given the reduced sample size, we rely on qualitative phonological categorization (AM/ToBI framework) and descriptive distributional trends rather than fine-grained quantitative phonetic measurements or inferential statistics. Therefore, the differences observed between varieties should be interpreted as preliminary trends that lay the groundwork for future quantitative validation.

Bearing this exploratory scope in mind, it is essential to characterize the two varieties under study before detailing their specific intonational structures. Our results show that the Central (Cércio and Vale de Mira) and Frontier (Cicouro and Constantim) varieties share a common phonological core but diverge significantly in how they encode pragmatic distinctions. Both varieties follow a typical Astur-Leonese pattern for neutral declaratives and wh-questions, characterized by a default falling nuclear contour (H+L* L%). However, a clear prosodic divergence emerges in yes/no questions. The Central variety maintains the falling contour across different pragmatic modalities (information- vs. confirmation-seeking), mirroring the 'intonational non-marking' strategy found in Portuguese and Italian. In contrast, the Frontier variety employs distinct nuclear configurations to signal these pragmatic differences, aligning with the strategies typical of Spanish and Catalan. Furthermore, while both varieties use similar tonal categories for focus and vocatives, they differ in their implementation: the Central variety tends to rely on nuclear tone contrasts, whereas the Frontier variety often utilizes boundary tone variations for disambiguation. This initial overview suggests that while Mirandese preserves a shared Astur-Leonese baseline, the Central variety shows greater prosodic proximity to Portuguese, while the Frontier variety exhibits patterns more closely related to the broader Ibero-Romance 'marking' languages.

4.1. Statements

4.1.1. Broad-focus statements

For both varieties, the nuclear pattern of the broad-focus statements is characterized by a rising prenuclear accent (L*+H) and a falling nuclear accent (H+L*) followed by a low final boundary tone (L%) (Figures 1 and 2). This nuclear contour involves a low tone (L*) aligned with the stressed syllable of the nuclear prosodic word, preceded by a high tonal target (H) and followed by a low boundary tone (L%). While the realization of the leading H shows some flexibility, the core pattern is stable. Interestingly, the central variety exhibits specific phonetic variability in the implementation of high tone in 29% of occurrences (2 out of 7 tokens). This variability was observed across all central speakers (Figure 3). These variations manifest as a fall initiated either from a preceding high *f*0 target or from a sustained plateau. This suggests that while the phonological target remains H+L*, its precise phonetic implementation can be influenced by the preceding intonational context.

Figure 1. Waveform, spectrogram, and *f*0 track of the broad-focus statement *Anda na praia a correr* '(She) is running on the beach', produced by a speaker from central variety of Mirandese.

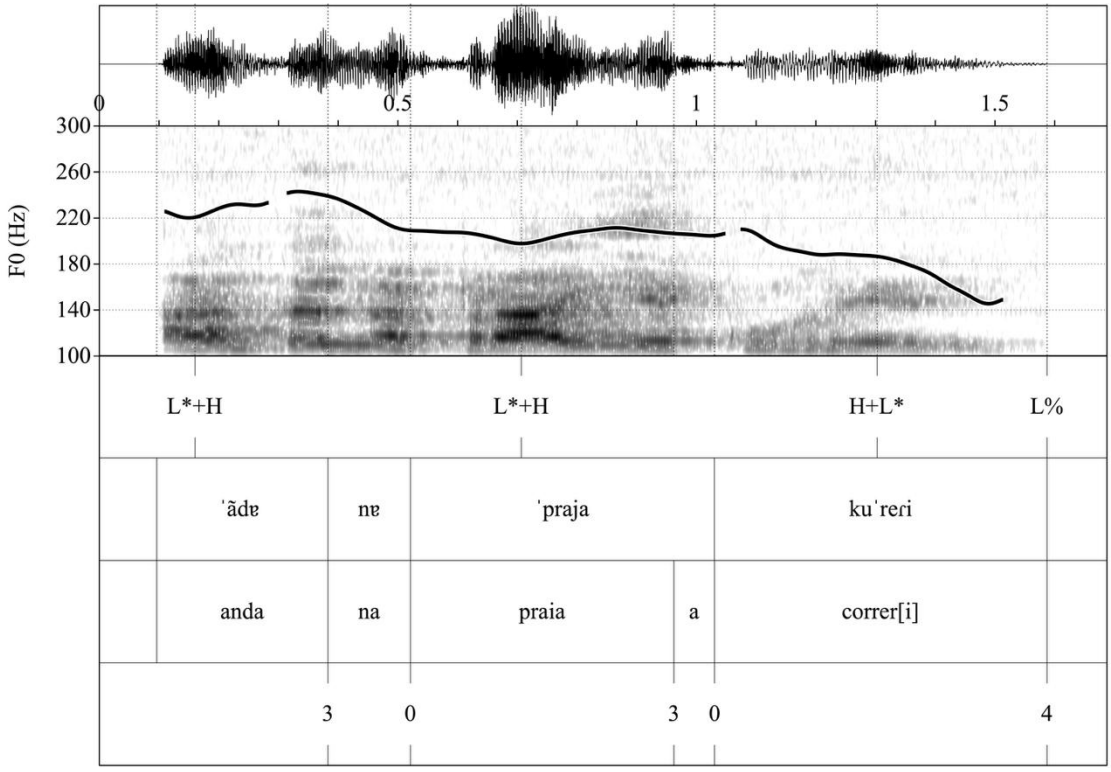


Figure 2. Waveform, spectrogram, and *f*0 track of the broad-focus statement *Lharanja* 'Orange', produced by a speaker from frontier variety of Mirandese.

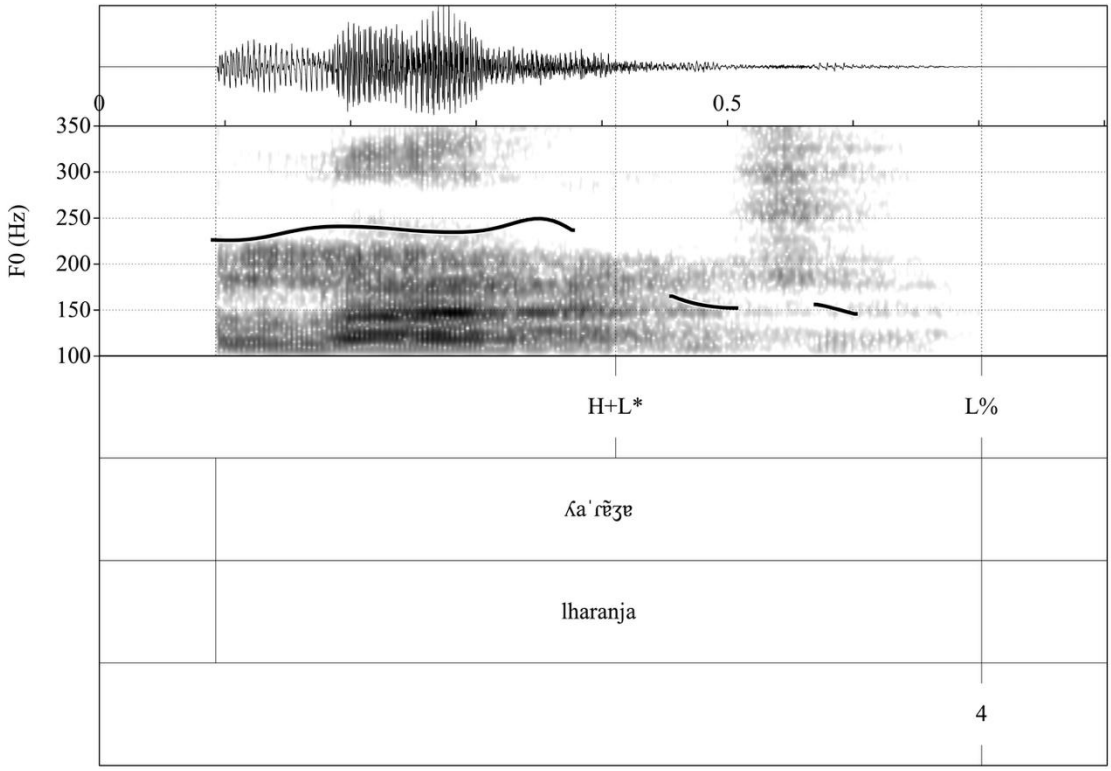
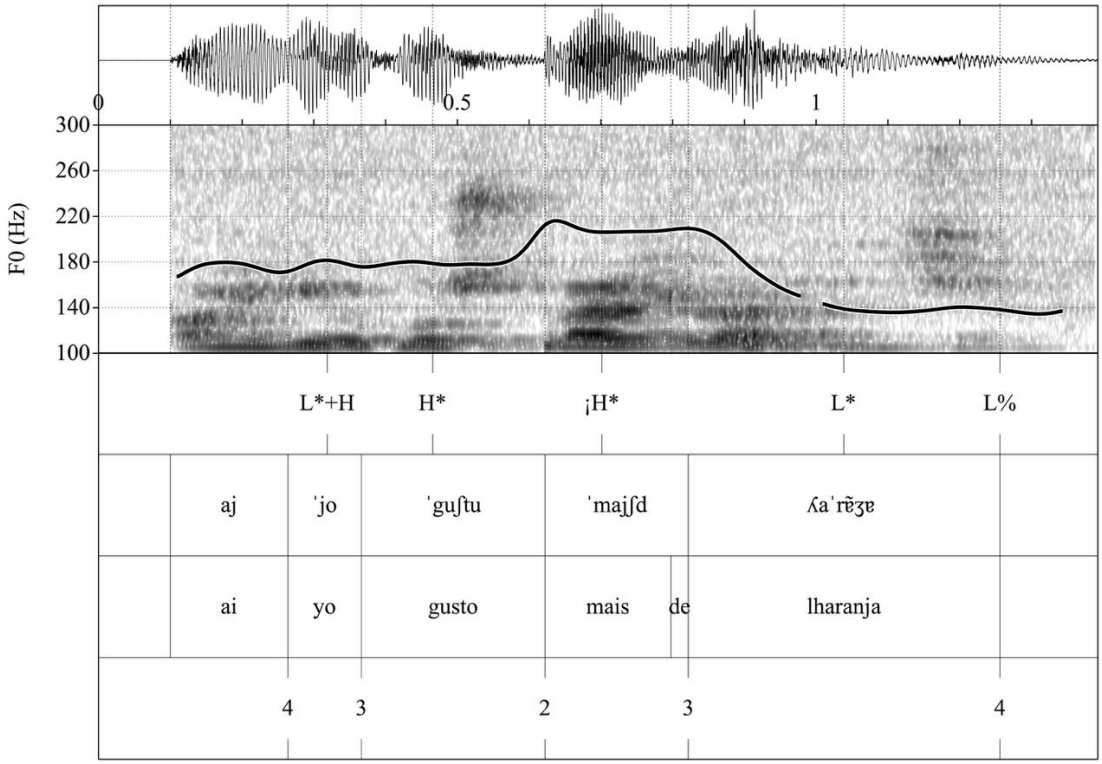
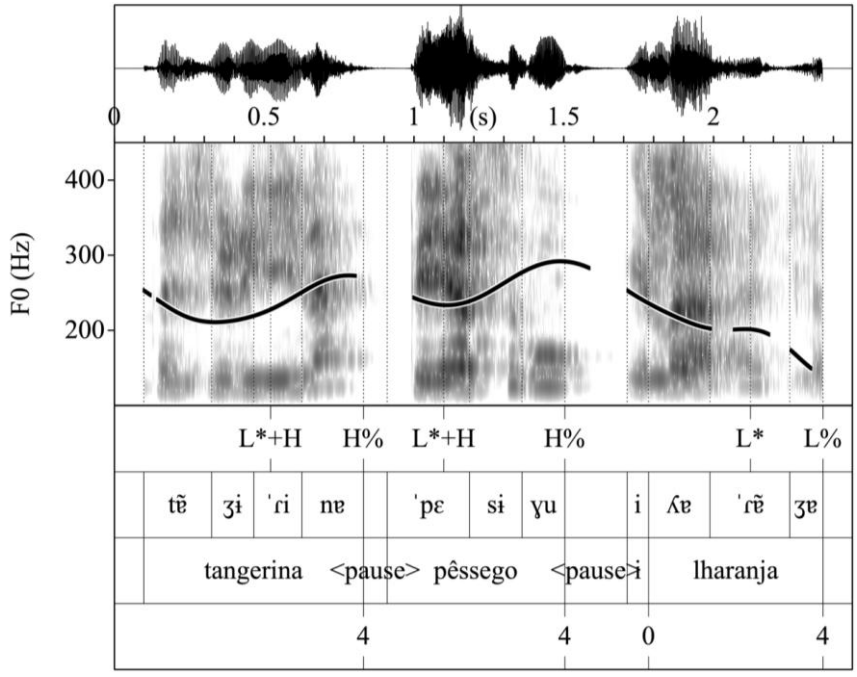


Figure 3. Waveform, spectrogram, and *f*0 track of the broad-focus statement (ai) *Yo gusto mais de lharanja* 'I prefere orange', produced by a speaker from central variety of Mirandese.



Declaratives with enumerations (Figure 4) were produced with a rising contour that involves a rising tone (L*+H) aligned with the stressed syllable of the nuclear prosodic word of the non-final IP, followed by a high boundary tone (H%).

Figure 4. Waveform, spectrogram, and *f*0 track of the utterance *Tangerina, pêssego i lharanja* 'Mandarin, peach and orange', produced by a speaker from frontier variety of Mirandese.



Below, we extract some examples of different types of focus (indicated by capitalization). In (1), contrastive focalization (or narrow focus) refers to a structure expressing the direct rejection of an alternative (i.e., “It is B, and not A”) (Gussenhoven 2008: 91). In (2), exclamations primarily serve to express the speaker's own feelings (Bolinger, 1989: 248). DCT also includes the structures in (3), and (4). These latter structures elicit certain types of phrases expressing the speakers' position and attitude towards beliefs, which can convey obviousness, doubt, or any other type of epistemic precept (Prieto *et al*. 2015, Roseano, Vanrell & Prieto 2015).

(1) Contrastive

a. *Bocé entra nua lhoija adonde nunca antrou i pregunta se eilhes ténen lharanjas. Mas la mulhier que t'atende nun t'antende bien.*
[You enter a shop where you've never been and ask if they have oranges. But the woman assisting you doesn't understand you well.]
A. *You quiero un quilo de lharanjas.*
[I want a kilo of oranges.]
B. *Lhimones?*
[Lemons?]
A. *Nó, you quiero LHARANJAS!!!*
[No, I want oranges!!!]

b. *Ancuntreste ua amiga na rue i preguntas se la Marie i l Joan tenien casa. Eilha admirada cula pregunta diç qu’eilhes se diborciórun. Eilha ansiste qu’eilhes se casórun. Tu repetes, dues bezes, anrabiada, qu’eilhes se diborciórun.*
[You met a friend on the street and ask her if Marie and Joan have a house (together). Surprised by the question, she says they got divorced. She insists they got married. You repeat, twice, annoyed, that they got divorced.]
A. *DIBORCIÓRUN-SE!!!*
[They got divorced!!!]

(2) Exclamation

Entras nua panadarie i cheira mui bien l pan. L que diries?
[You enter a bakery and the bread smells really good. What would you say?]
A. *Qu'oulor buono la PAN!*
[How good the bread smells!]

(3) Categorical

Stás a falar cula Rita subre la cena donte. Stás cun dúbedas se la Marie chegou depuis de bós. Dizes que nó, qu'eilha yá alhá staba.
[You're talking with Rita about yesterday's dinner. You are unsure if Marie arrived after you. You say no, that she was already there.]
A. *Nó, eilha yá alhá STABA.*
[No, she was already there.]

(4) Obvious

Stás cun ua amiga i falan subre l filho de la Marie, ua amiga an quemun. La Marie pregunta se l filho ye de l Mário. Tu, admirada cula pregunta, dizes que si, claro que ye de l Mário.

[You are with a friend talking about Marie's son, a mutual friend. Marie asks if he is Mário's son. You, surprised by the question, say yes, of course he is Mário's son.]

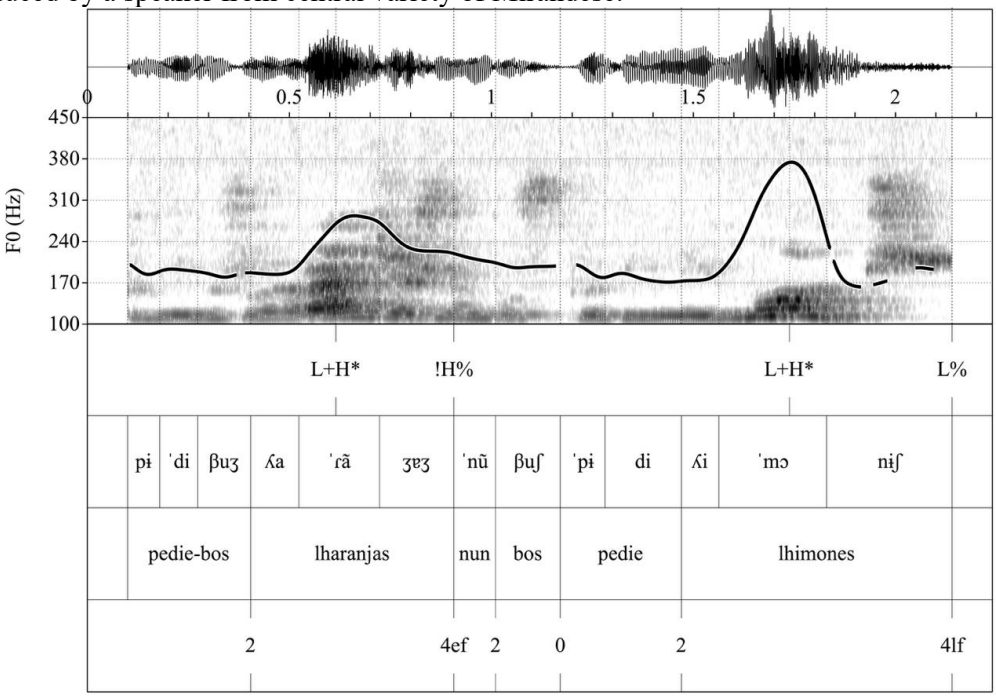
A. *Si, claro que ye de l MÁRIO.*

[Yes, of course he is MÁRIO's son.]

Our data indicate that the phonological category H* is the tone associated with the phonological word at the nucleus of the focus domain across narrow-focus constructions when this coincides with the IP head. Although phonetic variation may surface as a low-pitched movement preceding or following this accent, H* remains the selected phonological target for both varieties (Figures 5, 6, 7 and 8). The narrow-focus statement tune has a low boundary in both varieties (L%).

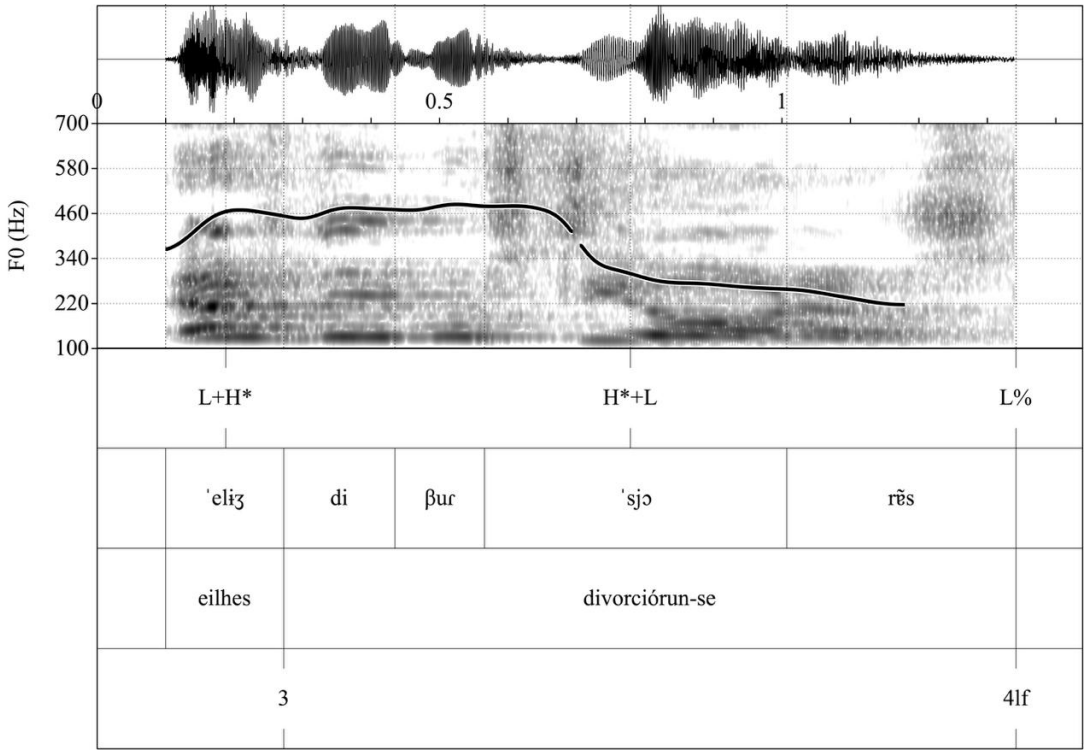
The nuclear accent of contrastive-focus statements is early rising (L+H*) and is followed by a low boundary tone at the end of the focused element. This is illustrated in Figure 5 for the utterance *Pedie-bos lharanjas, nun bos pedir lhimones* '(I) asked you for oranges; (I) didn't ask you for lemons'. The first intonation unit, associated to *lharanjas* [oranges], exhibits a rising pitch accent in the tonic syllable *-ran-*, and a sustained boundary tone in the post-tonic syllable *-jas*. The second intonational phrase is produced with a rising accent (L+H*) in the tonic syllable *-mo-* and a fall to the L boundary in the post-tonic syllable *-nes*. Notably, this predominant rising configuration in Mirandese diverges from the standard European Portuguese pattern, which relies on a falling accent (H*+L) for contrastive focus (Frota *et al*. 2015).

Figure 5. Waveform, spectrogram, and *f*0 track of the narrow-focus statement *Pedie-bos lharanjas, nun bos pedir lhimones* '(I) asked you for oranges; (I) didn't ask you for lemons', produced by a speaker from central variety of Mirandese.



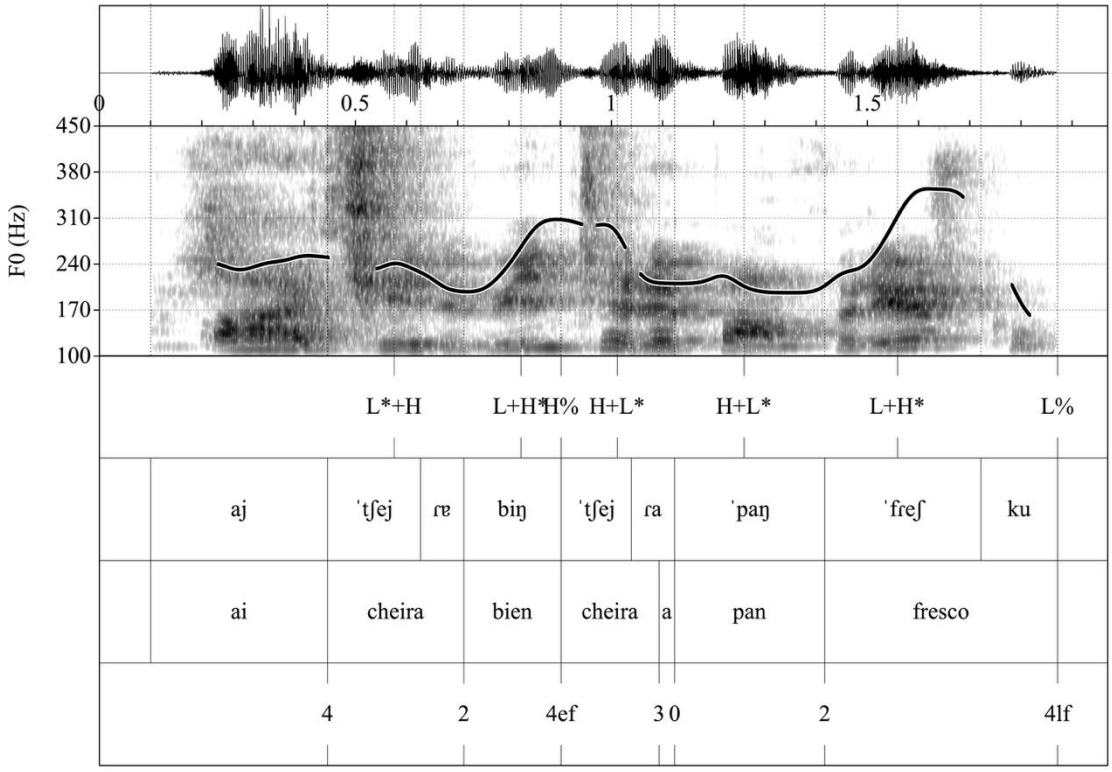
However, contrastive focus in Mirandese may also display alternative intonational configurations depending on the degree of emphasis. For instance, the contour of Figure 6 for the utterance *Eilhes divorciórun-se* '(They got) divorced!!!' shows a distinctly different alignment within the focus domain: a fall accent (H*+L) located within the stressed syllable. This demonstrates that while Mirandese typically uses a rising contour (L+H*), it can also employ the falling contour (H*+L) - the default category in European Portuguese - to encode focus in contexts of strong correction.

Figure 6. Waveform, spectrogram, and *f*0 track of the narrow-focus statement *Eilhes divorciórun-se* '(They got) divorced!!!', produced by a speaker from central variety of Mirandese.



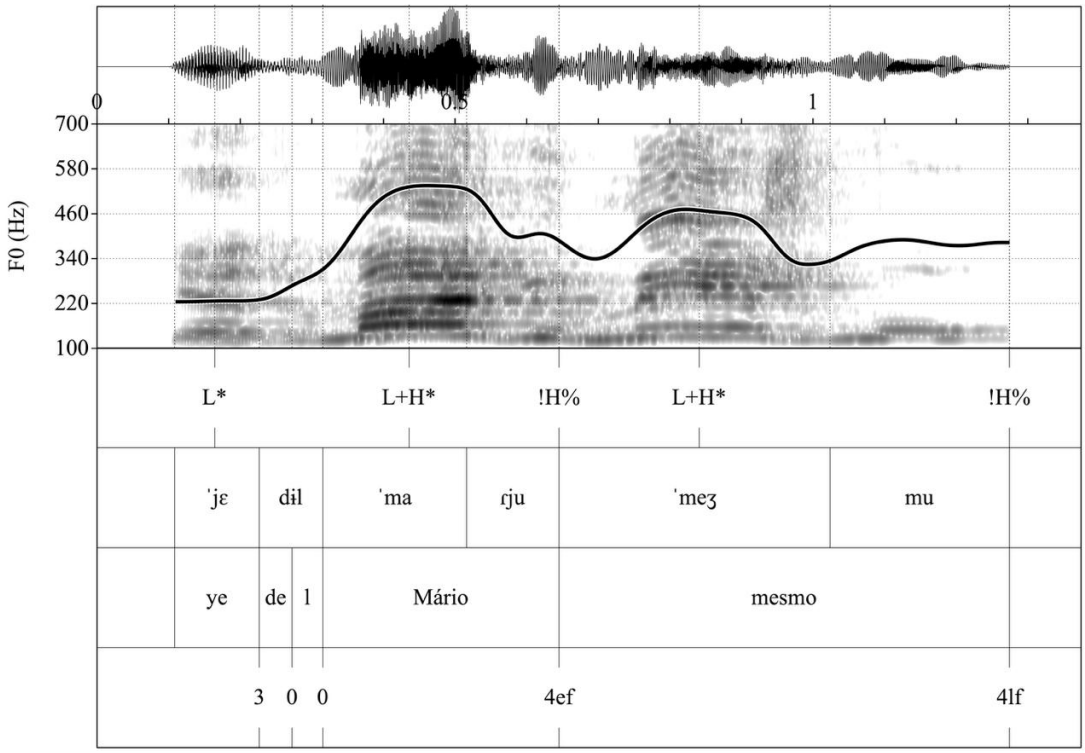
Considering the exclamative sentences, the nuclear accent is characterized by a rising contour (L+H*), followed by a low boundary (L%). Figure 7 offers an example of an exclamative sentence: in both cases, a rising configuration L+H*. In (4ef), the rising pitch accent is followed by a high boundary (H%), and in (4lf) the rising pitch accent is followed by a low boundary (L%).

Figure 7. Waveform, spectrogram, and *f*0 track of the exclamation statement *Ai, cheira bien. Cheira (a) pan fresco* 'Oh, (it) smells good. (It) smells like fresh bread', produced by a speaker from frontier variety of Mirandese.



The intonation of certain types of statements in Mirandese can be a linguistic tool to convey different types of epistemic biases on the part of the speaker. The DCT survey included situations that elicited certain sentence types that expressed posture and attitude towards beliefs, such as the communication of obviousness or doubt, as well as direct contradiction of a preceding move in the conversation. Figure 8 shows the intonation contour of the statement of the obvious *Ye de l Mário, mesmo* 'It is Mário's, of course'. The nuclear pitch contour consists of a rising nuclear pitch accent L+H* followed by a sustained !H% boundary tone.

Figure 8. Waveform, spectrogram, and *f*0 track of the statement of the obvious *Ye de l Mário, mesmo* 'It is Mário's son, of course', produced by a speaker from frontier variety of Mirandese.



4.2. Yes/no questions

4.2.1. Information-seeking yes/no questions

Information-seeking yes/no questions in Mirandese, while syntactically similar to declaratives, are primarily distinguished by intonation (e.g., *Manhana benes acá jantar* 'Tomorrow you come here for dinner' vs. *Manhana benes acá jantar?* 'Are you coming here for dinner tomorrow?'). They typically convey opposing choices (via yes/no). However, some yes/no questions focus on a specific constituent, presupposing the rest and questioning only that element (e.g., *A Inês vai a Lisboa AMANHÃ?* 'Is Inês going to Lisbon TOMORROW?'), confirming only if the time is "tomorrow and not another" (Brito 2003: 463, Real Academia Espanhola 2010). The DCT survey uses the contextual discourse shown in (6) to elicit information-seeking questions:

(6) *Entras ne l café i preguntas se ténen sumo.*
[You enter a coffeehouse, and you ask if they have juice.]
Ténen sumo?
[Do you have juice?]

Regarding nuclear accents, neutral yes/no questions exhibit greater variation in the nuclear contour in the varieties of Mirandese. Four types of nuclear contours were identified for information-seeking yes/no questions: H+L* L%, H* L%, L*+H L%, and L* HL%. Our data reveal a marked difference in the distribution of these patterns between the two varieties. In the central variety, three distinct nuclear accents were found: a falling configuration (H+L* L%) was the most frequent (56%), followed by H* L% (33%), and a rising-falling L*+H L% (11%). In contrast, the frontier variety

exhibited total consistency, with the rising-falling L* HL% contour occurring in 100% of the cases. As we can see in Figure 9, the central variety shows a preference for falling configurations, featuring either a falling nuclear tone (H+L*) or a high tone (H*), followed by a low boundary tone (L%). By contrast, the frontier variety displays greater consistency by employing a rising-falling movement. Figure 10 shows a low nuclear tone (L*) followed by a falling boundary tone (HL%). This latter rising-falling configuration (L* HL%) is also attested in the central variety, although the different phonetic alignment. Specifically, in the central variety, a rising nuclear tone (L*+H) occurs, with the rise realized on the stressed syllable, followed by a low boundary tone (L%) (Figure 11). In the frontier variety, however, the low tone (L*) is aligned with the stressed syllable, followed by the falling boundary tone (HL%).

Figure 9. Waveform, spectrogram, and *f*0 track of the yes/no question *Tu tenes çumo?* 'Do you have juice?', produced by a speaker from the central variety of Mirandese.

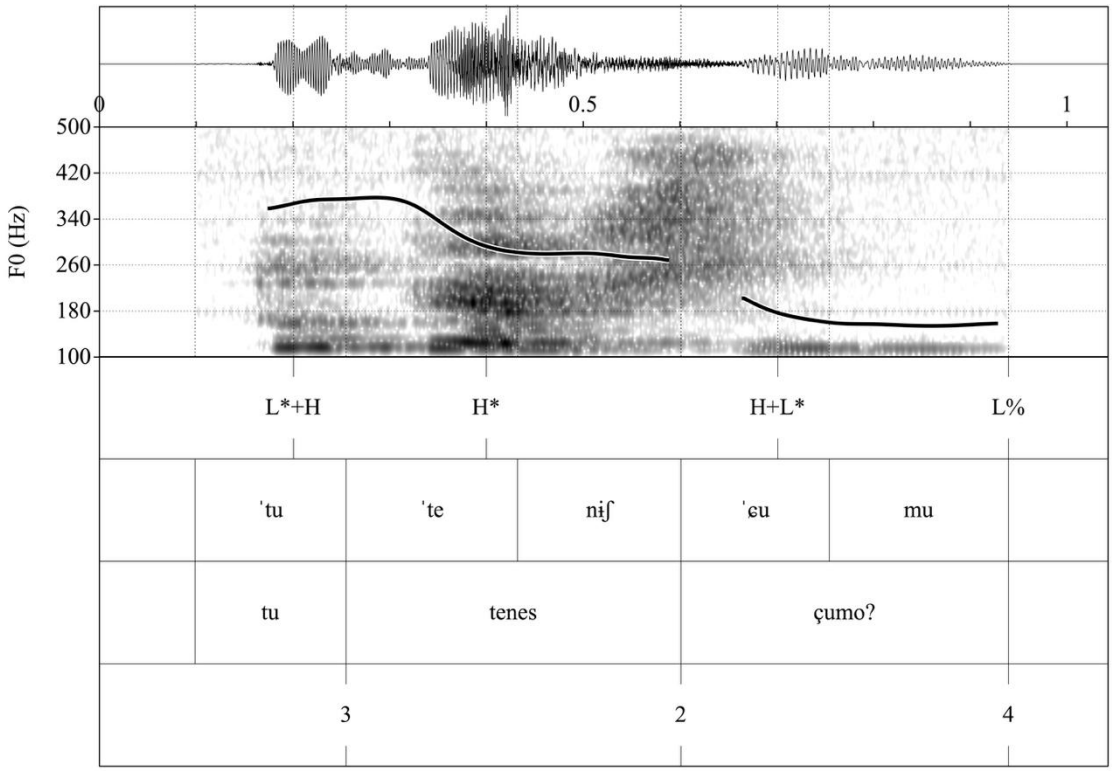


Figure 10. Waveform, spectrogram, and *f*0 track of the yes/no question *Tenes çumo?* 'Do (you) have juice?', produced by a speaker from the frontier variety of Mirandese.

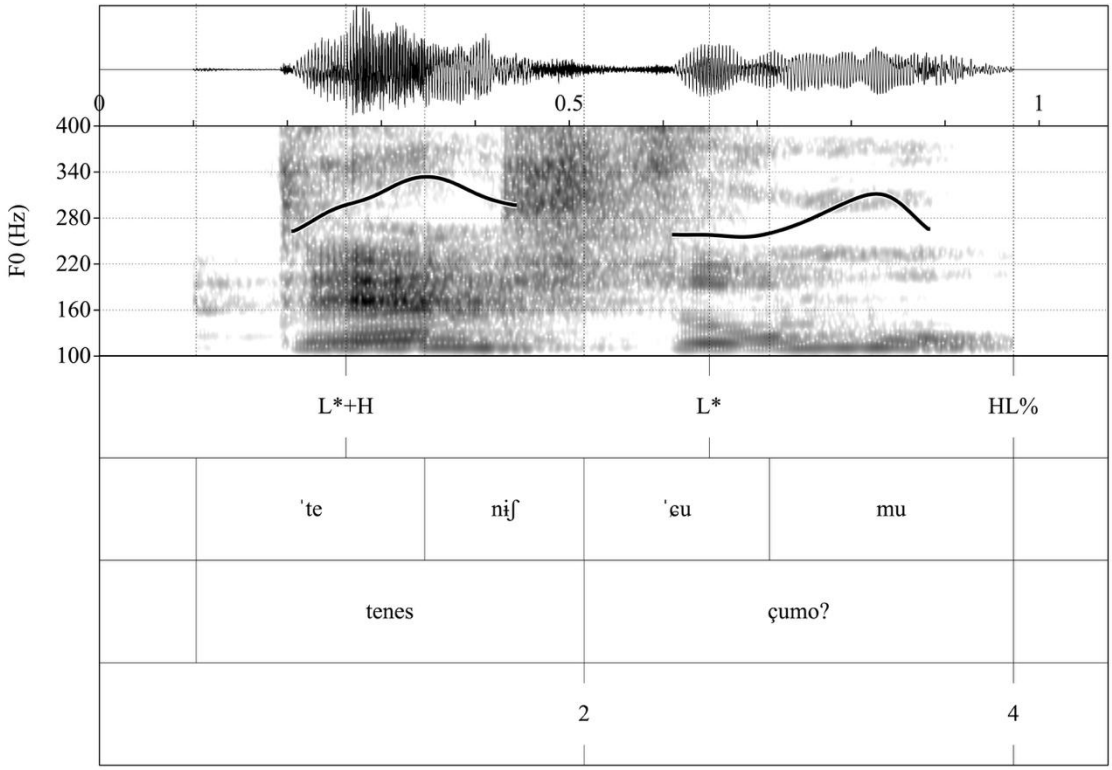
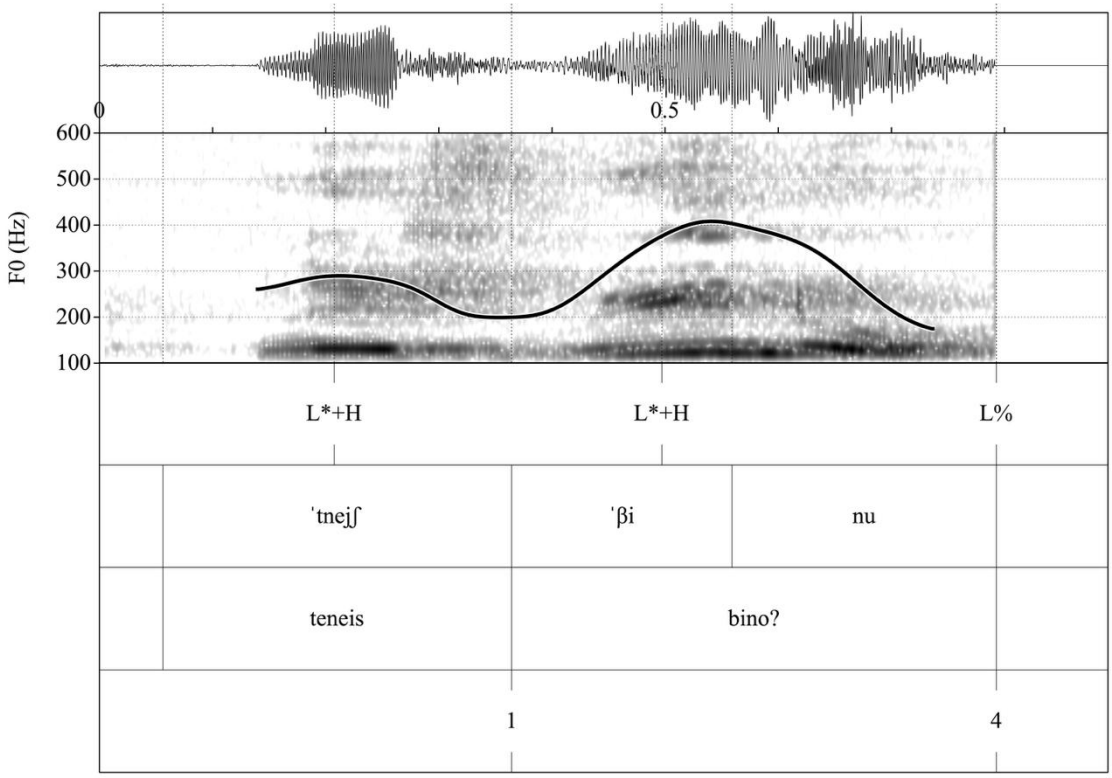


Figure 11. Waveform, spectrogram, and *f*0 track of the yes/no question *Teneis bino?* 'Do (you) have wine?', produced by a speaker from the central variety of Mirandese.



4.2.2. Confirmation-seeking yes/no questions

Unlike information-seeking yes/no questions, which request entirely new information, confirmation-seeking questions assume that the information has already been encoded in prior discourse (Bolinger 1978, Grice & Savino 2003). Additionally, in confirmation-seeking questions, the speaker holds an expectation regarding the answer grounded in prior belief, world knowledge, or information available in the discourse.

Empirical data from the central variety of Mirandese indicate a clear preference for a falling contour (H+L* L%), as in information- seeking yes/no questions, occurring in 66% of cases (Figure 12), with a secondary rising nuclear contour L+H*. In contrast, the frontier variety of Mirandese employs a rising-falling contour (L*+H L%) consistently for confirmation-seeking questions (Figure 13).

Figure 12. Waveform, spectrogram, and *f*0 track of the confirmation-seeking question *Tu tenes frio?* 'Are you cold?', produced by a speaker from the central variety of Mirandese.

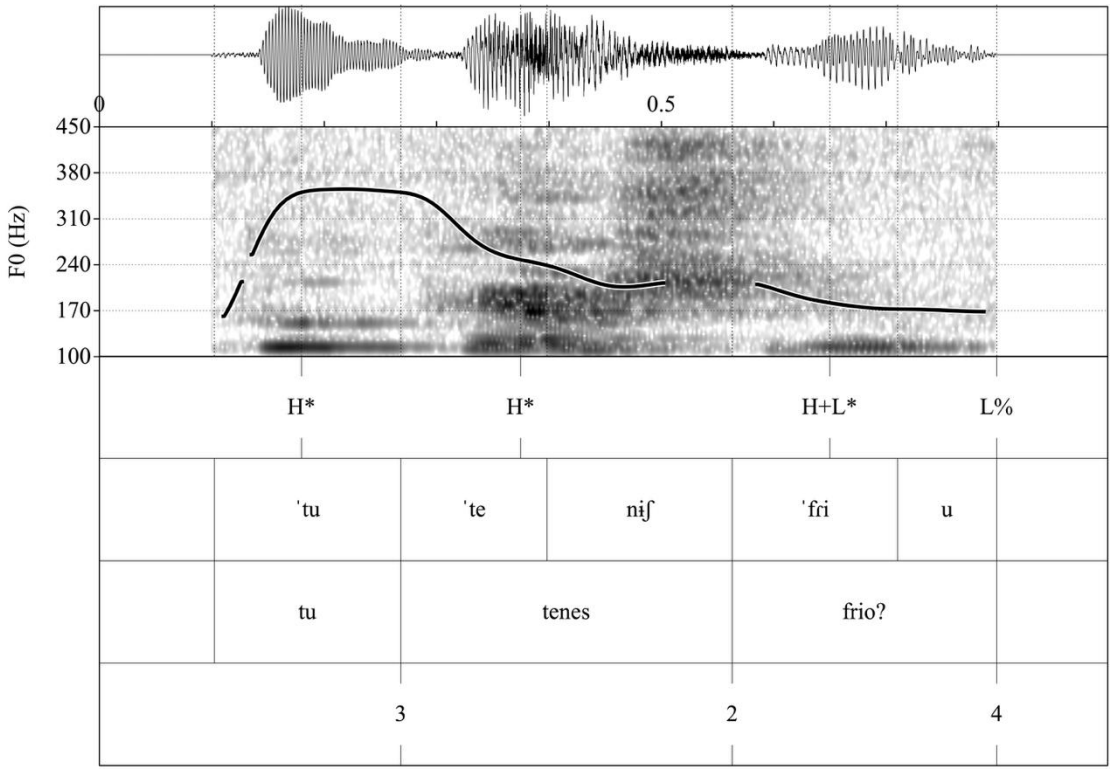
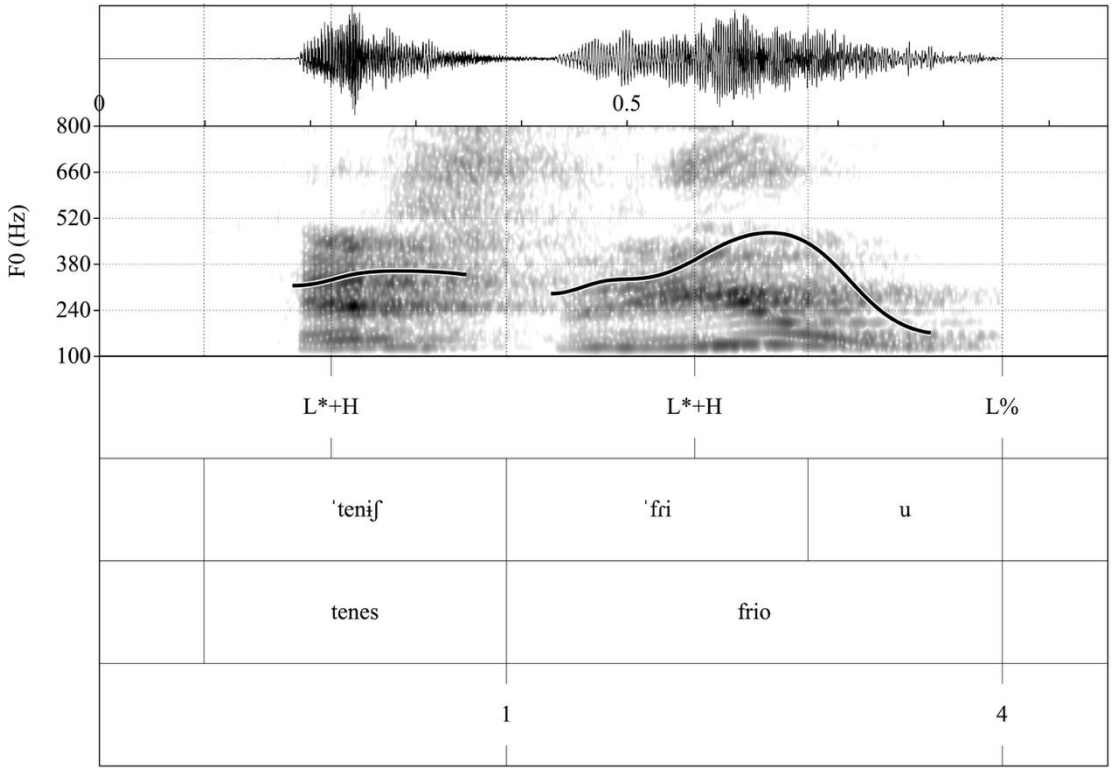


Figure 13. Waveform, spectrogram, and *f*0 track of the confirmation-seeking question *Tu tenes frio?* 'Are you cold?', produced by a speaker from the frontier variety of Mirandese.



Preliminary data suggests a potential divergence between Mirandese varieties regarding confirmation-seeking yes/no questions. The observed trends from our study indicate that the central variety of Mirandese does not select different intonational categories based on whether the speaker has a belief about the truth of the propositional content. In contrast, data from frontier variety suggest that the distinction between questions in which the speaker holds no belief regarding the propositional content and those where the speaker believes the content to be true is realized by a difference in the alignment of the circumflex contour. While in central variety information-seeking and confirmation-seeking are conveyed by H+L* L%, in frontier variety information-seeking questions are produced with the nuclear configuration L* HL% and confirmation-seeking questions are produced with a nuclear configuration L*+H L%, a contrast driven by differences in tonal alignment.

Our data show that the central variety explores the same phonologic category for both information- and confirmation-seeking yes/no questions; in the frontier variety, this contrast explores the dimension of tonal alignment (L* HL% and L*+H L%). These findings also reveal prosodic strategies specific to Mirandese within Romance languages (Frota & Prieto 2015): while some Romance languages like Spanish, Catalan and the frontier variety of Mirandese mark such pragmatic distinctions intonationally, others such as Portuguese, Italian and the central variety of Mirandese do not.

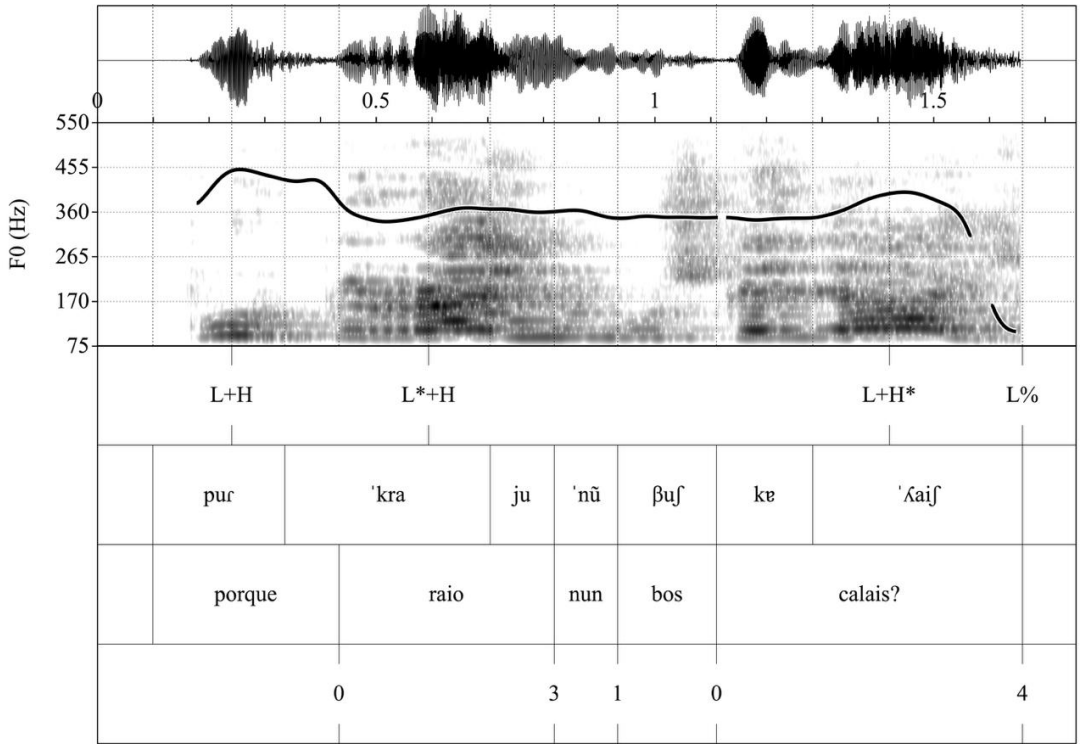
4.2.3. Imperative yes/no questions

Although specific to English, the theoretical framework proposed by Rudin (2018) provides a valuable lens for interpreting these pragmatic nuances. Rudin demonstrates

an epistemic distinction between falling and rising imperatives, with the latter exhibiting a more tentative or suggestive tone. Rising imperatives, often realized with a questioning intonation, resemble modal suggestions rather than commands. For instance, in the exchange "Write her a thank-you note?", the speaker is not issuing a directive but rather offering a soft suggestion, nearby to "You could write her a thank-you note." This contrasts with the falling imperative "Write her a thank-you note.", which is more direct and instructional in nature. Crucially, this cross-linguistic pragmatic distinction mirrors the intonational strategies we observed in Mirandese for differentiating commands from soft requests.

Imperative interrogatives in the central variety primarily exhibit the rising L+H* L% contour (Figure 14), though H* L% is also used. For the frontier variety, both L*+H L% and H* L% contours are used.

Figure 14. Waveform, spectrogram, and *f*0 track of the imperative question *Porque raio num bos calhais?* 'Why don't you shut up?', produced by a speaker from the central variety of Mirandese.



4.2.4. Echo yes/no questions

Echo questions are, in a sense, repetitions. In semantic terms, there is a repetition of the question, independently of the pragmatic context of the utterance (Blakemore 1994, Noh 1998), as exemplified below (7 and 8):

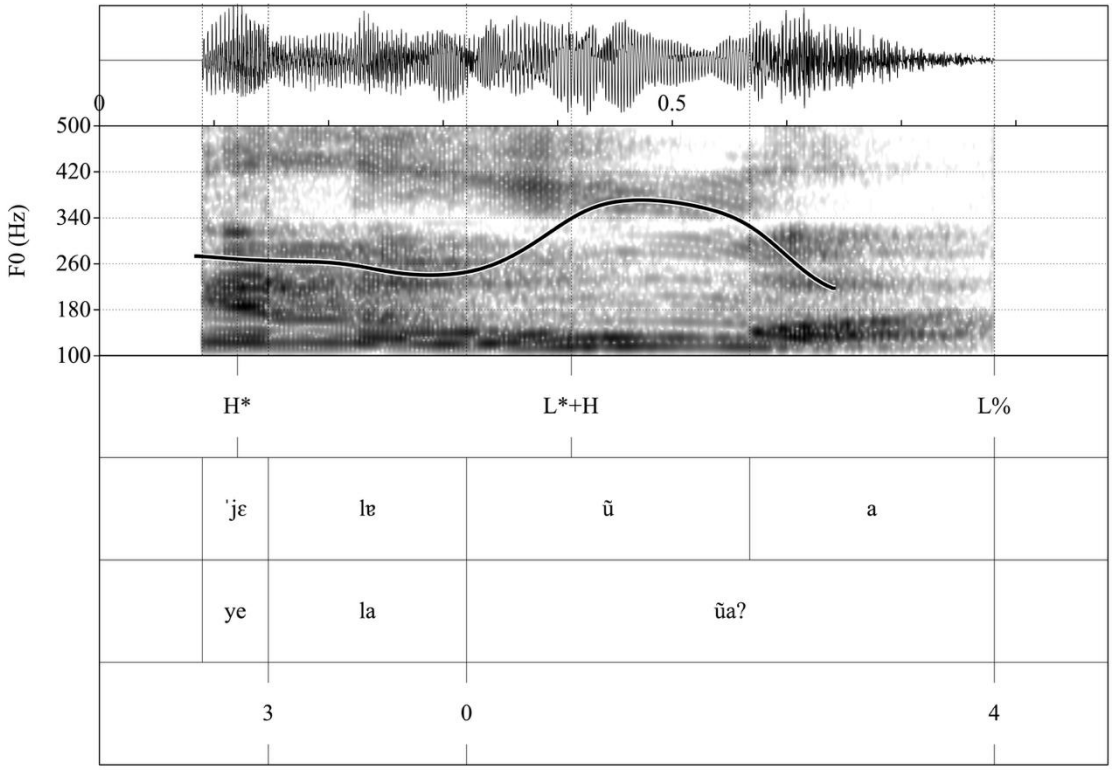
(7) *Preguntas las horas, mas nun percebiste bien la repuosta. Achas que ye ua. Cunfirma se ye ua.*
[You ask the time, but you're not sure if you understood the answer correctly. You think it's one o'clock. Confirm if it's one o'clock.]
(Que deziste,) que ye ua hora?
[('What did you say?'), is it one o'clock?]

(8) *La tue prima, la Rita, stá a pensar ir morar para Spanha. Naide staba a cuntar cun essa ambora. Quedas mui spantado i preguntas, sin acradito nisso, se eilha stá a dezir que bai morar para Spanha.*
[Your cousin, Rita, is thinking of moving to Spain. Nobody was expecting that. You're really surprised and you ask, in disbelief, if she's saying that she's going to move to Spain.]
(Stás a dezir que) bás morar para Spanha!?
[(Are you saying that) you're going to move to Spain!?]

As demonstrated in (7), the question effectively recovers the answer that was given. These structures can be used not only when the speaker did not hear or understand the response but also to express their incredulity regarding what they have heard (as in 8). The latter case is considered here to represent a non-neutral echo question.

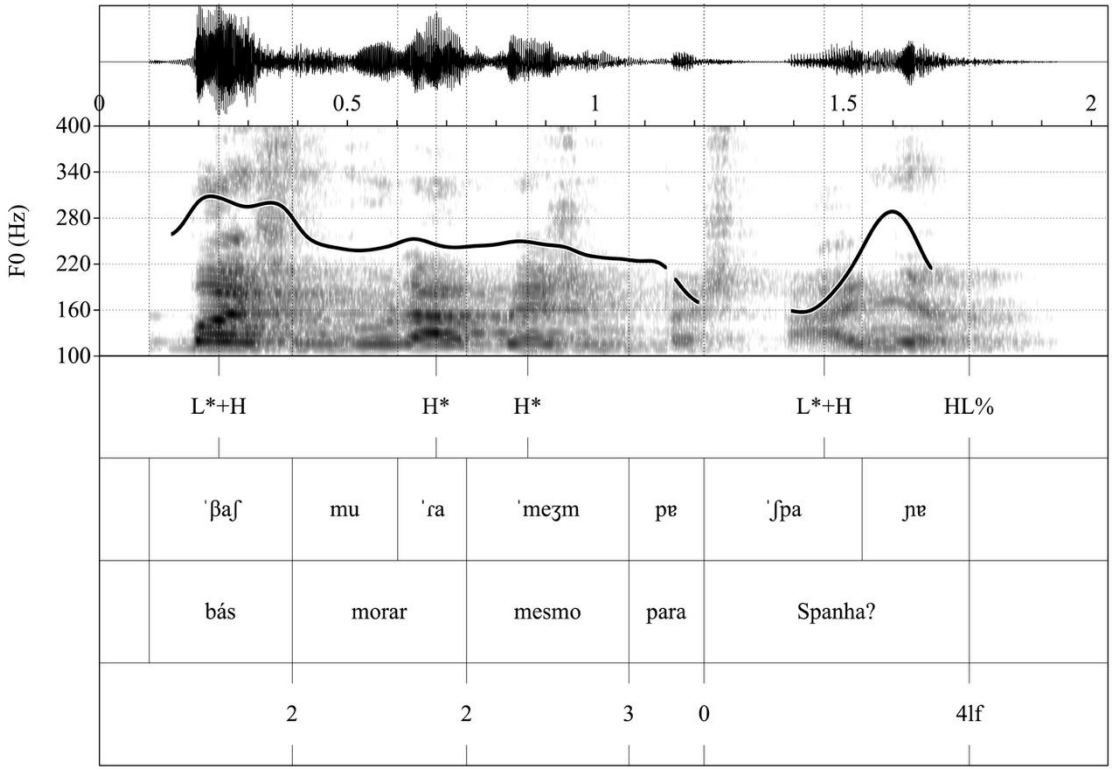
The nuclear configuration of echo yes/no questions in Mirandese presents a rising contour, followed by a low boundary: L*+H L% (Figure 15).

Figure 15. Waveform, spectrogram, and *f*0 track of the neutral echo yes-no question *Ye la ũa?* '(it) is one o'clock?', produced by a speaker from the frontier variety of Mirandese.



As we demonstrated in (8), echo yes/no questions may also be used to express incredulity, i.e. the speaker cannot believe that what he or she has just heard can be true. Figure 16 shows that the nuclear configuration of these echo yes/no questions present the same nuclear pitch accent of the neutral ones, i.e., a rising configuration L*+H, following by a complex boundary (HL%).

Figure 16. Waveform, spectrogram, and *f*0 track of the biased echo yes-no question *Bás morar mesmo para Spanha?* 'Are (you) really moving to Spain?', produced by a speaker from the central variety of Mirandese.

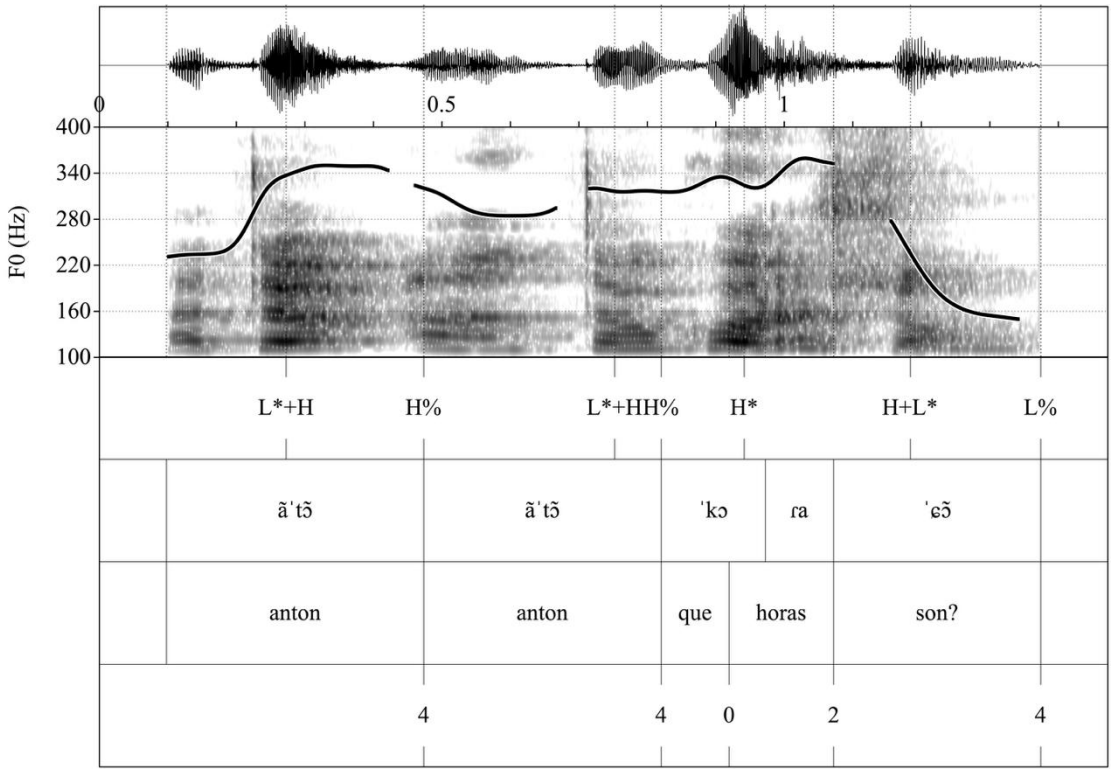


4.3. Wh- questions

Partial (wh-) interrogatives feature interrogative elements that mark the focus and request specific unknown information (e.g., *Que bino trago?* 'What wine do I bring?'), although the wh-word does not normally bear the most prominent accent (Ladd 2008). Wh-in-situ questions have two interpretations: a 'normal' one requesting information (like fronted wh-, e.g., *Quieres l qué?* 'What do you want?') and an 'echo' interpretation expressing surprise or seeking clarification of prior information (e.g., *Quieres L QUÉ?* 'What is it you want?') (Brito 2003). 'Normal' wh-questions usually bears a falling contour, while echo questions typically rise (Frota & Prieto 2015).

Wh-expression may not bear pitch accent, as it functions as a syntactic clitic in Romance languages, such as Northern Italian dialects and French (Poletto & Pollock 2009). Partial (wh-) interrogatives typically exhibit a falling nuclear contour, predominantly H+L* L%, distinguishing them syntactically from yes/no questions. Figure 17 shows an example of the most frequent nuclear configuration: H+L* L%.

Figure 17. Waveform, spectrogram, and *f*0 track of the neutral wh- question *Que horas son?* 'What time is (it)?', produced by a speaker from the frontier variety of Mirandese.



In addition to neutral wh-questions, our data also include biased wh-questions. Unlike neutral questions, biased questions are those in which the speaker holds a specific expectation or epistemic orientation toward a particular answer or context (Prieto 2015). In Mirandese, these biased wh-questions are characterized by a distinct prosodic marking: while they may share a falling trajectory with neutral ones (Figure 18), they exhibit a rising nuclear peak (Figure 19). This prosodic reinforcement serves to signal the speaker's pragmatic bias or increased involvement in the speech act.

Figure 18. Waveform, spectrogram, and *f*0 track of the biased wh- question *Quando ye que começas?* ‘When will you start (it)?’, produced by a speaker from the frontier variety of Mirandese.

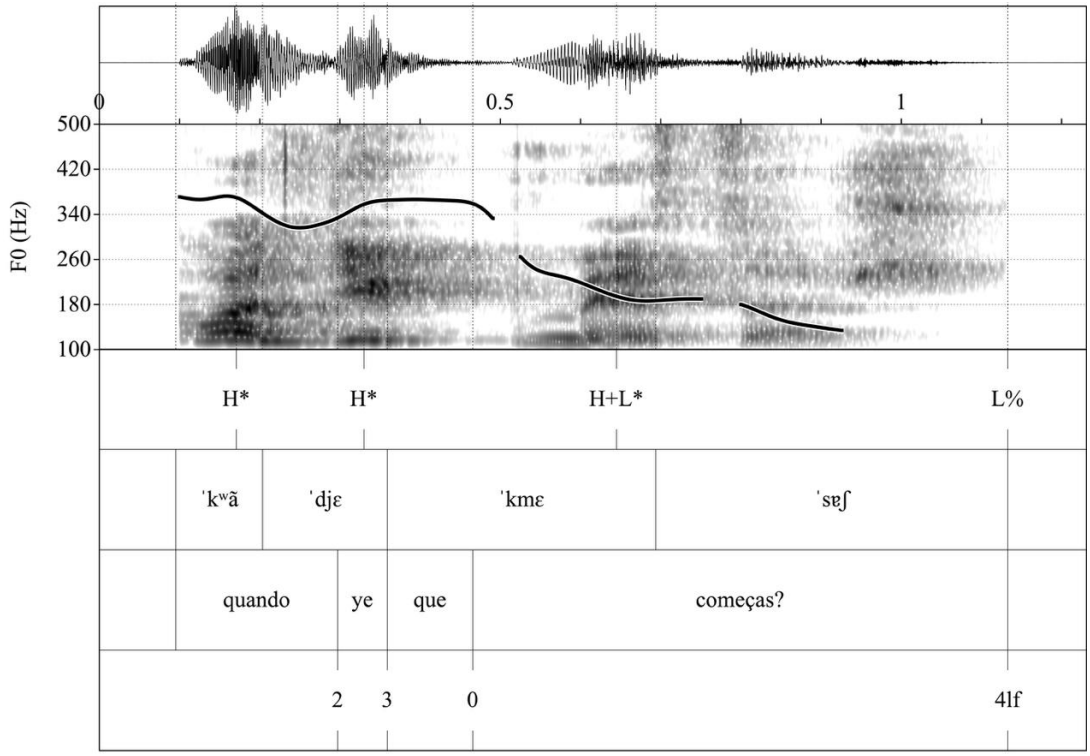
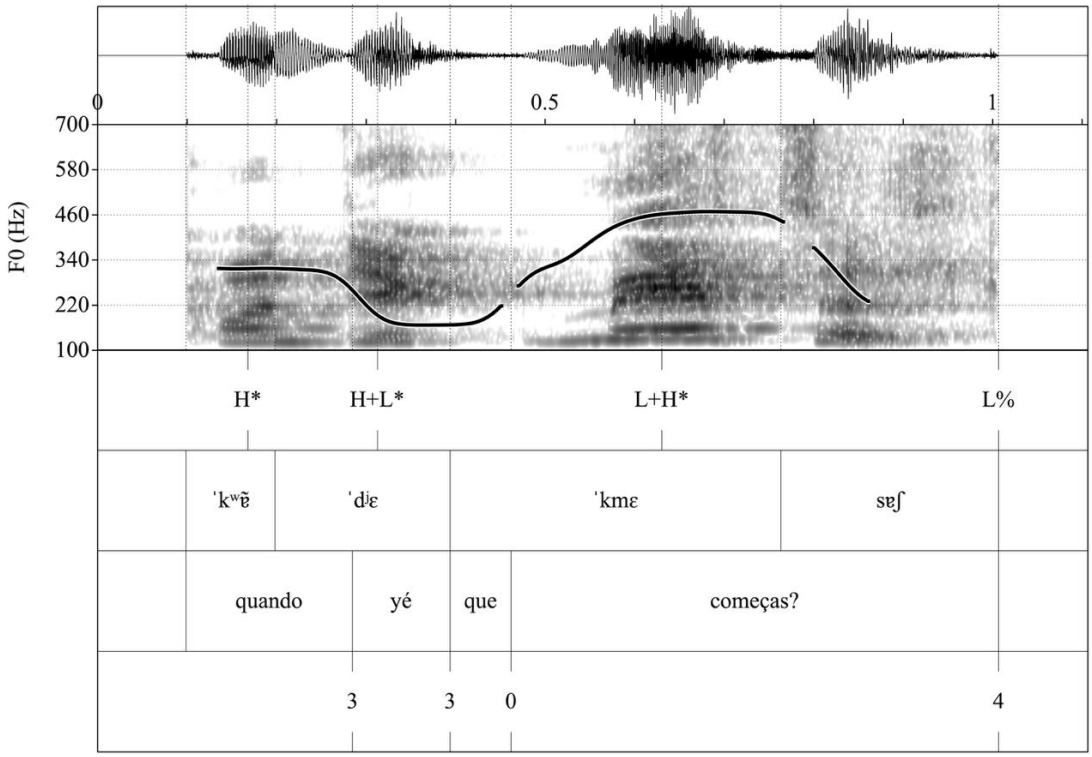


Figure 19. Waveform, spectrogram, and *f*0 track of the biased wh- yes/no question *Quando ye que começas?* ‘When will you start (it)?’, produced by a speaker from the frontier variety of Mirandese.



4.4. Imperatives: commands and requests

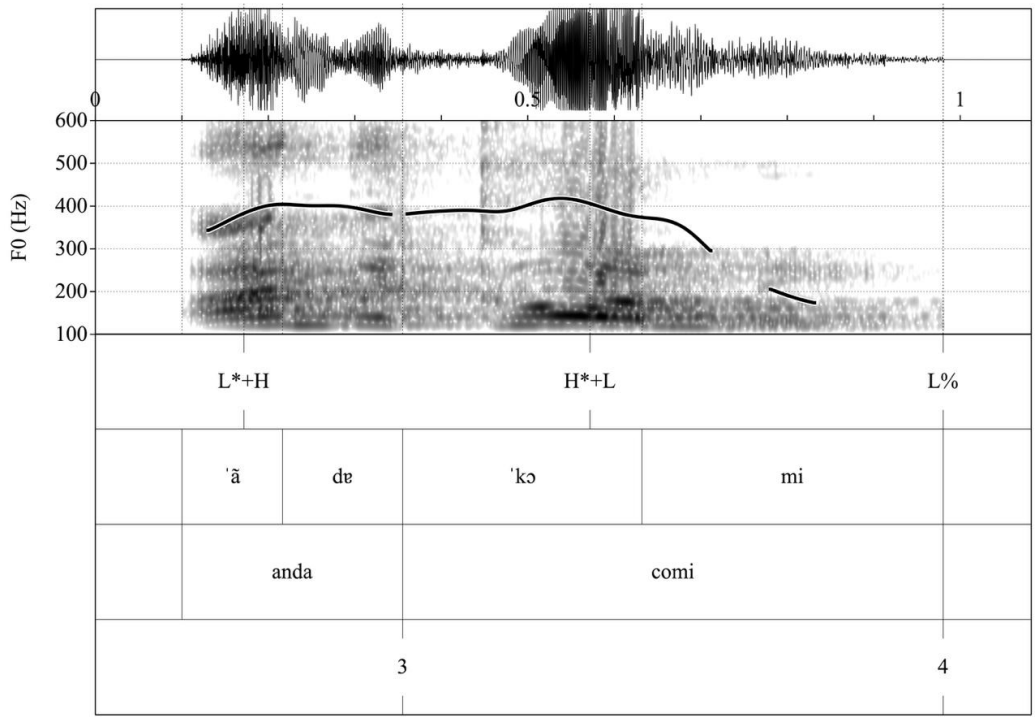
Regarding the intonation of Romance languages, Frota & Prieto (2015) note that prosody plays an important role in distinguishing between orders and requests: (i) through the nuclear contour (in Portuguese, varieties of Castilian and Italian, in Catalan, Sardinian, Friulian, and Romanian); (ii) through lengthening or pitch range (as in Occitan); or (iii) through a combination of both (as in Portuguese, Catalan, Castilian, Italian, and Romanian). The most common nuclear configuration in structures conveying an order is that found in neutral (broad focus) or focused (narrow focus) declaratives. It is worth noting that Astur-Leonese also uses the same nuclear configuration found in declaratives (Muñiz Cachón & Roseano 2022). The exception is found in French, Occitan, and Romanian, which use an H* L% pattern, which is not found in declaratives in these languages.

In Romance languages, requests are characterized by intonational movements that differ from those found in declaratives: (i) a low nuclear accent (L*), followed by a low (L%) or falling (HL%) boundary; or (ii) a high tone (H* or L+H*), followed by a low boundary (L%). Frota & Prieto (2015: 407) highlight the fact that the L* tone is characteristic of Iberian languages, while H* L% was found in French. We add to the latter group Astur-Leonese, which uses the H* tone (in this case, rising L+H*), followed by a low boundary, L% (Muñiz Cachón & Roseano 2022).

4.4.1. Commands

In both varieties of Mirandese, structures that express command value exhibit a nuclear contour identical to that found in focused declaratives: a falling movement, where the high tone is associated with the stressed syllable (H*+L) followed by a low boundary (L%), as shown in Figure 20. Our data confirm the nuclear movement that Frota & Prieto (2015) describe for Romance languages.

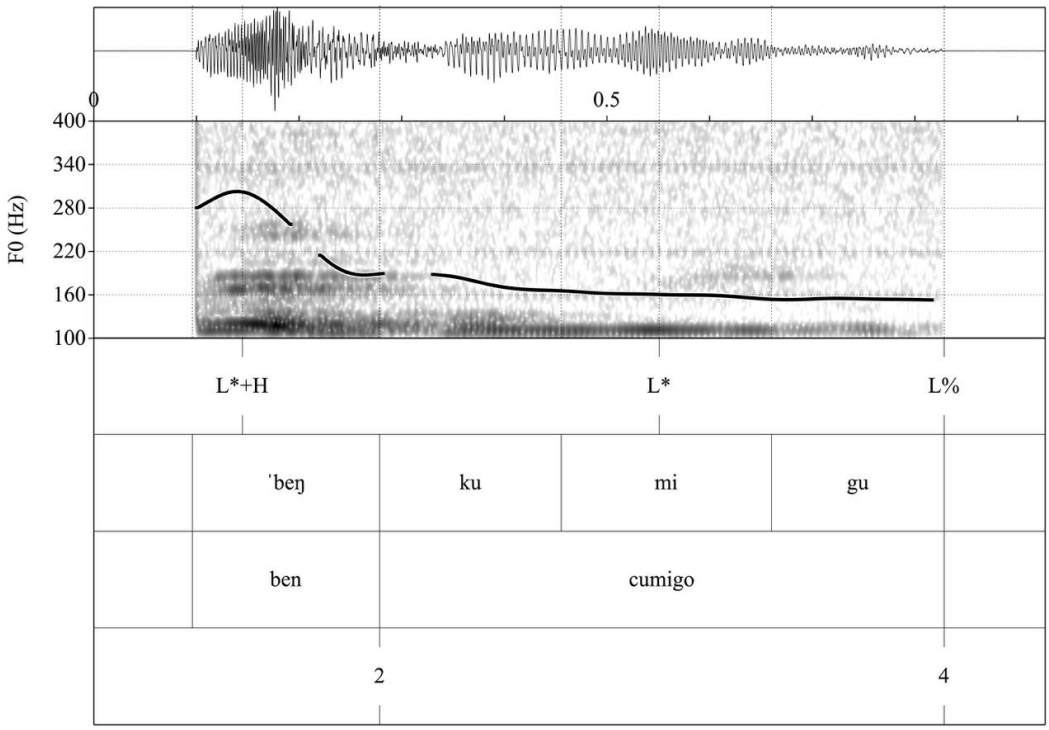
Figure 20. Waveform, spectrogram, and *f*0 track of the command *Anda, comi!* ‘Come on, eat!’, produced by a speaker from the central variety of Mirandese.



4.4.2. Requests

The contour used in requests is realized with a low tone associated with the nuclear stressed syllable (L*) and is followed by a low boundary (L%), as shows Figure 21.

Figure 21. Waveform, spectrogram, and *f*0 track of the request *Ben comigo* ‘Come (along) with me’, produced by a speaker from the central variety of Mirandese.



4.5. Calling contours

The intonation of vocatives has been widely studied in terms of their tonal configuration (Pierrehumbert 1980, Gussenhoven 2004, 2005, Arvaniti & Baltazani 2005, Borràs-Comes, Sichel-Bazin & Prieto 2015, Frota *et al*. 2015, Bibiri & Mocanu 2023, Muñiz Cachón & Roseano 2022). As described by Frota & Prieto (2015) for Romance languages, three strategies are observed for signalling initial call: (i) an downstep movement associated with the post-tonic syllable (!H%); (ii) a downstep movement associated with the last post-tonic syllable (H!H%); and (iii) in the unique case of French, where the downstep occurs on the tonic syllable (H+!H* !H%). As we can verify, in all Romance languages, the nuclear configuration always presents a high tone associated with the tonic syllable, followed by a downstep tone, remaining in suspension at the IP boundary. Conversely, in the insistent call, the nuclear tone H* or L+H* is followed by a low (L%) or falling (HL%) boundary.

In contrast to the description for Romance languages by Frota & Prieto (2015), Astur-Leonese presents a falling movement associated with the tonic syllable (H+L*), followed by a low boundary (L%). According to the authors, notably, the presence of an initial rise is associated with the first syllables, noted as %LH (Muñiz Cachón & Roseano 2022). Furthermore, insistent calls frequently employ the grammaticalized particle 'ho' in a final position, functioning as a discursive marker with an attenuating illocutionary force (Muñiz Cachón 2016, Muñiz Cachón & Roseano 2022). Crucially for the present analysis, the use of such discursive particles to convey illocutionary meaning is a strategy shared by Mirandese, as will be detailed below.

In our data, vocatives show variation between varieties and between first and insistent calls. The central variety uses H+L* L% for the first call and L+H* L% for insistent calls (Figure 22). The frontier variety uses L+H* !H% for the first call and L+H* HL% for insistent calls (Figure 23). Central variety also employs the discursive particle *ah*, which typically precedes calls when associated with the H+L* L% contour. This mirrors the functional role of the Astur-Leonese 'ho', suggesting a shared grammaticalization of particles to modulate illocutionary force within the Astur-Leonese domain, despite differences in linear positioning.

Figure 22. Waveform, spectrogram, and *f*0 track of the first (left) and second (right) calls, produced by a speaker from the central variety of Mirandese.

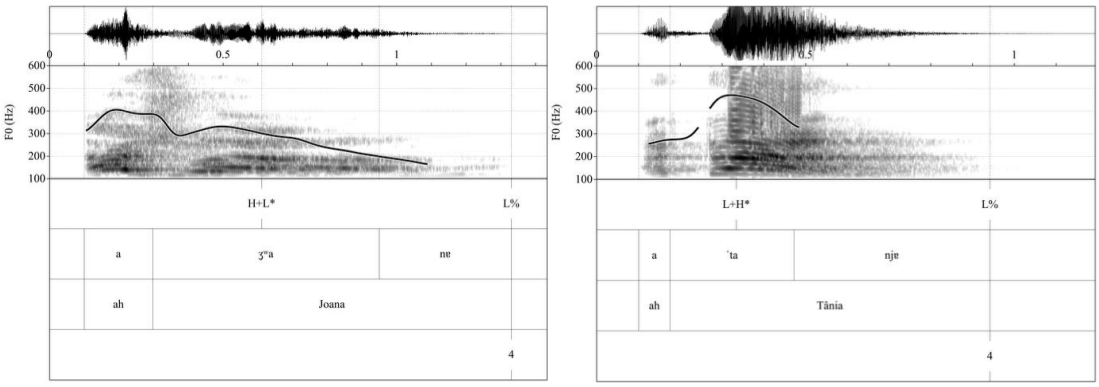
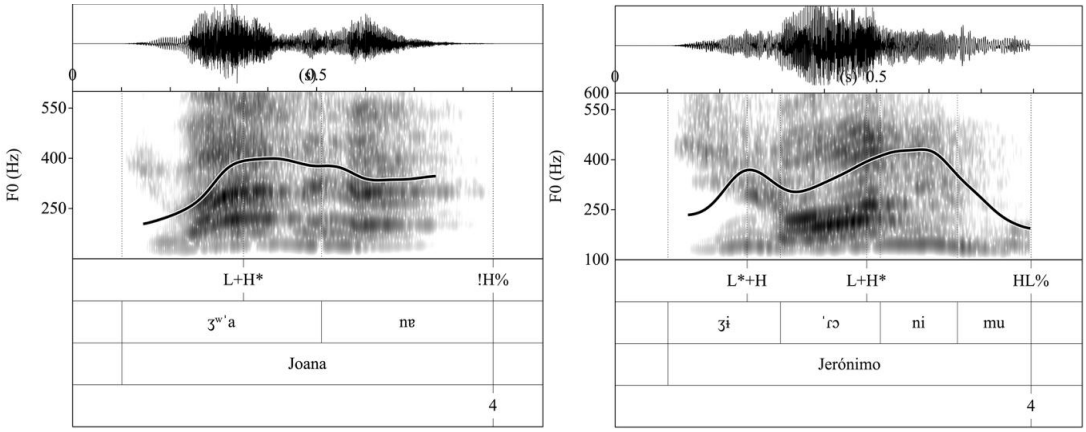


Figure 23. Waveform, spectrogram, and *f*0 track of the first (left) and second (right) calls, produced by a speaker from the frontier variety of Mirandese.



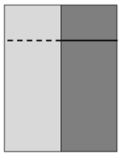
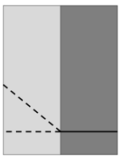
5. Intonational patterns of Mirandese

The inventory of pitch accents and boundary tones is based on the analysis of the data we have described above.

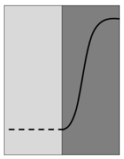
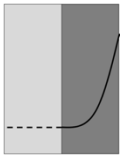
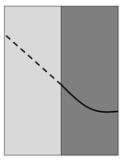
5.1. Pitch accents

As a general summary of our findings, the acoustic analysis reveals that Mirandese employs a diverse inventory of pitch accents to encode various pragmatic meanings, such as declaratives, questions, imperatives and callings, with notable dialectal variation between the central and frontier varieties. Table 2 summarizes the inventory of pitch accents that have been observed in our corpus. A schematic representation and description of the corresponding contours and the utterances where they are commonly found are also included.

Table 2. Inventory of monotonal and bitonal pitch accents in Mirandese and their schematic representations

Pitch accent	
monotonal	
H* 	This accent is phonetically realized as a high plateau (*f*0 valley - before and after - is optional in some pragmatic meanings; see L+H* below). In our data, it is attested in the nuclear position of narrow focus statements, confirmation (only central variety) and imperative yes-no questions, and vocatives.
L* 	This accent is phonetically realized as a low plateau at the minimum of the speaker's range. In our data, it is attested in the nuclear position of broad focus statements, information-seeking yes-no questions (only frontier variety), and requests.

bitonal

L+H* 	This pitch accent is phonetically realized as a rising pitch movement during the stressed syllable with the *f*0 peak located at the end of this syllable. In our data, it is attested in the nuclear position of narrow focus statements, confirmation (only central variety) and imperative yes-no questions, and vocatives.
L*+H 	This pitch accent is phonetically realized as a *f*0 valley on the stressed syllable with a rise on the post-tonic syllable. In our data, it is attested in the nuclear position of imperative yes-no questions (only frontier variety), and neutral and biased echo questions.
H+L* 	This pitch accent is phonetically realized as a *f*0 fall within the stressed syllable. In our data, it is attested in nuclear of broad focus statements, information-seeking yes-no questions (only central variety), confirmation yes-no questions (only central variety), neutral and biased wh- questions, vocatives (first call – only central variety).

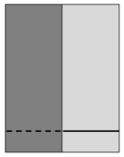
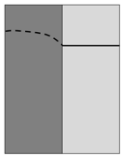
5.2. The boundary tones

Furthermore, our analysis reveals an intonational system characterized by the clear predominance of the low boundary tone (L%), which functions as the default marker for most sentence types. Other boundary tones appear to be constrained to highly specific pragmatic nuances: notably, !H% is restricted to first calls, whereas HL% occurs exclusively in biased echo questions. Table 3 summarizes the inventory of boundary accents that have been observed in our corpus. A schematic representation and description of the corresponding contours and the utterances where they are commonly found is also included.

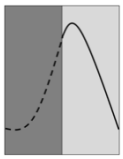
Table 3. Inventory of monotonal and bitonal boundary tones in Mirandese and their schematic representations

Boundary tones

monotonal

L% 	L% is phonetically realized as a low sustained tone. In our data, it is attested at the end of broad and narrow focus statements, exclamative statements, information-seeking yes-no questions (only central variety), confirmation and imperatives yes/no questions, neutral and biased wh- questions, neutral and biased echo questions, imperatives, and vocatives (only central variety).
!H% 	!H% is phonetically realized as a high pitch tone, higher than a low tone and lower than a high tone. In our data, it is attested at the end of obvious statements (only frontier variety), and vocatives (first call – only frontier variety).

bitonal

HL% 	HL% is phonetically realized as a high peak followed by a valley. In our data, it is attested in information-seeking yes-no questions (only frontier variety), biased echo questions, and vocatives (second call – only frontier variety).

6. Discussion

6.1. Summary of the intonational grammar of Mirandese

Our analysis reveals that, in both central and frontier varieties, broad focus statements sentences are typically realized with a falling nuclear contour. The central variety favours a H+L* pitch accent aligned with the stressed syllable, followed by a low boundary tone (L%), resulting in H+L* L%. This configuration mirrors patterns found in other Astur-Leonese varieties. The frontier variety similarly uses a falling movement but may differ slightly in tonal alignment. Overall, H+L* L% constitutes the default nuclear contour for neutral declaratives in Mirandese.

Narrow focus statements in Mirandese are characterized by a high pitch accent (H*) aligned with the most prominent prosodic word (PW). The tonal shape may vary: the central variety displays both rising (L+H*) and falling (H*+L) contours, with final boundary tones such as L% or downstepped !H%. The frontier variety predominantly uses L+H*, often followed by !H%. These configurations signal contrastive, categorical, or emphatic interpretations.

Information-seeking yes/no questions display clear prosodic divergence across varieties. The central variety of Mirandese maintains the falling contour H+L* L%, identical to that used in declaratives, but distinguished phonetically by a wider pitch range (Oliveira 2024). The frontier variety, however, uses a rising-falling contour L* HL%, marking a phonological contrast between declaratives and questions. These patterns situate Mirandese within the broader intonational typology of the northwestern Iberian Peninsula, which favours low boundary tones and falling or circumflex nuclear movements in information-seeking yes-no questions (Lopez-Bobo & Cuevas-Alonso 2010, Muñiz Cachón 2013, Fernández Rei 2016, 2019, Roseano 2020, Bargiela 2022).

Regarding confirmation-seeking our data reveal a lack of phonological differentiation from their neutral (information-seeking) counterparts in the central variety, where the nuclear configuration remains consistently H+L* L%. In contrast, the frontier variety distinguishes these pragmatic modalities through two distinct tonal alignments. These findings also reveal prosodic strategies specific to Mirandese within the broader context of Romance languages (Frota & Prieto 2015). While some Romance languages, such as Spanish, Catalan, and the frontier variety of Mirandese, mark such pragmatic distinctions intonationally, others, such as Portuguese, Italian, and the central variety of Mirandese, do not. This internal divergence highlights the unique position of Mirandese, where the central variety aligns with the cluster of Romance languages that do not use intonational marking to signal pragmatic

differences within yes/no questions, while the frontier variety follows the 'intonational marking' strategy typical of Spanish or Catalan.

As for imperative yes-no questions, the two varieties exhibit distinct preferences in their nuclear configurations. In the central variety, this sentence type primarily features the L+H* L% contour; although the H* L% configuration occurs less frequently, the H* phonological category remains prominently represented in the intonational grammar for this modality. In contrast, the frontier variety employs the L*+H L% contour, mirroring the movement observed in information- and confirmation-seeking questions. However, this variety also occasionally uses the H* phonological category, which accounts for the remaining cases. These patterns indicate that while the H* category is shared by both varieties, its functional distribution and frequency vary according to the dialectal area.

Wh-questions in Mirandese follow the common Romance pattern, where the interrogative pronoun occupies the left periphery and no special intonational marking is required (Frota & Prieto 2015). Both varieties use the default falling contour H+L* L%.

Echo questions are marked by a rising-falling nuclear configuration: L*+H L%. This contour appears in both varieties and aligns Mirandese with other Romance languages such as Italian and European Portuguese (Gili Fivela *et al*. 2015, Frota *et al*. 2015). The falling contour H+L* L% is also occasionally found, suggesting intonational flexibility. In coordinated echo questions, the first IP uses L*+H H% (or !H%), and the final IP closes with H+L* L%.

Commands are intonationally marked by a falling nuclear contour H*+L L%, aligning with the configuration used in narrow focus statements. In contrast, requests are realized with a low pitch accent (L*) followed by a low boundary tone, L* L%. This contrast in nuclear configurations serves as the primary cue to distinguish between commands and requests.

Vocatives exhibit clear prosodic differentiation. In the central variety, first calls are marked by H+L* L%, while second calls are realized with a rising-falling contour L+H* L%. In the frontier variety, the same nuclear configuration (L+H*) is used for both calls, but disambiguation arises from the boundary tone: a downstep boundary (!H%) for first calls and a complex falling boundary (HL%) for second calls. These patterns indicate that the two varieties employ different strategies - nuclear tone vs. boundary tone - to encode vocative contrast.

Table 4 presents an overview of all the main nuclear pitch configurations with their corresponding sentence types.

Table 4. Inventory of nuclear pitch configurations in Mirandese and their corresponding sentence types

Sentence type		**Inventory of nuclear pitch configurations**
Declaratives	Broad focus	H+L* L%
	Narrow focus	(L)H*(L) L%
Information-seeking yes-no questions	Neutral	H+L* L% (central) L* HL% (frontier)

Confirmation-seeking and imperatives yes-no questions	Confirmation	H+L* L% (central) L+H* L% (central) L*+H L% (frontier)
	Imperatives	L+H* L% (central/frontier) H* L% (central/frontier)
Wh- questions	Neutral	H+L* L%
	Biased	H+L* L%
Echo questions	Neutral	L*+H L%
	Biased	L*+H HL%
Imperatives	Commands	H*+L L%
	Requests	L* L%
Vocatives	First call	H+L* L% (central) L+H* !H (frontier)
	Second call	L+H* L% (central) L+H* HL% (frontier)

The analysis of our data confirms that phrasal prominence patterns in Mirandese align with those typically observed across the Romance domain. Specifically, the default phrasal prominence in Mirandese tends to be rightmost, with the final prosodic word in the intonational phrase serving as the head and bearing the nuclear pitch accent. As observed for European Portuguese, under narrow or contrastive focus, prominence shifts to the focused constituent. Our observations suggest that Mirandese employs, in convergence with European Portuguese, a specialized pitch accent to mark focus (Frota 2000); however, unlike European Portuguese, it also exhibits restructuring in prosodic phrasing.

6.2. Mirandese in the linguistic landscape of the northwest Iberian Peninsula

Mirandese, a minority Romance language spoken in northeastern Portugal, occupies a distinct linguistic and geopolitical position at the crossroads of Ibero-Romance variation. While administratively enclosed in Portugal, Mirandese shares deep structural and prosodic affinities with Astur-Leonese, with which it shares a common historical origin, and exhibits features that place it firmly within the intonational ecology of the northwestern Iberian Peninsula - a region characterised by linguistic diversity, bilingualism, and intense contact.

In this context, the prosodic system of Mirandese does not merely reflect internal phonological constraints but is also shaped by its proximity to and interaction with Galician, Astur-Leonese, Peninsular Spanish, and especially with regional varieties of European Portuguese. Specifically, prolonged language contact and the geographic continuum have likely facilitated the sharing of typological features - such as high tonal density and specific prenuclear alignments - blurring the lines between internal evolution and contact-induced convergence. In this sense, the intonation patterns of Mirandese can be understood to represent a linguistic enclave and provide insight into the survival of the historical substratum, areal convergence, and the

perseverance of minor language systems in the face of more dominant language systems.

Considering the tonal density and intonational alignment within Romance prosody, Mirandese has a high tonal density whereas approximately 90% of prosodic words (PW) within intonational phrases (IP) are tonally marked (Oliveira 2024). This situates Mirandese among the most tonally dense Romance languages, alongside certain varieties of Spanish and European Portuguese, and in contrast to the lower tonal density typical of standard European Portuguese (SEP) (Hualde 2007, Cruz 2013, Frota & Prieto 2015, Frota *et al*. 2015).

The prenuclear rising accent L*+H emerges consistently across declaratives and interrogatives, mirroring findings in Astur-Leonese (L+>H*) (Muñiz Cachón 2013, Muñiz Cachón & Roseano 2022), Galician (Moutinho & Fernández Rei 2008), Peninsular Spanish (Armstrong & Cruz 2014) and septentrional varieties of European Portuguese (Vigário & Frota 2003). It diverges from the H* commonly observed in SEP and aligns Mirandese more closely with the northwestern Romance intonational geoprosodic area.

Considering nuclear contours, it is possible to identify plausible dynamics of linguistic transmission and preservation in the face of external pressures. In neutral SVO declaratives, the preferred nuclear contour in Mirandese is H+L* L%, a falling movement also documented in Astur-Leonese (Muñiz Cachón 2013, Muñiz Cachón & Roseano 2022). The information seeking yes-no questions in Mirandese exhibit a dual system: while H+L* L% dominates in the central variety, the frontier variety displays a distinctive circumflex pattern (L* HL%), highly characteristic of Zamora (Bargiela 2022). These dual realisations within Mirandese suggest regional differentiation but also maintains Astur-Leonese prosodic traces despite extensive contact with other linguistic systems (Menéndez Pidal 1906, Dubert-García 2017).

The central conclusion of the prosodic analysis is that Mirandese preserves intonational traits directly inherited from the Astur-Leonese linguistic substratum, especially in rising prenuclear movements (L*+H), declaratives (H+L* L%), the low final boundaries (L%) in information seeking yes-no questions, a tonal contrast in vocative or pragmatic forms (e.g., H+L* vs. L+H*). At this stage, it is important to demarcate our demonstrated findings from plausible interpretations and speculative historical claims. The specific intonational inventory and the areal distribution of these contours represent our core empirical findings. Because patterns like falling declaratives and circumflex questions are common across the broader Romance domain, we interpret their presence in Mirandese as a highly plausible reflection of areal convergence and integration within the northwestern Iberian geoprosodic zone. However, asserting that these traits are direct inheritances from an Astur-Leonese substratum, or that they represent active sociophonetic mechanisms of linguistic resistance, remains a speculative exploration. Robust diachronic evidence and large-scale sociophonetic variation studies would be required to fully substantiate claims of historical substratum embedding versus contact-induced borrowing.

These traits are not superficial borrowings but appear to be phonologically embedded within the Mirandese prosodic grammar, suggesting a continuity of the Astur-Leonese intonational legacy despite the significant sociolinguistic dominance of Portuguese and the resulting contact-induced pressures on the Mirandese prosodic system. Moreover, Mirandese varieties mirror intonational variation patterns observed in Astur-Leonese dialects, such as those described in the *centro-sureño* variety (Muñiz

Cachón & Roseano 2022) and in urban bilingual zones of León and Zamora. This includes alignment-based where the timing of pitch peaks serves as a primary cue for information structure. Specifically, the maintenance of the peak within the tonic syllable (L+H*) in neutral contexts, contrasting with its displacement to the post-tonic (L*+H) to signal contrastive focus, reflects a conservative phonological trait shared with the Astur-Leonese branch but not in standard European Portuguese. Furthermore, the pragmatic use of specific boundary tones - such as the circumflex configurations found in insistent call and the falling patterns in information-seeking questions - closely aligns with the 'geoprosodic' continuity of the northwestern Iberian domain. These commonalities suggest that Mirandese has preserved a 'prosodic core' that functions independently of the national standard, anchored in its historical linguistic substrate.

Positioning Mirandese within a northwestern Iberian geoprosodic zone highlights its role as both a conservator and an innovator. On one hand, it retains prosodic structures lost in or marginalised by standardised Romance languages; on the other, it adapts and reconfigures these structures under the pressure of bilingualism and diglossia. Its proximity to Zamora, Galician, and Asturian, coupled with a history of relative isolation, may have contributed to the development of an intonational system that is distinctively regional rather than nationally aligned.

The evidence of shared nuclear configurations and the prevalence of low boundary tones (L%) in yes/no questions found in our data support Fernández Rei's (2019) proposition that the western Iberian border zones share a supra-regional prosodic substrate. This framework is further strengthened by Oliveira's (2024) proposal for an Iberian protosystem, which suggests that the distribution of L% and (H)L% boundaries serve as a diagnostic tool for linguistic continuum. From a geolinguistic standpoint, this region corresponds historically to the territory of *Gallaecia Magna*, a concept reconstructed by twentieth-century Romanists (notably Nogueira 1988) to describe an area of linguistic unity aggregating Galician and Astur-Leonese speakers prior to their diversification into distinct communities.

While debate persists over the precise territorial scope of *Gallaecia Magna*, recent work in both diachronic phonology and synchronic dialect geography (Dubert-García 2017) has reinforced the view that Galician, Astur-Leonese, and Mirandese share a constellation of features (phonological, morphological, and, as our data suggest, intonational) that distinguish them from surrounding linguistic systems. These shared features likely reflect a period of close areal unity during the early medieval period. In this view, Mirandese is an example of an intonational system that does not eliminate prior system elements from the inventory of intonational systems, rather it incorporates them within a dynamic prosodic grammar.

7. Conclusions

This study offers the first comprehensive phonological account of Mirandese intonation, based on data from both central and frontier varieties. The analysis covers declaratives, questions, imperatives, and vocative structures, highlighting the phonological representations that characterize each type.

The prosodic system of Mirandese testifies to the resilience of minority languages in contact zones. Through tonal density, shared accent inventories, and

systematic nuclear contours, it reveals deep structural convergence with Astur-Leonese and Galician varieties, while maintaining a distinctive phonological identity. Its intonational architecture contributes to the argument that prosody, far from being a peripheral component, serves as a core domain of linguistic continuity and resistance in historically multilingual regions.

These findings not only document the phonological repertoire of an endangered minority language in Iberia but also contribute to a deeper understanding of intonational variation in the Romance domain. The observed patterns reinforce the relevance of prosody in marking pragmatic distinctions, while also revealing how contact with Portuguese and sociolinguistic factors may shape prosodic strategies. Nevertheless, we acknowledge that these findings represent an initial and exploratory mapping. While the proposed tonal categories and varietal differences provide a highly plausible baseline for Mirandese intonation, the necessarily small sample size - a common constraint in fieldwork with critically endangered languages - means these patterns remain quantitatively under-validated. Future research should therefore explore additional varieties, extend to perception studies, and consider diachronic change. Crucially, subsequent large-scale studies employing fine-grained phonetic measurements and inferential statistics will be essential to empirically validate and further refine the boundaries of the intonational morphemes mapped in this study.

Acknowledgments

We would like to thank the three *Isogloss* reviewers for their insightful comments and suggestions. While the paper is a collaborative effort, any remaining errors or omissions are solely the responsibility of the authors.

References

Aguilar, Lourdes, Prieto, Pilar, Vanrell, Maria del Mar, & Paolo Roseano. 2024. *Sp_ToBI Traning Materials*. https://sp-tobi.upf.edu

Armstrong, Meghan E., & Cruz, Marisa. 2014. The intonational phonology of Peninsular Spanish and European Portuguese. In P. Amaral & A. M. Carvalho (eds.), *Portuguese-Spanish interfaces. Diachrony, synchrony, and contact*, 151-174. Amsterdam: John Benjamins. https://doi.org/10.1075/ihll.1.09arm

Alvarellos, Mercedes, Muñiz Cachon, Carmen, Díaz, Liliana, & Ruth González. 2011. La entonación en las variedades lingüísticas de Asturias: estudio contrastivo. *Revista Internacional de Lingüística Iberoamericana* 9(17): 111-120.

Arvaniti, Amalia, & Mary Baltazani. 2005. Intonational analysis and prosodic annotation of Greek spoken corpora. In S.-A. Jun (ed.), *Prosodic Typology: The Phonology of Intonation and Phrasing*, 84-117. Oxford: Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199249633.003.0004

Baldinger, Kurt. 1972. *La formación de los domínios linguísticos en la Península Ibérica*. Madrid: Gredos.

Bautista, Alberto, & Lurdes Moutinho. 2019. Aspectos da geoprosódia no planalto mirandês. *Intercâmbio* 39: 30-42.
https://revistas.pucsp.br/index.php/intercambio/article/view/44461

Bargiela, Víctor. 2022. Dedialectalisation of intonational patterns of yes-no questions in León, Zamora, Salamanca, and Palencia. *Estudios de Fonética Experimental* 31: 149-160. https://doi.org/10.1344/efe-2022-31-149-160

Beckman, Mary, & Gayle Ayers-Elam. 1997. *Guidelines for ToBI Labelling* (version 3). The Ohio State University Research Foundation.

Beckman, Mary, Hirschberg, Julia, & Stefanie Shattuck-Hufnagel. 2005. The Original ToBi System and the Evolution of the ToBi Framework. In Sun-Ah Jun (ed.), *Prosodic Typology: The Phonology of Intonation and Phrasing*, 9-54. Oxford: Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199249633.003.0002

Bibiri, Anca-Diana, & Mihaela Mocanu. 2023. Some considerations about intonation patterns of vocatives in Romanian. *Onomázein 11* : 86-104.
https://doi.org/10.7764/onomazein.ne11.01

Billmyer, Kristine, & Manka M. Varghese. 2000. Investigating instrument-based pragmatic variability: effects of enhancing discourse completion tests. *Applied Linguistics* 21(4): 517-552. https://doi.org/10.1093/applin/21.4.517

Blakemore, Diane. 1994. Echo questions: A pragmatic account. *Lingua* 94(4): 197-211. https://doi.org/10.1016/0024-3841(94)90009-4

Blum-Kulka, Shoshana, House, Juliane, & Gabriele Kasper. 1989. *Cross-cultural pragmatics: Requests and apologies*. Norwood, NJ: Ablex Publishing Corporation.

Boersma, Paul, & David Weenink. 2020. *Praat: doing phonetics by computer*. [Computer program]. Version 6.1.16.

Bolinger, Dwight. 1978. Intonation across languages. In J. Greenberg (ed.), *Universals of human language*, 471-524 (vol. II: Phonology). Palo Alto, CA: Stanford University Press.

Bolinger, Dwight. 1989. *Intonation and its uses*. Palo Alto, CA: Stanford University Press.

Borràs-Comes, Joan, Sichel-Bazin, Raféu, & Pilar Prieto. 2015. Vocative intonation preferences are sensitive to politeness factors. *Language and speech* 58(1): 68-83. https://doi.org/10.1177/0023830914565441

Büring, Daniel. 2012. Focus and intonation. In G. Russell & D. Graff Fara (eds.), *Routledge Companion to Philosophy of Language*, 103-115. New York & London: Routledge.

Brito, Ana M. 2003. Frases interrogativas. In M. H. Mateus, A. M. Brito, I. Duarte, & I. H. Faria (eds.), *Gramática da Língua Portuguesa*, 460-479). Lisboa: Caminho.

Contini, Michel, Lai, Jean-Pierre, Romano, Antonio, Roullet, Stefania, Moutinho, Lurdes, Coimbra, Rosa, Bendiha, Urbana, & Suzana Ruivo. 2002. Un projet d'atlas multimédia prosodique de l'espace roman. In B. Bel & I. Marlien (eds.), *Speech Prosody 2002*, 227-230. Aix-en-Provence: International Speech Communication Association. https://doi.org/10.21437/SpeechProsody.2002

Carvalho, José Gonçalo Herculano de. 2015[1952]. Porque se fala dialecto leonês em Terra de Miranda. In J. Meirinhos (ed.), *Fonologia mirandesa e outros estudos sobre o mirandês*, 203- 226. Coimbra: Imprensa da Universidade de Coimbra.

Costas, Xosé Henrique. 2022. *Persente i feturo de la lhéngua mirandesa: Studo de ls usos, atitudes i cumpeténcias lhenguísticas de la populaçon mirandesa*. Vigo: Universidade de Vigo.

Cruz, Marisa. 2013. *Prosodic variation in European Portuguese: phrasing, intonation and rhythm in central-southern varieties* [PhD Dissertation]. Repositório da Universidade de Lisboa. http://hdl.handle.net/10451/9893

Cruz, Marisa, Oliveira, Pedro, Palma, Pedro, Neto, Bruno, & Sónia Frota. 2017. Building a prosodic profile of European Portuguese varieties: The challenge of mapping intonation and rhythm. In P. Barbosa, M. Paiva & C. Rodrigues (eds.), *Studies on Variation in Portuguese*, 82-110. Amsterdam/Philadelphia: John Benjamins Publishing. https://doi.org/10.1075/ihll.14.03cru

Cruz, Marisa, Crespo-Sendra, Verònica, Castelo, Joelma, & Sónia Frota. 2022. Asking questions across Portuguese varieties. In M. Cruz & S. Frota (eds.), *Prosodic Variation (with)in Languages: Intonation, Phrasing and Segments*, pp. 36-70. UK: Equinox Publishing Ltd.

Dubert-García, Francisco. 2017. Sobre a Gallaecia magna e as relacións históricas e xeolingüísticas entre galego, portugués e asturiano. *Estudis Romànics* 39: 43-69. https://doi.org/10.2436/20.2500.01.215

Estebas-Vilaplana, Eva, & Pilar Prieto. 2010. Castilian Spanish Intonation. In P. Prieto & P. Roseano (eds.), *Transcription of intonation of the Spanish language*, 17-48. München: Lincom.

Ferreira, Amadeu. 2011. *O mínimo sobre a língua mirandesa*. Studos mirandeses: https://studosmirandeses.blogs.sapo.pt/1294.html

Félix-Brasdefer, J. César. 2010. Data Collection Methods in Speech Act Performance. In A. Martínez-Flor & E. Usó-Juan (eds.), *Speech Act Performance: Theoretical, Empirical and Methodological Issues*, 69-82. Amsterdam: John Benjamins Publishing. https://doi.org/10.1075/lllt.26.03fel

Fernández Planas, Ana, Dorta, Josefa, Muñiz Cachón, Carmen, Roseano, Paolo, Elvira-García, Wendy, & Ramon Massó. 2020. León y Palencia: dos patrones entonativos en las interrogativas absolutas neutras en el español europeo actual. *Zeitschrift für romanische Philologie* 136(1): 84-105. https://doi.org/10.1515/zrp-2020-0004

Fernández Rei, Elisa. 1997. Contribución ó estudio da entoación das cláusulas interrogativas (totais e parciais) en galego. In B. Fernández Salgado (ed.), *Actas do IV Congreso Internacional de Estudios Galegos*, 241-253. Oxford: Centre for Galician Studies. http://hdl.handle.net/10347/11981

Fernández Rei, Elisa. 2002. *Regras fonolóxicas posléxicas e regras precompiladas de alomorfia sintagmática: dominios prosódicos en galego* [PhD Dissertation]. Repositório da Universidade de Santiago de Compostela.

Fernández Rei, Elisa. 2016. Dialectal, historical and sociolinguistic aspects of Galician intonation. *Dialectologia: revista electrònica,* Special Issue 6: 147-169. https://raco.cat/index.php/Dialectologia/article/view/316139

Fernandez-Rei, Elisa. 2019. La entonación de las variedades ibéricas occidentales. In J. Dorta (Ed.) *Investigación geoprosódica AMPER*, 25-46. Frankfurt a. M., Madrid: Vervuert Verlagsgesellschaft. https://doi.org/10.31819/9783964568229-003

Fernández Rei, Elisa, & Ana Escourido. 2008. La entonación de las interrogativas totales a lo largo de la costa gallega. In A. Turculet (ed.), *La variation diathopique de l'intonation dans le domain roumain et roman*, 151-166. Iasi: Editura Universitatii Alexandru Ioan Cuza.

Frías Conde, Xavier. 2001. Os límites entre galego e asturoleonés em Asturias. *Revista de Fololog*ía *Románica* 18: 51-71.
https://revistas.ucm.es/index.php/RFRM/article/view/RFRM0101120051A

Frota, Sónia. 2000. *Prosody and Focus in European Portuguese: Phonological Phrasing and Intonation*. New York: Routledge.

Frota, Sónia. & Marisa Cruz. 2012-2015. *Interactive Atlas of the Prosody of Portuguese Webplatform*. https://labfon.letras.ulisboa.pt/InAPoP/

Frota, Sónia, & Pilar Prieto. 2015. Intonation in Romance: Systemic similarities and differences. In S. Frota, & P. Prieto (eds.), *Intonation in Romance*, 392-418. Oxford: Oxford University Press.
https://doi.org/10.1093/acprof:oso/9780199685332.003.0011

Frota, Sónia, Oliveira, Pedro, Cruz, Marisa, & Marina Vigário. 2015. *P-ToBI: tools for the transcription of Portuguese prosody*. https://labfon.letras.ulisboa.pt/InAPoP/P-ToBI/

Frota, Sónia, Cruz, Marisa, Fernandes-Svartman, Flaviane, Collischonn, Gisela, Fonseca, Aline, Serra, Carolina, Oliveira, Pedro, & Marina Vigário. 2015. Intonational variation in Portuguese: European and Brazilian varieties. In S. Frota, & P. Prieto (eds.), *Intonation in Romance*, 235- 283. Oxford: Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199685332.003.0007

Gili Fivela, Barbara, Avesani, Cinzia, Barone, Marco, Bocci, Guiliano, Crocco, Claudia, D'Imperio, Mariapaola, Giordano, Rosa, Marotta, Giovanna, Savino, Michelina, & Patrizia Sorianello. 2015. Intonational phonology of the regional varieties of Italian. In S. Frota & P. Prieto (eds.), Intonation in Romance, 140-197. Oxford: Oxford University Press.
https://doi.org/10.1093/acprof:oso/9780199685332.003.0005

Grice, Martine, & Michelina Savino. 2003. Map Tasks in Italian: Asking Questions about Given, Accessible and New Information. *Catalan Journal of Linguistics* 2: 153-180. https://doi.org/10.5565/rev/catjl.48

Gussenhoven, Carlos. 2004. *The Phonology of Tone and Intonation*. Cambridge: Cambridge University Press.
https://doi.org/10.1017/CBO9780511616983

Gussenhoven, Carlos. 2005. Transcription of Dutch Intonation. In S.-A. Jun (ed.), *Prosodic Typology: The Phonology of Intonation and Phrasing*, 118-145. Oxford: Oxford University Press.
https://doi.org/10.1093/acprof:oso/9780199249633.003.0005

Gussenhoven, Carlos. 2008. Types of Focus in English. In C. Lee, M. Gordon & D. Büring, (eds.), *Topic and Focus. Studies in Linguistics and Philosophy*, 83-100. Dordrecht: Springer. https://doi.org/10.1007/978-1-4020-4796-1_5

Hualde, J. 2007. Stress removal and stress addition in Spanish. *Journal of Portuguese Linguistics* 6(1): 59-89. https://doi.org/10.5334/jpl.145
Hualde, José Ignacio, & Pilar Prieto. 2015. Intonational variation in Spanish: European and American varieties. In S. Frota, & P. Prieto (eds.), *Intonation in Romance*, 350-391. Oxford: Oxford University Press.
https://doi.org/10.1093/acprof:oso/9780199685332.003.0010

Jun, Sun-Ah. 2005. *Prosodic Typology: The Phonology of Intonation and Phrasing*. Oxford: Oxford University Press.
https://doi.org/10.1093/acprof:oso/9780199249633.001.0001

Jun, Sun-Ah. 2014. *Prosodic Typology II: The Phonology of Intonation and Phrasing*. Oxford: Oxford University Press.
https://doi.org/10.1093/acprof:oso/9780199567300.001.0001

Ladd, D. Robert. 1980. *The structure of intonational meaning: evidence from English*. Bloomington: Indiana University Press. https://doi.org/10.2979/TheStructureofIntona

Ladd, D. Robert. 2008. *Intonational phonology*. Cambridge: Cambridge University Press. https://doi.org/10.1017/CBO9780511808814

Lopez-Bobo, Maria Jesús, & Miguel Cuevas-Alonso. 2010. Cantabrian Spanish Intonation. In P. Prieto & P. Roseano (eds.) Transcription of Intonation of the Spanish language, 49-86. München: Lincom.

Martins, Cristina. 1994. *Estudo sociolinguístico do mirandês. Padrões de alternância de códigos e escolha de línguas numa comunidade trilingue* [Master Thesis]. Repositório da Universidade de Coimbra. http://hdl.handle.net/10316/18271

Martins, Cristina. 1997. A vitalidade de línguas minoritárias e atitudes linguísticas: o caso do mirandês. *Lletres asturianes 62*: 7-42.

Merlan, Aurélia. 2007. Las variedades lingüísticas del noroeste peninsular: convergencias y divergências. *Lletres Asturianes 96*: 7-56

Merlan, Aurélia. 2009. *El mirandés: situación sociolingüística de una lengua minoritaria en la zona fronteriza portugués-española*. Astúrias, Uviéu: Academia Llingua Asturiana.

Matras, Yaron. 2009. *Language Contact*. Cambridge: Cambridge University Press.

Moutinho, Lurdes, & Elisa Fernandez Rei. 2008. Do sul da Galiza ao norte de Portugal: uma viagem através da frequência fundamental. *Fórum Linguístico* 5(1): 63-75. https://doi.org/10.5007/1984-8412.2008v5n1p63

Moutinho, Lurdes, Coimbra, Rosa, & Ana Vaz. 2011. Variación diatópica de la entonación en el portugués europeo continental. *Revista Internacional de Lingüística Iberoamericana* 9(17): 133-140.

Muñiz Cachón, Carmen. 2013. La entonación asturiana nel marcu de les llingües romániques: los atles prosódicos. *Lletres Asturianes* 109: 11-28.

Muñiz Cachón, Carmen. 2016. Aspeutos prosódicos y pragmáticos de la partícula ho. *Lletres Asturianes* 115: 73-88.

Muñiz Cachón, Carmen, & Paolo Roseano. 2022. Prosodia del Asturiano centromeridional: rasgos característicos y anotación en ASTUR_ToBI. In B. Blecua, J. Cicres, M. Espejel & M. Machuca (eds.), *Propuestas en fonética experimental: enfoques metodológicos y nuevas tecnologías*, 210-214. Girona: Universitat de Girona-Servei de Publicacions.

Nogueira, Carlos. 1988. O conceito geográfico-linguístico de Galécia Maior. In I. Castro (ed), *Sete ensaios sobre a obra de J. M. Piel*, 77-103. Lisboa: Instituto de Linguística da Faculdade de Letras de Lisboa.

Noh, Eun-Ju. 1998. Echo Questions: Metarepresentations and Pragmatic enrichment. *Linguistics and Philosophy* 21: 603-628. https://doi.org/10.1023/A:1005361528891

Oliveira, Pedro. 2024. *A entoação no contacto linguístico entre o mirandês e o português* [PhD Dissertation]. Repositório da Universidade de Santiago de Compostela.

Menéndez Pidal, Ramón. 1906. El dialecto Leonés. *Revista de Archivos, Bibliotecas y Museos* 10(2-3): 128-311.

Pierrehumbert, Janet. 1980. *The phonology and phonetics of English intonation* [PhD Dissertation]. Repositório da Massachussets Institute of Technonlogy. http://hdl.handle.net/1721.1/16065

Poletto, Cecilia, & Jean-Yves Pollock. 2009. Another look at wh-questions in Romance. The case of Mendrisiotto and its consequences for the analysis of French wh-in situ and embedded interrogatives. In D. Torck & W. Leo Wetzels (eds), *Romance Languages and Linguistic Theory 2006: Selected papers from 'Going Romance'*, 199-258. Amsterdam: John Benjamins.
https://doi.org/10.1075/cilt.303.12pol

Prieto, Pilar. 2015. Intonational meaning. *WIREs Cognitive Science* 6(4): 371-381. https://doi.org/10.1002/wcs.1352

Prieto, Pilar, & Paolo Roseano. 2010. *Transcription of Intonation of the Spanish Language*. München: Lincom.

Prieto, Pilar, Borràs-Comes, Joan, & Paolo Roseano. 2010-2014. *Interactive Atlas of Romance Intonation*. http://prosodia.upf.edu/iari/

Prieto, Pilar, Borràs-Comes, Joan, Cabré, Teresa, Crespo-Sendra, Verònica, Mascaró, Ignasi, Roseano, Paolo, Sichel-Bazin, Rafèu, & Maria del Mar Vanrell. 2015. Intonational phonology of Catalan and its dialectal variation. In S. Frota & P. Prieto (eds.), *Intonation in Romance*, 9-62. Oxford: Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199685332.003.0002

Quarteu, Reis, & Xavier Frías Conde. 2002. L mirandés: ũa lhéngua minoritaira an Pertual. *Ianua. Revista Philologica Romanica* 2: 89-105.
https://dialnet.unirioja.es/descarga/articulo/3731251.pdf

Real Academia Española. 2010. *Nueva gramática de la lengua española*. Madrid: Asociación de Academias de la Lengua Española.

Rodrigues, Ernesto, & Amadeu Ferreira. 2011. *A terra de duas línguas: antologia de autores transmontanos*. Academia de Letras de Trás-os-Montes, Instituto Politécnico de Bragança, Associação das Universidades de Língua Portuguesa. http://hdl.handle.net/10198/5784

Rodríguez Vázquez, Rosalía. 2019. The intonation of wh- questions in a language contact situation: the case of Galician and Galician Spanish bilingual speakers. *Journal of Experimental Phonetics* 28: 81-124. https://doi.org/10.1344/efe-2019-28-81-124

Roseano, Paolo. 2020. Análisis estadísticu de les distancies prosódiques ente los dialeutos del asturianu. *Lletres asturianes* 122: 13-40.

Roseano, Paolo, Vanrell, Maria del Mar, & Pilar Prieto. 2015. Intonational phonology of Friulian and its dialects. In S. Frota & P. Prieto (eds.), *Intonation in Romance*, 101-139. Oxford: Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199685332.003.0004

Rudin, Deniz. 2018. Rising imperatives. In S. Maspong, B. Stefánsdóttir, K. Blake & F. Davis (eds.), *Proceedings of Semantics and Linguistic Theory (SALT) 28*, 100-119. Ithaca, NY: CLC Publications. https://doi.org/10.3765/salt.v28i0.4408

Simpson, A. P. (2009). Phonetic differences between male and female speech. *Language and Linguistics Compass 3*(2): 621-640. https://doi.org/10.1111/j.1749-818X.2009.00125.x

Sosa, Juan Manuel. 1999. *La entonación del español*. Madrid: Cátedra.

UNESCO (2003) *Language vitality and endangerment*. UNESCO Publishing.

Vasconcellos, José Leite de. 1900. *Estudos de Philologia Mirandesa* (Vol. 1). Lisboa: Imprensa Nacional.

Vasconcellos, José Leite de. 1901. *Estudos de Philologia Mirandesa* (Vol. 2). Lisboa: Imprensa Nacional.

Vigário, Marina. 2010. Prosodic structure between the Prosodic Word and the Phonological Phrase: recursive nodes or an independent domain? *The Linguistic Review* 27(4): 485- 530. https://doi.org/10.1515/tlir.2010.017

Vigário, Marina, & Sónia Frota. 2003. The intonation of Standard and Northern European Portuguese: A comparative intonational phonology approach. *Journal of Portuguese Linguistics* 2(2): 115-137. https://doi.org/10.5334/jpl.31