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Articles

Guinea-Bissau Portuguese: What the intonation of yes-no question shows about this variety

Português guineense: O que a entoação das sentenças interrogativas mostra sobre essa variedade

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ABSTRACT

In Guinea-Bissau, Portuguese is the only official language, and, for historical and sociopolitical reasons, European Portuguese (EP) is assumed as the variety spoken. However, we find a multilingual space in which Kriol is the national unity language and Portuguese is spoken as a second language. In this context, we analyzed the intonation of neutral yes-no questions of Guinea-Bissau Portuguese (GBP), to examine whether the intonation of this sentence type resembles that found SEP (spoken in Lisbon) or whether we are facing a Guinea-Bissau Portuguese variety in formation. Using the theoretical framework of Prosodic Phonology and Intonational Phonology, we analyzed neutral yes-no questions produced

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through a reading task performed by four Guinea-Bissau participants, native speakers of Kriol, and speakers of Portuguese as a second language. Our results show that, for the pre-nuclear and nuclear contour as well as tonal density, the intonation of GBP neutral yes-no questions differs from SEP and is closer to Brazilian and African varieties already studied. This outcome was previously pointed out in the literature for declarative sentences, suggesting that GBP is developing its own intonational grammar.

Keywords: *intonation; yes-no questions; Portuguese spoken in Guinea-Bissau; Portuguese varieties.*

RESUMO

Na Guiné-Bissau o português é a única língua oficial, e, por razões históricas e sociopolíticas, governo e população assumem que no país se fale português europeu (PE). Todavia, encontramos ali um espaço multilíngue em que o kriol é a língua da unidade nacional e o português é falado como uma segunda língua. Diante deste contexto, analisamos a entoação das sentenças interrogativas totais neutras do português guineense (PGB), verificando se a entoação deste tipo frásico o aproxima das características do PE standard *(SEP) ou se estamos diante de uma variedade guineense em formação. Através do aparato teórico da Fonologia Prosódica integrada à Fonologia Entoacional analisamos sentenças interrogativas totais neutras produzidas através de tarefa de leitura por quatro participantes guineenses, falantes de kriol como língua materna e de português como uma segunda língua. Nossos resultados mostram que, quanto ao contorno pré-nuclear e nuclear e à densidade tonal, a entoação das interrogativas neutras do PGB se distingue do SEP e aproxima-se das variedades brasileiras e africanas já estudadas, resultado já apontado na literatura para as sentenças declarativas, assinalando a gramática entoacional desta variedade.*

Palavras-chave: *entoação; sentenças interrogativas; português falado na Guiné-Bissau; variedades de português.*

1. Introduction

From the linguistic perspective, the European Portuguese (EP) and Brazilian Portuguese (BP) are macro-varieties broadly investigated, having an extensive number of studies focusing on their grammatical

aspects. However, Portuguese is also the official language in other countries, especially the former Portuguese colonies located in Africa, where it is assumed that the European variety is spoken due to the fairly recent independence of these countries (in the 1970s). Many scholars have recently studied spoken Portuguese in each of these African countries and have found differences compared to European Portuguese in several areas[4].

In this paper, we focus on the prosodic features of Guinea-Bissau Portuguese (GBP), specifically on the intonation of neutral yes-no questions. There is still little research on this variety, especially in the domain of phonology, since Portuguese, although the official language of the country, is not the native language of most of the population (Kriol is the native language).

Studies such as those by Santos and Fernandes-Svartman (2014), Santos (2015), and Santos and Braga (2017) dealing with GBP neutral declarative sentences showed that the intonation of this variety differs from Standard European Portuguese (SEP), spoken in Lisbon. We analyzed the intonation of GBP neutral yes-no questions to verify whether it also differs from SEP, which is the variety assumed as the standard language in Guinea-Bissau.

According to Cá (2020), a Guinea-Bissau author, the Portuguese language, present in schools and other public places in Guinea-Bissau, especially in urban centers, is different from that spoken in Portugal, considering lexical, phonological, and syntactic features. Nevertheless, she pointed out that population and government believe that European Portuguese is spoken in the country.

Our research will provide further arguments for the discussion whether Portuguese spoken in Guinea-Bissau, especially in the city of Bissau, differs from SEP and might be seen as an emerging Guinea-Bissau variety of the Portuguese language from a phonological point of view.

4. A list of studies on the varieties of Portuguese spoken in Africa is available at https://catedraportugues.uem.mz/variedades-nao-europeias.

2. Historical and sociolinguistic background of Guinea-Bissau

Guinea-Bissau is a country in West Africa, located between Senegal (to the north) and Guinea (to the south and east), with the Atlantic Ocean to the west. With a population of about 1.759 million (Eberhard et al., 2018), the country is a multilingual and multi-ethnic territory, home to more than 20 groups with their respective languages, in addition to Kriol (Guinean Creole) and Portuguese.

The territory that today comprises Guinea-Bissau is part of the region that was once called the Upper Guinea Coast. It extended from the south bank of the Gambia River to a vaguely defined area along the coast of present-day southeastern Liberia, thus encompassing, either partly or entirely, Gambia, (southern) Senegal, Guinea-Bissau, Guinea, Sierra Leone, and Liberia, from a geographical point of view. It also encompassed the western Côte d'Ivoire from a historical and cultural perspective (Knörr & Trajano Filho, 2010). The continental region is also referred to as the Guinea Rivers of Cape Verde (Bull, 1989).

The social and political structure of the Upper Guinea coast region would have been formed, since the 13th century, by multiple encounters between the different groups and societies of the region (Knörr, in press). Several ethnic groups were present in the Upper Guinea coast region, such as Balanta, Bainouk, Biafada, Banhun, Fula, Jola, Papel, Mandinka, among others, speakers of languages belonging to three African language families (Atlantic, Mande, and Kru groups) (Hawthorne & Nafafé, 2016).

The Portuguese settlers arrived in the territory that now comprises Guinea-Bissau in 1446 (Kihm, 1994). Nevertheless, it is only in the early 16th century that a small number of Portuguese people began to settle there, concentrating in the region of Cacheu and, later, Bissau (Hawthorne & Nafafé, 2016). The Portuguese arrival caused long--term social changes in the region, which affected existing policies on the coast (Knörr, in press) and triggered the emergence of new social groups and categories.

Jacobs (2010) postulates that historical and linguistic arguments show that a proto-creole from Upper Guinea emerged and became

nativized in the late 15th and early 16th centuries in Santiago (Cape Verde), where it would have been brought to the mainland by Cape Verdeans. The latter settled in the region around Cacheu in the late 16th century. Kihm (1994), in turn, states that it is possible to estimate that Kriol was fully formed at the beginning of the 17th century. Furthermore, the author reports that until the mid-1920s, its sociolinguistic position had not changed since its creation, except that it had expanded to other places[5].

Until the Berlin Conference (1884-1885), the Portuguese presence in Guinea-Bissau was limited to its cities and small agricultural productions. But this starts to change with the partition of Africa, when "pacifying" incursions to the hinterland began. After several bloody operations, which lasted until 1915, Guinea-Bissau was entirely conquered by the Portuguese, although the submission of the Bijago archipelago only occurred in 1936 (Kihm, 1994). With this, populations moved, leading to the encounter of ethnic groups from the coast with groups from the countryside, who did not speak Kriol and had restricted contact with the Portuguese until then. From this moment on, Kriol became the lingua franca in Guinea-Bissau since none of the ethnic languages had hegemony among the various groups, and Portuguese was not massively in the territory and referred to as the language of the dominator.

This moment also marked the stigmatization of Kriol. In 1940, primary schooling began, conducted by the Catholic missions and only in Portuguese. Autochthonous languages and the Kriol language were both banned from the school environment. In 1946, Portugal passed a law to distinguish between Indigenous and Portuguese citizens, with one of the main criteria being the ability to speak, read and write Portuguese. However, this measure did not reduce or cease the use of Kriol.

With the formation of the African Party for the Independence of Guinea and Cape Verde (PAIGC) in 1956, a nationalist sentiment emerged, which eventually culminated in the fight for independence (1961-1974). It is under this context that Kriol finds its status as a language of national identity. Kriol "became both a practical tool for

5. Another variety of Guinean creole would be the one spoken in Ziguinchor (Casamance) in Senegal, outside the territory that currently comprises Guinea-Bissau.

linguistic unification within the Party and the armed forces and a symbol of the new Bissau-Guinean nationality." (Kihm, 1994, p.6).

Today, Kriol is the most widely spoken language in the country and constitutes national unity. The latest census conducted in the country (Instituto Nacional de Estatística, 2009) states that about 90% of the population speaks Kriol, between L1 and L2 speakers. However, studies about its prosodic features are still in progress (Braga, in progress).

After its independence (1974), Guinea-Bissau adopted Portuguese as its official language due to the need to maintain contact with the other former Portuguese colonies and the Portuguese-speaking countries in general (Kihm, 1994). Other reasons for the adoption of Portuguese as the official language are related to the high cost of producing educational materials in another native language. At the same time, the Portuguese already had all the educational equipment (Kohl, 2018). The 2009 Census states that one-third of the population speaks Portuguese, mainly as L2.

There is a detachment between the way Portuguese is taught in schools and the multilingual reality of the country. The teaching materials used in Guinean schools convey the message that the State itself considers the population to be L1 Portuguese speakers (Cá & Rubio, 2019).

According to Cá (2020), the Portuguese spoken in Guinea-Bissau already differs from the varieties spoken in Europe. It has gone through Africanization and nativization processes, acquired new lexical items, and adapted "to the sounds and rhythms of the local languages" (Cá, 2020, p. 32). It is present in schools, official documents, institutions, and other public places, being part of the population's daily life, even though its majority does not use it. However, the country does not recognize the variety of Guinean Portuguese yet and there is a "'preconceived' feeling [...] [that] Guinea-Bissau speaks Portuguese from Portugal" (Cá, 2020, p.32).

Cá (2020) allows us to conjecture that the Portuguese present in Guinea-Bissau has been distancing itself from EP, considered the official standard language, already presenting characteristics of a variety in formation.

Given the scope of this research and the area of grammar to which it contributes to, although the research about the prosodic features of Kriol will not be presented here and a prosodic transfer from Kriol might have occurred, we believe that our results will contribute to the description of the phonology of the variety of Portuguese spoken in Guinea-Bissau.

3. Theoretical framework

In this paper, we use the theoretical framework of Prosodic Phonology, as proposed by Selkirk (1984) and Nespor and Vogel (1986), in an integrated view to the Autosegmental-Metrical Intonational Phonology, of Pierrehumbert (1980) and Ladd (2008), among others. We make a description and intonational analysis of GBP neutral yes-no questions and investigate the relationship between the association of tonal events and intonational contour, and the prosodic constituents. The aim is to examine whether this African variety of Portuguese presents similar or distinct features from the standard European variety.

In general, Prosodic Phonology assumes that speech is organized into prosodic constituents considering the interaction between the phonological structure and the other modules of Grammar (Nespor & Vogel, 1986; Selkirk, 1984; among others). There is no obligatory isomorphy among prosodic and morphosyntactic constituents, so a prosodic constituent does not necessarily correspond to a morphosyntactic constituent. According to Nespor and Vogel (1986), among others, this prosodic organization is arranged hierarchically in prosodic domains, with each level composed of one or more prosodic units of the lower level. The phonological word[6] (PW), phonological phrase (PhP), and intonational phrase (IP) are part of the prosodic hierarchy.

We will focus on the domains of the Phonological Word (PW)[7], the Phonological Phrase (PhP), and the Intonational Phrase (IP), given that they have proved relevant to the association of tonal events with

6. In this paper, "prosodic word" and "phonological word" are used as synonyms.
7. Following Vigário (2003, 2010), we consider the phonological clitic to be a functional element, accentless and prosodically dependent, being adjunct or incorporated to the host prosodic word (Braga, in progress).

the intonational contour of the varieties of Portuguese already studied within the same theoretical framework (varieties of EP, BP, STP[8], LBP[9], and GBP itself)[10].

Considering the work done to describe varieties of Portuguese that make use of the integrated view between Prosodic Phonology and Intonational Phonology, we adopted in this article the definitions of the prosodic word (PW), phonological phrase (PhP), and intonational phrase (IP) initially revised for EP that was adapted from the relation-based definitions of Nespor and Vogel (1986).

Broadly speaking, in Portuguese, a PW contains a single primary stress (Vigário, 2003); the PhP is formed by a lexical head and the functional elements on its non-recursive side (the left side, in Portuguese) within the same syntactic maximum projection, and optionally, the non-branching complement phrase of this lexical head, if within the same maximum projection (Frota, 2000); and the IP is the constituent that presents a defined intonational contour, whose boundaries coincide with the position in which grammatical pauses may be inserted in an utterance, being formed by every sequence of adjacent phonological phrases of a root sentence or by every sequence of adjacent phonological phrases that is not incorporated structurally into the syntactic tree of the sentence (Frota, 2000).

In Autosegmental-Metrical Intonational Phonology, intonation has its own phonological organization (Frota & Prieto, 2015; Ladd, 2008; Pierrehumbert, 1980; among others). Ladd (2008) states that an intonational contour is formed phonologically by a sequence of discrete tonal events associated with specific points in the segmental string. Tonal events are formed from only two primitive tones, high (H) and low (L), which are sufficient for describing contours, even though the pitch range varies widely. The phonological sequence of tonal events, in turn, is realized phonetically through the fundamental frequency contour (F_0 of the acoustic signal).

8. Portuguese variety spoken in the island of São Tomé, in São Tomé and Príncipe.
9. Portuguese variety spoken in Libolo, a region of Angola.
10. See, for EP, Frota (2000, 2014), among others; for BP, Tenani (2002), Fernandes (2007a, 2007b), among others; for STP, Braga (2018), among others; for LBP, Santos (2020), among others; and for GBP, Santos (2015), among others.

For varieties of Portuguese already studied within this theoretical framework, the most relevant tonal events for describing intonation are the pitch accents and the tones related to prosodic constituent edges[11]. Pitch accents are the tonal events associated with metrically prominent syllables of the segmental string. Pitch accents can be monotonal (L* or H*) or bitonal (H*+L, H+L*, L*+H or L+H*), with the starred tone indicating the tone that is aligned to the stressed syllable. Edge tones are associated with the boundaries of prosodic constituents. Boundary tones can also be monotonal (L% or H%) or bitonal (LH% or HL%) and are associated with intonational phrase boundaries (Frota et al., 2015b).

In this paper, we analyze the GBP neutral yes-no questions through this theoretical framework. Yes-no questions are those that canonically have "yes" or "no" as the target response, as in "Did Maria eat the cake?". Portuguese is a language that distinguishes declaratives from yes-no questions solely through intonation (Frota, 2014). In other words, the segmental structure of these sentence types is identical, and there is no morphosyntactic marker that characterizes the yes-no question. Therefore, it is our understanding that the neutral (also called broad focus) yes-no question is one in which the speaker is seeking information that is unknown at the moment of enunciation.

The overview of the literature that has dealt with the prosodic characteristics of neutral yes-no questions in European, Brazilian, and African varieties of Portuguese within the theoretical framework outlined is presented below.

Neutral yes-no questions of European, Brazilian, and African varieties of Portuguese

Yes-no questions have already been analyzed prosodically for several Portuguese varieties. In Serra and Oliveira (this volume), preliminary results on the intonation of neutral yes-no questions of Portuguese spoken in Maputo, Mozambique are provided. In this section, we briefly present the characteristics of the intonation of this sentence

11. For a review and references regarding tonal events (and the prosodic domains relevant for their association) in Portuguese, please see: Frota (2014), Frota et al. (2015a), and Frota and Moraes (2016).

type as described in the literature for Portuguese spoken in Portugal, Brazil, São Tomé and Príncipe (São Tomé), and Angola (Libolo), concerning the pre-nuclear contour, the nuclear contour, and tonal density.

The pre-nuclear contour (that precedes the nuclear pitch accent) and the nuclear contour configuration may contribute to the distinction between sentence types within and between varieties from a prosodic perspective. In neutral yes-no questions, the nuclear contour is formed by the nuclear pitch accent, which appears associated with the last prosodic word of the intonational phrase, and the boundary tone, which is associated with the right edge of this intonational phrase. Tonal density, in turn, expresses the rate of association of pitch accents within the intonation phrase, discarding the first and last prosodic words. The higher the tonal density, the higher the rate of melodic events that are present in the intonational contour. Many studies have described the intonation of yes-no questions in EP. Frota (2002, 2014) and Frota et al (2015a) describe a falling-rising H+L* LH% contour for the Lisbon variety (SEP). Frota et al (2015a) found a nuclear rising L*+H H% contour for most EP varieties, except for SEP. Cruz (2013), in turn, described a different rising nuclear contour for the variety spoken in Castro Verde (ALE) (L* H%). The two rising contours have been reported as present in many varieties of EP (Cruz et al., 2022).

However, a rising-falling L* HL% contour is reported by Vigário and Frota (2003) and Frota (2014) for the Northern variety of Braga (NEP). Vigário and Frota (2003) describe that the rising of boundary tone H occurs following the low pitch accent, reaching the peak on the post-nuclear syllable, which will be followed by a fall to the completion of the complex boundary tone HL%. The authors point out, however, that if there are no segments for the realization of this complex boundary tone, there is the possibility of tonal truncation. In other words, if there is no segmental string on which the fall of the HL% complex boundary tone can anchor, only H% is realized. Falling contours in yes-no questions have also been found in Central-Southern varieties of EP (Cruz, 2013; Cruz et al., 2017), as well as in Northern Eastern varieties and in the islands of Azores and Madeira (Cruz et al., 2022). Only Frota et al (2015a) analyzed the tonal density of neutral yes-no questions of EP varieties. The authors found a low tonal density for SEP and a medium tonal density for the other varieties studied (Porto (POR),

Castro Verde (ALE), and Albufeira (ALG)). Tonal density does not contribute to the distinction between yes-no questions and statements.

As for the studies that described the yes-no questions in Brazilian Portuguese, Frota et al (2015a) describe the rising-falling L*+H L% contour as the nuclear contour of the neutral yes-no questions of the varieties of São Paulo (São Paulo (SP)), and Minas Gerais (Belo Horizonte (MG)), while the rising L*+H H% contour characterizes the varieties of Bahia (Salvador (BA)), and Rio Grande do Sul (Porto Alegre (RS)).

Castelo (2016) and Castelo and Frota (2017) picture the intonation of BP yes-no questions as a geographic continuum. The authors categorized as 'North' the capitals of Paraíba (PBa), Sergipe (SE), and Bahia (BA), as 'Center' the capitals of Rio de Janeiro (RJ), and Minas Gerais (MG), and as 'South' the capitals of Santa Catarina (SC), and Rio Grande do Sul (RS). They found a rising contour L* H% for the northern varieties, a rising-falling L*+H L% contour for the central ones, and a rising-falling contour with a complex boundary tone L* HL% for the southern ones. Castelo (2016) also points out, for the yes-no questions of the Northern region, a falling pre-nuclear pitch accent H+L* associated with the first prosodic word of the utterance, as well as a rising pre-nuclear pitch accent L*+H. For the yes-no questions of the Central and Southern regions, a rising pre-nuclear pitch accent L*+H was found. The author states the existence of distinct patterns for the two regions was statistically proven, with the initial pitch accent of sentences being "a good predictor for BP dialectal regions" (Castelo, 2016, p. 84), although this initial pitch accent was not relevant to distinguish yes-no questions from declaratives.

Rosignoli (2017), when analyzing in detail the characteristics of the intonational contour of several interrogative sentence types of the São Paulo variety (Brazil), states that the total intonation contour is responsible for encoding the pragmatic content of interrogative sentences and for distinguishing between the distinct types of interrogatives in this variety. The author found for the neutral yes-no questions of São Paulo variety a rising pre-nuclear pitch accent, mostly (L+)H*, associated with almost all prosodic words, and obligatorily to the heads of phonological phrases, as well as the nuclear contour L+ (!)H* L%.

Although the nuclear contours for this sentence type for Brazilian varieties are either rising-falling or only rising, we see configurations differing, especially concerning the alignment of the pitch accent with the nuclear syllable and/or the alignment of the tonal boundary tones (Cruz et al., 2022).

As for tonal density, Castelo (2016), Frota et al (2015a), and Rosignoli (2017) present convergent results: there are differences regarding tonal density across Brazilian varieties, with BA and MG showing medium tonal density, SP showing medium-high tonal density, and RS showing high tonal density for yes-no questions.

There are still very few studies on the prosody of neutral yes-no questions in African varieties of Portuguese. Braga (2019) analyzed this sentence type for São Tomé Portuguese (São Tomé and Príncipe) using reading task data and describes a rising-falling nuclear contour L*+ (¡)H HL% and a high tonal density.

Santos (2020), investigating the Angolan variety of Libolo (Angola), found two types of nuclear contours: a rising-falling contour L+H* L%, for both reading and semi-spontaneous speech, and a rising contour, L* H% or L+H* H%. The author also attested a high tonal density for the LBP yes-no questions in the reading task data. See also Serra and Oliveira's results (this volume) about the findings for neutral yes-no questions of Portuguese spoken in Maputo, Mozambique.

4. Materials, Data Collection Procedures, and Data Treatment

The analyzed dataset was obtained through a reading task including 10 neutral yes-no questions. The reading task is part of the InAPoP project corpora (Frota, coord., 2012-2015) and was adapted to GBP with the help of speakers of that variety. The task was performed by four Guinea-Bissau speakers aged between 20-25 years. They were three men and one woman, speakers of GBP as a second language and Kriol as the native language, university students at UNILAB (Malês campus - BA)[12], that arrived in Brazil less than 30 days from the first

12. Universidade da Integração Internacional da Lusofonia Afro-Brasileira (UNILAB) was founded in 2010 by the Brazilian federal government with the aim of preparing human

date the recordings started. All speakers signed an informed consent form, and the research project was submitted to University of Lisbon (Lisbon/Portugal) ethical committee (process 5_CEI2020).

The neutral yes-no questions were produced after a context that was presented to the participant through a PowerPoint file, followed by the sentence that should be read. An example of the context and sentence that comprised the task is shown in (a):

(a) [Context: I would like to know what happened].
[Utterance] *Os rapazes compraram lâminas?* (*Did the boys buy razors?)*

The experiment used 10 neutral yes-no questions, besides vocatives, commands, and requests, which were distractors sentences. All sentences were randomized, and the experiment was set up with three repetitions of each sentence.

All recordings were made with a MARANTZ digital recorder, model PMD660, at a frequency range of 48,000 Hz, in a monophonic channel, and a SENNHEISER external microphone, model EW122-P G3.

In total, 120 neutral yes-no questions were collected from the GBP speakers (10 sentences × 4 participants × 3 repetitions). Productions that presented truncations resulting from corrections made by the speaker were discarded, as they did not reflect the elicited sentence type. Thus, our final dataset included 111 sentences, of which 26 were produced by JSJ, 30 by LAC, 25 by RAS, and 30 by HGS.

Each sentence was segmented, labelled, and analyzed with *Praat* (Boersma & Weenink, 2014), to access the waveform, spectrogram, and the fundamental frequency contour (F_0). Then, the utterances were orthographical transcribed, and the P-ToBI system (Frota et al, 2015b) was used for intonational analysis.

resources to develop integration between Brazil and other countries of the Community of Portuguese Language Countries (CPLP), especially African countries.

5. Results

For our analysis of the GBP neutral yes-no questions, we focused on the nuclear contour configuration, pre-nuclear contour features, and tonal density, following the studies that have already investigated the intonational features of yes-no questions in several varieties of Portuguese[13], presented in section 3.

Configuration of the total intonational contour: pre-nuclear pitch accents and nuclear contour

The intonation features found for yes-no questions in GBP are different from the ones described for declarative sentences. In summary, Santos (2015) found mainly for the internal pitch accents the rising L*+H, and the falling nuclear contour is H+L* L%, although the author reports a low nuclear contour L* L% with less frequency. The author also found a high tonal density, with pitch accents obligatorily associated to the head of each phonological phrase, and the possibility of an additional tone associated with the pretonic syllables of long prosodic words.

Focusing on GBP neutral yes-no question, we present Figure 1, which illustrates the most frequent nuclear contour found for this sentence type in GBP, as well as the prosodic phrasing, annotated using the P-ToBI notation (Frota et al., 2015b), of the GBP yes-no question "Os rapazes compraram lâminas?" (Did the boys buy razors?) produced by speaker LAC. Thus, we can find:

(i) pitch accents aligned to the stressed syllables of the PWs of the sentence: L+H* associated with the stressed syllable of the PW (os raPAzes)$_{PW}$[14]; H* associated with the PW (comPRAram)$_{PW}$; and (L+) H* associated with the PW (LÂminas)$_{PW}$;

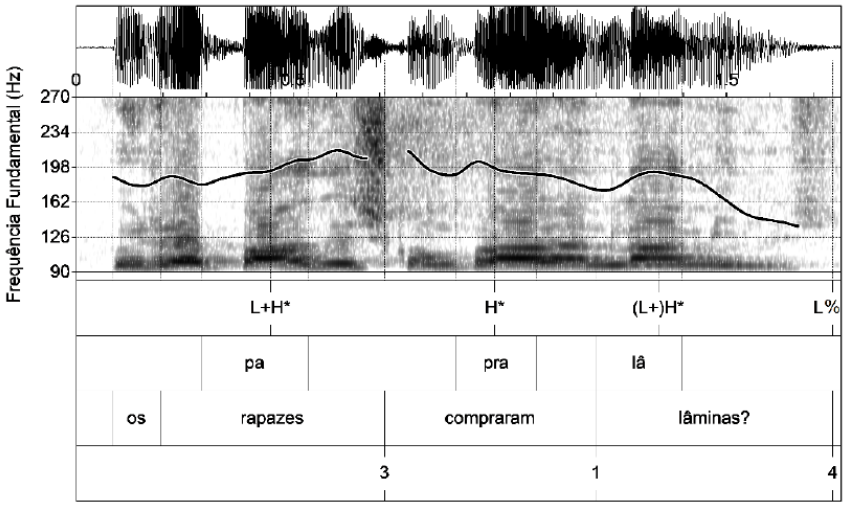
13. Our results were previously presented at "1º Congresso Internacional do PPGLEV - Vozes e escritas nos diferentes espaços da língua portuguesa", promoted by "Programa de Pós-Graduação em Letras Vernáculas" from UFRJ - Brazil, held online in November 16th to 18th, 2020.

14. Capitalized syllables indicate stressed syllables; phonological words are enclosed by parentheses; phonological phrases and intonational phrases are indicated with square brackets.

(ii) pitch accents associated with the head of each phonological phrase presented (whose right boundary is indicated with the break index 3): L+H* associated with the head of PhP [os rapazes]$_{PhP}$; and (L+)H* associated with the head of the phonological phrase [compraram lâminas]$_{PhP}$[15];

(iii) a pitch accent (L+)H* associated with the head (in bold) of the intonational phrase [os rapazes compraram **lâminas**]$_{IP}$ and an L% boundary tone associated with the right boundary of this IP (indicated with the break index 4).

Figure 1 – GBP neutral yes-no question "Os rapazes compraram lâminas?" (Did the boys buy razors?), produced by LAC in a reading task



We found that the nuclear contours initially analyzed as H* L% and L+H* L% appeared in competition (they varied in the repetitions of the same sentence in the productions of the 4 speakers). Therefore, we considered the two contours as phonetic variants of the same nuclear contour, which we will represent phonologically as (L+)H* L%, as Frota et al. (2015b). Thus, the configuration (L+)H* L% is the one that best describes the nuclear contour of GBP neutral yes-no questions, being found in 89.2% of the data, as shown in Table 1. Importantly, in over 90% of the data the nuclear contour is a rising-falling contour.

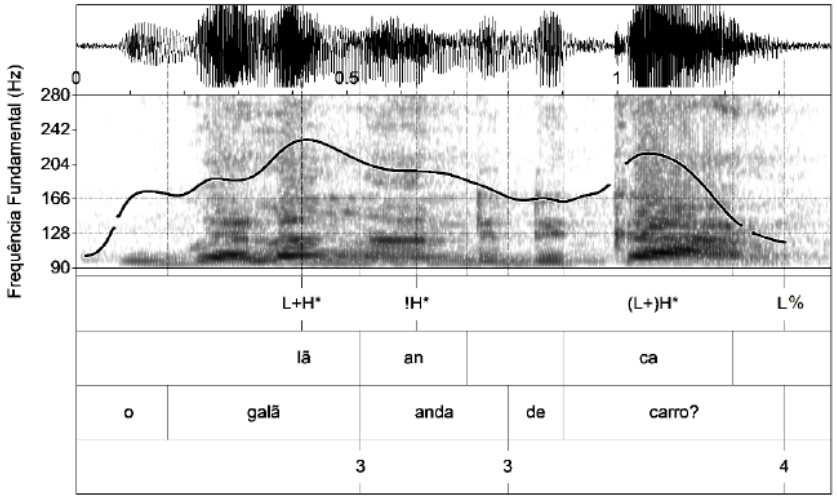
15. The phonological word that is the head of each phonological phrase appears underlined.

Table 1 – Configurations found for the nuclear contour of GBP neutral yes-no question

Configuration	JSJ	LAC	HGS	RAS	Total
(L+)H* L%	26	28	26	19	99 (89.2%)
L*+H L%	0	0	3	0	3 (2.7%)
L*+H H%	0	1	0	2	3 (2.7%)
(L+)H* H%	0	0	0	4	4 (3.6%)
H+L* L%	0	1	0	0	1 (0.9%)
L* L%	0	0	1	0	1 (0.9%)
Total of sentences	26	30	30	25	111 (100%)

As for the pre-nuclear contour, the pitch accents associated with the first prosodic word of the sentence correspond to the maximum point reached by F_0 on the intonational curve in 77.5% of the utterances analyzed. In 14.4% of the data, we found F_0 peaks with the same pitch range in both the first and the last prosodic words of the utterance. Although the percentage of the highest F_0 peak associated with the first prosodic word was the most prominent, it is essential to note that, in some cases, the pitch range of the pitch accent associated with the last prosodic word was close to the pitch range of the pitch accent associated with the first prosodic word. Both the first and the last prosodic words appeared with prominent F_0 peaks. Even if the F_0 peak of the first prosodic word was the highest, the F_0 peak aligned with the last prosodic word was often the second highest. Figure 2 illustrates this feature.

Figure 2 – GBP neutral yes-no question "O galã anda de carro?" (Does the hero ride a car?) produced by HGS in a reading task



Pitch accents found in pre-nuclear contour were a rising pitch accent L*+H and a high pitch accent H*, associated with the first prosodic word of the sentence in equal proportion. Less frequent were the pitch accents annotated as L+H* and (L+)H*. In addition to pitch accents associated with the first prosodic word of each sentence, pitch accents associated with other pre-nuclear prosodic words within the utterance were also found. Table 2 shows the distribution of the pre-nuclear pitch accents found in our data.

Table 2 – Configurations of pre-nuclear pitch accents in the intonational contour of GBP neutral yes-no question

Configuration	JSJ	LAC	HGS	RAS	Total
H*	30	27	20	8	85 (33.6%)
!H*	7	17	25	19	68 (26.9%)
(L+)H*	1	5	2	8	16 (6.3%)
L+H*	3	5	12	1	21 (8.3%)
L*+H	0	13	10	11	34 (13.4%)
H+L*	5	0	0	2	7 (2.8%)
H*+L	1	0	0	1	2 (0.8%)
L*	14	2	3	1	20 (7.9%)
Total pre-nuclear pitch accent	61	69	72	51	253 (100%)

As shown in Table 2, the pitch accent H* predominates in pre-nuclear prosodic words. Considering that the initial pitch accent L+H* only appears associated with the first prosodic word of the utterances and that H* associated also with the first prosodic word was seen in equal proportion, we observe that high pitch accents (H* and !H*) were found mostly in internal prosodic words, as illustrated in Figure 1 and Figure 2.

The fact that the pitch accent L*+H was found associated only with the first prosodic word, and the high tonal accents H* (and !H*, probably a phonetic variant) were mostly found in internal prosodic words follows Frota and Prieto's (2015, p. 412) description of the pre-nuclear contour as being characterized by the regular presence of the same type of pitch accents in many Romance languages. Consequently, the other pitch accent configurations present in the language inventory are used only as part of a nuclear contour.

Tonal density

Tonal density was calculated through the percentage of pitch accents associated with the prosodic words that constitute the utterance, excluding the first prosodic word and the pitch accent associated with it, and the head of the intonational phrase and its nuclear pitch accent.

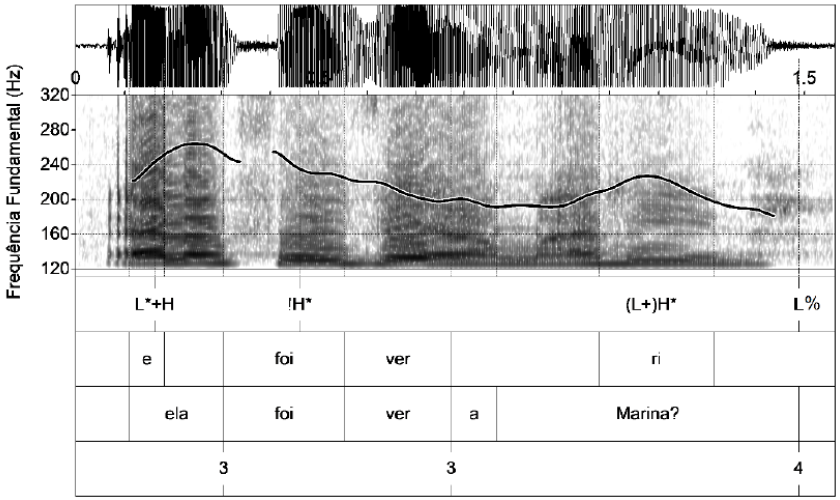
The tonal density values for GBP neutral yes-no questions are given in Table 3.

Table 3 – Tonal density of GBP neutral yes-no questions, by speaker (T* stands for pitch accent)

Informants	Pre-nuclear T*	Pre-nuclear PW	Tonal density
JSJ	37	43	86.0%
LAC	39	47	83.0%
HGS	42	48	87.5%
RAS	26	41	63.4%
Total	144	179	80.4%

The results show that both the individual speaker and overall values indicate that GBP yes-no questions exhibit a high tonal density (80.4% on average). The informant RAS, the only woman whose productions were analyzed so far, presented the lowest tonal density (63.4%). JSJ, LAC, and HGS had similar tonal density values (86%, 83%, and 87.5%, respectively). Figure 3 further illustrates the pitch accent distribution found in GBP.

Figure 3 – GBP neutral yes-no question "Ela foi ver a Marina?" (Did she visit Marina?), produced by RAS in a reading task



Thus, we describe GBP neutral yes-no questions as showing high tonal density. The pitch accent associated with the first prosodic word of the utterance presents the highest F_0 pitch. It is followed by a smooth fall of the intonational contour (when there is segmental material), where high pitch accents are found (H* or !H*). The nuclear contour presents a peak, which corresponds to a high tone associated with the stressed syllable of the last prosodic word of the utterance. At the end of the contour a low boundary tone is found, so the nuclear contour is represented by the configuration (L+)H* L%. The formation of two peaks, one at each edge of the intonational contour, seems necessary for the realization of this sentence type in GBP.

Considering this description of the intonation of GBP yes-no questions, we will compare the present findings with those reported in the literature for other varieties of Portuguese, especially SEP. The main goal is to examine whether the intonation of GBP yes-no questions is different or not from the standard European Portuguese variety.

6. GBP compared to other varieties of Portuguese

Our goal in this paper was to investigate whether, from an intonational point of view, the Portuguese spoken in Guinea-Bissau, specifically in Bissau, differs from SEP and might be seen as an emerging Guinea-Bissau variety of the Portuguese language. Thus, we compared our results to the descriptions of the intonation of yes-no questions provided for other Portuguese varieties and presented in Section 3. For the pre-nuclear contour, we will use the results from Frota (2014) for EP (SEP), and Castelo (2016), and Rosignoli (2017) for BP varieties. For tonal density, we will use the results from Frota et al. (2015a), for EP varieties, Frota et al. (2015a), Castelo (2016) and Rosignoli (2017) for BP varieties, Braga (2019) for the São Tomé variety (São Tomé and Príncipe), and Santos (2020) for the Angolan Libolo variety[16].

Although EP is the official language in Guinea-Bissau and SEP is taken as the model of EP in this country, both in writing and in speech, there are many differences between the intonational characteristics of the yes-no questions in the standard variety of European Portuguese (SEP)[17] and GBP: while SEP has a falling-rising nuclear contour H+L* LH% (Frota, 2002, 2014; Frota et al., 2015a), GBP has mostly a (rising-)falling (L+)H* L% contour, as our results showed. Thus, GBP also differs from other EP varieties, such as ALE (Cruz, 2013), which presents a rising L* H% nuclear contour, and ALG (Cruz, 2013), POR (Frota et al., 2015a), with L*+H H% contour. Furthermore, the GBP nuclear contour is close to the contour of other varieties of EP which also display a rising-falling contour, although it differs in the alignment

16. Tonal density value found for the yes-no questions in the spontaneous speech data.
17. We are mostly comparing GBP to SEP in the current paper. However, given that the intonation of yes-no questions is quite different across varieties of EP, and in particular SEP is distinct from most EP varieties (Cruz et al., 2022; Frota et al., 2015a), it may well be the case that GBP is closer to European Portuguese varieties other than SEP.

of the accentual tones: L* H(L)% was found for NEP (Frota, 2014; Vigário & Frota, 2003), and L*+H L% for the Northern Eastern variety of Castelo Branco (Cruz et al., 2022).

Regarding BP, although there are important differences in the configuration of the nuclear contour of neutral yes-no questions in the varieties of SP, MG, RJ, SC, RS, BA, SE and PBa, we can notice similarities between the (L+)H* L% contour found for the GBP yes-no questions and the contours present in the Central-Southern varieties of BP, which display a rising-falling configuration. In GBP, we found that the H tone was associated to the stressed syllable as in several BP varieties, and the H forms a small plateau until the onset of the following syllable. The first feature is similar to the variety of SP described by Rosignoli (2017), annotated as L+ (!)H* L%. Although, Castelo (2016), Castelo and Frota (2017), and Cruz et al. (2022), supported by statistical analysis, pointed out that the nuclear contour of SP, MG, and RJ varieties is L*+H L%. These studies also attested statistically that L* HL% is the nuclear contour for SC and RGS varieties. Nevertheless, none of the BP varieties were reported to have the small plateau of the H tone in the nuclear contour. The presence of the small plateau in GBP suggests that the alignment of the H tone might be earlier than in BP varieties.

Let us finally consider the African varieties of Portuguese already described in the literature. GBP shows similarities to the contour found for the Angolan variety of Libolo, described as L+H* L% (Santos, 2020), which also has a high pitch accent associated with the stressed syllable of the nuclear prosodic word of the yes-no question, followed by a low boundary tone L%. However, the H-tone plateau of the nuclear contour was not found in the Libolo variety either. It is interesting to note that the Libolo speakers were both Portuguese and Kimbundu speakers.

We will now focus on the pre-nuclear contour. In SEP the initial peak is related either to the high pitch accent H* or to the rising pitch accent L*+H associated with the first prosodic word of the utterance (Frota, 2014). In GBP we also find the pitch accent H* and L*+H associated with the first prosodic word. The L*+H pre-nuclear accent also resembles the pre-nuclear pitch accents found for the Central-South BP varieties (RJ, MG, SC, and RS), in Castelo's (2016) description.

Rosignoli (2017), in turn, describes the pre-nuclear accent (L+)H* for the SP variety, a configuration also found in the GBP pre-nuclear contour (although only in very few cases).

Finally, we will consider tonal density. While SEP presents a low tonal density for yes-no questions (Frota et al., 2015a), GBP presents a high tonal density, resembling the Brazilian variety of RS (Castelo, 2016; Frota et al., 2015a), and the African varieties of São Tomé (Braga, 2019) and Libolo (Santos, 2020), which present high tonal density for neutral yes-no questions. In between, there are the European varieties of POR, ALE, and ALG, which show medium tonal density (Frota et al, 2015a), as well as the Brazilian varieties of BA and MG (Castelo, 2016; Frota et al., 2015a), followed by the Brazilian varieties of SP and RJ, which show a medium-high tonal density (Castelo, 2016, for RJ, and Frota et al., 2015a; Rosignoli, 2017, for SP).

7. Conclusions and future research developments

The analysis aimed to describe the intonation of GBP neutral yes-no questions, examining to what extent the productions of Guinea-Bissau speakers would show similarities to the intonation patterns of European varieties of Portuguese (and mostly to SEP) since EP is the standard language adopted in Guinea-Bissau.

Our results show that the GBP neutral yes-no questions exhibit both properties that distinguish them from SEP, namely the rising-falling nuclear contour (although contours with a similar shape are found in other EP varieties) and the high tonal density, and properties that they share with SEP (such as the initial pre-nuclear pitch accent). In addition, GBP yes-no questions resemble some BP varieties (the Central-Southern ones) regarding the nuclear configuration and the initial pre-nuclear pitch accent. Furthermore, GBP especially resembles the African Portuguese varieties, due to the similar nuclear configuration and the high tonal density. The present findings, together with those previously reported for neutral declarative sentences (Santos, 2015; Santos & Braga, 2017; Santos & Fernandes-Svartman, 2014), suggest that GBP has some distinct features from SEP from an intonational point of view in two of the main sentence types (neutral declaratives

and neutral yes-no questions), as well as some distinct features from BP varieties (mainly the Northern ones). This conclusion supports Cá's (2020) argument that GBP might be an emerging variety of the Portuguese language.

The similarity found between GBP and some Brazilian and African Portuguese varieties corroborates Santos and Braga's (2017) finding, based on neutral declarative intonation, that overseas Portuguese varieties have intonational features that tend to bring them closer together. Regarding African varieties, it is also possible to think about the influence that contact with other autochthonous languages might have had on the intonational configuration of these varieties, especially in the case of Guinea-Bissau, which has a multilingual context.

In future research, we will investigate the intonational characteristics of Kriol and examine whether there are similarities between this language and GBP, in order to deepen our understanding of the variety of Portuguese spoken in Guinea-Bissau.

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Conflict of interests

The authors declare they have no conflict of interest to declare and bear full responsibility for the submission.

Credit Author Statement

We, Gabriela Braga, Sónia Frota, and Flaviane Fernandes-Svartman, hereby declare that we do not have any potential conflict of interest in this study.

We have all participated in the study conceptualization, methodology, study design, and edition. Author Gabriela Braga was responsible for the data collection, data generation, data validation, formal data analysis, and quantitative analysis. Authors Sónia Frota and Flaviane Fernandes-Svartman were responsible for fund-raising, project administration, project supervision, and for reviewing the content and writing of this study.

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