Word Order and Prosodic Phrasing in Breton

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1 Introduction

Breton (*brezhoneg*) is a severely endangered Celtic language from the Brittonic branch, spoken in Brittany, part of the French Republic, and related to Welsh and Cornish. In the early 20th century, approximately 93% of the population in Lower (western) Brittany spoke Breton on a daily basis, totaling 1.4 million speakers (Timm 2009). Today, only around 200,000 people actively speak Breton (Broudic 2009). The decline of Breton in the 20th century resulted from economic and institutional factors such as universal French-only education, compulsory military service, and changing lifestyles, which intensified after the Second World War. Negative attitudes toward the language, both internalized and external, were also decisive factors in the ongoing process of language substitution (Timm 2009, Moal in press).

Breton is an understudied language in terms of intonational phonology and the syntax-prosody interface (but see Ternes 1992, Kang in press). In this preliminary study, we investigate prosodic phrasing in Breton and its interaction with word order. Specifically, we examine neutral, broad-focus declarative sentences with various V1 and V2 word orders. Data are presented from two female native speakers: one in her eighties, a dialectal speaker from Treger with a command of Standard Breton, and one in her thirties, a native speaker of Standard Breton.

This paper is organized as follows. Section 2 introduces the reader to the basic word orders of declarative sentences in Breton. Section 3 deals with the fieldwork protocol. Section 4 presents the results of an interim, qualitative analysis of intonational contours, with special attention to prosodic phrasing and pitch accent detection. Finally, section 5 concludes the paper.

2 Word order in Breton

Breton is a verb-second language (see Jouitteau 2020, Jouitteau and Torres-Tamarit in press, as well as the references therein for more details about the syntax of Modern Breton). More specifically, the tensed element must occupy at least the second syntactic position in a sentence. All tensed elements in Breton are preceded by an unstressed particle (*rannig*)*: a*, which is selected after nominal elements, including infinitives, or *e*, which is used in all other contexts. SVO orders are possible in Breton and do not necessarily impose a focus or topic reading on the subject. Consequently, the SVO sentence in (1) can receive either a broad-focus reading (indicating an all-new informational structure) or a reading in which the subject is focalized or topicalized. The verb *troc'hañ* 'cut' surfaces with initial *d* in (7) due to initial consonant mutation. Similarly, the mutated form *wastell* 'cake' following the definite article, corresponds to the non-mutated form *gwastell*.

(1) *Nina a droc'ho ar wastell.*
Nina PTCL cut.3SG.FUT DEF cake
'Nina will cut the cake.'

In informationally all-new structures, the initial element in a sentence can be an infinitive, as in (2a), or an infinitival verbal structure that includes the object, as in (2b). This strategy is made possible through the use of the auxiliary verb 'do', which serves as the tensed element occupying the second syntactic position in the

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sentence. Furthermore, in these sentences, both a focalization and a topicalization reading are available.

(2) (a) *Troc'hañ* *a* *raio* *Nina* *ar* *wastell*.
cut.INF PTCL do.3SG.FUT Nina DEF cake
'Nina will cut the cake.'

(b) *Troc'hañ* *ar* *wastell* *a* *raio* *Nina*.
cut.INF DEF cake PTCL do.3SG.FUT Nina
'Nina will cut the cake.'

Verb-first word order is systematically possible in Breton only with the verb *emañ* 'be.3SG.PRES', which is used in the progressive tense. This particular verb, the only one canonically appearing at the beginning of a sentence in its inflected form, must be directly followed by its subject. Once again, no emphasis is placed on the verb, and it appears in structures where all elements convey new information, as illustrated in (3).

(3) *Emañ* *Nina* *o* *troc'hañ* *ar* *wastell*.
be.3SG.PRES Nina at cut.INF DEF cake
'Nina is cutting the cake.'

At least in spoken Standard Breton, though not in all traditional varieties, the aspectual structure formed by the preposition *o* plus the infinitive, as in (4a), or *o* plus the whole VP, as in (4b), can be fronted. Only (4a) conveys a broad-focus reading.

(4) (a) *O* *troc'hañ* *emañ* *Nina* *ar* *wastell*.
at cut.INF be.3SG.PRES Nina DEF cake
'Nina is cutting the cake.'

(b) [*O* *troc'hañ* *ar* *wastell*]$_{\text{Foc}}$ *emañ* *Nina*.
at cut.INF DEF cake be.3SG.PRES Nina.
'Nina is CUTTING THE CAKE.'

The progressive tense can also be expressed with an SVO word order. In Breton, the verb 'be' has five forms, depending on both word order and semantics. We have already seen the form *emañ*. When the subject appears before the verb, the form *zo*, preceded by the particle *a*, emerges, as illustrated in (5).

(5) *Nina* *a* *zo* *o* *troc'hañ* *ar* *wastell*.
Nina PTCL be.3SG.PRES at cut.INF DEF cake
'Nina is cutting the cake.'

As in English and French, Breton also uses the near future with the verb 'go'. (6) illustrates this tense with an SVO word order.

(6) *Nina* *a* *zo* *o* *vont* *da* *droc'hañ* *ar* *wastell*.
Nina PTCL be.3SG.PRES at go.INF to cut.INF DEF cake
'Nina is going to cut the cake.'

The near future is also possible with sentence-initial *emañ*, as illustrated in (7). Recall that *emañ* must always be directly followed by its subject.

(7) *Emañ* *Nina* *o* *vont* *da* *droc'hañ* *ar* *wastell*.
be.3SG.PRES NINA at go.INF to cut.INF DEF cake
'Nina is going to cut the cake.'

All the sentence types presented so far, which illustrate some of the rich word order structures allowed in

Breton, were used in our elicitation task to study how word order affects prosodic phrasing. In the next section, we briefly present the protocol we used to gather the data.

3 Protocol building

In this preliminary study, we investigate prosodic phrasing in broad-focus declarative sentences in Breton across a variety of V1 and V2 word orders. We present data from two female native speakers: JBS and MGG.

JBS, in her eighties, is a native speaker of a local variety belonging to the Tregerieg dialect and is also proficient in standard Breton. Socialized in Breton, she experienced no major interruptions in its use. Additionally, she is a Breton syntactician who has worked on the language.

MGG, in her thirties, is a native speaker of standard Breton, having acquired the language through Diwan, the Breton language-immersion school system in Brittany. MGG's task consisted of reading a context designed to trigger a broad-focus (all-new information) interpretation and then reading the target declarative sentence as naturally as possible three times. The proposed sentences were written in Standard Breton. The speaker could comment if she felt at ease with them or not, and propose some alternatives.

JBS's task, conducted in a previous stage of our research, and also administered to four other native traditional speakers (whose data are not yet analyzed), involved a context in French designed to elicit a broad-focus (all-new information) reading (e.g., context: *(Au téléphone) : Attends, je m'éloigne, je n'entends rien;* target sentence: *"Les enfants sont en train de rigoler."* '(On the phone): Hold on, I'm moving away, I can't hear anything. "The kids are laughing."'). She was then asked to translate both the context and the target sentence into her local variety of Breton, allowing for negotiation of natural lexical choices. To elicit different V1 and V2 orders, the researcher provided the initial constituent of the target sentence in Breton (e.g., subject—*ar vugale* 'the kids'; infinitive—*o c'hoarzhin* 'laughing'; or copula—*emañ* 'are'), prompting JBS to complete the sentence and utter it as naturally as possible three times. Even if asked to approximate their prosody as closely as possible to that of natural diction, achieving naturalness is obviously challenging. To mitigate cognitive fatigue, the researcher used distracting questions and interruptions.

The intonational contours produced by JBS and MGG were inspected qualitatively using Praat (Boersma and Weenink 2022). In this paper, we report on MGG's results but also compare them with those of JBS. The audio file of JBS and its transcription are already publicly available in COCOON (Jouitteau et al. 2023).

The task administered to JBS included several sentence types with different word orders (including sentence-initial expletive *bez'* and initial adverbial adjuncts, which are not illustrated in section 2). However, we began by focusing on five sentence types, both transitive and intransitive. Minimal pairs were employed—sentences differing only by the addition of an adjective to the subject noun phrase and an additional noun to the object noun phrase—creating heavy and light constituents in terms of phonological weight. Short subjects and objects consisted of a single prosodic word (marked with subscript $_S$), while long subjects and objects consisted of two prosodic words (marked with subscript $_L$). We illustrate in (8) all sentence types, followed by the target sentence. The masculine plural forms *vugale* 'kids' and *vihan* 'little' in (8b) are mutated forms corresponding to the non-mutated forms *bugale* and *bihan*, respectively.

(8) Sentence types, JBS's task

(a) Transitive

Type 1		*Type 2*	
S_SVO_S	*An dañvadez a ruilho ar gwer*. 'The ewe will spill the glasses.'	$VAuxS_SO_S$	*Ruilhañ a raio an dañvadez ar gwer.* 'The ewe will spill the glasses.'
S_SVO_L	*An dañvadez a ruilho ar gwer laezh*. 'The ewe will spill the glasses of milk.'	$VAuxS_SO_L$	*Ruilhañ a raio an dañvadez ar gwer laezh.* 'The ewe will spill the glasses of milk.'
S_LVO_S	*An dañvadez griz a ruilho ar gwer*. 'The grey ewe will spill the glasses.'	$VAuxS_LO_S$	*Ruilhañ a raio an dañvadez griz ar gwer.* 'The grey ewe will spill the glasses.'
S_LVO_L	*An dañvadez griz a ruilho ar gwer laezh*. 'The grey ewe will spill the glasses of milk.'	$VAuxS_LO_L$	*Ruilhañ a raio an dañvadez griz ar gwer laezh.* 'The grey ewe will spill the glasses of milk.'

(b) Intransitive

Type 3	S_SCopV	*Ar vugale (a) zo o c'hoarzhin*. 'The kids are laughing.'
	S_LCopV	*Ar vugale vihan (a) zo o c'hoarzhin*. 'The little kids are laughing.'
Type 4	CopS_SV	*Emañ ar vugale o c'hoarzhin.* 'The kids are laughing.'
	CopS_LV	*Emañ ar vugale vihan o c'hoarzhin.* 'The little kids are laughing.'
Type 5	VCopS_S	*O c'hoarzhin emañ ar vugale.* 'The kids are laughing.'
	VCopS_L	*O c'hoarzhin emañ ar vugale vihan.* 'The little kids are laughing.'

The task administered to MGG included transitive sentence types, exemplified in (9). For each sentence type, as illustrated in section 2, there were three target sentences—each with short and long subjects and objects—of which only two have been analyzed so far. For clarity in presentation, we only provide examples with long subjects and objects. The verb *klozañ* 'close' surfaces as *glozañ* due to initial consonant mutation. Similarly, the mutated form *vras* 'big' following the feminine noun *abadenn* 'show', corresponds to the non-mutated form *bras*.

(9) Sentence types, MGG's task

Type 1	SVO	*Ar sonerien yaouank a glozo an abadenn vras*. 'The young musicians will close the big show.'
Type 2	VAuxSO	*Klozañ a raio ar sonerien yaouank an abadenn vras*. 'The young musicians will close the big show.'
Type 3	VOAuxS	*Klozañ an abadenn vras a raio ar sonerien yaouank*. 'The young musicians will close the big show.'
Type 4	SCopVO	*Ar sonerien yaouank (a) zo o klozañ an abadenn vras.* 'The young musicians are closing the big show.'
Type 5	SCopGoVO	*Ar sonerien yaouank (a) zo o vont da glozañ an abadenn vras.* 'The young musicians are going to close the big show.'
Type 6	CopSVO	*Emañ ar sonerien yaouank o klozañ an abadenn vras*. 'The young musicians are closing the big show.'
Type 7	CopSGoVO	*Emañ ar sonerien yaouank o vont da glozañ an abadenn vras*. 'The young musicians are going to close the big show.'
Type 8	VCopSO	*O klozañ emañ ar sonerien yaouank an abadenn vras*. 'The young musicians are closing the big show.'
Type 9	VOCopS	*O klozañ an abadenn vras emañ ar sonerien yaouank*. 'The young musicians are closing the big show.'

In the next section, we present the results of our prosodic analysis, based on qualitative auditory and visual inspection of F_0 contours. Our goal is to identify the correlates of prosodic phrasing and the inventory of pitch accents used in broad-focus declarative sentences in Breton, with special attention to how word order affects prosodic phrasing.

4 Results

Breton is a stress language with default penultimate stress. Although each prosodic word (ω) receives stress, with acoustic correlates likely being duration and/or intensity, we have observed that not all ω's are associated with a pitch accent (PA). We have identified the phonological phrase (φ) as the domain for PA association and found that two-ω φ's usually surface with a single PA. Therefore, we claim that the presence of one PA correlates with the presence of one φ.

In broad-focus declarative sentences, non-final PAs are rising (LH*), except for the last one, which is low (L*). We have also observed that φ's are right-headed in Breton, meaning that the second ω typically receives a PA. This is the case unless the second member of the φ is a function word (an auxiliary or

copula), in which case the initial lexical word receives a more prominent PA, or the only PA of the φ. If a function word appears in sentence-initial position (e.g., the copula *emañ*), it can be phrased alone and thus receive a PA. In the next subsections, we describe the default intonational contours for each sentence type in (9) as uttered by MGG, and also compare them with those by JBS whenever relevant.

4.1 *Type SVO* In SVO sentences, each of the main components of the sentence (S, V, and O) receives a rising PA. In SVO structures with a short S and a short O, each ω receives a PA, anchored to its stressed syllable, including the V (Figure 1). However, when the S or the O is long (i.e. has two ω's), only the second ω carries a PA (Figures 2, 3 and 4). This indicates the right-headedness of φ's in Breton. Therefore, we propose that the number of PAs is coextensive with the number of φ's: $(S)_{\varphi}(V)_{\varphi}(O)_{\varphi}$. This means that in SVO sentences, there are exactly three separate φ's, independent of the number of ω's. For MGG, non-final PAs are rising (LH*), and the final PA is low (L*). For JBS, all PAs, including the final one, are usually rising (Figures 3 and 4). The boundaries of φ's are signaled by a rising boundary tone (H%), except for final φ's, which are marked by a low boundary tone (L%). We can claim that phonological weight (i.e., one-ω vs. two-ω XPs) does not appear to affect prosodic phrasing; prosodic constituency seems faithful to syntactic constituency, although V2 is consistently phrased alone, despite being a syntactic head rather than a syntactic maximal projection.

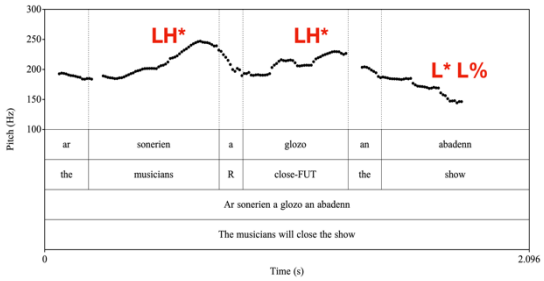

Figure 1. S_SVO_S (MGG)

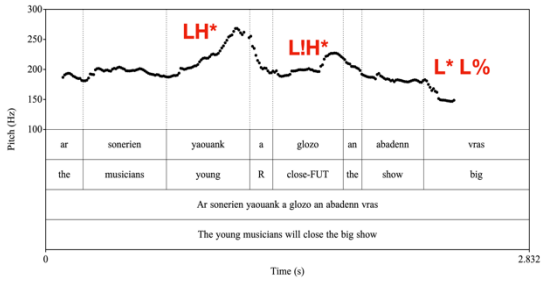

Figure 2. S_LVO_L (MGG)

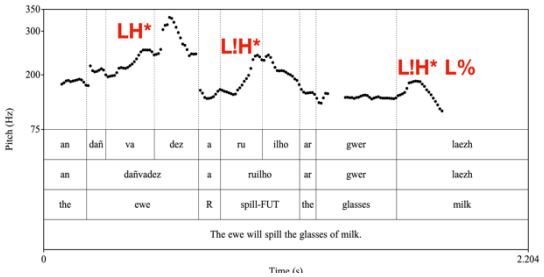

Figure 3. S_SVO_L (JBS)

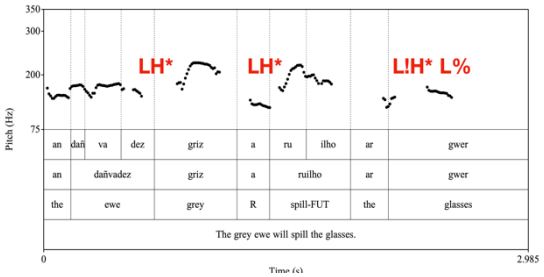

Figure 4. S_LVO_S (JBS)

4.2 *Type VAuxSO* In Breton declarative sentences, the syntactic second position is occupied by an inflected form of the auxiliary verb 'do' if the verb, in its infinitival form, appears in the sentence-initial position. In MGG's productions, the infinitive and the auxiliary seem to be phrased together, but each usually has a rise over the word, with the second one being downstepped (lower than the PA in the infinitive) (Figures 5 and 6). This likely indicates the presence of two φ's, possibly one nested within the other, suggesting a recursive prosodic structure, e.g., $((\text{Inf})_{\varphi}\ \text{Aux})_{\varphi}$, with a PA aligning with the right edge of each φ. In JBS's productions, however, only the infinitive carries a PA, while the auxiliary is deaccented and seems to behave as a left-adjoined prosodic clitic (Figure 7). These φ's, which contain the infinitive and the inflected auxiliary, contrast with the separately phrased S and O φ's in that the infinitive, positioned at the left edge of the φ rather than the right, receives the more prominent PA or the sole PA. Furthermore, the boundary tone that separates V+Aux from S is low.

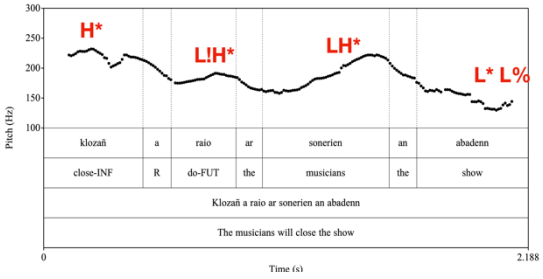

Figure 5. $VAuxS_SO_S$ (MGG)

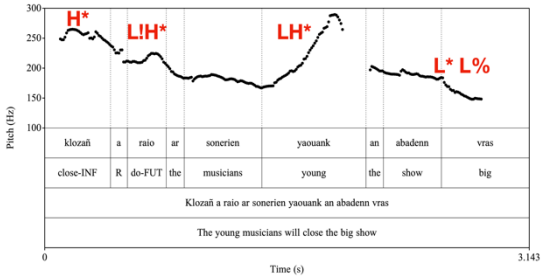

Figure 6. $VAuxS_LO_L$ (MGG)

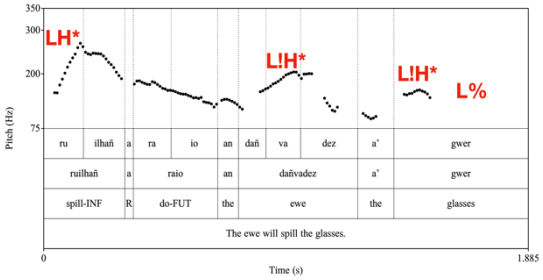

Figure 7. $VAuxS_SO_S$ (JBS)

4.3 *Type VOAuxS* The whole VP can be fronted before the auxiliary. In these cases, the infinitive and the O seem to be phrased together, and each one again has a rise over the word, which, as before, likely indicates two φ's displaying recursion. Interestingly, there is a clear prosodic break between the O and the auxiliary, which is now phrased separately from the verb and receives a PA. Whether the auxiliary is phrased alone, e.g., $(\text{Aux})_{\varphi}(\text{S})_{\varphi}$, or together with the S in a recursive prosodic structure, e.g., $((\text{Aux})_{\varphi}\ \text{S})_{\varphi}$, is not yet clear. However, in these structures, it receives its own PA and is not prosodically dependent on the immediately preceding VP. For this structure, data is available solely from MGG (Figures 8 and 9).

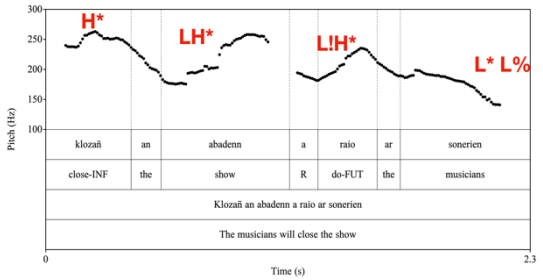

Figure 8. VO_SAuxS_S (MGG)

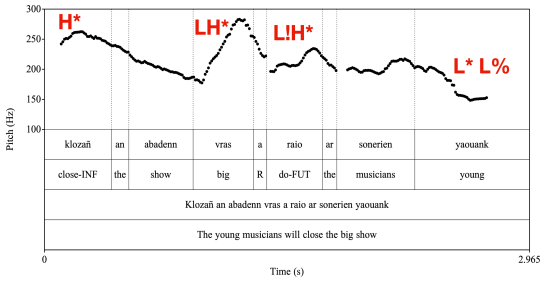

Figure 9. VO_LAuxS_L (MGG)

4.4 *Type SCopVO* In progressive structures with the copula *(a) zo* in second syntactic position, this form of the verb 'be' clearly right-adjoins to the aspectual phrase containing the V, and therefore receives no PA (Figures 10 and 11). The phrasing is thus $(S)_{\varphi}(CopV)_{\varphi}(O)_{\varphi}$.

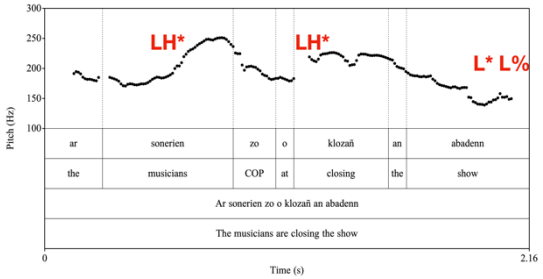

Figure 10. $S_S CopVO_S$ (MGG)

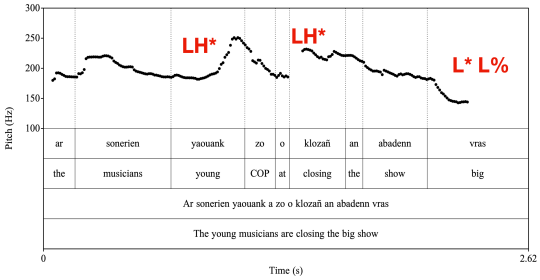

Figure 11. $S_L CopVO_L$ (MGG)

4.5 *Type SCopGoVO* In near future structures with the copula *(a) zo* preceding the aspectual phrase headed by the preposition *o* plus the infinitive of 'go', followed by the PP *da* + infinitive, the entire (CopGoV) structure is phrased together, and only the verb receives a PA (Figures 12 and 13). The phrasing is thus $(S)_{\varphi}(CopGoV)_{\varphi}(O)_{\varphi}$. The boundary tone following (CopGoV) is typically downstepped compared to that of S.

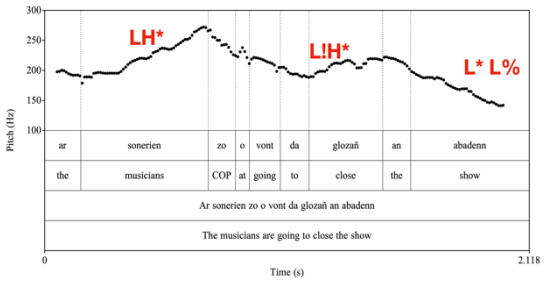

Figure 12. $S_S CopGoVO_S$ (MGG)

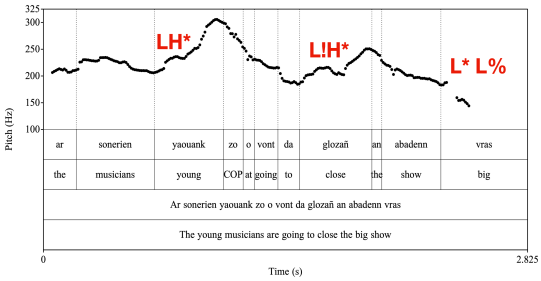

Figure 13. $S_L CopGoVO_L$ (MGG)

4.6 *Type CopSV(O)* In CopSV sentences, where the inflected copula *emañ* appears in sentence-initial position, *emañ* is phrased alone and thus receives its own pitch accent in JBS's utterances with intransitive verbs: $(\text{Cop})_{\varphi}(\text{S})_{\varphi}(\text{V})_{\varphi}$ (Figure 14). The situation is slightly different for our younger speaker; *emañ* appears to phrase with S and does not typically carry its own rise: $(\text{CopS})_{\varphi}(\text{V})_{\varphi}(\text{O})_{\varphi}$. If it does, the rise is downstepped (Figures 15 and 16): $(\text{Cop})_{\varphi}(\text{S})_{\varphi}(\text{V})_{\varphi}(\text{O})_{\varphi}$. This contrasts with the infinitive in VAuxSO structures, which has a clear and independent rise. In CopSVO sentences, the V can have its own rise, though it is smaller than the rise at the end of the S.

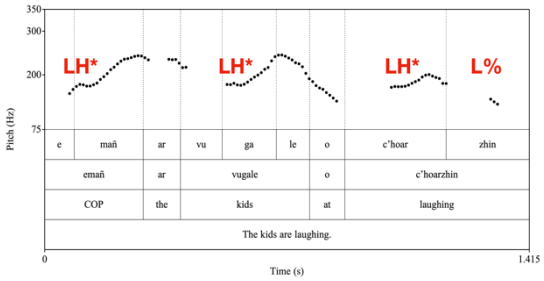

Figure 14. CopSSV (JBS)

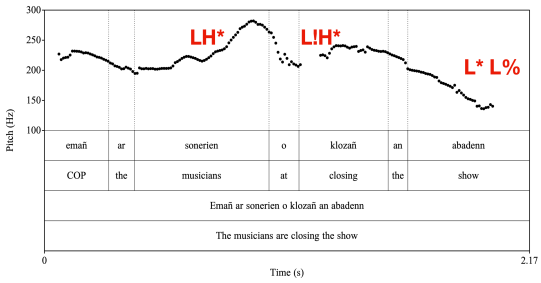

Figure 15. CopSSVOS (MGG)

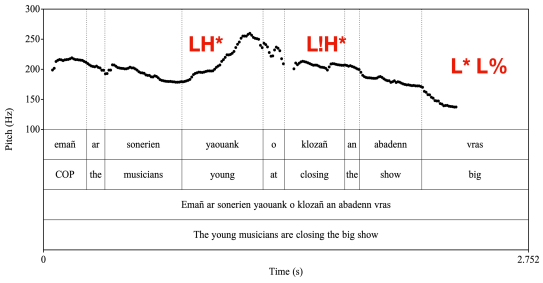

Figure 16. CopSLVOL (MGG)

4.7 *Type CopSGoVO* In these structures, as seen previously, *emañ* in sentence-initial position can be deaccented (Figure 17) or carry a downstepped LH* (Figure 18), yielding $(\text{Cop})_{\varphi}(\text{S})_{\varphi}(\text{GoV})_{\varphi}(\text{O})_{\varphi}$. Once again, the aspectual phrase and the infinitive, (GoV), are phrased together.

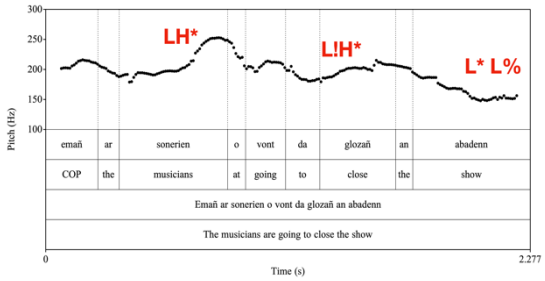

Figure 17. CopSSGoVOS (MGG)

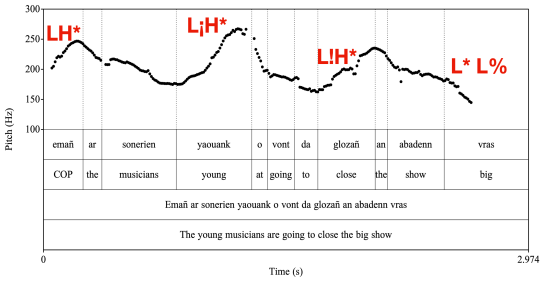

Figure 18. CopSLGoVOL (MGG)

4.8 *Type VCopS(O)* The structure VCopSO is prosodically parallel to VAuxSO. Unlike the auxiliary, however, the copula *emañ* following the sentence-initial aspectual phrase is always deaccented (Figures 19 and 20). Therefore, in both VAuxSO and VCopSO, headedness switches from right to left, as it is the verb that carries the most prominent PA or the sole PA. The deaccentuation of *emañ* in an intransitive sentence (VCopS) is illustrated in Figure 21, as produced by JBS.

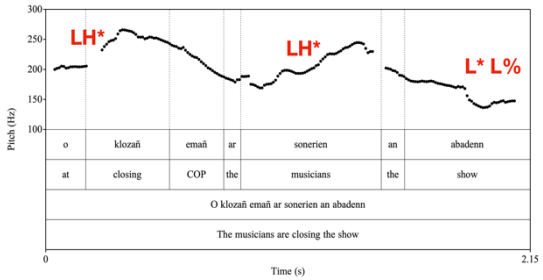

Figure 19. VCopSSOS (MGG)

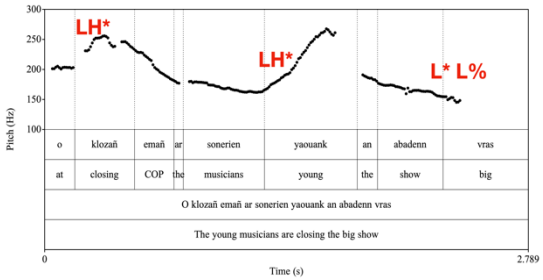

Figure 20. VCopSLOL (MGG)

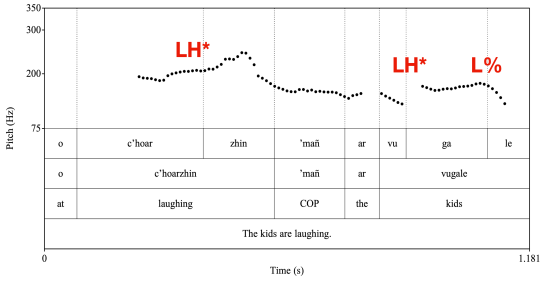

Figure 21. VCopSS (JBS)

4.9 *Type VOCopS* Again, the structure VOAuxS is parallel to VOCopS. This consists of phrasing the aspectual phrase together with the O, possibly indicating a recursive prosodic structure in which both the V and the O receive a PA. The copula *emañ*, completely deaccented, is then phrased together with the S.

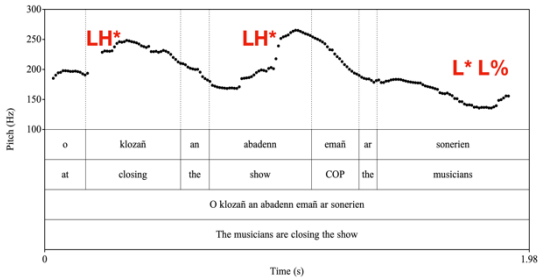

Figure 22. VOsCopSS (MGG)

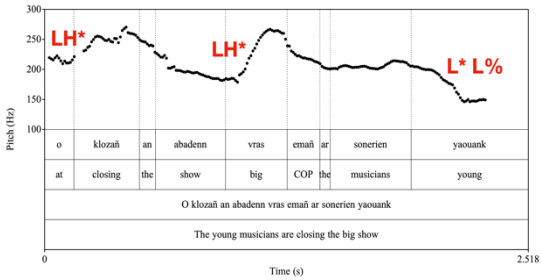

Figure 23. VOLCopSL (MGG)

4.10 *Summary* The table in (10) summarizes the proposed parsings that we have proposed so far, setting aside prosodic recursion, which requires a more in-depth prosodic analysis. Underlined constituents indicate left-headedness of φ, which is the marked, non-default pattern. When the V and the O are phrased together, both receive a pitch accent, and both are also underlined.

(10) Prosodic phrasing in Breton declaratives

Constituent Order	**Prosodic Phrasing**
SVO	(S)(V)(O)
VAuxSO	(VAux)(S)(O)
VOAuxS	(VO)(AuxS) or (VO)(Aux)(S)
SCopVO	(S)(CopV)(O)
SCopGoVO	(S)(CopGoV)(O)
CopSVO	(CopS)(V)(O) or (Cop)(S)(V)(O)
CopSGoVO	(CopS)(GoV)(O) or (Cop)(S)(GoV)(O)
VCopSO	(VCop)(S)(O)
VOCopS	(VO)(CopS)

5 Conclusion

This study provides the first systematic examination of how word order affects prosodic phrasing in Breton, a language with a rich variety of word orders in broad-focus declarative sentences. We identified the phonological phrase as the domain for pitch accent association. Phonological phrases are right-headed in Breton unless the second member of the phrase is a function word (e.g., auxiliary or copula), in which case only the initial word (S or V) is accented or receives a more prominent pitch accent. If the copula *emañ* appears in sentence-initial position, it can be phrased alone and receive a pitch accent.

Another key finding concerns T-S orders (S following tensed elements). The only sentences where S is prosodically integrated to its left with T involve the copula *emañ*: (CopS)(V)(O). Syntactically, these also represent the only Breton structures where the predicate cannot intervene between the copula and S, a pattern observed in the syntax of other Celtic languages with strict T-S orders. However, in Breton, T-S orders allow multiple interveners between T and S (e.g., *Emañ bremañ Nina o troc'hañ ar wastell* 'Nina is now cutting the cake.').

The only other structures where we observe prosodically grouped T-S orders in Breton are those in which the predicate plus the object are fronted: (*Troc'hañ ar wastell*)(*a raio Nina*), (*O troc'hañ ar wastell*)$_{\text{Foc}}$ (*emañ Nina*).

The syntax-prosody interface in Breton remains largely *terra incognita*. This study is a first step toward a more comprehensive understanding of intonational marking in the language. Following future empirical work with additional speakers, we aim to provide a syntax-first formal analysis of the prosodic data within Match Theory, employing modern tools for rigorous OT research, such as the Syntax-Prosody in Optimality Theory (SPOT) app (Bellik, Bellik & Kalivoda 2015-present).

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