

ALIGNMENT OF THE “EARLY” HL SEQUENCE IN MALTESE FALLING TUNE *WH*-QUESTIONS

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ABSTRACT

This study investigates two factors related to the falling tune found in *wh*-questions in Maltese. It examines the alignment, of the **H**(igh) and **L**(ow) tone targets found in the early part of this tune in an attempt at providing a more definitive phonological analysis of the tune. Carefully controlled laboratory speech is used in an attempt at quantifying the alignment details. The study also addresses the issue of the accentability or otherwise of *wh*- or *Q*(uestion)words in Maltese.

Evidence is provided for alignment of the **H** tone target on or around the beginning of the *Q*word rather than at the accented syllable for *Q*words having a stressed syllable removed by at least one syllable from the left edge of the phrase. Results are as yet unclear for monosyllabic or initially-stressed *Q*words, different strategies for dealing with tonal crowding possibly being at work. The analysis suggests that the *Q*word in Maltese does in fact receive an accent.

Keywords: intonational phonology, tonal alignment, *wh*-questions, accenting of *Q*(uestion)words, Maltese

1. INTRODUCTION

This study aims to further analysis of the intonation of Maltese interrogative word questions (henceforth referred to, for ease, as “*wh*-*q*(uestion)s”). Earlier analysis of the intonation of such questions reported in [22] was inconclusive on two main counts.

First, the analysis raised various questions about the realisation, particularly the alignment and scaling details, of the intonational form – a form which may also extend to other structures and contexts – of this type of question in Maltese. The primary aim of this study is therefore to use carefully controlled laboratory speech to re-examine the phonetic implementation details of the *wh*-*q* falling tune in Maltese. The study aligns with work in the A(utosegmental-)M(etrical) theory of intonational phonology, e.g. [10, 12, 17]. An interpretation of the implementation details for this tune in Maltese should allow for a more definitive analysis than that available to date.

Second, it was not clear whether the *Q*(uestion) word in such questions is accented or not in Maltese. The issue of the accentedness or otherwise of the

*Q*word in Maltese, at least in the highly constrained kind of data analysed, is also addressed.

2. BACKGROUND

2.1. *Wh*-questions and intonation

A strong tendency is reported for the global shape of *wh*-*qs* to be a (rise-)fall rather than a rise. A rising overall movement, as in other types of questions, has however also been observed, e.g. Bartels [2] p.172, suggests a rise as the canonical form for English *wh*-*qs* which involve a request for “further specification of an element that occurred in a prior utterance”. A number of studies, e.g. [8], examine the issue of whether the choice of the less commonly used rising intonation in such *qs* correlates with a difference in function as compared to that in their falling intonation counterparts. The possibility of *wh*-*qs* with rising intonation has been attested for Maltese, [4], as for other languages. However, the focus of the present study is on *wh*-*qs* involving a fall.

Experimental work has shown that information on phonetic details such as those relating to tonal alignment can be used to inform a phonological analysis of the tune in question. E.g. [13] show that alignment is relevant to the distinction between two rising pitch accents in Dutch. Similarly, [1] provide an analysis of the alignment and scaling of the intonational rise-fall in *wh*-*qs* in Greek. The analysis shows that the position and number of syllables before the stressed syllable crucially determine the tonal alignment and scaling details. The present paper forms part of a study of *wh*-*qs* in Maltese whose broader aim is that of providing an analysis of the alignment and scaling details of the tune which, although falling, is distinct from the falling tune found in declaratives. This paper reports on the part of the pilot study which deals with alignment.

The picture which has begun to emerge on the matter of the accentedness or otherwise of *wh*-words suggests that languages differ in this respect. Some languages, notably English, e.g. [12, 19], accent a word other than the *wh*-word; others accent the *wh*-word itself. Amongst the latter are Greek [1, 15], Hungarian [12], Korean and Japanese, cited in [7], and Tamil [11]. Ladd [12] suggests a greater

likelihood for the *wh*-word be accented in languages without *wh*-movement such as Bengali and Turkish; he however mentions Hungarian and Romanian as counter-examples. Others, e.g. [7, 19], have looked at the issue from the point of view of topic/focus, theme/rheme relations. Maltese is interesting in that, while it exhibits *wh*-movement – hence one could predict no accent on the *wh*-word – the relative freedom of constituent order possibilities it exploits [3, 6], constitutes an additional complication.

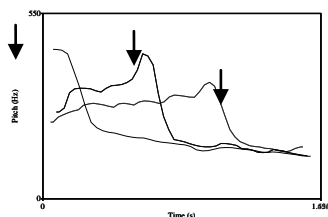
2.2. Question words in Maltese

Question words or *Q*words in Maltese can be simple or complex (cf. [20], also list in [16]). Some of the simple forms include: *fejn* ‘where’, *għaliex* ‘why’, *kemm* ‘how much’, *kif* ‘how’, *liema* ‘which’, *min* ‘who’, *xi/x* ‘what’. Many of these also occur in complex forms. E.g. *kemm* can occur in *minn kemm* literally ‘from how much’, *sakemm* ‘until/up to when’. In all cases, stress is assigned following rules for the assignment of lexical stress in Maltese [23]. (Throughout this paper, small capitals in the examples indicate lexically stressed syllables.)

Descriptions of Maltese such as [20] suggest that the *Q*word in Maltese is usually found *s*(entence)-initially. It can also occur in other positions, although with different degrees of acceptability and/or markedness, cf. [4]. [4] suggest that there is greater freedom in constituent order possibilities in the case of *wh*-qs of the sort sometimes termed ‘echo questions’ (what is meant by this term is not completely clear however). Participants in this pilot study seemed to be working with different acceptability criteria, the trade off between ‘neutrality’ and ‘acceptability’ often resulting in deviations from the expected ‘neutral’ rendering in patterned ways (cf. also 3.1 and Endnote ¹).

The example in Fig. 1 shows the F0 contours for one speaker’s rendering of 3 sentences involving *ma MIN* ‘with whom’ /mæ ‘mɪn/. The other constituents in these sentences are *mar JGHU*m /mæ: ‘jɛʊm/ ‘went for a swim’ and *ir-RAMla* /ɪr:æmlə/ ‘at Ramla Bay’.

Figure 1: F0 contours with *ma’ MIN* *s*-initially (solid line), medially (dashed line) and finally (dotted line). Arrows indicate the approximate location of the *Q*word.



2.3. Wh-questions and intonation in Maltese

The form of the tune in *wh*-qs in Maltese can be

characterized as involving a **H L L** sequence of tones (but cf. also Endnote ¹), with the possibility of either a **L%** or **H%** at the boundary (but cf. also below). [14] suggests that the initial **H** tone occurs ‘early’ in the I(ntonational)-phrase. It is followed almost immediately by a fall to **L**. F0 continues to lower to the end of the I-phrase, albeit with the possibility of additional accents and/or of a slight *s*-final rise. Examination of the contours in Fig. 1 suggests a tendency for the whole tune to gravitate towards the *Q*word, with the **H** tone in the sequence tending to anchor on or around the beginning of the *Q*word. The **H** target is followed quite quickly by a fall to a **L** tone (cf. [22]). What is still unclear is what the precise anchoring points for both these tones are.

The stretch following the initial **H L** sequence may involve some sort of pitch range compression and could be analysed as a **L**, with the possibility of either **L%**, or in cases having the *s*-final rise, also noted to occur in [22], a **H%** at the boundary. A **L H%** tonal sequence was described as occurring in post-nuclear stretches of speech in Maltese, cf. [21], and something similar may be involved here. The additional ‘minor’ accents which sometimes occur in longer utterances with a *s*-initial *Q*-word, could possibly be analysed as a **!H**, again with the option of a **L%** or **H%** at the boundary. The parts of this tune involving the additional accent/s and boundary tone sequences do not feature further in this analysis.

An additional characteristic of the tune under investigation which has already been noted, [14, 22], is the scaling of the **H** tone. The analysis carried out as part of this pilot study should allow further insight on this point, to be reported elsewhere.

To conclude, this study addresses the following questions: 1) What are the alignment details of the **H** and **L** tones noted to occur ‘early’ in the falling tune found in *wh*-qs in Maltese? 2) Does the *Q*word in Maltese receive an accent and if so, is it the main accent of the phrase? Answers to these questions can serve to inform an AM interpretation of this tune in Maltese on the lines of similar work on the intonational phonologies of other languages, cf. [10].

3. METHODOLOGY

The material used in this pilot study was carefully constructed to include mostly sonorant elements. The F0 tracks for the data collected involve few breaks, thus allowing for more accurate measurement and quantification of the phonetic implementation details.

3.1. Material and collection of data

Batteries of sentences involving various *Q*words in both simple and complex forms were constructed. The *Q*words tested are:

- *kemm* /kɛm:/ ‘how much/many’ – monosyllable, voiceless obstruent in onset;
- *min* /mi:n/ ‘who’ – monosyllable, nasal in onset and coda;
- *GHala* /ˈv:lə/ ‘why’ – initial stress, empty onset;
- *MEta* /ˈmɛtə/ ‘when’ – initial stress, nasal in onset).

Complex forms which allowed for the possibility of at least one syllable prior to the stressed syllable of the *Q*word were also tested. These are:

- *ghal KEMM* /ɛlˈkɛm:/ ‘for how much’ – final stress;
- *minn KEMM* /mɪnˈkɛm:/ ‘from how much’ – final stress;
- *iL-GHala* /ɪˈlɛlə/ ‘why’ – penultimate stress;
- *ghalFEIN* /ɛlˈfɛɪn/ and *ghalIEX* /vˈlɪːʃ/ – final stress;
- *ma’ MIN* /mɛːˈmi:n/ ‘with whom’ – final stress;
- *min MINnhom* /mɪːnˈmɪnːɔm/ ‘which one of them’ – penultimate stress.

Sentences with the *Q*word immediately following a highly frequent conversational speech linking device, *Mela* /mɛlə/ ‘so then, well then’, were also included in the data set. The full set of sentences for *ma’ min* /mɛːˈmi:n/ is:

Ma’ MIN mar jghum ir-Ramla?
Mar jghum ma’ MIN ir-Ramla?
Mar jghum ir-Ramla ma’ MIN?
Mela ma’ MIN mar jghum ir-Ramla?

A rough translation of the sentences in this set is: ‘(So), with whom did he go swimming to Ramla Bay?’. No attempt is made, in this translation, or at any stage of this study, to work out what information structure differences and/or topicalisation effects result from differences in the position of the *Q*word except to note that different speakers clearly have different acceptability criteria for different *Q*word positions and/or test sentences (cf. also Endnote ¹). [5]’s study of the “accentability” or otherwise of *Q*words suggests that there may be effects from various factors such as *wh-q* type and relative “engagement” or “interest”. Clearly, the present study is limited in this respect given the necessary trade-off in having data which would facilitate quantification.

Speakers were instructed to go for “neutral”, no added value, renderings. After a brief familiarisation period, speakers were recorded whilst reading the sentences in the context of mini-dialogues intended to enhance “natural” production. In spite of the difficulties involved in eliciting controlled data which still sounds “natural”, speakers managed to produce most of the sentences without excessive difficulty.

2 female and 2 male speakers of Standard Maltese with no known or observable speech or hearing difficulties took part in the pilot study. Recordings were made using a high quality digital recorder (Edirol R-09HR) in a quiet room. This paper reports on the analysis of the 2 female participants’ data.

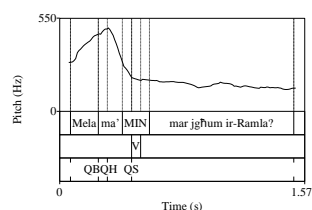
3.2. Analysis

F0 (measured in ERB, cf. justification in [1, 15]) and time measurements were made as follows:

- **QB**(eginning) – F0 at the beginning of the *Q*word;
- **QH**(igh) – F0 of the H target;
- **QS**(tressed vowel) – F0 at the start of the stressed vowel of the *Q*word.

An example analysis for the test sentence *Mela ma’ MIN mar jghum ir-Ramla?* ‘So, who did he go swimming to Ramla Bay with?’ is shown in Fig. 2:

Figure 2: Example analysis for *Mela ma’ MIN mar jghum ir-Ramla?* ‘So who did he go swimming to Ramla Bay with?’.

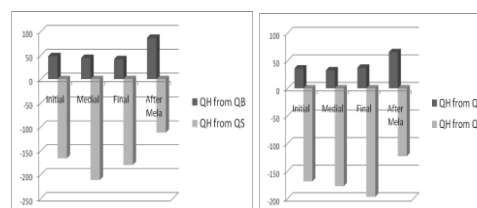


4. RESULTS

4.1. Alignment of the “early” HL sequence

Fig. 3 and Fig. 4 show the results of the analysis of the location of the **QH** i.e. the “early” **H** noted earlier, separately for the speakers analysed, for the 4 conditions: *s*-initial, *s*-medial, *s*-final and after *Mela*. Positive values indicate distance of **QH** from the beginning of the *Q*word, regardless of the sentential position of the *Q*word, whilst negative values indicate the distance of the stressed vowel from **QH**. The results presented here are for test items in which the stressed syllable of the *Q*word occurred at least one syllable from the left edge of the phrase.

Figure 3, 4: **QH** location in *msecs* in relation to **QB**, beginning of the *Q*word, and to **QS**, beginning of the stressed vowel, for all except initially stressed test items – (Fig.3 left) **F1**, (Fig.4 right) **F2**.



There is clear and consistent evidence that alignment of the **H** tone is very close to edge of what I will here call the *Q*word domain for both speakers. The presence of *Mela* alters things somewhat: reasons for this are as yet unclear. What is relevant here is that **QH** occurs at a consistent distance after the start of the *Q*word regardless of sentential position. By contrast, the distance of **QH** from the beginning of stressed vowel is not as stable. These results are consistent with data presented in [13] which highlights the possibility of alignment patterns of a highly systematic nature. In this case, alignment of **QH** seems to occur relatively soon after the start of the *Q*word.

The results for the monosyllabic and initially stressed *Q*words i.e. not preceded by *Mela*, are not presented here. A relatively large number of the utterances with an initially-stressed test item had to be discarded for reasons to do with difficulties on the part of the speakers in producing them and problems with the pitch tracking. As a result there was insufficient data for analysis. Examination of some of the pitch tracks suggests that, in the case of one of the speakers at least, tonal crowding may be leading to truncation of the **H** tone. Further analysis, of more data from the same speakers as well as of data from more speakers, is necessary.

These results suggest that the **H** target is in fact located at around the start of the *Q*word (the distance is of 45 and 35 *msecs* on average for F1 and F2 respectively for these data). The distance of **QH** from the start of the stressed vowel is more variable. Controlling for the type and amount of segmental material before the start of the stressed syllable could help clarify the facts. The results of the analysis indicate that the fall to **L** is usually completed before or early in the stressed vowel.

4.2. Accentedness or otherwise of the *Q*word

These data suggest that an accent does in fact get assigned to the *Q*word in the *wh*-qs analysed. Thus, while the presence of additional “minor” accents, possibly resulting from some kind of pitch range compression, has been noted, it is clear that, at least in renderings of the highly constrained *wh*-qs in the data set analysed, the *Q*word is accented in Maltese.

5. CONCLUSION

The analysis presented here provides evidence for alignment of the **H** tone in the *wh*-qs in Maltese slightly after the start of the *Q*word. This was the case for all cases of *Q*words in different sentential positions except following *Mela*. The alignment of the **L** tone appears to be less stable although this tone seems to be associated with the stressed syllable of the *Q*word.

These data also suggest that the *Q*word in Maltese does in fact attract accent. The **H** tone target in the sequence is reached before the stressed syllable of the *Q*word in all cases in which there is any sonorant material prior to the stressed vowel which can “carry” the target **H**, the tone associated with the lexically syllable itself being a **L** tone.

6. REFERENCES

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¹ In the course of this investigation, a rendering of the *wh*-q falling tune involving a H H L sequence was also noted. One speaker, F1, produced a number of utterances using this tune, all in cases involving a *s*-medial *Q*word, which she claimed to find “not so natural”. Pragmatically, use of this “stylized” version of the tune seems to involve some kind of hard-to-define added value (cf. audio file 2 for a “stylized” version of the same utterance as in audio file 1).