

THE INTONATION OF QUERIES AND CHECKS ACROSS LANGUAGES: DATA FROM MAP TASK DIALOGUES

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ABSTRACT

This paper examines the phonetics and phonology of functional rises in Saarbrücken German, Bari Italian and Sofia Bulgarian. These rises are accounted for as (i) rises up to a boundary associated with a H boundary tone, and (ii) accent rises, with a L+H accent. In all three varieties, H boundary tones function as continuation rises, and L+H accents occur in information-seeking questions (queries) and some, but not all, types of confirmation-seeking question (checks).

INTRODUCTION

The predominance of final rising contours in questions (see e.g. Bolinger's survey [1]) has led to claims by Cruttenden [2] of a universal distinction between rises (signalling "open", meaning) and falls (signalling "closed") meaning. He classifies "open" as being in general non-assertive, examples of which are "listing" and "continuity". He also refers to the endpoint of a phrase: in the absence of a rise/fall distinction, non-low and low endings serve to distinguish open from closed meanings.

Ohala [3] goes so far as to say that the correlation between high pitch and such "open" meanings is part of a frequency code for size used by animals in face-to-face encounters. His assumption is that the end point of the contour is of primary importance and it is this which is high. It is also reported that phenomena such as absence or presence of final lowering [4] or declination [5] may serve this function. However, what the universals literature does not deal with are local rises which occur before the phrase end.

Prefinal rises which serve an "open" function have been found in a number of languages, although they are rarely analysed as accentual rises. Exceptions are Transylvanian Hungarian, with a rising (LH) nuclear accent [6] in its question contour, and Palermo Italian which has accent rises for all "open" functions [5]. Yet it is not necessarily the case that a language makes use of only

one type of rise. In fact, all three language varieties examined in this paper, Saarbrücken German (SG), Bari Italian (BI) and Sofia Bulgarian (SB), exhibit accentual rises in some "open" functions and high boundaries in others. An analysis of such functions requires speech data which is as natural as possible. Below we discuss how dialogue data were gathered, which "open" discourse functions were selected for analysis, and which types of functional rises are used to express them.

INTONATION IN DIALOGUE

One way of looking at "open" functions is to look at intonation within dialogues, as has been done for English in task-oriented dialogues, by Nakajima and Allen [8] using TRAINS world maps and Kowtko [9] using the Edinburgh map task corpus [10]. Nakajima and Allen parameterise f0 traces in terms of onset and final f0 and peak f0 ratio (a means of determining inter-utterance declination). They distinguish high from low endpoint, rather than rises or falls, thus allowing falls to mid to pattern with rises to mid. High phrase-final endpoints are shown to have one type of "open" function, signalling that the speaker intends to continue the speech act. However, this analysis concentrates on boundary and global f0, an approach not necessitating prior analysis of the intonation, but also not giving information about pitch movement within the utterance. It does not analyse non-final rises.

Kowtko, examining single word phrases in Scottish English, uses six intonational categories and an independent set of discourse categories, defined within the framework of conversational games [11].

The data analysed here follows this methodological lead as far as the dialogue recordings and the analysis of the discourse are concerned, but the analysis of the intonation is different. Rather than global shapes, contours are analysed as comprising mono- and bitonal pitch

accents and two levels of boundary tone.

Map Tasks in SG, BI and SB

A modified version of the Edinburgh Map Task was carried out in each of the three language varieties. The task involved verbal co-operation (via auditory channel only) between two participants, each having a map, with the aim of transferring as accurately as possible a given route from one map to the other. There are a number of discrepancies in placement and positioning of landmarks on the maps. Since our aim was to examine intonation contours, the names of the landmarks contained mainly sonorants and were controlled for word stress pattern.

The pairs of subjects were of the same dialect background and knew each other well. They were unaware as to the purposes of the recording. For SG, 8 speakers were used, for BI 6, and for SB 8. Each speaker participated in two map tasks. The recordings were first transcribed orthographically. The orthographic transcriptions were analysed for the occurrence of a small set of discourse functions. Relevant tokens were then digitised and labelled intonationally using a system developed separately for each variety, based on the ToBI system for English [12].

Coding of Conversational Games

The initiating move in the following three game types was coded: 'query', 'check' and 'align'. These are defined as follows (cited from [11], page 4):
 QUERY-YN: "Yes-no question asks for new or unknown detail about some part of the task; does not request clarification about instructions (that would be check); e.g. 'Do you have a rockfall?'"
 CHECK: "checks self-understanding of a previous message or instructions by requesting confirmation directly or indirectly; makes sure that a complicated instruction is understood. e.g. 'So you want me to go down two inches'"
 ALIGN: "Checks the other participant's understanding or accomplishment of a goal; elicits a positive response which closes a larger game; checks alignment of both participants' plans or position in task with respect to goal; checks attention, agreement, or readiness, e.g. 'Ok?' meaning 'Are you with me?'"

Although opening moves of

INSTRUCT and EXPLAIN games are usually considered to be "closed", initial portions of them can be considered "open", especially when beginning a list of actions or items. These are also examined.

A preliminary attempt to classify utterances in terms of the kind of functional rise they contain (accentual or boundary-related), along with auditory analysis of the dialogues, led to the need for more differentiation within the category of checks. Three subcategories were proposed:

C0 - very low or no confidence that the information received is correct, therefore incredulous

C1 - medium level of confidence with no clear expectation as to the reply type

C2 - high confidence, not expecting a negation of the proposition but mostly expecting positive feedback. In some, but not all, cases, speakers continue to speak without waiting for such a signal.

Along Cruttenden's "open-closed" dimension, C2 could be said to be closed, C1 open and C0 extra-open. C2 checks, having a "closed" meaning, do not have functional rises. In fact, they all tend to have 'stepped down to' accents; SG has: H+!H*LL%, BI has !H+L*LL%, and SB has !H*LL%. The form of these contours will not be discussed further.

In all three varieties, queries and aligns have accent rises, as do C1-type checks. Continuation contexts in INSTRUCT and EXPLAIN moves have a final H boundary tone in all three varieties; SG additionally has an accent rise. In C0 checks, SG has a high boundary whereas the other varieties have an accent rise.

A closer analysis of the intonation patterns in each variety showed that the accent rises were not all timed in the same way.

TONAL ANALYSIS

A transcription system loosely based on the ToBI system developed for English [12] was used for each variety. In accentual rises, attention was paid to the alignment of the stressed syllable of the accented word with the F0 minimum and maximum corresponding to the L and H tones of a L+H (rising) accent. In addition, two boundary tones were used. For each language, the tonal analysis and morphological and syntactic markers used to distinguish each of the moves

considered are given below.

Saarbruecken German

Queries (Q) and aligns (A) are generally distinguished from other moves by syntax (verb initial in interrogatives, verb second in declaratives) and intonation. The contour used is L*+H LL%.

1. Hast du ein blaues Wohnmobil? (Q)
Do you have a blue camper?

2. Bist du fertig? *Are you ready?* (A)

Within a dialogue context, the role of intonation is considerable. There are many cases where the verb is superficially phrase initial, through ellipsis of an initial discourse particle, such as 'dann' then. These are usually checks of type C2 where the speaker is assertive and confident, as in (ellipses in parentheses):

3. (Dann...) müssen wir zurück.

(Then...) we have to go back.

Additionally, there are many elliptical queries and checks with no verb which also rely on intonation to distinguish them from other moves.

C1 checks have L+H*LL%, as in:

4. Den, dem linken? *The, the left one?*

C0 checks have a contour which is described in the literature on Standard German as 'Echo-frage' or Satz-Rückfragesatz [13]. It is L* HH%.

5. die Wiese?! *The meadow?!*

Non-final utterances have a combination of a L+H* pitch accent and either HL% or HH%, where an upstep rule as in [10] means that L% following H is high and H% following H is very high. The second contour type is often followed by a hesitation (possibly meaning that the H% is a floor-holding device).

6.an der Wiese dann vorbei...
then past the meadow...

Bari Italian

Italian has no morphological or syntactic markers for signalling interrogativity; intonation bears the functional load. Queries and aligns have L+H*LL% on the final potentially stressed syllable in the phrase. The final LL% tones are only fully realised when there is a postaccentual syllable to carry them, also as in PI. Queries (1,2) and an Align (3) are given below (X=focussed, X=accented):

1. Hai agNELlo? *Do you have 'lamb'?*

2. Hai l'arca di no'E?

Do you have Noah's ark?

When the focal accent is earlier in the phrase, a downstepped L+H* follows, as

in Palermo Italian (PI) [5], although in PI the accent is L*+H instead of L+H*.

3. Non HAI un ristorante Anima Mia?

Do you not have a restaurant A. M.?

A slight final rise was found in a few emphatic queries, transcribed L+H*LLH%. In checks of type C1, L+H* is also used, although deaccenting after the focal accent serves to distinguish these from queries.

4. Non DEVO andare verso la scritta?

I don't have to go towards the writing?

C0 incredulous checks are distinguished from C1 by means of expanded pitch range, as well as by voice quality. Non-final utterances are either L*LLH% (5) or H*HH% (6). The latter is only in non-initial and penultimate phrases.

5. Io ho un secondo albero de MEle...

I have a second apple tree...

6. SCENdi...(e siamo arrivati)

Go down...(and we're there)

Canepari [14] claims that Bari questions are falling-rising, a pattern we have not found in our spontaneous data.

Sofia Bulgarian

Queries and aligns have L*+H LL%. A question particle 'li', which is placed after the focussed word, distinguishes them from other moves. Examples of a query, 1, and an align, 2, are as follows:

1. Kragla li e? *Is it round?*

2. Narisuva li go? *Have you drawn it?*

They constitute typical 'li-question contours' as reported in [15].

C0 checks have L*+H LL% and do not have a question particle:

3. Pravo nagore otivam!?

I go up to the right!?

This is comparable with the description in [15] of emotionally coloured questions where there is a rise-fall, except when the accent is phrase-final, in which case there is a fall-rise. Our analysis of this is that the rising part is accentual and the final low is a boundary tone which, rather like BI, is not realised in the absence of a free syllable to carry it. In our examples, the initial rise begins low in the range, equivalent to level 1 or 2.

C1 checks have L+H*LL%, also with no question particle:

5. Tvoite malini sa moita mina?

Your raspberries is my mine?

Non-finality is expressed with L* HH%:

6. Marshruta ti tragva nagore...

Your route goes upwards...

Summary

Details of accent and boundary type and syntactic and morphological features of the moves across languages are given in table 1. LL% occurs in all cases not specified for boundary tones.

Table 1. Types of rise according to move

Move	SG	BI	SB
Query	L*+H Verb 1st	L+H* -	L*+H Q particle
Check C0	L* HH%	L+H* ↑range	L*+H -
Check C1	L+H* -	L+H* deaccent	L+H* -
Align	L*+H Verb 1st	L+H* -	L*+H Q particle
Conun	L+H* HL%	L* LH%	L* HH%

IMPLICATIONS

High boundaries in the majority of the world's languages may serve to determine the illocutionary force of the whole phrase, making it an information- or confirmation-seeking questions, the former corresponding to QUERIES and ALIGNS, the latter to CHECKS. It is therefore sensible for the boundary tone (H%) to be a property of the phrase, as is the case in [4]. The accentual rises shown here serve the same function. This is evidence for assigning pitch accent type at the level of the phrase too.

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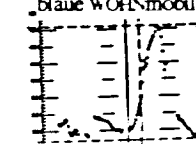
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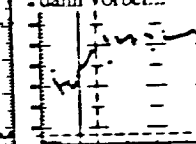
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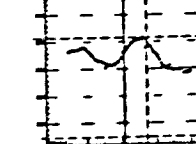
-SG 1. hast du das
blaue WOHNmobil?



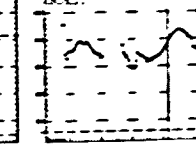
-SG 5.an der WIESE
dann vorbei...



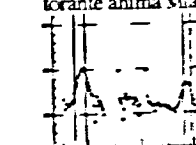
-BI 1. hai agNELlo?



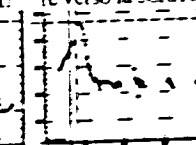
-BI 2. hai l'arca di
no'E?



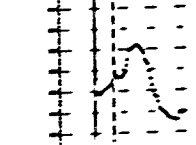
BI 3.non HAI un ris
tiorante anima Mia?



BI 4 non DEVO anda
re verso la SCRITta?



-SB 1.KRAGla li e?



-SB 6. marshruta ti
tragva naGORE...



Figure 1: F0 contours, vowel of accented syllable is between vertical cursors.