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# High Rising Terminals in Dublin: forms, functions and gender.

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## Abstract

High Rising Terminals, Uptalk, or Upspeak, are stylistic rises that can be found at the end of declarative statements. They have been studied in numerous varieties of English and in other languages too. It has been shown that these rises can take on different phonetic and phonological forms and convey various pragmatic functions depending on the varieties in which they are found. The present study provides a description of these forms and functions in Dublin (Republic of Ireland). Based on a corpus of 5 speakers from the PAC-Dublin corpus that was recorded in the Irish capital in 2018, the study shows that HRTs are mainly realized with late rises and nuclear rises and that they are different from interrogative and continuative rises, notably because they are steeper than the latter. A sociolinguistic analysis of our corpus also shows that the gender of the speakers has an influence on the occurrence of the phenomenon, which does not seem to be the case for age range. This article thus provides a multidimensional analysis of stylistic rising tones in statements in Dublin.

**Index Terms:** prosody, intonation, phonology, phonetics, HRT, varieties of English, gender.

## 1. Introduction

The present study focuses on the variety of English spoken in Dublin (now DE). DE has not been described in detail from the point of view of its intonation. [1] describes the intonation system of the Irish capital as not very different from that of the British standard. This is confirmed by a study ([2]) based on 22 read sentences (assertive declaratives, interrogatives and questioning declaratives), which shows that assertive declarative sentences are mainly realised with falls (H\*L%), and that terminal rises in this context are "possible, but not particularly common" (with only 6 % of rises found). Along the same lines, [3]'s results correlate [2]'s.

HRTs are known to be spreading around the world ([4]). Even though the phenomenon has not been much described in DE, our study confirms that it is present in this variety of English and the aim of this paper is to provide a description of HRTs in the Irish capital city. First the PAC project is introduced, along with the protocol used to record the data. Then the PAC-Dublin corpus and the method that was used for this study are detailed. We then make a brief summary of several studies on HRTs in different varieties of English before focusing on the main characteristics (mainly phonetic and pragmatic ones) of uptalk in Dublin.

## 2. Corpus and method

### 2.1. The PAC Project

The PAC (the French acronym for phonology of contemporary English [5]) project aims at describing the different varieties of English spoken around the world. The project uses comparative data to describe the systematic aspects of each variety.

The main goal of this programme is to create a database for the different varieties of English spoken around the world to enable specialists from various disciplines to study and describe them accurately. In 2021, around 130 hours of speech were recorded in the framework of the PAC project with 259 different speakers and 28 corpora from 9 different countries. The programme currently has 28 active researchers. The PAC protocol consists of the following tasks:

- Two wordlists to read (one for vowels, one for consonants);
- A text to read;
- A formal conversation between the fieldworker and the speaker, that aims at collecting metadata on the speakers. The conversation focuses on the informants' personal and professional life and their perception of their accent as well as the city they live in;
- An informal open-ended conversation between two speakers, in the absence of the fieldworker.

As part of our PhD research ([6]), we developed an extension to this protocol in order to study the prosody of English varieties more precisely, and more particularly their intonation. This PAC-Prosody extension ([7]) is composed of several tasks that aim at studying different degrees of spontaneity. The extension consists of:

- Sentences to read (most of which are given with a context);
- A picture to describe;
- A Map-Task ([8]) that should be performed by two speakers. A Map-Task is a game between two persons where one has to guide another through a map. The speakers do not know that their maps are different so as to elicit questions and spontaneous reactions.

### 2.2. The PAC-Dublin Corpus

The PAC-Dublin corpus was recorded by the first author in 2018 following the PAC-Prosody protocol. The 30 cisgender informants, 18 women and 12 men aged between 19 and 78 years old, all live in the south of Dublin and grew up in this part of the city. They were chosen from the same area in order to reduce the geographical variation which is, according to the

people that were recorded, very important in the Irish capital. The speakers belong to the middle, lower middle and upper middle classes. All participants belong to the same social circles and are all family members or close friends since they were recruited using the ‘friend of a friend’ technique ([9]).

### 2.3. Method

The study is divided into two parts: the first is based on the whole PAC-Dublin corpus and aims at describing the phonological forms of HRTs in Dublin. The second part aims at studying the phonetic forms of HRTs and at observing the differences between stylistic rises and systemic ones (in interrogatives and incomplete sentences). This part, which is more qualitative, is based on the study of the 5 speakers who produce the most HRTs in the corpus (3 women and 2 men).

Table 1: Speakers selected for the qualitative study

Speaker	Age	Gender	Job
AB1	33	F	Teacher
CF1	23	F	Artist
MH2	74	F	Retired
KB1	33	M	Teacher
TC2	35	M	Engineer

#### 2.3.1. Tasks used for the analysis

Different speech tasks were used in this study. In order to study the phonological forms of HRTs in Dublin, the sentence-reading task, the picture-description one, the Map-Task and the informal conversation were considered. For practical purposes, the qualitative study bears only on the read sentences, the picture, and about 3 minutes of the Map-Task.

The criteria for a rise to be considered an HRT and to be studied are the following:

- The rise must be located at the end of an intonation unit and must occur in a statement;
- The rise must display at least one of the pragmatic functions that are commonly associated with HRTs (see 3.1).

We did not have any preconceptions about the phonetic or phonological forms of the rises.

#### 2.3.2. Orthographic and intonative annotations

The sentences were then annotated into tone units with Audacity (version 2.4.2), then annotated with SPAAS ([10]) for the orthographic annotation and alignment, and finally with IViE ([11]) for the intonation on PRAAT [12].

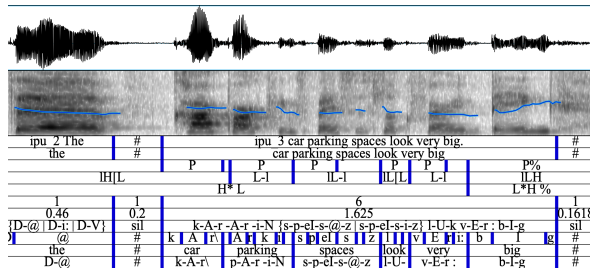


Figure 1: Sentence from the picture-description task annotated with SPPAS and IViE on PRAAT.

The picture on figure 1 shows a sentence annotated with SPPAS and IViE (Intonational Variation in English) on PRAAT. The first tier is orthographic, the second is a normalized orthographic annotation (where capital letters and punctuation are removed), the third is the prominence tier where stress and accent are annotated with the letter ‘P’, the fourth is the phonetic tier, the fifth is the phonological one, and the other tiers are the different words and phonemes aligned to the signal. One of the main reasons why IViE was chosen to annotate the PAC-Dublin corpus is that the method uses a phonetic tier that makes it possible to study precisely how phonological tones are realised. Another reason is that [13] and [14] showed that ToBI ([15]) was not adapted to non-standard varieties of English. IViE uses 10 different phonological tones that are displayed in Table 2 and given with their description.

Table 2: Phonological tones used in IViE and their description

IViE tone	Description
H*L %	Nuclear fall
H* L%	High static tone on the nucleus followed by a low tone or a fall
H*L H%	Nuclear fall followed by a rise or a high tone
L*H %	Nuclear rise
L*H H%	Nuclear rise followed by another rise or a higher tone
L*H L%	Nuclear rise followed by a fall or a low tone
H* %	High static nuclear tone
L* %	Low static nuclear tone
H* H%	High static nuclear tone followed by a higher tone
L* H%	Low static nuclear tone followed by a rise or a higher tone

## 3. HRTs: main characteristics and phonetic forms

HRTs are stylistic rises displaying different characteristics (particularly regarding their phonetic and phonological forms and their pragmatic functions) according to the variety of English in which they appear. These rises are to be distinguished from the systemic ones, which can be found in some cities of the north of the United-Kingdom and that are part of an intonation system called Urban Northern British Intonation (UNBI, see [16] and [17]). Indeed, UNB rises are an integral part of the intonation system of the varieties concerned and are the default tone for statements. In contrast, HRTs are used to add another layer of meaning to what is being said by using intonation (in a more or less intentional way). HRTs are the result of a choice from the speaker and represent a variation, whereas UNB rises are the default tone in the system.

### 3.1. Pragmatic functions

The pragmatic functions associated with HRTs are many and varied. Among the most often described are the search for confirmation ([18], [19], [4]), the will to collaborate with the interlocutor ([20], [21]), the will to make the interlocutor more important than the words ([22], [23], [24], [25], [26]), politeness ([20]), the search for a common ground ([21]) or the inclusion of new information in this common ground ([25], [27]), the will to distance oneself from what is being said or to distance oneself from a speech (in the case of reported speech, or when giving one's opinion on something for example; see

[21]) and to hold the floor ([28], [29]). These functions are numerous and often oriented towards the interactional aspects of speech. In Dublin, we were able to find several of these functions, including the search for confirmation that the interlocutor is following the conversation, that they understand what is being talked about (or that they know the subject being talked about), the desire to distance oneself from a statement to show that it is only an opinion and that the speaker is not sure that what they are saying is an absolute truth, the search for collaboration, politeness, the desire not to be assertive, the desire to share or establish a common ground, and the desire to hold the floor.

### 3.2. Phonetic and phonological forms and influence of several sociological criteria in different varieties of English

As mentioned earlier too, phonological and phonetic forms vary a lot depending on the varieties of English under study.

However, one element seems to be recurrent: the late and dramatic impressions conveyed by HRTs (see [4] and [30] for instance). Some differences in the way speakers produce these rises seem to exist, nonetheless. For [31] for instance, HRTs in the Antipodeans are characterised by rises that extend to the end of the intonation unit, while they are more commonly realized as nuclear rises followed by plateaus in the United States. Some scholars also talk about differences in the size of the rise regarding the increase of F0: in Australian English, [32] talk about an average augmentation of 40 % and [33] show that the pitch rise is more important in interrogative rises than in HRTs. The alignment can also be different: in New Zealand, [34] explain that HRTs never start on unstressed syllables except when the word is monosyllabic and [35] that HRTs always start on a stressed post-nuclear syllable when there is one, or on an unstressed post-nuclear syllable. This shows that, even in the same variety of English, there are many differences regarding HRTs, their shape(s) and functions. These differences can be explained, among other reasons, by sociological factors. Indeed, it has often been proved that HRTs are mostly used by young (see [4], [36], and [37]) women (see [38] and [20] for instance). These differences can also be explained by the context of speech that is studied.

[39] showed that, in Australia, uptalk is more frequent in explicative speech tasks or when the speakers give their opinion. [40], [41] and [42] also proved that in New-Zealand HRTs are more frequent in a narration context. Likewise, [6] showed that, in Dublin, the sentence-reading task was a bad environment for HRTs to appear, while stylistic rises were far more frequent in the picture-description task or in the Map-Task.

There are many studies on HRTs: the phenomenon appears to be very complex because its shapes and functions may vary according to the speakers, their intentions, and the context of speech.

## 4. Results

Our analysis of 84 HRTs from the Map-Task, the picture-description task and the read sentences shows that five different tones are used in Dublin for stylistic rises: L\*H % (a rise on the nuclear syllable that can sometimes be followed by a plateau), L\* H% (a low static tone on the nuclear syllable followed by a rise or a high static tone on the post-nuclear syllable(s)), L\*H H% (a rise on the nuclear syllable followed by a higher tone on the post-nuclear syllable(s)), H\* % (a high static tone on the

nucleus), and H\* H% (a high static tone on the nucleus followed by a higher tone on the post-nuclear syllables). However, it should be noted that 55,5 % (46 tokens) of all the HRTs we found are realised with the L\* H% tone, and 28,9 % (24 tokens) with L\*H %. The third most frequent tone is L\*H H% with only 7,2 % (6 tokens).

In the qualitative study, 34 HRTs were extracted, 17 of which are realised with L\* H%, 13 with L\*H %, 2 with H\* H% and only one with H\* % and L\*H H%.

Table 3: Different tones found in Dublin in the whole PAC-Dublin corpus

Tone	Shape	%
L*H %	Nuclear rise	28,9 %
L* H%	Low static tone followed by a rise or a high static tone on the post-nuclear syllables	55,5 %
L*H H%	Nuclear rise followed by a higher tone	7,2 %
H* %	High static tone	3,6 %
H* H%	High static tone followed by a higher tone	4,8 %

One of the main interests of using IViE (see 2.3.2) to annotate data is that the intonation is studied on four different levels with one tier for each: an orthographic tier, a prominence one where stress and accent are annotated, a phonological one, and a phonetic one. This last tier makes it possible for the researcher to compare different realisations of the same phonological tone in a detailed manner. Several elements could thus be observed.

### 4.1. Augmentation of the F0 curve

As mentioned in 3.2, many scholars focused on the mean augmentation of the F0 curve while studying HRTs in several varieties of English. In order to understand how HRTs in Dublin are realized, the starting and ending point of each rise of the qualitative study (which comprises five speakers, see table 1) were manually measured on PRAAT, and the difference between the two values was converted to percentages. This method was chosen so that relative differences between the speakers due to their different pitch ranges would not affect the values. The results show that the mean augmentation is 50,4 % (54,4 % for women and 31,2 % for men). The mean augmentation is 22 % in rising interrogatives and 30,5 % in continuative rises (in incomplete sentences). This shows that, in Dublin, HRTs are realised with a greater pitch rise than the interrogatives and the continuatives. These differences can easily be seen on the two figures (Figure 2 and 3) below.

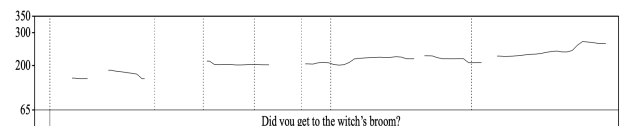


Figure 2: Interrogative rise by MH2

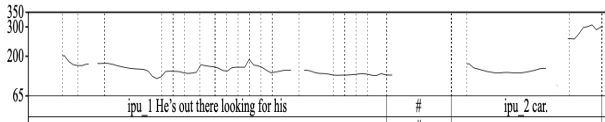


Figure 3: HRT rise by MH2 (the same speaker)

#### 4.2. Starting point of the rise

In order to get a better understanding of how HRTs are realised in the Irish capital city, we observed the starting point of the rises (in Hertz). Those values being relative to each speaker because of the speech range, for each of them, the starting point of the HRTs, of the interrogative rises, and of the continuative ones was compared. We found out that the rises in HRTs start slightly lower than in interrogatives and higher than in continuatives (see Table 4). Yet, the difference is not always striking (see AB1 for instance), and the study did not include enough occurrences to be reliable (see TC2 for whom no interrogative rises could be studied). So the starting point of the rise does not strictly allow the differentiation between stylistic and systemic rises in the present study.

Table 4: Starting points of the different types of rises in the qualitative study

	HRTs	Interrogatives	Continuatives
AB1	190,4 Hz	189 Hz	176,8 Hz
CF1	187,7 Hz	206 Hz	180,8 Hz
MH2	177,5 Hz	216 Hz	161,6 Hz
KB1	96 Hz	102,2 Hz	88,3 Hz
TC2	108 Hz	/	84,8 Hz

#### 4.3. Phonetic tones

We also studied the way in which the tones described in 3.3 were realised from a phonetic point of view. The analyses show that for the 34 HRTs selected, 13 different phonetic realisations are produced by the five speakers. The most common ones are ILH (a low pre-nuclear tone followed by a nuclear rise which corresponds to the L\*H % tone) with 12 occurrences, and ILh (a low pre-nuclear tone followed by a low static tone on the nucleus and a rise – or a high static tone- on the post-nuclear syllables, which corresponds to the L\* H% tone), with 8 occurrences. An interesting point is that ILH never occurs when there are post-nuclear syllables, and that ILh only appears when there are post-nuclear syllables. We thus conclude that the two phonological tones L\*H % and L\* H% are actually two phonetic realisations of the same tone, and that the configuration of the intonation unit is the only element that determines which of the two is going to be used by the speakers. The choice between L\*H % and L\* H% is not intentional and only depends on the structure of the sentence.

#### 4.4. Influence of sociological factors

The use of HRTs is often correlated to several sociological factors (see 3.2). In our study on DE, we retained five: the speakers' age, their gender, their social class, their feeling of belonging to Dublin and its culture ([43] show that this parameter plays a part on the segmental level), and their level of fluency in Irish. This article will only dwell on the age and gender, but more results about the other three factors are given in [6].

Our observations show that, in the qualitative study, women make more HRTs than men with 29 stylistic rises produced by the three women against only five of these rises made by the two men (the same speech tasks were used for this study for both women and men, that is to say the read sentences, the picture-description task (with a mean duration of 2,3 minutes for AB1, 2 for CF1, 1,15 for TC2, 27 seconds for MH2 and 42 seconds for KB1) and the same three minutes from the Map-Task). It should be noted that the two men that were studied here (KB1 and TC2) are the ones that made the most HRTs of all men. In order to understand whether these results apply to the rest of the PAC-Dublin corpus, we extended our study to the rest of the speakers. The 84 HRTs show that only 11 stylistic rises are pronounced by men (13,1 % of the total). Even though there are more women than men in the corpus (18 women and 13 men), the difference described here is too important to be a mere coincidence. Women produce more HRTs than men in Dublin in terms of frequency, but also in terms of quantity. Indeed, among the 18 women of the corpus, 13 made at least one HRT (72,2 % of the women, with a mean of 5,6 HRTs by speaker). Only six men made HRTs out the 12 (50 % with an average of 1,8 HRT by speaker).

If gender plays a role in the way HRTs are used in Dublin, age does not seem to be a decisive criterion. Indeed, out of 84 rises, 28 are produced by speakers under 24 years old (six different speakers), 32 by those between 24 and 35 (seven different speakers), and 24 by those who are more than 35 (six different speakers).

## 5. Conclusions

The present study made it possible to show the main characteristics of High Rising Terminals in Dublin for the first time. We displayed some of the pragmatic functions that can be associated to these stylistic rises in the Irish capital, and we examined the different phonological forms of uptalk. We showed that the two most common tones L\*H % (a nuclear rise) and L\* H% (a low static tone on the nuclear syllable followed by a high tone or a rise on the post-nuclear syllables) are two phonetic realisations of the same tone, and that the choice between the two only depends on the structure of the intonation unit and the presence -or not- of post-nuclear syllables.

We also gave details about the phonetic realization of those tones and proved that HRTs could be distinguished from interrogative rises and continuative ones because HRTs usually have a more dramatic pitch rise (with a mean 50,4 %) than the two types of systemic rises we studied (22 % for the interrogatives and 30,5 % for the continuatives).

Finally, it was shown that the speakers' gender play a role in the way they use uptalk in Dublin. Nevertheless, we are conscious that this qualitative study only focuses on five speakers, on a small sample of rises, and on a selection of speech tasks that are not always representative of the way people actually speak when they are not being recorded. However, the results displayed in this article allow us to make hypotheses that we will be able to verify or reject in further studies on the whole PAC-Dublin corpus. This study is also the first (to the best of our knowledge) on stylistic rises that focuses on Dublin English.

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