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# Phonetics or phonology? The case of falling contours in County Galway English

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## ABSTRACT

*The starting point of this research is the hypothesis that Irish might have an influence on Irish English at the intonational level. Three types of sentences (declaratives, WH-Questions and Yes-No Questions) are studied based on the PAC-Galway corpus: 33 speakers from two locations, Galway and Gaeltachtaí (Irish-speaking areas), and with a varying use of Irish. Three recurrent contours emerge of the data: H\*L % (simple fall), H\* L% (late fall) and L\* % (low static tone), all three belonging to the category of falls. However, the three contours are distributed among the three types of sentences, this finding raising the issue of the phonetic or phonological status of these contours. The variables of location and use of Irish were therefore tested, but the hypothesis of the influence of Irish on English intonation was not confirmed. Gender and age were then taken into consideration, showing that the latter parameter seems to have an influence on the realisation of the various falling patterns, and arguing for the phonetic status of these contours.*

*Key words:* Irish English / Gaeltacht / Sociolinguistics / Prosodic contours / Phonetics-Phonology interface.

## RESUME

*Le point de départ de cette recherche est l'hypothèse selon laquelle l'irlandais pourrait exercer une influence sur l'anglais d'Irlande au niveau intonatif. Trois types de phrases (déclaratives, WH-Questions et Yes-No Questions) sont étudiés sur la base du corpus PAC-Galway : 33 locuteurs provenant de deux endroits, Galway et des Gaeltachtaí (zones irlandophones), et ayant une utilisation variable de l'irlandais.*

*Trois contours récurrents émergent des données : H\*L % (chute simple), H\* L % (chute tardive) et L\* % (ton statique bas), tous trois appartenant à la catégorie des chutes. Cependant, les trois contours sont répartis parmi les trois types de phrases, ce résultat soulevant la question du statut phonétique ou phonologique de ces contours. Les variables de localisation et de la pratique de la langue irlandaise ont donc été testées, mais l'hypothèse de l'influence de l'irlandais sur l'intonation anglaise n'a pas été confirmée. Le genre et l'âge ont ensuite été pris en considération, montrant que ce dernier paramètre semble exercer une influence sur la réalisation des différents contours descendants, et plaidant pour le statut phonétique de ces contours.*

*Mots-clés :* Anglais d'Irlande / Gaeltacht / Sociolinguistique / Contours prosodiques / Interface phonétique-phonologie.

## Introduction

At the suprasegmental level, the interface between phonetics and phonology is a complex matter, especially when dealing with varieties of English. The same issues as at the segmental level arise. To give but one example, in the UNBI (Urban Northern British Intonation) varieties of English, in which the default tone for declaratives is a rise (or a rise-slump) (North of Ireland, Glasgow, Manchester, etc., see Cruttenden, 1994, among others), is the rise a phonetic variant

of the phonological fall of SBE? Should it then be coded as a fall when phonological annotation is performed? Intonation, and more generally suprasegmentals, lack documentation as far as varieties of English are concerned, and this might explain why it is so difficult to tackle such issues.

The present article is based on an investigation of Irish English intonation in County Galway English and proposes a reflexion on the phonetics / phonology interface for falling contours in this variety of Irish English. Irish English has been studied on a segmental level, and so has its relationship to Irish (Kallen, 1997; Filppula, 2002; Hickey, 2004). However, few suprasegmental studies exist, let alone on the influence of the Irish language on Irish English intonation, which is the starting point of our research.

Irish has indeed a central role to play in Ireland. With the independence in 1922, Irish underwent unprecedented changes, being proclaimed Ireland's national and first official language, before English. This new status came along with several language revival policies: Irish is as equally present as English in public places, and speaking the language is a requirement in some specific domains (administration, politics, or education: Ó Riagáin, 2008; Romaine, 2008). Irish is compulsory in every school of Ireland as well, either as the medium of education in all-immersion schools (Gaelscoileanna) or as a subject of education (3 hours a week) in all other schools of Ireland (Murtagh, 2003). This language also prevails as the first means of communication in some specific regions of Ireland, known as Gaeltachtaí, or Irish-speaking areas, mostly located on the West Coast of Ireland (Ó Giollagáin & Mac Donnacha, 2008; Smith-Christmas & Ó hÍfearnáin, 2015). Figure 1 in the section 1 shows that the largest number of Irish speakers can be found in the West of Ireland, County Galway being the most populated one with 49% of the population "indicating they could speak Irish" (Central Statistics Office, 2016<sup>1</sup>).

Our initial hypothesis is that Irish intonation might have an influence on English intonation and more strikingly so in Irish-speaking areas and/or in people speaking Irish fluently. County Galway seemed the most appropriate area to investigate this matter. Grabe & Post (2002) and Bongiorno (2021) provided a good insight on Dublin English intonation, but to the best of our knowledge, intonation in County Galway and in the West of Ireland in general has only been studied for Irish (Dalton & Ní Chasaide, 2005, 2007; Dalton, 2008).

A brief survey of previous studies on Irish and Irish English intonation is given in the first part of the present paper. The focus is on three specific types of sentences: declarative sentences, WH-questions and Yes-No questions. In the following section, the PAC-Galway corpus, collected for a larger study (Théveniaut, in progress) is presented, as well as the method used to annotate intonation. The third part of the article is dedicated to an inventory of tones found on nuclear syllables<sup>2</sup> for each type of sentences. The results of this analysis raise the issue of the phonetic or phonological status of the contours found, which is discussed in the fourth section.

## 1. Previous studies

As mentioned above, the few intonation studies available for the West of Ireland have only focused on Irish. Dalton (2008) worked on several dialects of Irish in different Gaeltachtaí, among which County Galway Irish<sup>3</sup>, in the Gaeltacht of Cois Fharraige.

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<sup>1</sup> Central Statistics Office (2016) (<https://www.cso.ie/en/releasesandpublications/ep/p-cp10esil/p10esil/ilg/>)

<sup>2</sup> The nuclear syllable is the last accented syllable of an intonation phrase, IP.

<sup>3</sup> More commonly known as (South) Connemara Irish.

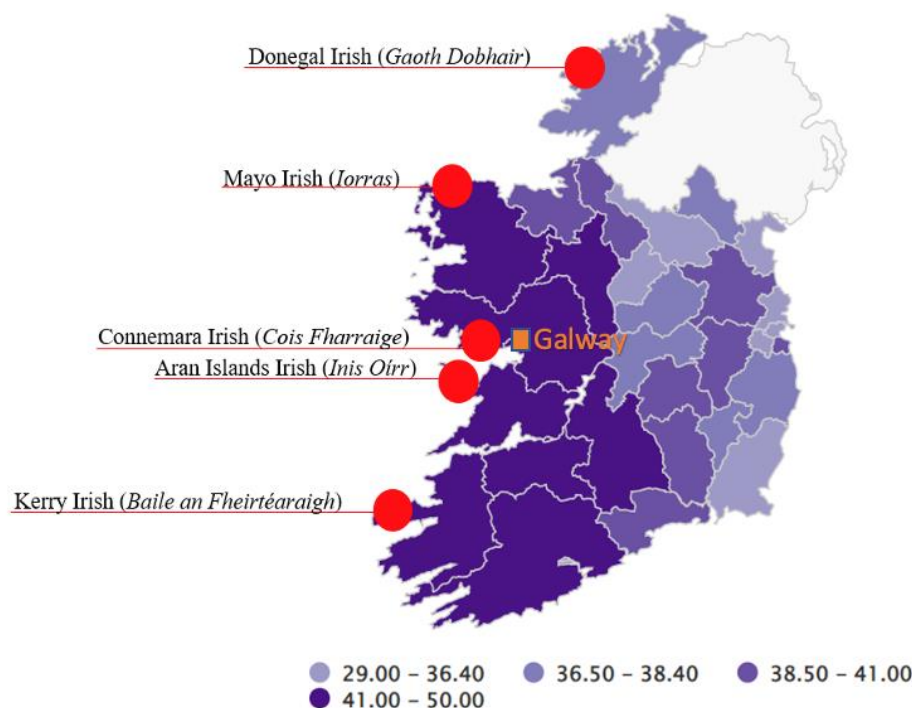


Figure 1. Percentage of Irish speakers in each county and location (adapted from Central Statistics Office, 2016)

Figure 1 illustrates the percentage of speakers in each county of the Republic of Ireland and localizes the dialects and Gaeltachtaí which Dalton (2008) investigated. She worked on a corpus of 55 context-free sentences (Corpus A: Basic Type Sentences) including statements, WH-questions and Yes-No questions in Irish, and annotated intonation with the IViE system (Grabe *et al.*, 1998, see 2.2. below). The results show that on nuclear syllables for Cois Fharráige Irish, H\*L % (simple fall) is the prominent contour across the three types of sentences, with 97% of the occurrences for both statements and WH-questions, and 83% of the occurrences in Yes-No questions.

Bongiorno (2021) studied the same types of sentences in Dublin English (she collected a PAC corpus in Dublin, including 14 context-free statements, WH-questions and Yes-No questions) and also used the IViE annotation system. Her results show a majority of L\* % (low static tones): 59% in statements and 37% in WH-questions. As for Yes-No questions, 38% are realised with the L\*H % contour (simple rise).

Out of comparison, the unmarked nuclear contour for declaratives and WH-questions in Southern British English (SBE) is the fall (Wells, 2006; Cruttenden, 2014), annotated H\*L % in IViE. Grabe & Post (2002) confirm this tendency for Cambridge English. Yes-No questions are reported to be realised with a default rising pattern in SBE (Wells, 2006; Cruttenden, 2014; Grabe & Post, 2002), although Herment *et al.* (2020) report a prevailing falling pattern for Yes-No questions in read speech (on contextualized questions).

In order to study the influence of Irish on Irish English, County Galway seemed the most appropriate area since it contains both Gaeltachtaí (Irish-speaking areas) and Galway city (where Irish is not the main means of communication), and also because the variety of Irish spoken in County Galway (Connemara Irish, Cois Fharráige, see Figure 1) has been documented.

## 2. Corpus and method

A corpus in County Galway was collected in 2021 by the first author, in the framework of the PAC programme (Phonology of Contemporary English, Durand & Przewozny, 2012), which aims at studying English varieties and their phonetic and phonological variations in relation to geographical, social and cultural aspects. For each corpus, the LVTI questionnaire (Langue, Ville, Travail, Identité<sup>4</sup>) enables researchers to build a sociolinguistic profile of the speakers (Przewozny *et al.*, 2014). For our study, the PAC-prosody extension (Bongiorno *et al.*, to appear) to the original PAC protocol was used to investigate suprasegmentals.

### 2.1. The PAC-prosody protocol

The PAC-prosody protocol proposes a continuum from controlled to spontaneous speech. The speaking tasks speakers must perform stretch from one end of the continuum to the other, starting with a reading task, where speakers must read two lists of words, 33 sentences and a text, followed by the description of a picture, a Map-Task (Anderson *et al.*, 1991) and two conversations (formal and informal, see Bongiorno *et al.*, to appear, for details). For the present study, only the read sentences were analysed, and we focused on the three types of sentences shown in Table 1. The formal conversation, based on the LVTI questionnaire, enabled us to establish the sociolinguistic profile of each speaker: in the present study, it helped us collect information about where the speakers lived and how they used Irish (see 2.3).

Declaratives (12)	A man from the garage called He proves his manliness He proves manly Here is the man	I don't like to drive Man is an animal She likes those three trees There's some manliness here	There's a man from the garage here There was a man from the garage here This toy is grey Your daughter is gorgeous
WH- Questions (4)	How will they manage to be on time? What do you think is the best thing to do? Where is your plane supposed to land? Why should I call him?		
Yes-No Questions (4)	Can he remember any other names? Do you think it's a good idea? Is that the friend she told me about? Will you need us to take your coat?		

Table 1. Sentences analysed for the present study.

### 2.2. Annotation of intonation: the IViE system

The prosodic annotation system IViE (Intonational Variation in English, Grabe *et al.*, 1998, 2000; Grabe, 2001) was used for our study of County Galway English. This system is based on the autosegmental metrical approach (AM, Pierrehumbert, 1980). The middle tone (M) is added to the high (H) and low (L) tones of AM to give more landmarks within the speaker's pitch range. Previous studies dealing with the intonation of Irish or Irish English have used IViE, so we felt it would be convenient to use it too to allow easier comparisons. The second reason why we chose this system is that it has been shown to be more efficient to compare different varieties of English (Nolan & Grabe, 1997) because it provides a phonetic annotation tier, which is then converted into a phonological tier. The first one gives indications on the phonetic contour of each prominent syllable. Accented syllables, annotated in capital letters (H, L), are distinguished from unaccented syllables, annotated (h, l). In this perspective, "HL-l" indicates a fall from the accented syllable to the end of the intonational domain; mHL-l" indicates that

<sup>4</sup> Language, City, Work, Identity

the pitch on the accented syllable is higher than that on the preceding unaccented ones. Figure 2 below is extracted from the IViE labelling guide (Grabe, 2001) and shows the possible phonetics – phonology mappings for a falling tone: several phonetic contours (H-l, mH-l or mHl-l, etc.) can correspond to a phonological fall labelled H\*L (high target on prominent syllable followed by low target in same intonational domain).

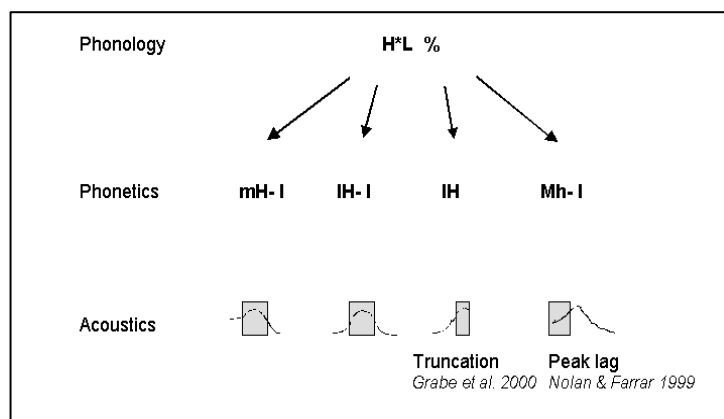


Figure 2. phonetics – phonology mappings for a falling tone in IViE (Grabe, 2001).

In IViE, 10 phonological contours were established based on several studies on non-standard varieties of English (Grabe, 2002). Each phonological contour corresponds to several possible phonetic forms (Table 2). “\*” indicates a pitch tone and “%” a boundary tone.

Possible phonetic annotations	Phonological annotations	Description of the contour
HL, HL-l, L-l, hML...	H*L %	Simple Fall
H-l, Hl-l...	H* L%	Late fall
L, Ll-l...	L* %	Low target
LH-l, LHl-l...	L*H L%	Rise (plateau)-fall
LH, LHh-h, lMH...	L*H %	Rise (plateau)
L-h, Ll-h...	L* H%	Late Rise
H, Hh-h...	H* %	High target
HL-h HLh-h...	H*L H%	Fall-rise
H-h...	H* H%	High accent followed by a rise
LH-h...	L*H H%	Double rise

Table 2. The IViE phonetic and phonological annotations (adapted from Grabe, 2001)

### 2.3. The PAC-Galway informants

County Galway English, in South Connemara, is the focus of our investigation (see Figure 1). 33 speakers, aged 21 to 76 and coming from two main regions of County Galway, were recorded.

#### 2.3.1 Location

The place where the informants live was the first recruitment criterion. 14 speakers from two Gaeltachtaí (places where Irish is the main language) were recorded (Figure 3), as well as 19 speakers living or working in Galway, where English is the main language (Figure 4).





Figure 3. The Gaeltacht of Cois Fharráige, including speakers from An Spidéal, Furbo and Barna, and the Gaeltacht of An Cheathrú Rua/Carraroe, including speakers from Lettermore and Costelloe.



Figure 4. Galway city, including speakers from the inner neighbourhoods (Eyre Square, Bohermore and Shantalla), suburban areas (Rahoon, Knocknacarra, Salthill) and surrounding areas (Corrandulla, Oranmore and Kilamena).

People from a Gaeltacht area tend to speak Irish daily. However, in Galway City, both monolinguals and bilingual speakers are to be found. This is the reason why we decided to establish a second criterion to classify our speakers according to their use of and proficiency in Irish.

### 2.3.2. Use of Irish

In the LVTI questionnaire, speakers had, among other things, to self-rate their proficiency (from no Irish to fluent) and frequency (from never to daily) in speaking Irish.

A system of points was then established as follows:

- Proficiency: from 0 to 3 for no Irish / basic Irish / intermediary / fluent.  
+0,5 was added when Irish was their first language.
- Frequency: from 0 to 3 for never / rarely / monthly /daily.

We added combinable bonuses for those speaking Irish: at work (+0,25); with friends or remote family (+0,25); at home: with some members of the family (+0,25) / with everyone (+0,5).

Combining results for each category, we obtained scores ranging from 0 to 7,5 (Table 3). A gap between 4 and 6,25 was found in our scores, so that we could easily make two groups of speakers:

- Group 1. From 0 to 4 points with a profile of speakers corresponding to

0: English = first language – no Irish/never

1: English = first language – basic Irish/never

2: English = first language – basic Irish/rarely

3: English = first language – basic Irish/monthly OR intermediary Irish/rarely

4: English = first language – intermediary/monthly

- Group 2: from 6,5 to 7,5, with a profile of speakers corresponding to

6,25: English = first language – fluent/daily (at work OR with friends, but not at home)

7: Irish = first language – fluent/daily (at work AND with friends, but not at home)

7,25: Irish = first language – fluent/daily (at work, with friends, at home, but not with everyone)

7,5: Irish = first language – fluent/daily (at work, with friends, at home with everyone).

	<b>Group 1</b> 14 speakers					<b>Group 2</b> 19 speakers			
Score	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>6,25</b>	<b>7</b>	<b>7,25</b>	<b>7,5</b>
Speakers	MS1 CG1 TB1 DK1	MC1	AH1 BM1	OR1 DC1 MF1 LB1	RB2 RC1 GC1	NOB1 EOC1 LC1 BB1	CM1 POG1 PB1 AF1	AOC1 GW1 MNG1 RB1 SG1 MMDF1	SS1 BNS1 CNE1 CNF1

*Table 3. Score for “use of Irish” of the PAC-Galway informants*

As expected, GROUP 1 and GALWAY, and GROUP 2 and GAELTACHT overlap but are not exactly the same. GROUP 1 and GALWAY contain the same speakers but one, BM1, who lives in a Gaeltacht. All the speakers of GAELTACHT are in GROUP 2 (except BM1) and GROUP 2 also includes EO1, LC1, CM1, PB1 AOC1 and AF1, who live in Galway.

### 3. Results on the three types of sentences

33 speakers (see Table 3) read 20 sentences (see Table 1), which amounts to 660 nuclear tones annotated, among which 6 had to be put aside because misread.

The overall results for each type of sentences are presented in Table 4 below. The first four tones are falling contours and the six next are rising contours, this is why they are calculated together in the very last column.



Tones	Declaratives	WH-questions	Yes-No questions	Total	
H*L %	22%	30%	19%	23%	81%
H* L%	36%	22%	17%	30%	
L* %	23%	36%	18%	24%	
L*H L%	4%	2%	2%	3%	
L*H %	5%	5%	30%	10%	19%
L* H%	4%	2%	5%	4%	
H* %	2%	2%	3%	2%	
H*L H%	3%	0%	2%	2%	
H* H%	0%	1%	4%	1%	
L*H H%	1%	0%	0%	0%	

Table 4. Overall results for the 3 types of sentences.

Out of 654 nuclear occurrences, 81% are produced with a falling contour across the three types of sentences. Three patterns prevail: H\* L% (late fall), L\* % (low static tone) and H\*L % (simple fall), representing respectively 30%, 24% and 23% of the occurrences.

In declaratives, the most common pattern appears to be H\* L%, which represents 36% of the 395 occurrences, while L\* % and H\*L % stand respectively for 23% and 22% of the occurrences.

Interestingly, and contrary to Dalton's (2008) findings on Irish, WH-questions are produced with a majority of L\* % with 36% of the 129 occurrences, but H\*L % and H\* L% represent 30% and 22% of the occurrences respectively. The predominant pattern L\* % echoes the 36,5% of L\* % found in Dublin English for WH-questions (Bongiorno, 2021).

Finally, results on Yes-No questions show a prominence of simple rises (L\*H %), covering 30% of the 130 occurrences, even if the next more frequent tones are H\*L %, L\* % and H\* L% (respectively 19%, 18% and 17% of the occurrences). This means that when added, falling patterns finally predominate in Yes-No questions.

To summarize these global results, they differ from those found in Dalton's (2008) and Bongiorno's (2021) studies, except for WH-questions, which are mostly produced with L\* %. This corroborates Bongiorno's results (2021) on Dublin English, but goes against Dalton's findings (2008) on Irish.

As mentioned above, falling contours are predominant (as expected in read speech, see Herment *et al.*, 2020), and the three main contours emerging from our data are H\* L% (late fall), L\* % (low static tone) and H\*L % (simple fall). However, they are distributed among the three sentence types. This raises the question of the phonetic or phonological status of these contours. In her study of Dublin English, Bongiorno (2021) suggests that the two rising tones L\*H % (rise) and L\* H% (late rise) might be two allotones of the simple rise, depending on the number of syllables following the nuclear syllable. In Grabe (2004), a study of several dialects of English, both L\*H % (rise) and L\* H% (late rise) are to be found, but not in the same dialects. These considerations led us to wonder if the phonological contours given in Table 2 were really phonological, and in the particular case of our data, if it was possible to consider that our recurrent patterns, H\*L % (a high target followed by a low target), H\* L% (a falling movement on the prominent syllable, followed or not by low targets), and to some extent L\* % (a low static tone on the prominent syllable, followed or not by low targets) could be allotones of one falling tone. The phonetic forms would then depend on other criteria, which are discussed in the next section.

#### 4. H\*L %, H\* L%, L\* %: phonetics or phonology?

To try and answer this question, our data was examined in more detail. We first looked at the presence or absence of each contour for every type of sentences across the two variables of location and the use of Irish, then we observed the use of each nuclear contour in two conditions: with and without post-nuclear syllables.

##### 4.1. Location and use of Irish

The variables used to recruit our informants were first tested: location (see 2.3.1) and use of Irish (see 2.3.2). Indeed, as mentioned in the introduction, our initial hypothesis was that Irish might have an influence on the intonation of Irish English.

It must be reminded that, as explained in 2.3.2, GROUP 1 only contains GALWAY speakers but one (BM1) and that all the GAELTACHT speakers except BM1 are therefore in GROUP 2, which also includes 6 speakers living in Galway.

The graphs below (Figures 5 to 7) show the distribution of the different prosodic contours for each type of sentences, with regards to location on the left and use of Irish on the right. The number of occurrences is given in percentage. General linear models were run with R studio<sup>5</sup> to check possible correlations between the variables and the contours.

##### 4.1.1. Declaratives

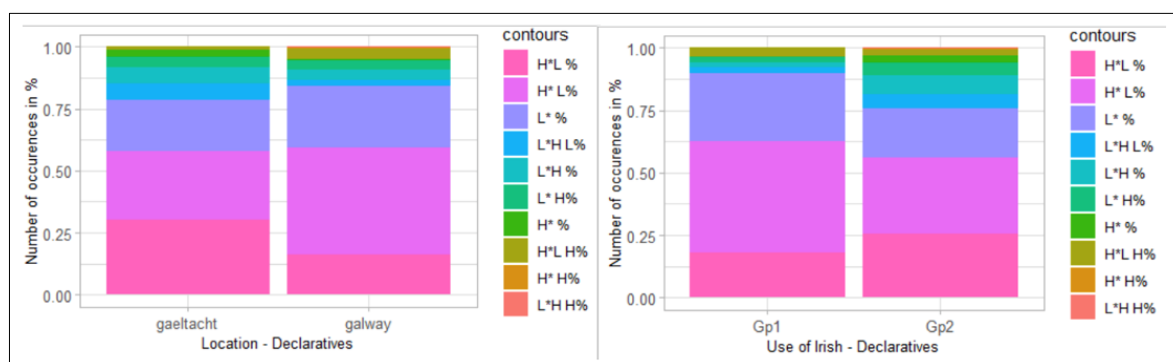


Figure 5. Distribution of tones for declaratives, with regards to location on the left and use of Irish on the right.

As far as declaratives are concerned (Figure 5), the same three recurrent patterns emerge for both variables: H\* L%, H\*L % and L\* %. However, while significant interactions on H\* L% between GROUP 1 and GALWAY are evidenced, especially on the use of H\* L% ( $p < 0,05$ ), the opposite situation is not as clearly established.

H\* L% (late fall) is by far the most frequent pattern in declaratives among GALWAY speakers (43%), compared to GAELTACHT speakers (27%) and the difference in the use of H\* L% is significant ( $p < 0,01$ ) between the two groups. Speakers from the GAELTACHT use a majority of H\*L % (fall) (30%), compared to 16% in the GALWAY group. H\*L % is significantly more present in the GAELTACHT than in GALWAY ( $p = 0,0465$ ).

When taking a closer look at the use of Irish, we notice that both groups use H\* L% as their prominent pattern, with 45% for GROUP 1 and 30% for GROUP 2. The use of H\* L% proves to be significantly more frequent among GROUP 1 than among GROUP 2 ( $p = 0,0194$ ).

What is interesting is that GALWAY speakers (and therefore GROUP 1 speakers) use L\* % as their second most frequent pattern (as a reminder, L\* % is the most frequent pattern for statements in Dublin according to Bongiorno, 2021), while L\* % only represents the third most

<sup>5</sup> Version 2022.07.2+576, R Studio, 2015

frequent pattern for GAELTACHT speakers and informants from GROUP 2, after H\*L % and H\*L % respectively.

#### 4.1.2. WH-questions

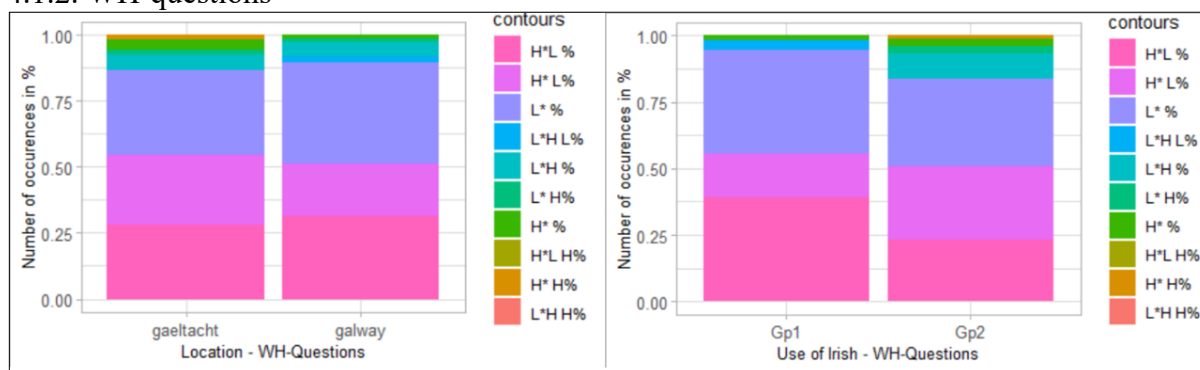


Figure 6. Distribution of tones for WH-questions, with regards to location on the left and use of Irish on the right.

In WH-questions (Figure 6), the low static tone L\* % comes out in both variables. Speakers living in the GAELTACHT realise 32% of their occurrences with L\* % (33% for GROUP 2), while those living in GALWAY use it in 38% of their occurrences (39% for GROUP 1). For GROUP 1, L\* % is equally ranked with H\*L %. No significant effect is found on WH-questions across both variables ( $p > 0,1$ ) for all three contours H\*L %, H\* L% and L\* %. The equivalence GALWAY-GROUP 1 is therefore not as clear as for statements.

#### 4.1.3. Yes-No questions

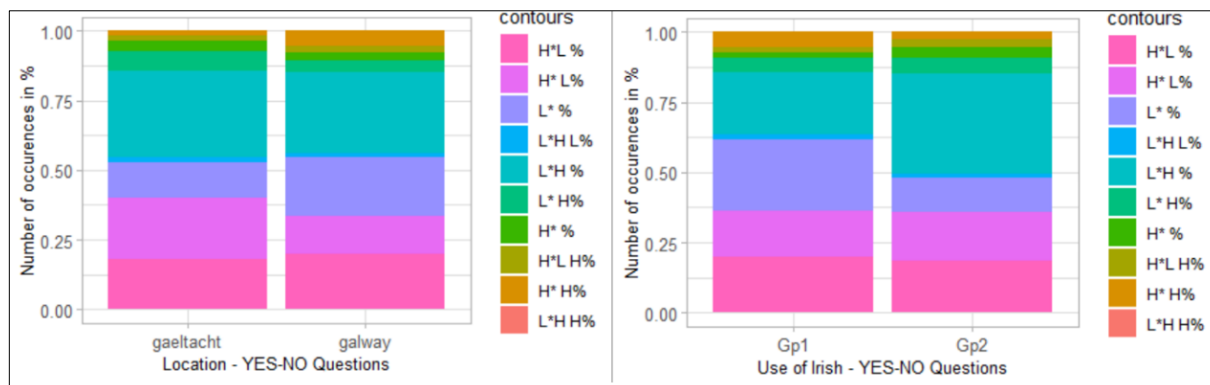


Figure 7. Distribution of tones for Yes-No questions, with regards to location on the left and use of Irish on the right.

Finally, in Yes-No questions (Figure 7), the simple rise L\*H % is privileged. Speakers from both GALWAY (29%), GAELTACHT (31%) and GROUP 2 (36%) use L\*H % as their most frequent pattern, while informants from GROUP 1 use L\* % as their prominent pattern (25%). This corresponds neither to Dublin (Bongiorno, 2021), nor to Irish (Dalton, 2008).

Otherwise, no tendency for a second pattern seems to spring out from one category to another, each of the categories having their own second pattern: GAELTACHT with H\* L%, GALWAY with L\* %, GROUP 1 with L\*H % and GROUP 2 with H\*L %. However, the second pattern for GROUP 1 (L\*H %) is the first pattern found in Dublin and the second pattern for GROUP 2 (H\*L %) is that found in Irish.

#### 4.1.4. Partial conclusion

Three obvious findings come out from our investigation on location and use of Irish.

- For Yes-No questions, GROUP 1 (weak use of Irish) differs from the other groups, with the use of a static low tone (L\* %) while the other groups use a falling tone (H\*L %). When taking a look at the second most frequent pattern, our results for GROUP 1 (weak use of Irish) and GROUP 2 (strong use of Irish) are in line with Bongiorno (2021) and Dalton (2008)'s results, partially confirming our hypothesis of the influence of Irish on Irish English intonation.
- WH-questions are produced with L\* % across the 4 groups, except in GROUP 1 again, for which H\*L % is equally distributed with L\* %. We did not expect GROUP 2 (strong use of Irish) and GAELTACHT to use L\* %, which is not reported in Dalton's (2008) study on South Connemara Irish.
- A great deal of variability emerges from our data. The three emerging falling contours –simple fall (H\*L %), late fall (H\* L%) and static low tone (L\* %)— are present across all groups and all types of sentences.

The first two points show that our hypothesis about the influence of Irish intonation on Irish English intonation is only partially confirmed. The last point goes against the argument that the three falling contours are phonological tones. Other criteria must be looked at.

#### 4.2. Number of post-nuclear syllables

Following Bongiorno (2021), who looked at the number of post-nuclear syllables to compare L\*H % and L\* H%, we analysed our data in the light of the presence or absence of post-nuclear syllables (Table 5). Post-nuclear syllables are necessarily present when H\* L% is annotated: *told me about*, *call him*, *garage here*, *manliness*, *gorgeous* (the prominent syllables are underlined). Therefore 0 occurrence of H\* L% is found without post-nuclear syllables. But what for H\*L % and L\* %?

WITH post-nuclear syll.			WITHOUT post-nuclear syll.		
tones	occ.	%	tones	occ.	%
H*L %	18	6%	H*L %	126	37%
H* L %	203	66%	H* L %	0	0%
L* %	19	6%	L* %	133	39%
Other	68	22%	Other	80	24%

Table 5. Overall number and percentage of occurrences realised with the tones, in sentences with or without post-nuclear syllables.

Table 5 shows a majority of H\* L% when post-nuclear syllables are present, but a few occurrences with post-nuclear syllables are also found with both H\*L % and L\* % and they have a distribution of tones almost identical (6% each).

Table 6 below therefore proposes a more detailed account: the number and the percentage of occurrences realised with the three falling tones H\*L %, H\* L% and L\* %, with and without post-nuclear syllables in the three types of sentences.

Types of sentences	WITH post-nuclear syll.				WITHOUT post-nuclear syll.			
	occ.	tones	occ.	%	occ.	tones	occ.	%
declaratives (391 occurrences)	225	H*L %	15	7%	166	H*L %	68	41%
		H* L %	148	66%		H* L %	0	0%
		L* %	13	6%		L* %	74	45%
		Other	48	21%		Other	24	15%
WH- questions (130 occurrences)	43	H*L %	3	7%	87	H*L %	35	39%
		H* L %	30	70%		H* L %	0	0%
		L* %	3	7%		L* %	42	48%
		Other	7	16%		Other	10	12%
Yes-No questions (129 occurrences)	41	H*L %	0	0%	86	H*L %	23	27%
		H* L %	25	61%		H* L %	0	0%
		L* %	3	7%		L* %	17	20%
		L*H %	7	17%		L*H %	39	45%
		Other	6	15%		Other	7	8%

Table 6. Number and percentage of occurrences realised with the 3 falling tones H\*L %, H\* L% and L\* %, with and without post-nuclear syllables in the three types of sentences.

For occurrences with post-nuclear syllables, there is a majority of H\* L% in all types of sentences. L\* % and H\*L % both correspond to the second most frequent patterns. H\*L % is a little more frequent than L\* % in declaratives, joint first with L\* % in WH-questions and fully absent in Yes-No questions.

For occurrences without post-nuclear syllables, L\* % is a little more frequent than H\*L % in declaratives and WH-questions. In Yes-No questions, it is the other way round (even though the simple rise L\*H % is the prevailing pattern).

Our hypothesis about the presence or absence of post-nuclear syllable is not confirmed, in neither of the three types of sentences, it is only a strong tendency. The counter-examples might be due to individual preferences, so we need to examine what happens for the different speakers.

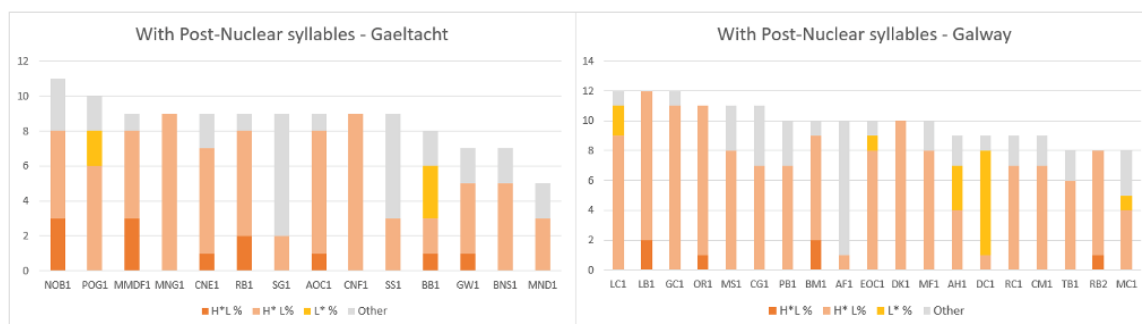


Figure 8. Distribution of tones for situations with post-nuclear syllables, with regards to speakers from the GAELTACHT on the left and speakers from GALWAY on the right.

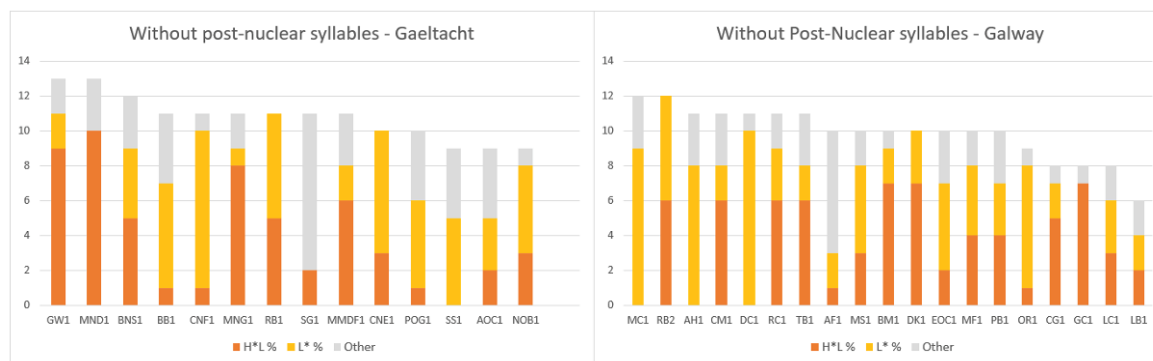


Figure 9. Distribution of tones for situations without post-nuclear syllables, with regards to speakers from the GAELTACHT on the left and speakers from GALWAY on the right.

Figure 8 describes the tendency for each speaker when post-nuclear syllables are present and figure 9 when post-nuclear syllables are absent. The results are presented for GAELTACHT and GALWAY to provide better visibility.

There is no striking difference between the two groups, in neither of the two conditions (with or without post-nuclear syllables), but inter-speaker differences are visible.

With post-nuclear syllables (figure 8), only 11 speakers (out of 33) produce H\*L % (especially in the GAELTACHT group) and only 7 produce L\* % (more so in the GALWAY group). Three speakers (MNG1, CNF1 in GAELTACHT and DK1 in GALWAY) always produce the same tone (H\* L%). DC1 (GAELTACHT) produces mainly L\* %.

Without post-nuclear syllables, L\* % is more frequent than with post-nuclear syllables. Figure 9 shows inter-speaker variability too, but also a lot of intra-speaker variability: most speakers produce the two tones H\*L % and L\* % when post-nuclear syllables are absent. Only SS1 (GAELTACHT), MC1, AH1 and DC1 (all three in GALWAY) produce no H\*L %.

If a tendency emerges for H\* L% to be realised much more frequently than the other 2 falling patterns when post-nuclear are present, the distinction between H\*L % and L\* % remains unclear. Other factors such as gender and age are worth focusing on.

### 4.3. Age and gender

Table 7 proposes the distribution of the two patterns H\*L % and L\* % according to age and gender.

	Age			Gender	
	21-35	36-50	>50	M	F
H*L %	38%	48%	63%	53%	46%
L* %	62%	52%	37%	47%	54%

Table 7. Distribution of H\*L % and L\* % with regards to age and gender

The figures for gender intersect in the table, females preferring L\* % and males H\*L %, but the difference is not important. For age, the results are much more striking: the younger the informants, the more they tend to produce L\* %, and conversely, the older speakers get, the more they prefer H\*L %.

Significant effects come out when general linear tests are run on the three types of sentences across the variables age and gender, but mainly only on declaratives (perhaps because the corpus contains more declaratives than WH- and Yes-No questions). Among male speakers, the youngest group use fewer H\*L % compared to males aged between 36-50 (p=0,0461) and over 50 (p=0,0442). For the L\* % contour, among female speakers, the youngest group use more L\* % than females aged between 36-50 (p=0,0119) and over 50 (p=0,0186). Finally,

males aged over 50 realise significantly fewer L\* % than males aged between 21-35 (p=0,006) and to a certain extent than those aged between 36-50 (p=0,009).

Only one significant effect is found for WH-questions, with more H\*L % for males aged between 36-50 than among the youngest group of speakers (p=0,0461).

It can be concluded from these results that the difference between H\*L % and L\* % is linked to age, and this would argue for the phonetic status of these two contours.

## Conclusion

An analysis of the nuclear contours on three types of sentences (declaratives, WH-questions and Yes-No questions) by speakers of County Galway was performed, using IViE to annotate intonation. In this annotation system, the issue of the phonetics-phonology mapping is central. The results of our analysis showed that three falling contours predominate, H\*L % (simple fall), H\* L% (late fall) and L\* % (static low tone), but that they are distributed across the three sentence types. The question of the phonetic or phonological status of those three falling patterns was then raised and discussed.

The variables of location and use of Irish were examined, to test our initial hypothesis that Irish might have an influence on Irish English intonation. This was only partially confirmed.

The number of post-nuclear syllables was then taken into consideration, to test the hypothesis that when post-nuclear syllables are present, the H\* L% contour is realised, while H\*L % is chosen when post-nuclear syllables are absent. Again, this hypothesis was only partially confirmed. There is a strong trend towards these strategies, but counter-examples are found.

Finally, gender and age were considered. The latter parameter revealed significant for the choice between H\*L % and L\* %, younger speakers preferring L\* %.

Our hypotheses are only partially confirmed and a lot of variation is found in our data, however three strong tendencies spring up:

- H\* L% is preferred when post-nuclear syllables are present.
- Younger speakers tend to produce more L\* % patterns.
- Speakers living in Galway and with a weak use of Irish also tend to produce more L\* %.

This corroborates Bongiorno's (2021) findings on Dublin, where L\* % predominates. This tone seems to be much more frequent among Irish monolingual speakers. Since it seems to be also associated with young speakers and speakers living in cities, could it be considered as a feature of urban Irish English? And since people living in Gaeltachtaí and older speakers take on this tone as well at times, could it be considered as spreading among the Irish population and becoming a feature of Irish English more generally?

As far as the phonetic /phonological status of the three falling contours under scrutiny is concerned, the arguments highlighted in the present study seem to argue for their phonetic status. However, as already mentioned, the phonetics/phonology interface is a very complex matter, and further investigation would be necessary. It could be interesting to run perception tests to check pragmatic meanings and to confirm the influence of age, among other criteria.

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