The Corpus of Irish English Speech (IES)

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Abstract

The past years have witnessed the collection of various corpora for the study of Irish English (IE). Most have been developed and driven by diverse research foci with a specific aim in mind, however, at present data sources consist of unavailable and/or outdated audio files of English spoken primarily in Dublin and Belfast. Additionally, a very limited number of investigations on the prosodic features of IE varieties have been conducted to date. As a result, a comprehensive overview of IE prosodic diversity is still missing and existing speech corpora do not allow for the analysis of intonation patterns, which requires more controlled, purpose-built data sets. A prosodic corpus devoted to the analysis of IE varieties needs to be incorporated into the research agenda. This contribution presents the corpus of Irish English Speech (IES) with the following objectives: to collect recordings of spoken IE across present-day Ireland under a unified protocol in order to guarantee comparisons among different datasets; to obtain an initial phonological inventory of each variety examined; to compare the phonological systems of diverse IE varieties; and to provide researchers with accessible and open data sources. The core of the corpus has been gathered in accordance with the guidelines of the *Interactive Atlas of Romance Intonation* project (Prieto, Borràs-Comes & Roseano, 2011-2014) via a questionnaire based on the Discourse Completion Task, which was translated and readapted for Irish English speakers, and a Map Dialogue Task designed to obtain spontaneous speech productions. This method has yielded the collection of a wide range of intonation patterns concerning different types of context-specific utterances, such as statements, questions, imperatives and vocatives. After an overview of the segmental phonology of IE, previous studies on the prosodic features of IE varieties and the speech corpora of IE will be examined with the purpose of identifying the gaps in existing literature, which will then be followed by a detailed outline of the development of the corpus of IES. This contribution will provide an illustrative example for fully exploiting the potential of the IES database and call for further in-depth investigations on IE prosody.

Key words: corpus linguistics, intonation, Irish-English varieties, prosody, speech corpus.

1. Introduction

This contribution presents the corpus of Irish English Speech (IES) and has various aims: (1) collecting recordings of spoken Irish English across present-day Ireland with a unified protocol in order to guarantee comparisons among different datasets; (2) obtaining an initial phonological inventory of each variety examined in terms of intonation patterns; (3) comparing the

phonological systems of diverse Irish English varieties which are still unexplored; and (4) providing researchers with available and open data sources.

Research on Irish English (hereafter, IE) has recently begun to examine the phonology of IE and shed light on new tendencies across Ireland. For instance, Hickey (2004) describes northern features occurring in the transition zone from south to north, from Dundalk down to Waterford, in the South, West and Midlands of Ireland. Moreover, while investigations examining socioprosodic variation are scarce (Bessell & Mulhall, 2014; Nicora & Meluzzi 2022), a small number of studies consider social age factor, sociolinguistic and sociophonetic aspects of variation (Milroy & Milroy, 1978; Collins, 1997; McCafferty, 2001, 2007; Peters, 2012, 2016). Albeit indirectly, the corpus presented here contributes to this field of research by readapting the lexical sets for vowel values proposed by Wells (1982) and for consonants by Hickey (2007) in the creation of a Map Dialogue Task to collect data on IE speech productions, which hopes to be useful for future investigations from different perspectives.

As far as studies concentrating on prosodic features of IE spoken in Ireland are concerned, especially in terms of intonation patterns, a very limited number of investigations have been carried out to date (Dorn, 2006; Kalaldeh, 2009; Kalaldeh et al., 2009; Kalaldeh, 2011), and the most significant research is the *Intonational variation in English* (IViE) project, which mainly focused on native accent varieties found in the UK and Ireland (Grabe et al., 2005). These studies outline intonation patterns of some IE varieties within the theoretical framework of Autosegmental-Metrical (AM) theory (Pierrehumbert, 1980; Ladd, 1996) and are based on the Tone and Break Indices (ToBI) annotation system (Silverman et al., 1992; Beckman & Ayers, 1994-97).

On the other hand, the past years have witnessed the collection of various speech corpora for the study of IE, available on *The Irish English Resource Centre* website, which is devoted to all matters pertaining to academic research into IE. By far the most recent data sources for IE

phonology containing audio files of IE are enclosed in two speech corpora. The *Sound Atlas of Irish English* (Hickey, 2004) contains over 1,500 recordings made between the 1990s and 2002 in urban and rural settings and includes a large number of speakers from Belfast and Dublin. The second source, the *SPICE-Ireland* corpus (Kirk & Kallen, 2012), constitutes a pragmatically annotated version of part of *the International Corpus of English: Ireland Component (ICE-Ireland),* which was in turn designed to test the hypothesis that even standard English shows significant linguistic differences across the political border in Ireland. Both speech corpora were developed with a very specific aim in mind, and as a result the collected data do not allow for an investigation of intonation patterns, which usually requires more controlled, purpose-built data sets.

The paucity of studies conducted so far, along with outdated data sources geared towards specific prosodic outcomes hindered researchers from providing a comprehensive overview of current prosodic diversity in present-day Ireland. To fill this research gap and gain a better knowledge of IE prosody, a prosodic corpus devoted to the analysis of IE varieties has yet to be examined and needs to be incorporated into the research agenda.

After an overview of the segmental phonology of IE, which has been of utmost importance in creating the Map Dialogue Task used for data collection (section 2), the state-of-the-art of IE Prosody (section 3) will be outlined with the purpose of identifying the gaps in existing literature. This section includes the theoretical framework and studies exploring the prosodic features of IE varieties, as well as the spoken corpora of IE collected up to the present time. Then, special attention will be given to the development of the corpus of IES, including the project's aims, participants, the creation of the survey and the methodology of data collection

(section 4). The conclusions show how this corpus complements existing speech corpora and the possible methods of analysis that could be utilised to fully exploit its potential (section 5).[1]

2. Segmental Phonology of Irish English

The supraregionalisation phenomenon in the Republic of Ireland does not necessarily entail the full adoption of standard English pronunciation, and in fact the maintenance of differential linguistic features can be equally viewed as a goal vis-à-vis extranational varieties of English. As Hickey (2007) claimed this view would see the supraregional variety of the south of Ireland as the standard of the Republic of Ireland. Native speakers of IE know which features are part of the supraregional variety and which are not. For instance, such speakers are aware that *t*-lenition, as in *city* ['siti] is permissible in the supraregional variety, but that the extension of lenition to a glottal stop ['siʔi] is not (Hickey, 2007: 312).

In his volume *Accents of English* (1982), Wells presented a lexical set, that is, a group of words all of which have the same pronunciation for a certain sound in a given variety. His intention was to look at the vowel values and their realisation in accents of English throughout the world. Later, Hickey (2007) claimed that the choice of words was not sufficient to deal with the phonetic distinctions present outside the Republic of Ireland and in turn proposed a consonantal lexical set to examine the variation across forms of English (see Table 5.6 Lexical sets of supraregional Irish English, Hickey, 2007). The lexical sets necessary for a comprehensive treatment of IE presented by Hickey (2007, p. 327) include diverse vowel and consonantal values. Some examples for both vowels and consonants were reported as follows:

[1] The idea of the author to design and develop the corpus of IES stems from their doctoral thesis (Nicora, 2020, unpublished) and other publications in which an in-depth investigation on the prosodic features of IE spoken in Galway (GW) was deemed necessary to evaluate the effectiveness of explicit prosodic-pragmatic training on speech productions of Galwegian learners of Italian as a foreign language (Nicora et al., 2019; Nicora et al., 2018; Gili Fivela & Nicora, 2018).

1. Vowels

- FOOT /ʊ/ Basically, the same as present-day southern British English; a quite forward realisation is found in Dublin English.

- MOUTH /aʊ/ In eastern dialects and in Dublin there is a front starting point for the vowel in this set, at least /æ/, colloquially /ɛ/. Although traditionally IE normally has a low starting point [aʊ], a very quick raised starting point, especially in females, was found across newer varieties of Dublin English.

- GOAT /oʊ/ In traditional vernacular and rural varieties outside Dublin, a long monophthong is found [go:t]. In mainstream IE there is slight diphthongisation with a higher end point, i.e. [goʊt]. The realisation with a centralised starting point [əʊ] is a prominent feature of advanced Dublin English. In local Dublin English, a diphthong with a low starting point is typical: [gʌot].

- HAPPY /-i/ A tense vowel in this position is typical of IE. However, it changes in Ulster Scots.

2. Consonants

- THIN /t̪ (θ)/ A dental stop is found in both mainstream IE and advanced Dublin English, but an alveolar stop is typical of local Dublin English.

- THIS / d̪ (ð)/, a dental stop is characteristic of supraregional varieties. Local Dublin English shows an alveolar stop. The shift to [v] (or to [f] in the THIN lexical set) is unknown in Ireland.

- TWO /t-/ In the initial position /t/ is not lenited, so that one has a normal stop. In advanced Dublin English there is a tendency for very slight affrication, especially in young females.

- RAIL /-l/ A velarised [ɬ] was previously found in local Dublin English and now is spreading into the speech of young people throughout the Republic of Ireland. Non-local varieties and supraregional IE had an alveolar [l] in all positions.

- LOOK /l-/ The lateral in the word-initial position is alveolar, irrespective of the syllable-final realisation. In contact IE a velarise [ɬ] may occur. (Hickey, 2005, p. 77).

- RUN /r-/ In the word-initial position /r/ is realised as an alveolar continuant [ɹ].
- SORE /-r/ In advanced Dublin English a retroflex is used [ɻ]. Mainstream varieties still use a non-retroflex (as in the word-initial position). With the spread of retroflexion, the next generations will use a retroflex in mainstream varieties, unless the current trend is reversed.
- TALKIN /- ŋ/ The alveolarization of /ŋ/ is not as widespread in southern IE as in the north.

The lexical sets for supraregional Irish English necessary for a comprehensive treatment of IE was only partially used in the creation of the Map Dialogue Task for the development of the prosodic corpus (section 4.2). Notwithstanding, IE spontaneous speech productions can be analysed not only from a prosodic or interactional point of view, but also from a phonetic and sociophonetic perspective, thereby corroborating previous findings or shedding light on new tendencies among IE speakers.

Furthermore, an increasing number of contributions on IE have focused on the phonological features and prominent sociolinguistic patterns of variation. There has been an emphasis on the phonology of IE on English in (London)Derry and Northern English (McCafferty, 2001, 2007); on Dublin English (Hickey, 2005); and on Southern IE (Hickey, 2007b). Looking more closely at sociolinguistic and sociophonetic variation, Milroy and Milroy (1978) employed a social network-based approach to investigate patterns of variation in three working class communities in Belfast. Similarly, Collins (1997) carried out a network study in the Claddagh community of south-west Galway city to examine the tendency towards diphthongisation of /o/, and Fieß (2000) performed a non-network based study examining the impact of the social age factor on variation in rural east Galway. More recently, Peters (2016) examined individual patterns of variation in the IE spoken in the Bóthar Mór district of Galway city. Data collection involved four female speakers belonging to different age groups, and the results from the data analysis of two vowel variables and one consonant variable reveals that patterns of variation are conditioned by the social age factor and that intergenerational-based

change appears to be in progress. Although some of these studies are outdated, they offer insights into linguistic variation within the constraints of social factors including age, gender, and the nature of the social network.

Additionally, there is a lack of studies dealing with socioprosodic variation in IE. To the best knowledge of the author the first attempt in this direction was a perceptual experiment carried out by Bessel and Mulhall (2014), who examined the perceptions of IE young adult listeners from County Cork about origin, occupation and socio-economic class based on speech samples. Findings suggested that IE speech varies depending on location and gender and that perceptions are closely intertwined with the type of phonetic features. Similarly, a recent investigation on the perceptions of IE listeners on IE spoken in Galway (GW), Letterkenny (LK) and West Cork (WCK), based on speech samples from all varieties mentioned, revealed that: GW and WCK accents are usually correctly identified on the basis of the mouth diphthong, whereas LK is often mistaken with that of Derry; and the LK accent has undergone a shift towards Ulster dialects, thus correlating with the socio-economic factors of the last 20 years (Nicora & Meluzzi, 2022).

3. Prosody of Irish English

Ireland is divided linguistically as well as politically into two broad parts: the north and the south. The north, comprising the six counties within the state of Northern Ireland and a large part of county of Donegal (Donegal is also part of the Republic of Ireland), has a complex linguistic landscape with two major historical varieties: Ulster Scots (Donegal, Derry, Antrim and Down counties), which refers to the speech from the original Lowland Scots settlers, and Mid-Ulster English (Harris, 1984), from descendants of English settlers to central parts of Ulster (Hickey, 2004). As Amador-Moreno explained:

> This long-established contact between Ulster and Scotland, and the insertion of new forms of English brought about with the plantations, is what gives grounds for the present-day methodological differentiation between Southern Irish English (SIrE) and Northern Irish English (NIrE) (2010, p. 21).

A delimited boundary zone can be drawn roughly from Sligo to Dundalk on the east coast below the border with Northern Ireland (Ó Baoill, 1991). North of this line the accents are Ulster-like, and south of this dividing line the southern values begin to appear. The border counties such as Monaghan, Cavan or Louth are characterised by mixed accents (northern and southern).

Studies on the prosodic features of IE varieties spoken in Ireland conducted to date have been scarce (Grabe et al., 2004; Kalaldeh, 2009, 2011; Kalaldeh et al., 2009). Furthermore, most of such studies have been conducted following the Autosegmental-Metrical (AM) theory (Pierrehumbert, 1980; Ladd, 1996) and based on the Tone and Break Indices (ToBI) annotation system (Silverman et al., 1992; Beckman & Ayers, 1994-1997).

In what follows, I will first introduce the theoretical framework to the paper and I will then present the literature review. The design of the corpus of Irish English Speech (IES) aims to include future investigations based on this type of intonational analysis, which may allow the researchers to compare new results with those provided by previous research in existing literature. In any case, the data collected may be exploited through other methods of analysis and for diverse purposes, which will be illustrated further on.

3.1 Theoretical Framework

The majority of studies conducted on IE prosody draws on the AM theory, stemming from a tone-sequence model for English developed by Janet Pierrehumbert in 1980. The term *Autosegmental-Metrical* (coined by Ladd in 1996) reflects the connection between the two subsystems of a phonological analysis of intonation: an autosegmental tier representing the

intonation's melodic part, and the metrical structure representing prominence and phrasing. According to this, the AM model is a phonological theory of intonational structure that connects stress and phrasing with intonation, and relies on an abstract phonological representation coupled with pitch tracks. In her works, Pierrehumbert (1980; Pierrehumbert & Beckman, 1988), the author analyses the melodic contour as the product of a sequence of pitch accents and edge tones, interpolated by connection lines that may give rise to the intonation contour.

This model assumes that the surface realisation of pitch contours derives from sequences of high (H) and low (L) tones. The pitch accents (PA) are attached to metrically strong syllables and may correspond either to a single H or L tone (monotonal), in which case the tone is associated with the syllable and marked by an asterisk * (i.e., H* or L*). The PA may also correspond to a combination of two tones (bitonal), which are separated by a '+' sign; the tone associated with the syllable is called the *starred tone*, whereas the non-starred tone is called the *leading tone* if it precedes the starred tone (i.e., L+H*), or the *trailing tone* if it follows it (i.e., L*+H). This model also includes edge tones, which may be either phrase accents or boundary tones. Phrase accents (marked by a hyphen "L-" or "H-") are placed between the last pitch accent and the end of the prosodic constituent. Boundary tones correspond to terminal tonal specifications and are marked by a percentage sign (%). The most perceptually salient pitch accent, typically the last one in an Intonational Phrase (IP), is called the *nuclear pitch accent*. Therefore, the combination of a nuclear pitch accent and its subsequent boundary tone is known as a *nuclear combination* or *configuration* (i.e., L*+H L% or H*+L LH%).

The Tone and Break Indices (ToBI) prosodic transcription system, based on the AM theory, was developed for the prosody of American English corpora for use in speech synthesis. Thereafter, this system was adapted to obtain an inventory of pitch accents and edge tones for many languages and/or varieties (Frota & Prieto, 2015). According to the guidelines for the ToBI labelling (Beckman & Hirschberg, 1994; Beckman & Ayers, 1997), the system consists of

a recording of speech, along with an associated spectrogram and pitch track that allow for visualisation of the fundamental frequency (f0) contour and placement of a symbolic label arranged in four parallel tiers for speech/tonal events.

3.2 Intonation Patterns in Irish English

In our view, the most comprehensive research on English intonational variation that includes IE regional varieties spoken in Dublin and Belfast is the *Intonational variation in English* (IViE) project (Grabe et al., 2005). Analysed within the AM framework, the labelling system used was indeed the IViE system (Grabe et al., 1998), a variant of the ToBI. The IViE transcription system includes three tiers closely related to prosody: one tier consists of labels for rhythm, another labels the pitch accents (PAs) associated with the prominent syllable in an utterance, and the last provides a phonological representation of PAs. The tone inventory of the phonological tier is based on the phonological accounts of Southern Standard British English and on autosegmental models of intonation in terms of using primitives H and L. The following labels are illustrated below (Table 1):

Table 1

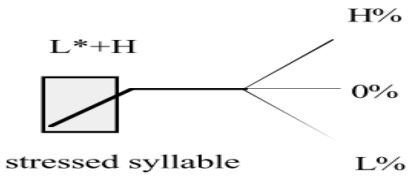
***IViE Transcription of Inventory Tones* (Grabe et al., 1998)**

Tone Labels		Tone Modifiers	
H*	High pitch target	^	Upstep of a tone
H*L	High pitch target followed by low target	!	Downstep of a tone
H*LH	Fall rise	_	Precede tone and indicated displacement of a tone to the right, e.g. H*_L
L*	Low target		
L*H	Low target followed by high target	+	Connects tones, e.g. H*+L
L*HL	Rise fall		

In addition to the boundary tones H% and L% used in the ToBI system, the IViE system presents the 0 (zero)% boundary tones (i.e., the pitch on the last syllable does not change from the immediately preceding tone) (Figure 1).

Figure 1

***IViE Transcription of Boundary Tones* (Grabe et al., 1998)**



The IViE project included nine urban centres in the UK and Ireland: London, Cambridge, Bradford, Leeds, Newcastle, Liverpool, Dublin and Belfast. Results show that Dublin IE is characterised by the H*L% nuclear combination as the most commonly exhibited accent for statements, wh- and yes/no questions, while presenting an L*H% label for declarative questions. The Belfast IE phonological inventory appears to be strikingly different from other Southern British English varieties (Grabe, 2004) and from Dublin IE, due to the high percentage of a L*H% nuclear combination in all types of utterances (see Table 2) (as previously predicted by Rahilly, 1991 and Cruttenden, 1995 for declaratives).

Table 2

***Intonation Patterns in Declaratives, Wh-questions, Yes/No Questions and Declaratives Questions in Two IE Varieties: Dublin IE and Belfast IE* (Grabe, 2004)**

	Nuclear Accent	DEC	WH-Q	Y/N-Q	DEC-Q
Belfast	H*L%	4.2	5.6	0	0
	H*L H%	0	0	0	0
	H* H%	0	0	0	0
	H* %	0	0	0	0
	L*H%	83.3	94.4	94.4	83.3
	L*H H%	0	0	5.6	16.7
	L*H L%	12.5	0	0	0
Dublin	H*L %	94	77.8	68.4	27.8
	H*L H%	0	5.6	15.8	0
	H* H%	0	0	0	0
	H*%	0	0	0	0
	L*H %	6	16.7	15.8	50.0
	L*H H%	0	0	0	5.6
	L*H L%	0	0	0	22.2

A noteworthy research project on Drogheda IE (Kalaldeh, 2011) described segmental and suprasegmental features with the aim of delimiting Drogheda to either southern or northern varieties, due to its strategic location at the furthest Northeast end of the boundary zone separating northern IE and southern IE. Preliminary results on intonational differences between statements and questions (declaratives, wh- and yes/no questions) in Drogheda IE have proven that final rises are an indicator of interrogative status. The incidence of nuclear rises is significantly lower in declarative questions compared to other English varieties (Grabe, 2004), suggesting a certain similarity to Dublin IE. Moreover, evidence has revealed a low incidence of final risings in question intonation and more particularly in declarative questions, where a higher register level is used as an intonational marker. At the same time, nuclear accents appear to occur with higher peaks, especially in yes/no and declarative questions. Table 3 below reports nuclear combinations found in Drogheda IE, and Figure 2 illustrates the related intonational cues (Kalaldeh, 2009).

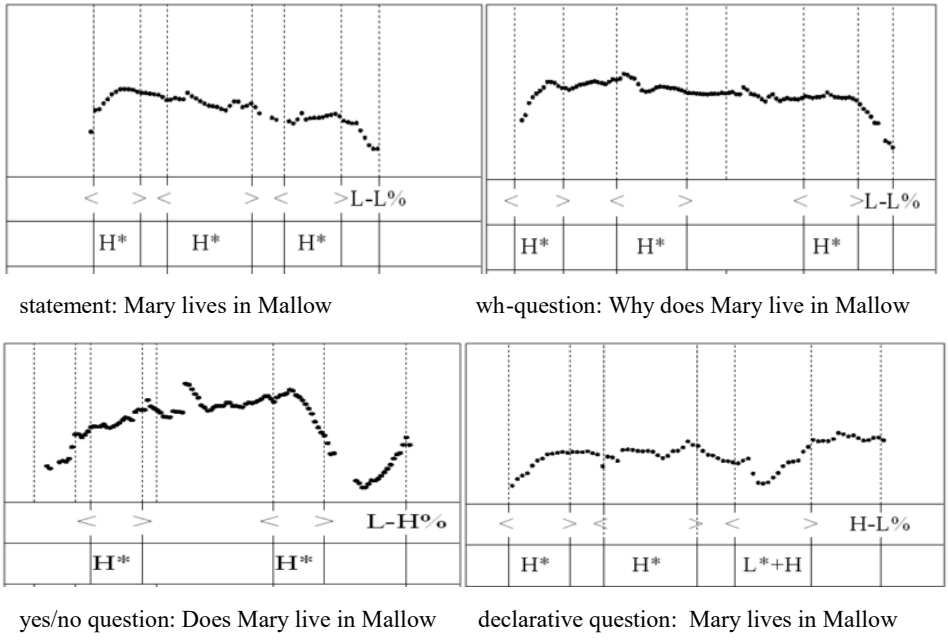
Table 3

Intonation Patterns of Drogheda Irish English **(Kalaldeh, 2009)**

Drogheda English	Pre-nuclear	Nuclear	Boundary tones
Statements	H*	H*	L-L%
Wh-questions	H*	H*	L-L% (If a rise, L-H%)
Yes/no questions	H*	H*	L-H%
Declarative questions	H*	L*+H	H-L%

Figure 2

Prototypical Intonational Patterns of IE Drogheda in Statements and Questions **(Kalaldeh, 2009)**



statement: Mary lives in Mallow

wh-question: Why does Mary live in Mallow

yes/no question: Does Mary live in Mallow

declarative question: Mary lives in Mallow

As for prosodic differences across IE varieties, a pilot project on tonal alignment (investigated as a function of the number of unstressed syllables before pre-nuclear and after nuclear accents) across three IE regional varieties revealed the following concerning prosodic differences according to Kalaldeh et al. (2009): Dublin IE appears to have a fixed peak alignment of H* (in H*+L nuclear combination) at the vowel consonant (VC) boundary of the

prominent syllable; Drogheda IE also shows a fixed peak of H* aligned near the end of the vowel within the nuclear syllable; however, in Donegal IE (northern IE variety), the location of the valley L* (in L*+H nuclear combination) is fixed and usually falls within the vowel of the prominent syllable. Findings are preliminary and provide some evidence of prosodic differences across three IE varieties.

3.3 Irish English Speech Corpora

The *Irish English Resource Centre* is a website[2] designed by Professor Raymond Hickey, who updates the site continuously with new information about the current state of research on Irish English, including details of various corpora, data collections and comprehensive bibliographical information. This website is a useful tool, as it presents a complete list of the surveys carried out on Irish English up to the present day.

As far as data sources for Irish English phonology in Hickey's website are concerned, there are two incomplete surveys of English in Ireland. The first linguistic survey of Irish English was initiated by Henry and published in 1958, even though it never came to fruition. The second survey called *The Tape-Recorded Survey of Hiberno-English Speech* (TRS; Adams et al., 1985), consists of 374 questions and free speech samples collected in the four major dialect areas of Ireland: Connaught, Leinster, Munster (the Cork area in particular) and especially Ulster. The project took place in the 1970s and was designed in an attempt to gather a few local words and pursue research on the phonology of Irish English. Informants of three age groups (9-12, 35-45 and 65-75 years) were tested for their pronunciation of specific key words. The collected data were then digitalised, and two CDs were created containing approximately 22 hours of recordings.

[2] The website is available online at the following address http://www.uni-due.de/IERC . Accessed in March 2022.

More recently, *A Sound Atlas of Irish English* by Raymond Hickey (2004) offers a full overview of Irish English. The data for the Atlas were gathered by the author himself, who carried out linguistic field research, travelling throughout the entire Republic of Ireland and Northern Ireland between the mid 1990s and 2002. The data collection consists of over 1,500 recordings comprising speakers from both genders and ages from 11 to over 80. The project had a dual purpose as a useful research tool for scholars interested in Irish English and as a reliable source of up-to-date information on the different kinds of English spoken in Ireland, which could also be used for comparative work with varieties of English all over the world.

In relation to the latter, it is worth mentioning the International Corpus of English (ICE)[3], a project initiated in 1988 and coordinated until 1996 by Sidney Greenbaum (Greenbaum & Nelson, 1996). It included spoken and written samples of English from countries where English is the first language (such as Canada and Australia) or an additional official language (e.g., India and Nigeria). The ICE protocols provided an internationally valid methodology for defining speakers of Standard English and for collecting as well as analysing the gathered data. ICE-Ireland is the Irish component of ICE and is an important research tool, as it offers not only 300 transcribed spoken texts in fifteen different discourse situations (from casual face-to-face and telephone conversations to broadcast discussions and business transactions), but also 200 written texts from published and unpublished domains. Based on the corpus of the ICE-Ireland, the most relevant corpus of Irish English speech samples in line with the aims of the present contribution is the *Systems of Pragmatic Annotation in the Spoken Component of ICE-Ireland* (SPICE-Ireland Corpus, 2012), which provides annotations for the utterance speech-act function, utterance tags, discourse markers and prosody (pitch movements). However, as specified in the guidelines of the SPICE corpus, phonology was not included in the scope of the original ICE project, which is instead focused on grammar and lexis. As the researchers point out:

[3] The website is available at http://ice-corpora.net/ice/ Accessed in March 2022.

> The inclusion of phonetics and phonology into ICE would have made it a very different corpus from the one intended in the original design. Nevertheless, in the course of transcribing ICE-Ireland, it became clear to us that certain prosodic features were often decisive in making transcriptions. […] that prosody within Irish standard English was not uniform […]. Thus, it was decided to incorporate elements of prosody into the annotation system (Kirk & Kallen, 2012, p. 35).

The system used in SPICE is based on a concept of the ToBI system, although an analysis of the breaks between units (such as a clitic and its host, or single words and sentences) was excluded. Its objective was to reflect the inter-relationships of prosody, syntax and pragmatics, rather than achieving a specifically phonological analysis. Broadcast discussions, interviews, news, talks, business transactions, classroom discussions, demonstrations, face-to-face and phone conversations, spontaneous commentaries, legal cross-examinations and presentations and parliamentary debates were included. Beyond the fact that a prosodic analysis had not been considered prior to the collection of data, at present more than twenty years have passed since the development of the SPICE corpus, which does not include prosodic annotation for all texts. In addition to that, the number of speech samples seems to be limited, and the SPICE-Ireland CD-ROM offers each text in both .doc and .txt formats, thus excluding recordings.

Furthermore, it is worth mentioning the Limerick Corpus of Irish English (L-CIE; Farr et al., 2004) which consists of casual conversational data collected largely in informal settings and includes a one-million-word corpus of English spoken in Ireland. This genre-based corpus aims to represent a variety of discourse contexts across speaker interactional relationship types, described as pedagogic, transactional, professional, socialising and intimate, thereby bridging research and pedagogy into the fields of grammar, lexis and discourse. The authors argue the potential of the L-CIE corpus for pedagogical purposes and discuss the use of language corpora along with teaching materials to give access to more refined language information by furnishing

an illustrative example of the linguistic phenomenon of 'hedging'[4] and conversational features in the context of Irish English. Despite this, the L-CIE corpus is not in the public domain and hence not accessible to researchers wishing to use it. As a result, most of the abovementioned speech corpora have been designed and developed to perform phonological analysis and/or show the use of language with a very specific aim in mind and dependent on various research foci, which differs from one geared towards prosodical analysis, and yet which are also unfortunately not available to the research community. In conclusion, data samples collected so far, including studies examining IE varieties within the AM theory and the ToBI system, belong primarily to speakers from Dublin, Belfast, and Drogheda, while data sources (often unavailable and/or outdated) do not allow for an investigation of intonation patterns, which usually requires more controlled, purpose-built data sets.

4. The Corpus of Irish English speech (IES)

4.1 Aims

The objectives of the corpus of IES are as follows: (1) primarily to collect recordings of spoken Irish English across Ireland with a unified protocol in order to guarantee comparisons among different datasets; (2) to obtain an initial phonological inventory of each variety examined; (3) to compare the phonological systems of diverse Irish English varieties which are still unexplored within the AM framework; and (4) to provide researchers with open data sources.

4.2 Data Collection

Data collection used the same methods previously employed for the collection and analysis of data on Romance languages and dialects (Frota & Prieto, 2015). The *Interactive Atlas of*

[4] Hedging is a linguistic phenomenon which mainly refers to the use of adverbs or adjectives in a sentence to express ambiguity, caution or probability.

Romance Intonation (IARI)[5] coordinated by Prieto, Borràs-Comes and Roseano (2010-2014), presents audio and video materials for the study of the intonation of different Romance languages and dialects, including utterances representing different sentence-types, conversations and interviews that are all accessible through an interactive map. Data were collected by means of a questionnaire based on the Discourse Completion Task (DCT; Blum-Kulka et al., 1989), an inductive method largely used for research on pragmatics and sociolinguistics, in which the researcher provides a series of communicative situations and then asks the subject to respond accordingly.

The survey developed for the AIRI project was used to collect data of Italian varieties (Gili Fivela et al., 2015) and was further modified to include other types of utterances. The project in question (Nicora, 2020) aimed at examining the effectiveness of explicit prosodic training on foreign language speech productions of Irish English learners of Italian on the basis of a contrastive phonological analysis of two varieties spoken in two areas: Galway (Irish English) and in La Spezia (Italian). In line with this purpose, the questionnaire was translated into English, and careful consideration was given to lexical items, so that the materials could be better understood by, and more suited to Irish English speakers. According to the IARI guidelines:

> One decisive factor that should be noted before administering the questionnaire to informants is that it should be adapted before administering to the specific dialect under investigation. In addition, by making this adaptation, lexical items and sayings that do not exist in that dialect will not appear in the questionnaire, ensuring that possible misunderstandings of the situation are avoided (IARI, 2011: 5).

[5] Available to the following website: http://prosodia.upf.edu/iari/index.html Accessed in March 2022.

Since 2018 data collection has been carried out to first gather speech productions of Galwegian people and then to further expand the IES corpus to include other varieties of Irish English.

More recently, the author designed a Map Dialogue Task formulated to gather data on spontaneous speech productions and dialogue interaction among speakers. Data were collected in Galway city, Mayo, Dublin, East Donegal and West Cork areas for approximately a total of 45 minutes of spontaneous speech productions. The Map Task is a validated technique for collecting data in which two participants cooperate to complete a specific task (Blum Kulka, et al., 1989). In this case, each of the two participants has a map of an imaginary town marked with buildings, monuments, rivers, parks, bars, pubs and shops. A route is marked on the map of one of the two participants, the map-giver (see Appendix A), who has to give instructions to the other participant. The version of such map, given to the other participant who follows the map (map-follower), differs a little as the route is not marked (see Appendix B). Hence, this participant has to ask questions to the map-giver to reproduce the same route on the unmarked map. The Map Task for Irish English was based on the lexical sets referring to vowel values presented in Wells (1982) and referring to consonants as described in Hickey (2007, p. 327). Both the lexical sets were then readapted to design the Map Task (see Table 4). Although the main aim of this contribution is to show how the prosodic corpus was built in order to analyse IE intonation patterns across Ireland, the author considered it to be of utmost importance to include lexical sets that might be useful for future investigations in the field of phonetics, sociophonetics and sociolinguistics. The data will be available to researchers who wish to carry out a discourse analysis or better understand the segmental characteristics of IE.

Table 4

The Corpus of Irish English Speech (IES): Lexical Sets for Designing the Map Task

Vowel lexical sets			
Short vowels	Long vowels	Rising diphthongs	Unstressed vowel
Pub /ʌ/ Cat; Black /æ/ Full; Book /ʊ/	Bar /a:/ Coffee /ɔ:/ Bead /i:/ Fool /u:/	Goat boat /oʊ/ Mouth Sounds /aʊ/ Tiny /aɪ/	Happy /-i/ Party /-i/ Hardy /-i/
Consonantal lexical sets			
L-sounds	R-sounds	Velar Nasal	Dental stops/fricatives
Link /l-/ Fool /-l/	Road /r-/ Burren /-r-/	Morning /ŋ/ Walking /ŋ/	Three /θ-/ Trees /t-/ City /-t-/ Patrick /-t-/ Right /-t/
Alveolar, alveolo-palatal sibilants	Glottal	Affricates	Velar Stops
Music /-s-/ Shop /ʃ-/ Station /-ʃ-/ Asian /-ʒ/	Hardy /h-/	Church /tʃ-/ China /tʃ-/	Cat /k-/ Goat /g-/

4.3 Participants

The eligibility criteria for participants are the same as those laid out by the IARI project: both genders are represented; all speakers were born in the Republic of Ireland and had been exposed to their own variety in their everyday life; their educational level ranked from a secondary school to a university degree. At present, data have been collected from 30 participants aged 18-50 among which 10 were based in Galway City (GW), 3 in County Mayo (MY), 5 in West Cork

(WCK), 10 in East Donegal (ED), 2 in Dublin (DB), as Table 5 below shows. The landscapes include urban and rural areas.[6]

Data collection is still on-going[7], with the aim of incorporating as many IE varieties across Ireland as possible.

[6] According to the Central Statistics Office (CSO) an urban area is a town with a total population of 1,500 or more and therefore Raphoe located in East Donegal with a population of less than 1,500 is included in rural areas. https://www.cso.ie/en/releasesandpublications/ep/p-urli/urbanandrurallifeinireland2019/introduction/

[7] The database of the IES, including the ~~survey~~ questionnaire, the list of target utterances and a description of methodology employed, is available on the website www.github.com and will be updated as the project advances.

Table 5

The Corpus of Irish English Speech (IES): Irish English Varieties and Participants

Irish English varieties	County	Origin	Landscape	Gender
Galway City (GW)	Galway	Galway City	Urban Area	F
		Galway City		F
		Galway City		F
		Galway City		F
		Galway City		F
		Galway City		F
		Galway City		M
		Galway City		M
		Galway City		M
		Galway City		M
Mayo (MY)	Mayo	Westport	Urban Area	F
		Westport		F
		Westport		F
West Cork (WCK)	Cork	Skibbereen	Urban and Rural Areas	F
		Dunmanway		F
		Bantry		F
		Bantry		M
		Bantry		M
East Donegal (ED)	East Donegal	Lifford	Urban and Rural Areas	F
		Lifford		F
		Lifford		F
		Letterkenny		F
		Buncrana		F
		Stranorlar		F
		Stranorlar		F
		Ballybofey		M
		Raphoe		M
		Raphoe		M
Dublin (DB)	Dublin	South Dublin	Urban Areas	F
		North Dublin		M

4.4 The Questionnaire

The questionnaire includes a wide range of contexts/target utterances used during the Discourse Completion Task for collecting data on Irish English varieties. In total, 48 stimuli were produced. As can be seen in Table 6, the first column refers to the types of statements, and the second one to the types of questions; both outline the pragmatic value of the expected utterance.

Table 6

The Corpus of Irish English Speech (IES): types of target utterances used for data collection

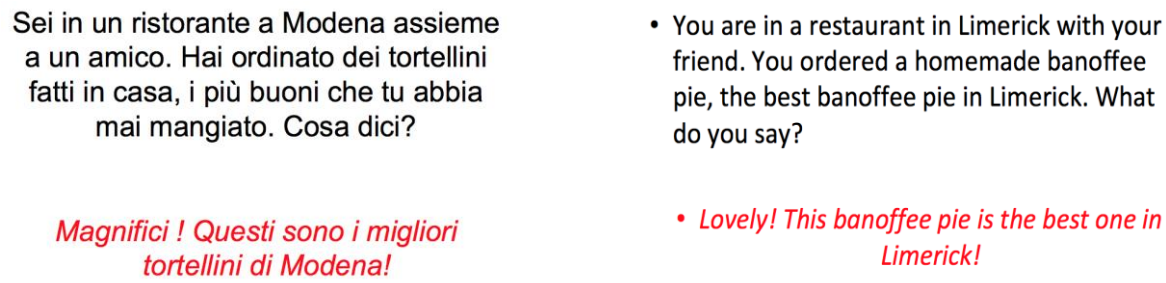
Statements	**Questions**
Broad Focus Contrastive-Corrective Focus List Exclamative - Exclamative Emphatic Imperative (command) - Imperative Exhortative Vocative Dubitative	Polar seeking information Polar Echo Confirmation – Polar Echo Surprise Polar dubitative Polar dubitative surprise Wh- seeking information Wh-Echo Confirmation - Wh-Echo Surprise Wh Echo disjunctive Rhetoric Disjunctive Tag

Along the lines of the IARI project, speech samples of the IE variety were gathered by readapting the questionnaire survey utilised for Romance language data collection (in particular that used for Italian) into English and making it more suitable for Irish people. Throughout data collection, the focus was to elicit natural sentences appropriate for everyday conversations. The context/situation was proposed so that speakers could respond in the most natural, spontaneous way possible, as if the situation was actually happening at that very moment. Proposing a corpus design which is sensitive to context allows for more refined descriptions of intonation patterns, including their frequency in a very specific context of use. As a result, the subject was engaged in the intended pragmatic circumstances and induced to make use of specific lexical target utterances and words. Figure 3 provides two examples of a situation well-suited to eliciting an

exclamative sentence for collecting data on Italian varieties (left), while the context and target utterance were modified to make it more suitable for Irish speakers (right). Through this necessary adaptation, lexical items that do not normally occur in that variety were not included in the questionnaire, ensuring that possible misunderstandings of the situation were avoided. The context reflects an Irish reality, where, for instance, a banoffee pie is a typical dessert. Therefore, the typical Italian *tortellini* dish was substituted by the reference to a banoffee pie, and the city of *Modena* is replaced with Limerick. Both items are proparoxytones: indeed, they present two post-tonic syllables after the tonic syllable.

Figure 3

Examples of a Context Well Suited to Eliciting an Exclamative Sentence in Italian (left) and in Irish English (right)



Since the idea of developing a survey for Irish English speakers derived from a research project in which one of the subordinate aims was to compare the two phonological systems of Galway IE and La Spezia IT, the choices to design and create IE target utterances are closely intertwined with the types of words/utterances in the Italian survey. Terms or names more suited to the Irish cultural context were introduced such as Angelina, Fidelma, Dunlavin, Limerick,

Banoffee pie, Niamh; paroxytone words in Italian had to be kept in English: Angelina, Fidelma, Dunlavin; proparoxytone words in Italian had to be kept in English: Jonathan, Beverly, yellowish, tangerines, mandarins, lemonade; the Italian word '*mandorle*' (a proparoxytone word) is replaced by 'mandarins', even if in some cases, it was pronounced as a paroxytone word due to the elision of the /da/ syllable within the word. Appropriate lexical items related to Irish culture were selected with some specific criteria in mind: for instance, voiced consonants were preferred over unvoiced ones (i.e. lexical choices such as 'model', 'Angelina', 'to murmur'), or paroxytone words in Italian had to be kept in English such as Angelina, Fidelma, Dunlavin. The same position was assigned for lexical accents within utterances, for instance in the case of lists (broad focus statements), and the Italian syntactic structure has been retained in English, for instance when the target word is presented in a final position.

However, in some cases it was not possible to use the Italian syntax, as it would have been considered unnatural for Irish people. Furthermore, although some target sentences were introduced for a better comparison with Italian language, alternative target sentences were also formulated and included. The decision to keep all the types of target sentences stems from the idea to gather as much information as possible with an eye towards the future and to allow researchers to compare IE intonation patterns with those belonging to Romance languages. In conclusion, punctuation had to be avoided in order not to cause any prosodic pause.

4.4 Methodology

Before the recording took place, the experiment's procedure was explained to each of the participants. The participants did not interact and they were requested to sign both a consent form and a personal information form to authorise the processing of their personal data. Afterwards, stimuli were presented to the subjects over a PC monitor in pseudo-randomised order, with the different pragmatic interpretations appearing in a sequence. Subjects were first

asked to carefully read and interpret the written text describing a context/situation. Second, subjects were requested to produce a spontaneous utterance that fit the situational contexts presented, in accordance with the IARI guidelines: "it is very important that the informants do not read the possible answers (the answers that appear in the questionnaires are for the researcher's approximate reference and do not have to coincide with the spontaneous responses)" (2011: 5). In the event that the subjects might produce a sentence that was not appropriate in the given context, the researcher would explain the context to the participant in a clearer manner and ask the informant to reformulate the target utterance with regard to the communicative function elicited by the given situation. Third, subjects were requested to read, as spontaneously as possible, the target utterance proposed by the researcher.

The full set of target contexts was presented to the participants twice, so that 4 target utterances were collected for each context.[8] In total, 5.760 speech tokens have been gathered to date. Each experiment took approximately one hour, so a total of 30 hours of data collection were gathered. Audio recordings of the intonational questionnaire survey on the Irish English variety spoken in the Republic of Ireland were conducted in a soundproof room in the Hardiman research building at the National University of Ireland, Galway, using a Macintosh HD MacOs equipped with a built-in microphone. The environment was free of background noise, no one could enter the room, and using a mobile phone was not allowed. More recently, the recordings have been carried out on a Zoom call: sounds are clear and do not include environmental noise. Audio samples were manually segmented with the speech visualisation software called PRAAT[9] and labelled according to the following criteria:

[8] Every participant was asked to read the context and afterwards say something in their own words that would fit the situational context. Then each subject was asked to read in a spontaneous manner the target sentence proposed by the researcher. Participants produced two sentences for each context. Because the whole task was performed twice, they produced 4 target sentences for each context.

[9] https://www.fon.hum.uva.nl/praat/

i) Each .wav file contains only one target sentence;

ii) The name of each .wav file is in line with a systematic file naming (for instance, GW-IE-01-14-L1-BF): an abbreviation of the spoken variety (ED stands for East Donegal, MY for Mayo, GW for Galway, DB for Dublin and WCK for West Cork); an abbreviation for the language Irish English (IE); a digit code for the speaker (01/02/03/04 or 05); a context number (of 1 to 60); a letter for a read (L) or spontaneous (S) version; the number of repetition (1 or 2); an abbreviation for the type of utterance (for instance: BF means broad focus);

iii) The .wav file includes both a short initial and a final silence.

One of the main issues with the analysis of the Irish English variety data was deciding how to segment syllables. According to the principle of syllable strength (Wells, 1990), consonants are syllabified with whichever of the adjacent vowels is more strongly stressed, or if they are equally stressed with the leftward one; a word such as *Melanie* would be segmented as *Mel-an-ie*. Fudge (1984), on his part, advocates a consonant vowel (CV) pattern, in which the intervocalic consonant is syllabified with the following vowel, and therefore *Melanie* would be syllabified as *Me-la-nie*. In the present study the syllables have been segmented according to the CV pattern, because this is the most traditional perspective used in the AM framework.

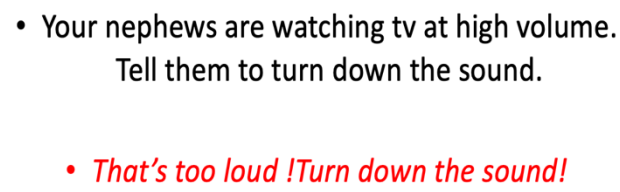
5. Current Application and Related Results

As previously mentioned, maximising the potential of the corpus of IES means evaluating the target utterances and words proposed in the questionnaire. A recent investigation on vowels and diphthong variation between the two IE varieties spoken in Galway (GW) and Letterkenny (LK) (Nicora et al., 2020) illustrates how to exploit data sources from IES and how to analyse them from a phonetic perspective. Let's take the following example: first, researchers identify and

select various target utterances comprising two key words like “mandarins” and “tangerines” to analyse the cardinal vowels /a/ and /i/. Then, the target utterance “That’s too loud! Turn down the sound!” was selected as it seems to be particularly suited for performing an acoustic analysis on the mouth diphthong, as it contains three target words that in turn include the /aʊ/ diphthong (Figure 4).

Figure 4

Example of Target Utterance Including the MOUTH Diphthong in Three Target Words



142 speech tokens were manually annotated in PRAAT, a speech visualisation software used for acoustic analysis, in order to investigate the cardinal vowels in the words “mandarins” and “tangerines” and the mouth diphthong in the target sentence. A script was then used to extract the F0, F1, F2 and F3 values at 7 target points and a one-way analysis of variance (one-way ANOVA, or Analysis of Variance) on the vowels’ formants was performed[10].

Results revealed a tendency towards a centralization of the cardinal vowels, qualitatively confirmed for the mouth diphthong, realised as a [ɑʊ] by the GW speakers and as a [øY] by the LK speakers, even though with great variation among same-variety speakers. In spontaneous speech, this latter was reduced to a more centralised [ɵ] monophthong for a quarter of the corpus.

[10] This technique is used to offer an overview on the cardinal vowels and on the mouth diphthong variation across two Irish English varieties.

Although the findings of this phonetic experiment across IE varieties are preliminary and need to be confirmed through analysis of a wider sample, including a native speaker's perceptive test on IE variation, this study seems to be a valuable example of how it would be possible to make the most of the IES corpus, thus demonstrating its potential.

6. Conclusion and Further Research

The Corpus of Irish English Speech (IES) stems from the need to fill a gap in the research on IE prosody and aims to offer a more comprehensive overview of the prosodic features of IE varieties spoken in present-day Ireland. Although still in its infancy, it can be viewed as a step forward towards a better description, understanding and dissemination of Irish English prosody. At present, the corpus of IES contains 5.760 speech tokens of the IE varieties spoken in Galway city, West Cork urban areas and East Donegal urban and rural areas, which reflect a wide range of target utterances such as statements, yes/no questions, wh-questions, echo questions, imperatives and vocatives. Although the corpus was created to conduct a prosodic contrastive analysis of intonation patterns belonging to IE varieties across Ireland, data collected through the survey questionnaire based on a discourse completion task can be exploited for diverse purposes, which span from phonetic, sociophonetic, sociolinguistic as well as pedagogical. Future investigations may focus on the development of an interactive atlas of IE prosody, resembling that crafted for Romance intonation, on the creation of educational resources based on data samples of the IES corpus and on the implementation of IE spoken outside the borders of present-day Ireland. In particular, exploring IE from a global perspective would allow researchers to investigate language dynamics and the evolution of IE prosody in different settings, in its context of use as well as in contact with other language varieties. In conclusion, it could be also interesting to involve children and young people as a target audience, one that has historically been largely overlooked.

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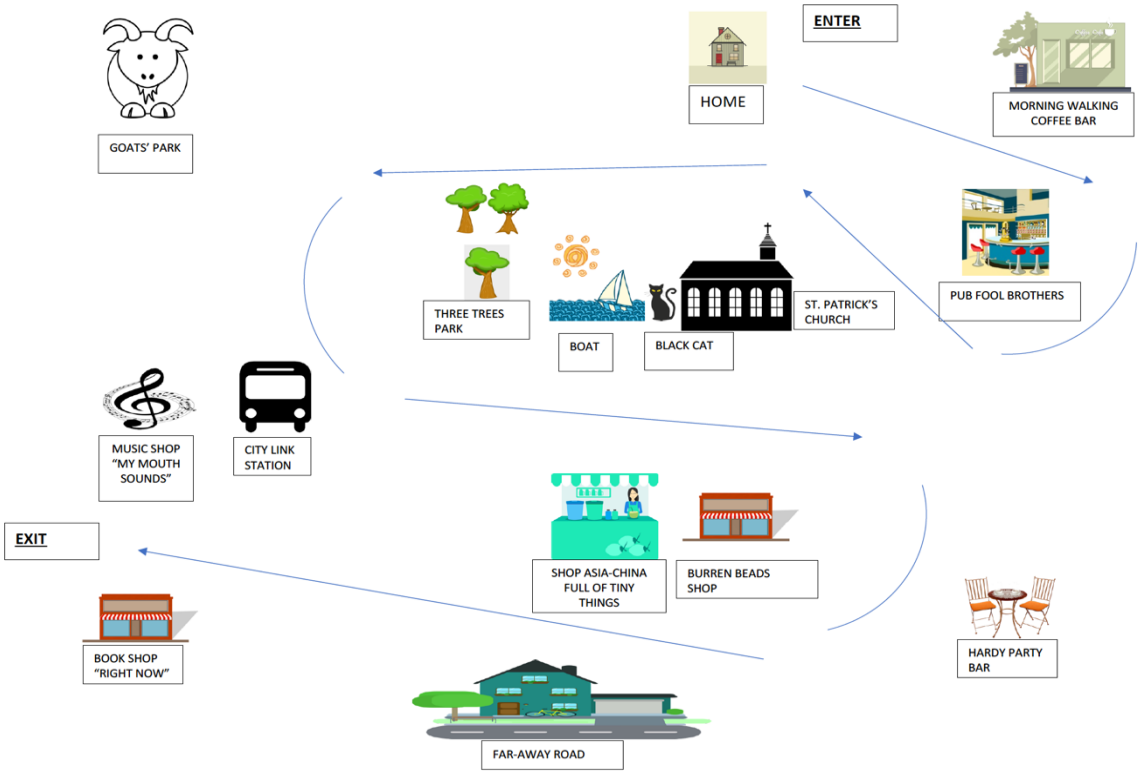
Appendix A: Map-Giver



Appendix B: Map-Follower