Studying intonation in varieties of English: Gender and individual variation in Liverpool

Claire Nance, Sam Kirkham, Eve Groarke
Lancaster University

Abstract

In this chapter we report a study of intonational variation in Liverpool English. We begin by reviewing previous sociophonetic approaches to intonation and identify solutions to methodological issues that have proved problematic in the past. We then present data from an ongoing into intonational variation in Liverpool across several sentence types. We examine phonological and phonetic variation using Autosegmental Metrical analysis (Ladd 2008) and an acoustic analysis of pitch range. Our results suggest some gender-related variation in the contours produced and the pitch range used by speakers. In doing so, we demonstrate the utility of using controlled materials for developing an initial sociophonetic description of a variety's intonational system. We conclude by discussing future avenues for sociophonetic research on prosodic variation.

1 Introduction

Much of the previous research sociophonetic research in the UK has considered variation at the segmental level, but substantially less has been conducted on prosodic variation (Foulkes et al. 2010). In this chapter, we provide an overview of sociophonetic treatments of intonation and identify directions for future research in this area. We then present results from a small-scale study of intonational variation in Liverpool English, which is widely recognised to be a highly distinctive variety of British English. In his phonetic description of this variety, Watson (2007: 358) remarks that work on Liverpool English intonation is 'minimal' and that 'more systematic investigation is required'. This chapter aims to contribute towards plugging this gap in the literature and also works towards a better understand sociolinguistic variation in the UK. In the remainder of this section, we review previous sociolinguistic intonational work in the UK, different analysis frameworks,

and some suggestions for best practice. In Sections 2 and 3 we present the results of our analysis of Liverpool intonation so far, and in Section 4 we suggest directions and methods that could be used in future work.

1.1 Phrase-final rises and the 'Urban Northern British' Group

The intonational feature that has perhaps received most attention in UK studies is the extensive use of phrase-final rises in declaratives in the north of the country, where falls would be more common in the south (e.g. Cruttenden 1994:133; Ladd 2008). In such instances, a sentence such as 'They like eating cake' might be produced with the pitch rising on or just after the final accented syllable of the phrase, which then stays at a high plateau until the end of the phrase. Another common pattern is for pitch to drift downwards slightly at the end of the phrase. In Cruttenden's (1997) terminology, these are referred to as a 'rise-plateau' and 'rise-plateau-slump' respectively. Additionally, Cruttenden refers to a contour known simply as 'rise' where pitch glides upwards slowly to the end of the phrase.

The use of phrase-final rises in decalaratives appears to be a dialectal feature, which is common in several urban dialects such as Glasgow (Mayo 1996; Mayo et al. 1997; Vizcaino-Ortega 2002; Cruttenden 2007; Sullivan 2010; Nance 2013; Nance 2015), Belfast (Jarman & Cruttenden 1976; Wells and Peppé 1996; Rahilly 1997; Grabe et al. 2000; Grabe & Post 2002; Lowry 2002; Grabe 2004; Sullivan 2010), Birmingham, Newcastle (Pellowe & Jones 1978; Local et al. 1986) and Liverpool (Knowles 1973, 1978). The broad intonational similarity between these dialects in declaratives has led Cruttenden (1997) to refer to this group of dialects as the 'Urban Northern British' group (UNB).

Specific to the Liverpool context, Knowles (1973:175) notes that Liverpool speakers employ a narrower pitch range than other dialects, and also states that middle class speakers are less likely to use the traditional Liverpool rising contours compared to working class speakers. Knowles (1973) states that the rising contour in Liverpool is most likely to be of Irish origin due to the substantial numbers of Irish immigrants to the city in the nineteenth century. However this seems unlikely for several reasons.

First, as Cruttenden (1994:133) notes, Irish immigration cannot explain all of the rising contours in the UNB group: Newcastle did not have substantial numbers of Irish immigrants until well after the first commentaries on the city's distinctive intonation. Second, there is extensive variation in Irish and Irish English intonation (Dalton & Ní Chasaide 2003; Dalton & Ní Chasaide 2005; Dorn et al. 2011). Many dialects of Irish and Irish English do not use rising contours in the way that the UNB group do. Therefore, even if UNB rises are the result of Irish immigration, this is not a straightforward relationship and is likely to be indirect and multifaceted.

1.2 Uptalk

The rises discussed above, which are traditional dialect features of the UNB group, are qualitatively and sociolinguistically different to another kind of rise which has been widely studied in the sociophonetic literature: High Rising Terminal. Also referred to as 'Uptalk', or 'Australian Question Intonation (AQI), High Rising Terminal (HRT) is an apparently recent addition to the UK intonational inventory (Bradford 1997; Shobbrock & House 2003; House 2006; Barry 2007; Levon et al. 2015). This contour is distinguished by a contour that rises and then keeps on rising until the end of the phrase to the uppermost reaches of a speaker's commonly used pitch range (Ladd 2008:125). Previously, HRT was thought to not occur in the UNB dialects (Fletcher & Harrington 2001; Fletcher et al. 2002; Fletcher et al. 2005; Ladd 2008), though recent work suggests that it is beginning to be used in these dialects as well (Cruttenden 2007; Sullivan 2010; Nance 2015). In terms of the sociolinguistic distribution of these two kinds of rise, the UNB rise is a feature of the traditional dialects of the cities in which it occurs. HRT, however, is an innovative feature and has been observed as occurring most frequently in upper middle-class and female speakers (Bradford 1997; Barry 2007; Levon 2015; Warren 2016). A schematic diagram showing the comparison between contours considered as UNB rises and contours considered HRT is shown in Figure 1.

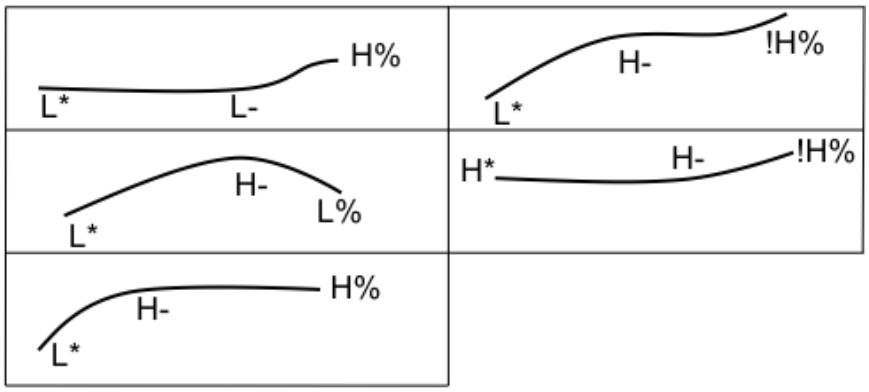

Figure 1: Comparison of different kinds of rising contour in our notation. UNB rises are shown on the left and HRT rises on the right. For a fuller description of all kinds of HRT rise, see McGregor & Palethorpe (2008).

1.3 Sociophonetics of intonation

The most commonly investigated intonational feature with reference to sociolinguistic variation is the use of HRT. Previous studies have found that the use of HRT tends to be more prevalent among young females, but it is still used by male speakers nonetheless (Guy & Vonwiller 1984; Guy et al. 1986; Fletcher et al. 2005; Ritchart & Arvaniti 2014). There is also evidence of variation relation to ethnicity, such as the use of greater HRT amongst ethnically Maori people in New Zealand (Britain 1992). Warren (2005) notes gender and age differences in the phonetic realisation of HRT, with young females starting their rises later in the phrase. Studies not focusing on the use of HRT also note sociolinguistic differences in pitch and intonation more generally; for example, Daly & Warren's (2001) study of New Zealand English find that women may use a greater pitch range and dynamism than men.

A parameter along which intonation has been found to vary is speech context, or 'style' in the Labovian sense. For example, Cruttenden (2007) finds intonational 'diglossia' in the speech of a young Glaswegian woman: in conversational speech she uses the rise-plateau and rise-plateau-slump contours typical of Glaswegian, but in read speech she uses more falls which are typical of southern British English. Similarly, Lowry (2011) describes differences between males and females and finds that females are likely to style-shift, using different proportions of rising and falling contours across read sentences, story-telling, and an interactive task. Taking a slightly

different approach, Podesva (2011) demonstrates how the frequency of specific intonation patterns and their phonetic realisation are used by three gay professionals to construct different personae in different social contexts.

A complicating factor in a sociolinguistic treatment of intonation is that this prosodic feature is often used to convey subtle pragmatic meanings (see House 2006 for a review), which must be accounted for before a sociolinguistic analysis of the data can be put forward (Milroy & Gordon 2003:185; Foulkes, Scobbie & Watt 2010:721). It is for this reason that many of the studies cited here (as well as our own) choose to investigate intonation using carefully controlled read sentences or map tasks rather than sociolinguistic interviews or more naturally occurring data.

If data have been collected in the form of read sentences, then the pragmatic function of the sentence can be pre-defined, and different functions easily compared. This is the approach taken in recent surveys of British English and Irish Gaelic dialects (e.g. Grabe et al. 2000; Grabe & Post 2002; Dalton & Ní Chasaide 2003; Grabe 2004; Dalton & Ní Chasaide 2005; Dorn et al. 2011). Another possible way of accounting for pragmatic function is to code for it within existing data and use this coding information in statistical modelling to account for any pragmatic effects. For example, Stirling et al. (2001) developed a framework for coding discourse events, which was then used in later studies (Fletcher & Harrington 2001; Flecther et al. 2002; Fletcher et al. 2005; McGregor & Palethorpe 2008). Similarly, Ritchart & Arvaniti (2014) classified each sentence type as one of the following: question, statement, holding the floor, and confirmation request. Using a coding scheme developed for analysing different discourse events in sociolinguistic interviews (Gregersen et al. 2009), Nance (2013, 2015) and Jespersen (2015) chose to compare a subset of discourse functions within interview and conversational data.

1.4 Analysing intonation

Two main approaches are used in sociolinguistic approaches to intonational variation. The first uses an Autosegmental Metrical (AM) framework (e.g. Pierrehumbert 1980; Ladd 2008) to transcribe contours into phonological units. The second compares the

phonetic realisation of contours that are phonologically identical or similar (e.g. the timing of the start of a rise, or the pitch range used a rise; see Warren 2005). Some studies use a combination of both, identifying phonological differences between speakers and sentence types, but also analysing phonetic differences within phonological categories. AM approaches to intonation claim that an intonational contour can be broken down into a series of significant pitch events, which are the phonological building blocks of intonational meaning. For example, 'pitch accents' are contrastive pitch events, which occur on stressed syllables, but not every stressed syllable receives the extra prominence associated with a pitch accent. Pitch accents are usually notated by * in AM notation. A pitch accent associated with low pitch is shown as L*, and a pitch accent associated with high pitch is notated as H*. Breaking down a continuous intonational contour into phonological units is analytically useful for a variety of reasons. We have found this approach convenient for sociophonetic analysis as it allows us to make meaningful comparison of similar elements such as pitch accents or how phrases are ended.

The most commonly used AM framework is ToBI (Tones and Break Indices), which was originally developed to transcribe American English intonation (Beckman & Elam 1997; Beckman et al. 2006). Early studies conducted using ToBI quickly realised that it was often necessary to adapt transcription systems such as ToBI for the language or dialect under study (for applications of this principle see Jun 2005, 2014). Using ToBI, or another widely used AM framework such as IViE (Grabe et al. 2001), the proportion of different contour types can be compared across sociolinguistic categories or discourse functions and sentence types.

In ToBI, the final pitch accent in the phrase is known as the 'nuclear accent', while in IViE 'nuclear accent' refers to the most prominent pitch accent in the phrase. Generally speaking, the most prominent pitch accent is also the last one and seems to be an important location for intonational meaning (Ladd 2008:131). The accent preceding the nuclear accent is known as the 'pre-nuclear accent'. In AM approaches, intonational contours can be divided into large units known as Intonation Phrases (IPs). A boundary tone occurs at the end of an IP and is notated with the '%' symbol. Pierrehumbert (1980:19) states that IP boundaries can be found where a speaker

makes a non-hesitation pause, or at a point where they could pause without disrupting the flow of discourse. However, as pointed out by Cruttenden (1997:29) and Nolan (2008:440), there may be little or no pause between IPs in spontaneous speech. Instead, these authors suggest looking at a combination of prosodic features which taken together may be indicative of an IP boundary. Such prosodic features can include lengthening of the final syllable, a large pitch excursion (up or down), a change in loudness (usually quieter at the end of an IP), and a general slowing down of speech rate (Cruttenden 1997:29-37). Phrase accents mark the boundary of smaller prosodic units, known as 'intermediate phrases' (ips). Phrase accents are usually notated with a '-', i.e. a low phrase accents would be 'L-' and a high phrase accent would be 'H-'. Some AM approaches, such as IViE, do not recognise the existence of ips; see Grabe (1998) for discussion on this topic.

Similar to sociophonetic studies of segmental variation, the phonetic influence of surrounding material must also be accounted for in intonational analysis. The majority of intonation studies measure f0 as an estimate of pitch, yet f0 can only be measured in voiced sounds. For this reason, many studies choose to compare read sentences where the material can be closely controlled in order to include mainly voiced sounds. The amount of unaccented material preceding and following pitch accents may also affect their realisation: first, nuclear accents are susceptible to 'truncation' (Erikson & Alstermark 1972) and/or 'compression' (Bannert & Bredvad 1975). These terms refer to strategies adopted by speakers when there are not enough syllables after the nuclear accent to fully realise a boundary tone contour. Speakers can adopt two strategies: either end their contour abruptly and not produce a full rise or fall, *truncation*; or they can compress the full contour into a short space of time, *compression*. In order to allow for potential compression or truncation effects, sociolinguistic studies of uncontrolled material should account for the number of syllables after the nuclear accent (see Warren 2005; Nance 2015). Secondly, pitch accents are also susceptible to the effects of 'tonal crowding' (e.g. Arvaniti, Ladd & Mennen 2006), which refers to a process by which pitch accents occurring in close succession are affected by the proximity of other pitch accents. In order to account for this possibility, studies of uncontrolled materials could avoid IPs where there is no unaccented material between

pitch accents, and label the number of syllables between each pitch accent to include in the modelling.

In this section we have spent some time reviewing the AM approach to intonation in the hope that it will be more widely used in sociophonetic study.

1.5 Summary and research questions

To summarise the relevance of this previous work to the current study: Liverpool is claimed to belong to the UNB group of dialects where phrase-final rising intonation contours are common, but this dialect has been subject to little modern intonational study: the most detailed description was conducted in Knowles (1973) before the advent of widespread digital speech recording and analysis. Although data from Liverpool were collected in the Intonational Variation in English project (e.g. Grabe 2004), this was not fully analysed or compared to the other dialects. In this chapter, we aim to provide a descriptive account of Liverpool intonation to fill this gap in our understanding of variation in one of the UK's major urban centres. We also aim to investigate how intonation varies along two social dimensions in Liverpool: speaker gender and individual variation. The research questions investigated here are as follows:

1. What are the characteristic features of Liverpool intonation?
2. Is there evidence to suggest sociolinguistic variation in Liverpool intonation?

2 Method

The participants for this study were five male speakers and four female speakers aged 20-22. All were born and raised in Liverpool and had spent the majority of their lives in the city and its suburbs. Four participants had spent some time away at university in Lancaster and one had attended university in Leeds. The speakers were all of lower middle class or upper working class background. Participants were recorded by the third author in their own home, or in a quiet room at the University of Liverpool or

Lancaster University. Recordings were made onto laptop computer using a Beyerdynamic Opus 55 headset microphone and a Sound Devices USBPre2 preamplifier and audio interface.

The data collection consisted of (1) read sentences, and (2) a task designed to elicit more natural speech within a structured context. The sentences were presented to each participant twice on the computer screen in random order, interspersed with twelve distracter sentences. The sentences included eight declaratives (e.g. 'They are drawing the library'), four questions without morphosyntactic markers (e.g. 'He's running the relay?'), four inversion questions (e.g. 'Will you live near the building?'), four wh-questions (e.g. 'Why are we drawing?'), and four coordination questions (e.g. 'Did you say yellow or mellow?'). These particular contexts were chosen to reflect the data collection method used in the IViE project for later comparison with other varieties (see Appendix for a list of sentences). We changed the lexical content of the sentences from the IViE materials to make them more relevant to a northern speech community; for example, we altered sentences referring to London suburbs. The second speech task required participants to watch a silent two-minute cartoon featuring the well-known British fictional character 'Mr Bean'. They were then asked to watch the video again and provide a commentary on the events as they unfolded. In this study, we only analyse data from the sentences part of the experiment, and do not report any further information on the video description task. In total, we analysed 419 nuclear pitch accents and boundary tones. 16 utterances were excluded as unsuitable for analysis, mainly due to the presence of substantial creaky voice among some female speakers. The data presented here are the first stage in a wider project comparing intonational variation in Liverpool to intonational variation in Manchester, a city around 50 miles away from Liverpool that is not reported as part of the UNB intonation group.

In this chapter, we concentrate on the pitch events at the end of intonation phrases: nuclear pitch accents, phrase accents, and boundary tones. Our analysis has two aspects: a categorical phonological analysis using ToBI labelling, and a phonetic analysis of pitch height and range within phonologically similar contours. In order to conduct this analysis we used a version of ToBI adapted for Glaswegian English –

GlaToBI (Mayo 1996; Mayo et al. 1997). We selected this labelling system, as Glasgow English, similar to Liverpool English, is reportedly part of the UNB group of dialects. GlaToBI removes the intrinsic up-step cuing property of an H phrase accent such that H-L% represents a falling pitch, rather than a level pitch in conventional ToBI. Additionally, contra Mayo (1996), we have retained the more conventional L* and L*+H labels rather than their suggested L*H. Figure 2 shows a schematic representation of each contour, its GlaToBI label, and a description of the contour. In this initial description we combined some tonal categories for clarity: Downstepped !H* accents were combined with H*; H+L* accents were combined with L*. We also allowed for the possibility of no discernable pitch movement.

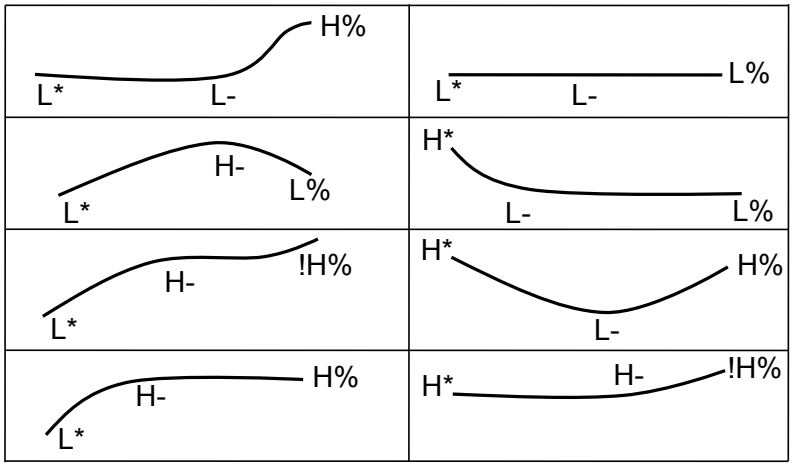

Figure 2: Schematic representation of each contour and its GlaToBI labelling.

Previous descriptive work on Liverpool suggests that speakers exploit a small pitch range in their intonation, leading to the perception that they are somewhat monotone (Knowles 1973:175). In order to investigate this phonetic aspect of intonation, we obtained measures of f0 at the turning points in pitch, which were manually identified during the ToBI labelling. The pitch range for each speaker was calculated as the median f0 of their L*, L- and L% values subtracted from the median of their H*, H- and H% values. Values are reported in semitones using the formula $12 * \log2(f / 127.09)$ where f refers to the frequency in Hertz (Traunmüller & Eriksson 1995) in order to compare pitch excursions in a perceptually meaningful way.

3 Results and Discussion

3.1 Characteristics of Liverpool intonation

This section shows the results of the ToBI labelling of different sentence types (discourse functions) according to each speaker's productions. The contours used by each speaker in each discourse function are shown in Figure 3.

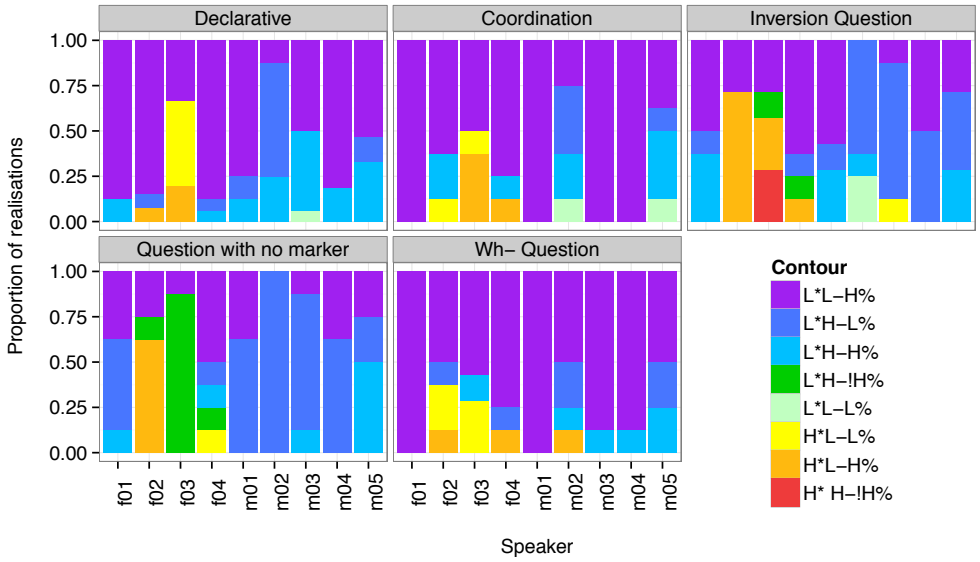

Figure 3: Contours used in each sentence type by each speaker.

Overall, the most commonly occurring contour was L* L-H% (shown in purple in the figure), which in Knowles' (1973) terminology is a 'rise'. In these contours, f0 rose gradually from the final pitch accent onwards, and reached an H target right at the end of the IP. This H was not especially high in pitch, so we do not consider these as related to the HRT phenomenon. The widespread use of the 'rise' is somewhat in contrast to the previous literature on the UNB dialect group. Studies of Belfast and Glasgow report widespread use of the 'rise plateau', which Knowles refers to as a 'step' (e.g. Mayo 1996; Grabe 2004; Cruttenden 2007; Sullivan 2010; Lowry 2011). In these contours, pitch rises to its final high target on the accented syllable and remains there on a plateau. These contours, represented here as L* H-H% (light blue in the figure), were fairly common in our data, but not as widespread as L* L-H% (purple in the figure; 12.6% and 55.3% of the data respectively). High rises were only used by one speaker in one context: inversion questions. This suggests that HRT is not used in declaratives by our speakers and we have no evidence suggesting that it is used by speakers in Liverpool.

Since Liverpool speakers use rising contours in declaratives, an interesting question is how they distinguish questions and statements. In the case of inversion questions (e.g. 'Will you live near the building?') and wh-questions (e.g. 'Why are we drawing?'), there are clear lexical or syntactic cues to the phrase being a question. However, in the case of questions without morphosyntactic markers (e.g. 'He's running the relay?'), cues must come from elsewhere. In Liverpool, there appears to be a clear intonational difference between these questions and declarative statements: our speakers use mainly 'rises' (L* L-H%) for declaratives (62.59%, 87/139 tokens), and L* H-L% for questions without markers (43.06%, 31/72 tokens). In these L* H-L% contours, pitch dropped markedly at the end of the phrase, almost to the speaker's minimum pitch. The difference between the use of these two different contours was significant ($\beta = -3.68$, $p < .001$; logistic mixed effects regression model with contour variant as outcome variable, sentence type and gender as fixed effects, and speaker and accented word as random intercepts).

Our analysis also considers the pitch range used by speakers. The pitch range of each speaker in semitones is shown in Figure 4 (absolute values). This was calculated as the difference between each speaker's value for H tones and each speaker's value for L tones. Liverpool speakers do indeed appear to exploit a fairly narrow pitch range. For some speakers, the range used is between 1-2 semitones. The range that humans can distinguish is typically around 1 Hz – less than 1 semitone (Kollmeier, Brand & Myer 2008). In comparison to the values, which are just perceivable, the ranges employed by our speakers are not vastly different so we would agree with Knowles' (1973) observation that small pitch ranges are used in Liverpool.

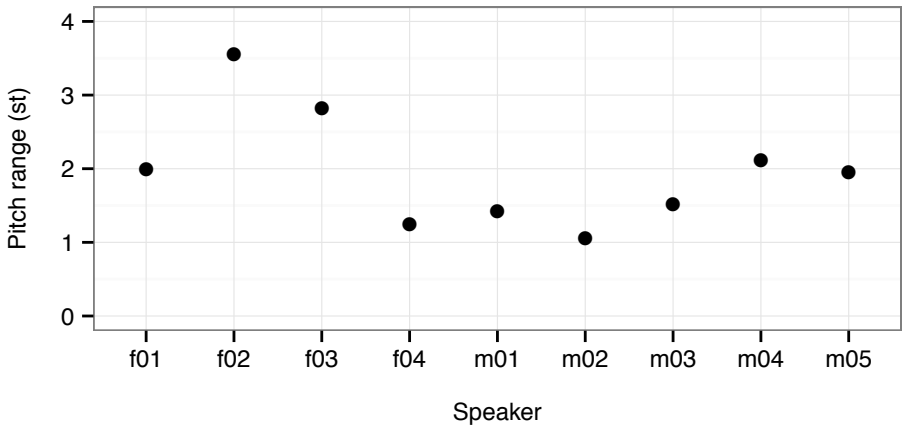

Figure 4: Median pitch range used by each speaker (absolute values; semitones).

3.2 Variation in Liverpool intonation

In this section we consider differences across the dataset in order to suggest avenues for future sociolinguistic work on intonation in Liverpool. There are two possible sociolinguistic parameters along which our data might vary: gender and across individuals. In terms of gender-based variation, we found significant differences between male and female speakers in the proportion of L* H-L% contours ($\beta = -2.58$, $SE = 1.12$, $p = .02$; logistic mixed effects regression model with contour variant as outcome variable, sentence type and gender as fixed effects, and speaker and accented word as random intercepts). We also considered the possibility of gender variation in the pitch range data. In this case, there were no significant differences between the male and female speakers in our sample (*t*-test, ns.).

Although there were no significant gender differences in the pitch range exploited, from examining Figure 4 it is clear that f02 and f03 are behaving somewhat differently from the other two female speakers, and also from the male speakers in the sample: f02 and f03 use a much larger pitch range than the other speakers. Similarly, looking at the data in Figure 3, f02 and f03 again behave differently from the rest of the dataset, using more falling contours (H* L-L% and H* L-H%). In particular, f03 used a large number of H* L-L% contours in declaratives, which would be more typical of southern British English than Liverpool English. We collected data about the social background and mobility of our speakers, in the form of their postcode which was used to evaluate the level of social deprivation in their area, and

information as to whether they had moved house or city, but found no substantial differences in the backgrounds of f02 and f03 when compared with the other speakers. Our study is small-scale but these data provide insight into future possibilities for research into sociolinguistic variation in Liverpool. It appears that there may be some influences from other varieties in the speech of two female speakers, which may hint at change in Liverpool, and/or gender-based variation within the community.

4 Conclusions

This chapter has presented some of the methods used and common parameters analysed in sociolinguistic treatments of intonation. Foulkes et al. (2010:721) state that the paucity of sociophonetic studies on prosody may be due to the difficulties surrounding controlling for pragmatic function. Recent research has started to address this, most notably in the area of intonation (e.g. Warren 2016). Our own analysis also aims to show how controlled materials can be used to produce interesting and sociolinguistically meaningful data, especially as a starting point for conducting an initial dialect description and sociolinguistic investigation.

Our study has provided some initial analysis of Liverpool intonation within a modern phonological framework: Autosegmental Metrical phonology (Pierrehumbert 1980; Ladd 2008). We have demonstrated that Liverpool is a member of the Urban Northern British group, commonly employing rising contours in declaratives as claimed in previous literature such as Cruttenden (1997), Ladd (2008) but now explicity investigated. These contours are similar to other UNB dialects such as Glasgow and Belfast in the sense that the rise takes place over a narrow pitch range and starts from low in the speaker's range, unlike HRT contours (Ladd 2008). However Liverpool is slightly different from previous descriptions of Belfast and Glasgow as the most common kind of declarative rise is a very gradual drift upwards in pitch until the end of the IP, unlike the step up in pitch and plateau of Belfast and Glasgow.

Although our study so far is small-scale in nature we have provided some possible insight into variation in the community: two female speakers behave somewhat

differently to the rest of the sample and use a wider pitch range overall, as well as fewer rising contours in declaratives. Instead they produced some declaratives that were more typical of non-UNB varieties. There are several possible explanations to this finding: first, that as a result of dialect contact young women in Liverpool no longer use the intonation which is distinctive of their dialect. Secondly, that these young women were reacting to the fairly formal context of reading sentences from a computer screen. It is also possible that their behaviour is speaker-specific and not reflective of any kind of wider trend. Out of these three explanations, we find the second most convincing. Research on Liverpool English suggests that the city's dialect is resisting some of the changes sweeping across other British varieties such as /t/-glottalling (Watson 2006, 2007; Clark & Watson 2016). We therefore find it unlikely that intonation is changing in such a radical fashion. However, it seems probable that these young women may be able to style-shift and produced sentences in a formal southern-influenced manner for the purposes of our experiment. Our ongoing analysis of the video retelling data will allow us to better answer this question.

Future research could consider these possibilities in more detail. Liverpool is an interesting context because of Watson's (2006) claim that the city is resisting many diffusing features, and because the dialect of the area is so distinctive. We are continuing this analysis in more detail with a larger dataset and also comparing Liverpool to a non-UNB area, Manchester, which is a geographically proximal but linguistically-distinct city. This raises an interesting question regarding where an isogloss between a UNB variety such as Liverpool and a non-UNB variety such as Manchester might lie. Is there a sudden divide? Or is there a border zone, which is intonationally varied? In addition to this, our data suggest some possibility of gender variation in intonation, but how widespread is such variation in the community? Are there differences according to social class? Questions such as these have been addressed through sociophonetic treatments of segmental features, but greater analysis of prosodic features is necessary in order to provide more comprehensive accounts of sociophonetic variation and change. We hope to inspire future research in this area.

5 Acknowledgements

This research was funded with a Lancaster University Linguistics and English Language undergraduate internship (SPRINT). We would like to thank our participants for lending their time and expertise. Many thanks to the anonymous reviewers and the editors of this book for their feedback.

6 Appendix

List of sentences used for eliciting contours:

(1) Simple statements:

1. He was bringing some dinner.
2. You were stirring the pudding.
3. We were driving in a limo.
4. They are drawing the library.
5. We were wearing some goggles.
6. He was running in the relay.
7. She was drowning in the river.
8. We were living near the building.

(2) Questions without morphosyntactic markers:

1. He's running the relay?
2. You were stirring the pudding?
3. She's drowning in the river?
4. They're drawing the library?

(3) Inversion questions:

1. Can I drive in a limo?
2. Were you drawing the library?
3. Will you live near the building?

4. Are they wearing some goggles?

(4) WH-Questions:

1. Where is my dinner?
2. When are you running?
3. Why are we drawing?
4. Who'll be the driver?

(5) Coordinations:

1. Are you growing limes or lemons?
2. Did you say mellow or yellow?
3. Are we going bowling or running?
4. Did he say lino or lilo?

7 References

Arvaniti, Amalia, D. Robert Ladd & Ineke Mennen. 2006. Phonetic effects of focus and 'tonal crowding' in intonation: Evidence from Greek polar questions. *Speech Communication* 48, 667–696.

Bannert, R. & A. Bredvad. 1975. Temporal organisation of Swedish tonal accent: the effect of vowel duration. *Working Papers in Phonetics*, Lund University 10.

Barry, Angela. 2007. *The Form, function, and distribution of High Rising intonation in Southern Californian and Southern British English*. Ph.D. thesis, University of Sheffield, Sheffield.

Beckman, Mary & Gayle Ayers Elam. 1997. *Guidelines for ToBI labelling*. Ohio: The Ohio State University Research Foundation.

Beckman, Mary, Julia Hirschberg & Stefanie Shattuck-Hufnagel. 2006. The origi- nal ToBI system and the evolution of the ToBI framework. In Sun-Ah Jun (ed.) *Prosodic models and transcription: Towards prosodic typology*, Oxford: Oxford University Press.

Boersma, Paul & Daniel Weenik. 2014. *Praat: Doing phonetics by computer* [computer program]. Version 5.4.04. URL http://www.praat.org/.

Bradford, Barbara. 1997. Upspeak in English. *English Today* 13(3), 29–36.

Britain, David. 1992. Linguistic change in intonation: The use of high rising terminals in New Zealand English. *Language Variation and Change* 4, 77–104.

Clark, Lynn & Kevin Watson. 2016. Phonological leveling, diffusion, and divergence: /t/ lenition in Liverpool and its hinterland. *Language Variation and Change* 28(1), 31–62.

Cruttenden, Alan. 1994. Rises in English. In J. Windsor-Lewis (ed.) *Studies in general and English phonetics*, 155–173, London: Routledge.

Cruttenden, Alan. 1997. *Intonation*. Cambridge: Cambridge University Press, 2nd edn.

Cruttenden, Alan. 2007. Intonational diglossia: A case study of Glasgow. *Journal of the International Phonetic Association* 37(3), 257–274.

Dalton, Martha & Ailbhe Ní Chasaide. 2003. Modelling intonation in three Irish dialects. In *Proceedings of the 15th International Congress of Phonetic Sciences*, Barcelona.

Dalton, Martha & Ailbhe Ní Chasaide. 2005. Tonal alignment in Irish dialects. *Language and Speech* 48(4), 441–464.

Daly, Nicola & Paul Warren. 2001. Pitching it differently in New Zealand English: Speaker sex and intonation patterns. *Journal of Sociolinguistics* 5(1), 85–96.

Dorn, Amelie, Maria O' Reilly & Ailbhe Ní Chasaide. 2011. Prosodic signalling of sentence mode in two varieties of Irish (Gaelic). In *Proceedings of the 17th International Congress of the Phonetic Sciences*, Hong Kong: City University Hong Kong.

Erikson, Y. & M. Alstermark. 1972. Fundamental frequency correlates of the grave word accent in Swedish: The effect of vowel duration. *Speech transmission laboratory KTH. Quarterly progress and status report* 2-3.

Fletcher, Janet, Esther Grabe & Paul Warren. 2005. Intonational variation in four dialects of English: The high rising tune. In Sun-Ah Jun (ed.) *Prosodic typology: The phonology of intonation and phrasing*, 390–409, Oxford: Oxford University Press.

Fletcher, Janet & Jonathan Harrington. 2001. High-rising terminals and fall-rise tunes in Australian English. *Phonetica* 58, 215–229.

Fletcher, Janet, Lesley Storling, Ilana Mushin & Roger Wales. 2002. Intonational rises and dialogue acts in the Australian English map task. *Language and Speech* 45(3), 229–253.

Foulkes, Paul, James Scobbie & Dominic Watt. 2010. Sociophonetics. In William Hardcastle, John Laver & Francis Gibbon (eds.) *Handbook of the phonetic sciences*, 703–754, Oxford: Blackwell.

Grabe, Esther. 1998. *Comparative Intonational Phonology: English and German*. Ph.D. thesis, Max Planck Institut für Psycholinguistik, Nijmegen, The Netherlands.

Grabe, Esther. 2004. Intonational variation in urban dialects of English spoken in the British Isles. In Peter Gilles & Johan Peters (eds.) *Regional variation in intonation*, 9–31, Tübingen: Linguistische Arbeiten.

Grabe, Esther & Brechtje Post. 2002. Intonational variation in English. In B. Bel & I. Marlin (eds.) *Proceedings of Speech Prosody*, 343–346, Aix-en-Provence.

Grabe, Esther, Brechtje Post & Francis Nolan. 2001. Modelling intonational variation in English. In *Proceedings of prosody 2000*, 51–57, Poznan, Poland: Adam Mickiewitz University.

Grabe, Esther, Brechtje Post, Francis Nolan & Kimberley Farrar. 2000. Pitch accent realization in four varieties of British English. *Journal of Phonetics* 28, 161–185.

Gregersen, Frans, Søren Beck Nielsen & Jacob Thøgersen. 2009. Stepping into the same river twice on the discourse context analysis in the LANCHART project. *Acta Linguistica Hafniensia* 41, 30–63.

Guy, Gregory, Barbara Horvarth, Julia Vonwiller, Elaine Daisley & Inge Rogers. 1986. An intonational change in progress in Australian English. *Language in Society* 15, 23–52.

Guy, Gregory & Julia Vonwiller. 1984. The meaning of an intonation in Australian English. *Australian Journal of Linguistics* 4, 1–17.

House, Jill. 2006. Constructing a context with intonation. *Journal of Pragmatics* 38, 1542–1558.

Jarman, Eric & Alan Cruttenden. 1976. Belfast intonation and the myth of the fall. *Journal of the International Phonetic Association* 6, 4–12.

Jespersen, Anna. 2015. Intonational rises and interation structure in Sydney Aboriginal English. In *Proceedings of the 18th International Congress of the Phonetic Sciences*, Glasgow.

Jun, Sun-Ah (ed.). 2005. *Prosodic typology: The phonology of intonation and phrasing*. Oxford: Oxford University Press.

Jun, Sun-Ah (ed.). 2014. *Prosodic typology II: The phonology of intonation and phrasing*. Oxford: Oxford University Press.

Kollmeier, Birger, Thomas Brand & Bernd Meyer. 2008. Perception of speech and sound. In: Benesty, Jacob, M. Mohan Sondhi & Yiteng Huang, (eds), *Springer handbook of speech processing*. Berlin: Springer Verlag 61–83.

Knowles, Gerald. 1973. *Scouse: The urban dialect of Liverpool*. Ph.D. thesis, University of Leeds, Leeds.

Knowles, Gerald. 1978. The nature of phonological variables in scouse. In Peter Trudgill (ed.) *Sociolinguistic patterns in British English*, London: Arnold.

Ladd, D. Robert. 2008. *Intonational phonology*. Cambridge: Cambridge University Press, 2nd edn.

Levon, Erez. 2015. *Gender and interactional meaning: High Rising Terminals in London*. Oral presentation at International Conference on Language Variation in Europe conference.

Local, John, John Kelly & Bill Wells. 1986. Towards a phonology of conversation: Turn-taking in urban Tyneside speech. *Journal of Linguistics* 22, 411–437.

Lowry, Orla. 2002. The stylistic variation of nuclear patterns in Belfast English. *Journal of the International Phonetic Association* 32(1), 33–42.

Lowry, Orla. 2011. Belfast intonation and speaker gender. *Journal of English Linguistics* 39(3), 209–232.

Mayo, Catherine. 1996. *Prosodic transcription of Glasgow English: An evaluation of GlaToBI*. Master's thesis, University of Edinburgh, Edinburgh.

Mayo, Catherine, Matthew Aylett & D. Robert Ladd. 1997. Prosodic Transcription of Glasgow English: An Evaluation Study of GlaToBI. In G. Kouroupetroglou & G. Carayiannis (eds.) *Proceedings of an ESCA Workshop: Intonation: Theory, Models and Applications*, 231–234.

McGregor, Jeannette & Sallyanne Palethorpe. 2008. High Rising Tunes in Australian English: The communicative function of L* And H* pitch accent onsets. *Australian Journal of Linguistics* 28(2), 171–193.

Milroy, Lesley & Matthew Gordon. 2003. *Sociolinguistics: Method and interpretation*. Oxford: Blackwell.

Nance, Claire. 2013. *Phonetic variation, sound change, and identity in Scottish Gaelic*. Ph.D. thesis, University of Glasgow, Glasgow.

Nance, Claire. 2015. Intonational variation and change in Scottish Gaelic. *Lingua* 160, 1–19.

Nolan, Francis. 2008. Intonation. In Bas Aarts & April McMahon (eds.) *Handbook of English linguistics*, 433–459, Malden, Massachusetts: Blackwell.

Pellowe, J. & V. Jones. 1978. On intonational variability in Tyneside speech. In Peter Trudgill (ed.) *Sociolinguistic patterns in British English*, 101–121, London: Arnold.

Pierrehumbert, Janet. 1980. *The phonology and phonetics of English intonation*. Ph.D. thesis, Massachusetts Institute of Technology, Cambridge, Massachusetts.

Podesva, Robert. 2011. Salience and the social meaning of declarative contours: Three case studies of gay professionals. *Journal of English Linguistics* 39(3), 233–264.

Rahilly, Joan. 1997. Aspects of prosody in Hiberno-English: The case of Belfast. In Jeffrey Kallen (ed.) *Focus on Ireland*, Amsterdam: John Benjamins.

Ritchart, Amanda & Amalia Arvaniti. 2014. The form and use of uptalk in southern california english. In *Proceedings of Speech Prosody*, Dublin.

Shobbrock, Katherine & Jill House. 2003. High Rising Tones in Southern British English. In *Proceedings of the 15th International Congress of Phonetic Sciences*, 1273–1276, Barcelona.

Stirling, L., Janet Fletcher, Ilana Mushin & Roger Wales. 2001. Representational issues in annotation: Using the Australian map task corpus to relate prosody and discourse structure. *Speech Communication* 33, 113–134.

Sullivan, Jennifer. 2010. *Approaching intonational distance and change*. Ph.D. thesis, University of Edinburgh, Edinburgh.

Traunmüller, Hartmut & Anders Eriksson. 1995. The perceptual evaluation of F0-excursions in speech as evidenced in liveliness estimations. *Journal of the Acoustical Society of America* 97, 1905–1915.

Vizcaino Ortega, Francisco. 2002. A preliminary analysis of Yes/No questions in Glasgow English. In *Proceedings of Speech Prosody*, 683–686, Aix-en-Provence.

Warren, Paul. 2005. Patterns of late rising in New Zealand English: Intonational variation or intonational change? *Language Variation and Change* 17, 209–230.

Warren, Paul. 2016. *Uptalk: The Phenomenon of Rising Intonation*. Cambridge: Cambridge University Press.

Watson, Kevin. 2006. Phonological resistance and innovation in the North West of England. *English Today* 22(2), 55–61.

Watson, Kevin. 2007. Liverpool English. *Journal of the International Phonetic Association* 37(3), 351–360.

Wells, Bill & Sue Peppé. 1996. Ending up in Ulster: prosody and turn taking in English dialects. In Elizabeth Couper-Kuhlen & Margret Selting (eds.) *Prosody in conversation: interactional studies*, 101–131, Cambridge: Cambridge University Press.