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Intonational variation and change in Scottish Gaelic

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Text

Abstract

This paper investigates intonational variation and change in Scottish Gaelic (henceforth 'Gaelic'), a minority endangered language undergoing revitalisation. In particular I focus on bilingual speakers aged 13–14 who are attending immersion education in the Isle of Lewis, a Gaelic-heartland area, and in the city of Glasgow where Gaelic has no community history. The young people are compared to older Gaelic-dominant speakers in Lewis. Results suggest a substantial difference in Gaelic prosodic structure between the older and younger speakers, with older speakers speaking Gaelic as a language with contrastive word accents (prosodically similar to Swedish), and young people speaking Gaelic as an intonation language (prosodically similar to English). Further analysis of the young people's intonation suggests cross-language influence from Glaswegian English on the realisation of pitch accents and boundary tones in Glasgow Gaelic. These results are discussed in terms of the impact of language contact and bilingualism on intonational structure, and language change in this context of minority language revitalisation.

Keywords: Scottish Gaelic; Bilingualism; Language contact; Intonation; Prosody; Language revitalisation

1. Introduction

A wide body of research has suggested that when a person speaks more than one language, features of one language are typically transferred into the other language. For example, people learning a second language are usually perceived as having a 'foreign accent' due to transfer from their native language(s) (e.g. Flege et al., 1995; Piske et al., 2001). Similarly, research has found that bilinguals can transfer phonetic features of both their languages in a bidirectional manner, depending on individual and societal factors (e.g. Mennen, 2004; Fowler et al., 2008). On a wider scale, the effects of societal second language learning, bilingualism and contact with other language(s) may have long-term outcomes in shaping the sound systems of the languages in question (Thomason and Kaufman, 1988).

While less studied than segmental features, these broad trends have also been noted in studies of prosodic variation (e.g. Chun, 2002; Mennen and de Leeuw, 2014). For example, previous work has shown that it is common for second language learners to transfer prosodic aspects of their native language into their second language even after many years of exposure to the second language (L2) (Atterer and Lass, 2004; Mennen, 2004; Trofimovich and Baker, 2006; Swerts and Zerbian, 2010). Similarly, studies of the bilingual repertoire of simultaneous bilinguals indicate a mixing of prosodic systems. Sometimes this process results in the 'fusion' (Queen, 2001) of prosodic elements to form new structures, which do not exist in the native languages of the bilingual or multilingual speaker (Cruz-Ferreira, 1999; Queen, 2001, 2006).

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Several instrumental studies have considered prosody in contexts of long-term language contact. For example, Simonet et al. (2008) and Simonet (2011) describes the realisation of utterance-final pitch accents in Majorcan Catalan and Spanish by Catalan-dominant bilinguals and Spanish dominant bilinguals. As well as finding cross-linguistic differences, Simonet most interestingly notes that the Spanish of Spanish-dominant bilinguals is becoming more similar to the L2 Spanish spoken by native Majorcan Catalans (see also Romera and Elordieta, 2013). He suggests that situations of language contact such as Spanish in Majorca may lead to the (symmetric or asymmetric) convergence of two languages and the development of new community norms. Simonet's results are similar to the hypothesised explanation of the data in Colantoni and Gurlekian (2004), who suggest that Buenos Aires Spanish may be influenced by the L2 Spanish of Italian speakers, i.e. a second language variety can influence a community's dominant language.

O'Rourke (2005, 2012) compares Spanish intonation in Peruvian speakers with varying degrees of contact with Quechua. Those with no contact with Quechua (in Lima) displayed similar focus strategies as other varieties of Spanish, whereas those with greater contact with Quechua (in Cuzco) did not. Interestingly, level of bilingualism in Quechua did not predict intonation patterns suggesting that a Quechua-influenced variety of Spanish is spoken by Cuzco inhabitants, rather than individuals transferring features of their Quechua into Spanish. A community-wide mixed intonation pattern stemming from contact is also hypothesised in Elordieta and Calleja (2005) who identify tonal alignment patterns in the Spanish spoken in a Basque area, which lie between Basque and Spanish norms, and in Sichel-Bazin et al. (2012) who interpret their findings for southern French intonation in terms of contact with Occitan.

The present study considers data primarily from students in Gaelic immersion education. Immersion education is defined here as a programme where at least 50% of the teaching is delivered in the target language (Genesee, 1987). While not specifically focussed on prosody, several previous studies have considered the phonetic behaviour of such pupils and as such are relevant here. By and large, these studies find that although immersion school pupils become fluent and proficient speakers of the language in question, they do not sound the same as native speakers of the target language, and specifically, transfer phonetic patterns from their other language (Harada, 2006; Menke, 2010). Home language background is often cited as playing a role in phonetic production, where those students with a home language background in the immersion schooling language are more likely to reproduce the traditional phonetic structures of the language (Morris, 2013, 2014).

The current study builds on the previous work discussed above and considers prosodic variation in a context of minority language immersion schooling, on the one hand in a community which has experienced long term language contact between Gaelic and English, and on the other hand in an area which has no history of Gaelic as a community language. In doing so I contribute to the literature on contact and intonation in the following ways: first, by providing an intonational sketch of variation within the understudied context of contemporary Scottish Gaelic; secondly, by considering contact between a word accent language and an intonation language; and thirdly, by considering intonational data from immersion school students.

1.1. Research context: Scottish Gaelic

Scottish Gaelic is a language spoken by approximately 58,000 people (1% of the Scottish population) according to the latest available figures from the 2011 UK Census. While the Gaelic context has previously been described as a canonical case of language death (Dorian, 1981), Gaelic is now undergoing revitalisation (McLeod, 2006). Traditionally, the language is associated with the rural Highlands and Islands of Scotland, and the densest concentration of Gaelic speakers remaining is located in the Outer Hebrides, a chain of islands off Scotland's north west coast (60% Gaelic speaking, 2011 Census).

One of the locations considered in this study is the Isle of Lewis, the largest and most northerly island in the Outer Hebrides. Gaelic has been spoken in Lewis since the language of the island shifted from Norse around the seventh–ninth century AD (Macdonald, 2004:21). Although primarily a Gaelic-speaking island until recently, all Gaelic-speaking inhabitants of Lewis are now more or less bilingual (excepting perhaps a handful of pre-school age children). Gaelic is widely spoken by the older generations but less so among young people, and among people living in the main town, Stornoway (Munro et al., 2011; Nance, 2013). As such, Lewis is an example of a community in a situation of language contact. In the distant past, the contact was with Norse, and in more recent times, contact is with English.

While traditional heartlands such as Lewis remain an important stronghold for Gaelic, in recent years urban central Scotland has become an increasingly significant centre for the language. The most recent census results suggest that 16% of Gaelic speakers now live in either Glasgow or Edinburgh, and many more live in surrounding urban areas. The reasons for this population shift are twofold: one the one hand, Gaelic speakers from north west Scotland have moved to the city looking for work. In particular, Gaelic speakers have traditionally moved to Glasgow for work since at least the seventeenth century (Withers, 1998). On the other hand, many revitalisation measures are centred in urban Scotland such as the development of Gaelic media initiatives in Glasgow, the political importance of Edinburgh, and opportunities in teaching and the arts in both cities.

A major component of Gaelic language revitalisation is the introduction and development of Gaelic-immersion schooling, also known as Gaelic-medium education. Glasgow is of particular significance in the development of Gaelic-medium schooling as it is the location of one of the first fully Gaelic-medium primary schools (along with another school in Inverness), and is still the location of the only fully Gaelic-medium secondary school. Additionally, a fully Gaelic-medium primary school recently opened in Edinburgh. Apart from these exceptions, all other Gaelic-medium education is carried out in a Gaelic stream within an otherwise English-medium school (MacLeod, 2003). Gaelic-medium education has been hailed as the successful major component of the Gaelic revitalisation programme. For example, the 2011 census figures indicated a slight decline in speaker numbers overall since the previous census in 2001, but an increase in speakers aged 5–19. It is thought that this increase is largely due to Gaelic-medium education.

Students attending Gaelic-medium classes occasionally come from Gaelic-speaking backgrounds but the majority of pupils, especially in non-Highland and Island areas, come from families with no Gaelic-speaking background (O'Hanlon et al., 2010). The vast majority of pupils attend Gaelic-medium nursery classes from age two onwards, before moving onto primary and sometimes secondary schooling. As such, they are immersed in the language from at least age 2 and would in many contexts be considered 'early bilinguals' (e.g. Paradis, 2004). On the rare occasions where Gaelic is spoken in the household of young Gaelic-immersion pupils, such speakers could be considered simultaneous bilinguals. On even rarer occasions (none are included in the present study), children are brought up exclusively in Gaelic and are only exposed to English when attending nursery at age 2–3.

1.2. Participants in this study

The data for this study come from sociolinguistic interviews, which were conducted in 2011 in Lewis and Glasgow. The interviews were conducted in Gaelic by myself in the participant's home (in the case of the Lewis older speakers), or in a quiet room at the school (in the case of the Lewis and Glasgow younger speakers). Before carrying out the recordings used for this study, I conducted a period of two months observation in each school and visited the rural area of Lewis three times for a number of weeks, ensuring that each participant was personally known to me before recording. This study aims to compare the intonational productions of young people in two contrasting communities where Gaelic-medium education is provided. Lewis was chosen as a Gaelic heartland community and is compared with Glasgow, where, as discussed above, Gaelic revitalisation is taking place but the city has no history of a Gaelic-speaking community other than an immigrant one. These data are compared to the speech of older Gaelic-dominant bilinguals in order to show how young speakers' speech is innovative compared to traditional forms of the language.

The 6 Lewis older speakers grew up in entirely Gaelic-speaking households in a rural part of Lewis at a time when Gaelic was very much the community language. At the time of recording they were aged 61–86, and were partly or fully retired. All spoke Gaelic on a daily basis and reported feeling 'more comfortable' in the language compared to English. These participants learned English via immersion when they first attended school. They reported speaking Gaelic in the playground and amongst themselves, but the language was forbidden in the classroom.

In contrast, for the young people in this study Gaelic is now the language of instruction for the majority of their education. The 12 young Lewis speakers were aged 13–14 and were attending Gaelic-medium schooling at the island's only secondary school. At this school, I recorded 16 out of 18 students in the class and analysed the 12 who provided the most data. For more details on participant selection see Nance (2013). Due to the school experiencing difficulties in recruiting Gaelic-speaking teachers, the pupils received around half of their lessons in Gaelic and the rest in English. All the Gaelic-medium teachers at the school at the time of recording were from Lewis with two exceptions. The pupils reported speaking English to one another, and 3 of them reported speaking Gaelic with one of their parents. None of the students came from entirely Gaelic-speaking households. In Lewis more generally, however, it is common to hear Gaelic spoken in shops and businesses and signs are bilingual in the majority of cases (NicAoidh, 2010; Munro et al., 2011; Nance, 2013)

The 21 Glaswegian young speakers were also aged 13–14 and were attending Gaelic-medium schooling in Glasgow. A total of 28 students at the Glasgow school were recorded out of a possible 30 in their class, and I analysed the 21 who yielded the most data (see Nance, 2013 for more information). The Glaswegian students also commented that they spoke English to one another at all times, and from my own observations this was indeed the case. Due to teacher shortages, the students in Glasgow also received around half of their lessons in Gaelic and the rest in English. The framework, administration and ethos of the school is one of Gaelic wherever and whenever possible and it is hoped that as new teachers are trained and recruited the lessons will be conducted 100% in Gaelic. For the moment however, a pragmatic compromise has been adopted. Over half of the Gaelic-speaking teachers at the school at the time of recording were from Lewis, the rest were from other Outer Hebridean islands. Out of the 21 students analysed here, 3 spoke Gaelic at home with one parent and none had two Gaelic-speaking parents. One speaker additionally reported that his mother spoke to him in Gaelic sometimes. In Glasgow it is extremely rare to hear Gaelic spoken in the street and use of the language is mainly restricted to cultural events specifically designed to promote the language (McLeod et al., 2014).

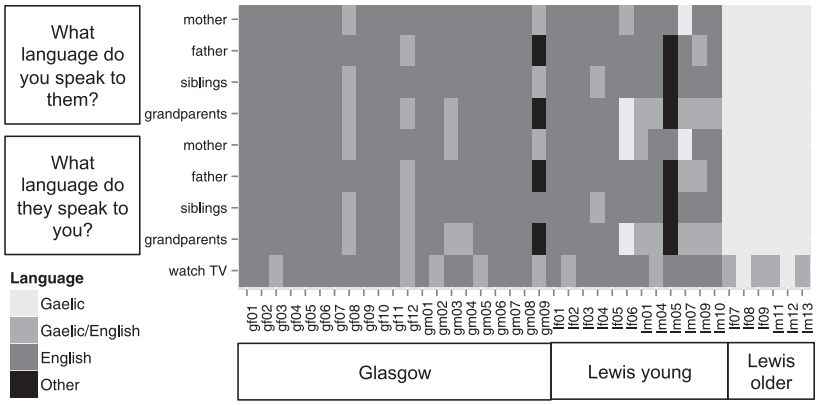

Fig. 1. Reported language use among all participants.

During the interviews, I asked participants about their use of Gaelic and English. A summary of the language use patterns can be found in Fig. 1. Speaker code initial letters refer to the location: 'l' = Lewis, 'g' = Glasgow. Then the speaker's gender: 'f' = female, 'm' = male. Here, the participants were asked which language they used in a variety of contexts. The figure shows the preference for Gaelic among the older speakers in Lewis. It must be noted, however, that in the case of the older speakers these questions refer to their parents and grandparents, many of whom have now passed on. The older speakers who had children reported speaking mainly Gaelic to their children, with some English. Language use patterns show more English among the young speakers. Only one young person in Lewis reported speaking Gaelic to a parent 100% of the time, and only two young people (both from Lewis) reported that their parent spoke Gaelic to them 100% of the time. The rest reported mixed Gaelic and English depending on context, level of tiredness, and other participants in the conversation. Gaelic usage was more frequent with grandparents, especially in Lewis. Two young people spoke another European language with the family of one of their parents, coded here as 'other' for anonymity.

1.3. Research questions and outline

The first research question addressed in this study is *Do young Gaelic speakers in immersion schooling produce lexical pitch accents in the manner of older Gaelic-dominant speakers?* This question is addressed in Section 2. Results suggest that although older speakers reproduce the system previously described in the literature, there is no evidence of lexical pitch accents among young people in either Glasgow or Lewis, even among those from Gaelic-speaking homes. These results are discussed in terms of the functionality of lexical pitch accents in Gaelic and the sociolinguistic status of Gaelic and English. After obtaining these results I conducted a second analysis, described in Section 3, focussing on the intonation of the younger speakers only and discussing the question *What is the nature of intonational productions among young Gaelic speakers?* This analysis finds large differences between Lewis and Glasgow young people, and the results are discussed in terms of the differing social contexts of the two places, home language backgrounds of the young people in question, and contact with local Englishes. Section 4 draws together the two analyses and indicates how this study contributes to the wider discussion on prosodic systems in contact, and the future for Gaelic.

2. Analysis 1: lexical pitch accent in Gaelic

The prosodic systems of the world's languages can be divided into three very broad categories: languages making use of lexical tone on each syllable of each word such as Mandarin or Hausa, languages which do not use lexical tone such as English or Spanish, and languages which fall somewhere between the two making partial use of lexical tone on some words (e.g. Laver, 1994:462–463). This third group is diverse, containing languages such as Japanese, Serbo-Croat, Swedish and North Biskaian Basque. Such languages are variously referred to as 'word accent' or 'pitch accent' languages. Gussenhoven (2004:41–42) problematises this division between 'tone' and 'word/pitch accent' languages, and suggests it is theoretically unhelpful to group together such languages which are diverse in terms of typology and 'word/pitch accent' realisation. His model prefers to separate 'tone' (including 'word/pitch accent' languages), and 'non-tone' languages. Here, I use the term 'lexical pitch accents' to refer to the tone patterns in Scottish Gaelic, and to disambiguate from the non-lexically contrastive pitch accents discussed in Section 3. I make the distinction from tone

Table 1
Examples of tone near minimal pairs from the literature.

Accent 1			Accent 2		
Gaelic	IPA	English	Gaelic	IPA	English
bò	poː	cow	bogha	po.ə	rockpool
balg	paʟ̪ʸak	belly	ballag	paʟ̪ʸ.ak	skull
duan	t̪uən	song	dubhan	t̪u.ən	hook
ainm	ɛɲɛm	name	anam	an.əm	soul
seinn	ʃəiɲ	sing	sithinn	ʃi.iɲ	venison
falbh	faʟ̪ʸav	going	falamh	faʟ̪ʸ.əv	empty

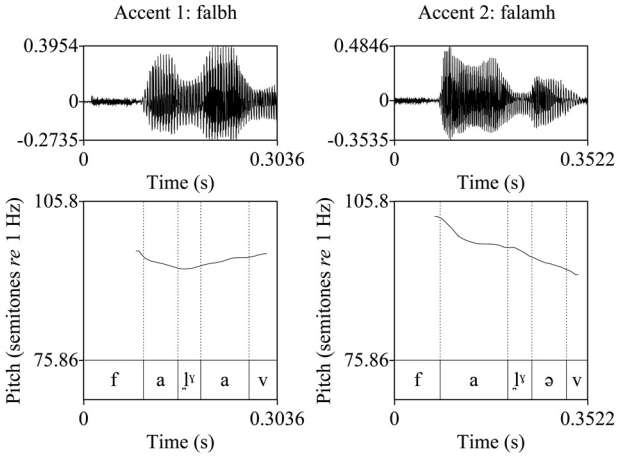

Fig. 2. Pitch traces from *falbh* 'going' and *falamh* 'empty' spoken by speaker lf08, an older Lewis speaker.

languages as it is consistently made in the literature referring to Scandinavian dialects and to Scottish Gaelic dialects (e.g. Bruce, 1977; Gårding, 1989; Ladefoged et al., 1998; Ambrazaitis, 2009).

All dialects of Gaelic reportedly have lexical stress on the first syllable in the word, and several dialects (including Lewis Gaelic) are said to have contrastive lexical pitch accents (Borgstrøm, 1940; Oftedal, 1956; Dorian, 1978; Bosch and de Jong, 1997; Ladefoged et al., 1998; Ternes, 2006). According to previous descriptions, the lexical pitch accent contrast in Gaelic is based on syllabicity: pitch accented monosyllabic words have a rising or low pitch; and pitch accented polysyllabic words have a falling, high, or rising falling pitch (Borgstrøm, 1940:54; Oftedal, 1956:28; Dorian, 1978:31). It is however important to note that syllabicity in Gaelic is a much-debated topic in the phonological literature (Clements, 1986; Bosch and de Jong 1997; Bosch, 1998; Hall, 2006; Hammond et al., 2014; Iosad, 2014). Following the Swedish tradition (see Bruce, 1977), I refer to the monosyllabic Gaelic rise/low as Accent 1; and the more complex polysyllabic fall/rise-fall/high as Accent 2 (contra Ternes, 2006).

Bosch and de Jong (1997) and Ladefoged et al. (1998) investigate the use of the lexical pitch accent system acoustically using near minimal pairs, and find that speakers do indeed differentiate the two accents as described in the dialect descriptions above. Examples of the near minimal pairs described in Bosch and de Jong (1997), Ladefoged et al. (1998) and Ternes (2006) include the pairs shown in Table 1. A full discussion and critique of the decisions concerning syllabification in Gaelic is outside of the scope of the current paper, but see in particular Hammond et al. (2014) for discussion of this issue and an experimental approach to syllabification in Gaelic.

The last pair of words in Table 1 occurred in the dataset in the middle of phrases spoken by older Lewis speaker lf08. The pitch traces from these contrasting words are shown in Fig. 2. Ternes (2006:134–135) gives a list of 8 near minimal pairs of tone words. This list is not designed as an exhaustive list and a few more pairs could be added from, for example, Bosch and de Jong (1997) and Ladefoged et al. (1998). However it seems clear that this is a contrast with fairly low functional load. Fig. 2 shows the only pair of words, which occurred in the dataset uttered by the same speaker. This finding suggests (albeit from a relatively small corpus) that the lexical pitch accent contrast is also functionally rare in spoken Gaelic. As a point of comparison, Gårding (1989:65) suggests that there are approximately 350 pairs of words contrasted by accent in Swedish.

Previous prosodic work on Gaelic has either concentrated on syllabification and/or the lexical pitch accent system in near minimal pairs. Only Borgstrøm (1940), to the best of my knowledge, has discussed the interaction of lexical pitch accents and sentence-level intonation. He notes that the sentence as a whole is usually falling. If the last word is Accent 1 with a rising pitch, this is often very reduced phrase-finally (Borgstrøm, 1940:53). Similarly, MacAulay (1979), who provides a descriptive account of sentence-level intonation but does not discuss the interaction with lexical pitch accents, suggests that the default end to an intonational phrase is a falling contour.

This section describes the analysis conducted to investigate whether all of the speakers in this study (Lewis older speakers, Lewis younger speakers, Glasgow young speakers) use the lexical pitch accent system previously described for Gaelic. I first describe the method of data collection, then outline the methods (Section 2.2), before describing the results (Section 2.3) and how they motivated the analysis of young people's intonation (described in Section 3).

2.1. Data

Interview data were chosen for three reasons. First, older Gaelic speakers often have limited literacy skills in the language, and in the current sample 3/6 older speakers were unable to read Gaelic. Secondly, in a previous word-list study with middle-aged Lewis speakers (reported in Nance, 2011; Nance and Stuart-Smith, 2013), I attempted to elicit tone near minimal pairs from the participants, but found they were disinclined to produce tonal contrasts on words out of context. Thirdly, a previous study of intonation in Glaswegian English demonstrated that many Glaswegians are 'intonationally diglossic' (Cruttenden, 2007). Glaswegians typically use the intonation characteristic of their dialect in spontaneous conversation but use an intonation more typical of Standard Scottish English when reading. For these reasons data from interviews were used for this analysis.

Each interview lasted between 30 and 50 min and discussed the participants' attitudes to Gaelic and Gaelic-medium education, and topics of local interest to the older speakers, or popular music, culture and school with the younger speakers. The interviews were recorded onto a laptop computer at 44 kHz sampling rate with 16-bit quantisation using a Beyerdynamic Opus 55 headset microphone, a Rolls LiveMix pre-amplifier, and a USB audio interface.

2.2. Method

In order to conduct this study, approximately 30 Intonation Phrases (IPs) per speaker were extracted. The boundary of each IP was defined as the point at which a cluster of prosodic features marking a boundary occurred. These included a pause, a large pitch excursion, a slowing of speech rate, a change in loudness (usually quieter at the end of an IP), and lengthening of the final syllable (Cruttenden, 1997:29–37). Only IPs that unambiguously met these criteria were analysed and IPs that included hesitations or false starts were excluded. I considered only IPs that contained two or more pitch accents, where the most prosodically prominent pitch accent was the final accent. The total number of speakers, pre-nuclear and nuclear pitch accents analysed in this study is summarised in Table 2.

Ladd's (2008:6) definition of intonation states that prosodic variation can be used to convey '*sentence-level* pragmatic meaning'. A method was therefore needed to control for different pragmatic functions and their various potential influences on the realisation of the lexical pitch accents. The framework selected was an adapted version of the Discourse Context Analysis (DCA; Gregersen et al., 2009). This framework was designed to classify discourse functions within sociolinguistic interviews. Two of the discourse functions from the full DCA were used in this study: phrases from Narratives and General Accounts. Narratives are a large discourse structure, which contains a clear introduction, complication and resolution to a consistent storyline (e.g. Labov and Waletzky, 1967; Eggins and Slade, 1997:244; Smith, 2006). An example narrative is in Table 3 demonstrating the narrative structure suggested in Labov and Waletzky (1967). The speaker is a younger Lewis speaker and is telling a story about how she appeared on TV once.

Table 2
Total number of speakers and pitch accents analysed in this study.

Gender	Lewis old		Lewis young		Glasgow		Totals
	Female	Male	Female	Male	Female	Male	
Speakers	3	3	6	6	12	9	39
Pre-nuclear accents	95	90	193	188	378	286	1230
Nuclear accents	95	90	193	188	378	286	1230
Total accents	190	180	386	376	756	572	2460

Table 3
Example of a narrative from the dataset (lf06 younger Lewis speaker).

Line number	Gaelic	English	Narrative structure
1	Rinn mi fear eile airson 'Dè a-nis?' agus erm	*I did another one [a TV appearance] for 'Dè a-nis?' [Gaelic programme for children] and erm*	Abstract
2	Chaidh sinn ann an hot air ballon a bh'ann	*We went in a hot air balloon*	Orientation
3	Chan e fear real dìreach fear fake	*It wasn't a real one, just a fake one*	Complication
4	Bha le [FRIEND'S NAME] is bha sinn a falbh ann an Glaschu airson dà latha	*It was with [FRIEND'S NAME] and we went to Glasgow for two days*	
5	Ach bha e uabhasach math air sgath bha sinn aig an hotel sa h-uile càil	*But it was really great because we were in a hotel and stuff*	Evaluation Resolution Coda
6	So bha e uabhasach math	*So it was really great*	

General accounts on the other hand are an exchange of facts without the storyline running behind them; for example, details about the participant's family. Within the macro speech act category of the DCA (macro speech acts are concerned with the nature of the actions being carried out in a stretch of discourse, Gregersen et al., 2009:37) I only used exchanges of information: this excluded any instances of the participants giving their opinion on a topic or person. I also excluded interrogatives and lists. IPs and their discourse function were coded in ELAN (Sloetjes and Wittenburg, 2008).

Each IP was orthographically transcribed and the words able to carry a lexical pitch accent noted. The penultimate and phrase-final words able to carry a lexical accent were then given an auditory descriptive label of pitch pattern, based on Autosegmental Metrical accounts of tone (Bruce, 1977; Pierrehumbert, 1980; Ladd, 2008). Auditory analysis was favoured here over acoustic analysis due to the non-controlled nature of the dataset. Many detailed phonetic studies of the realisation of lexical pitch accents discuss the alignment of specific tones to specific segments or syllables within the accented word (e.g. Bruce, 1977; Ambrazaitis, 2009). It is not the aim here to provide a full Autosegmental Metrical description of Gaelic, which would have to be the subject of future research. Instead the aim is to provide a descriptive account as to whether the previously described patterns are produced by speakers in this dataset. With this in mind, the descriptive labels above do not preclude any assumptions about alignment or which tone is the starred tone (Arvaniti et al., 2000). Labelling was carried out in Praat (Boersma and Weenink, 2012) and was based on an auditory impression of the pitch pattern over the accented word. These descriptive labels were as follows (including the lexical accent they are traditionally associated with), and examples are shown in Fig. 3:

Low pitch accent L (Accent 1); High H (Accent 2)
Fall HL (Accent 2); Rise LH (Accent 1)
Fall-rise HLH (not traditionally attested); Rise-fall LHL (Accent 2)

The HLH pattern was not reported in previous descriptions such as Ternes (2006), but the label was included here to allow for potential non-traditional realisations among younger speakers. The total number of words analysed for each speaker group belonging to Accent 1 or Accent 2 is in Table 4. The criteria used to define whether a word was Accent 1 or Accent 2 were based on the discussion in Ladefoged et al. (1998) and Ternes (2006) of syllabicity in Gaelic. Words which were monosyllabic according to these previous accounts are considered as Accent 1 and words which are polysyllabic are considered as Accent 2.

2.3. Results

Based on previous work, it was expected that if an accented word were monosyllabic, speakers would produce an L or LH pitch contour, and if an accented word were polysyllabic, speakers would produce an H, HL or LHL tone. Fig. 4 shows the way in which individual speakers produced (traditionally) Accent 1 and Accent 2 words: contours L or LH were considered Accent 1 contours, and contours H, HL or LHL were considered Accent 2 contours. This Figure clearly indicates large production differences between Accent 1 words and Accent 2 words among the Lewis older speakers, but little-to-no differences in accent production among the Lewis and Glasgow young speakers. The young Lewis speakers produce about half and half Accent 1 contours and Accent 2 contours, but the Glasgow speakers mainly produced Accent 1 contours in all contexts.

While visual inspection of Fig. 4 suggests differences in production between Accent 1 and Accent 2 words among Lewis older speakers, it is possible that speakers may be producing false positives i.e. producing the appropriate pitch pattern 'by chance'. For example, the Glasgow young speakers mainly appear to be producing an appropriate pitch pattern for Accent 1 words, but as will become clear in Section 3, this LH pattern is a characteristic pattern for Glaswegian

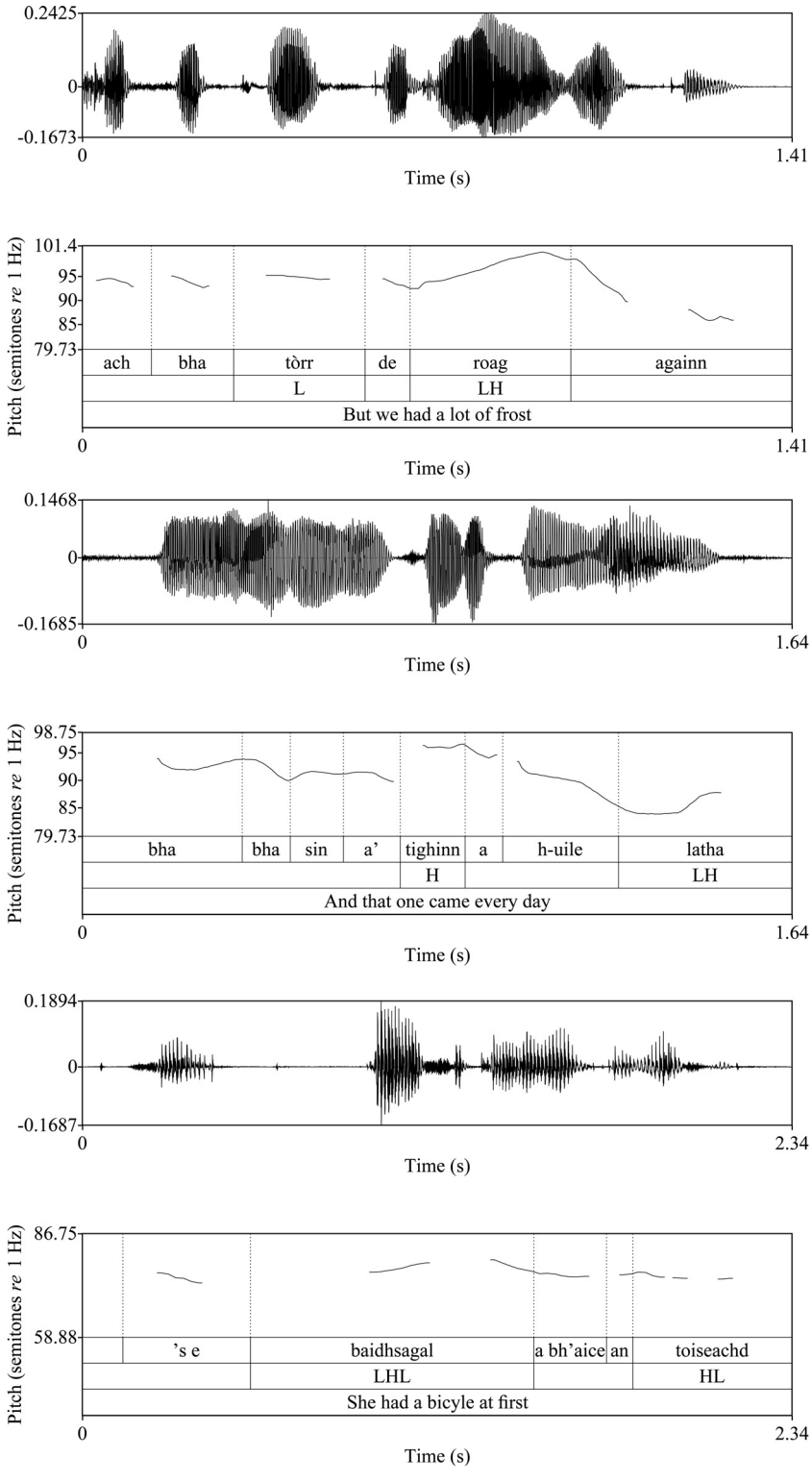

Fig. 3. Examples of descriptive labelling. Top panel, L and LH spoken by speaker lf07; middle panel H and LH spoken by lm11; bottom panel LHL and HL spoken by lm13.

Table 4
Number of word analysed in Analysis 1 according to speaker group and whether the word was Accent 1 or Accent 2.

Speaker group	Accent 1	Accent 2
Lewis older	145	225
Lewis young	349	413
Glasgow	537	791

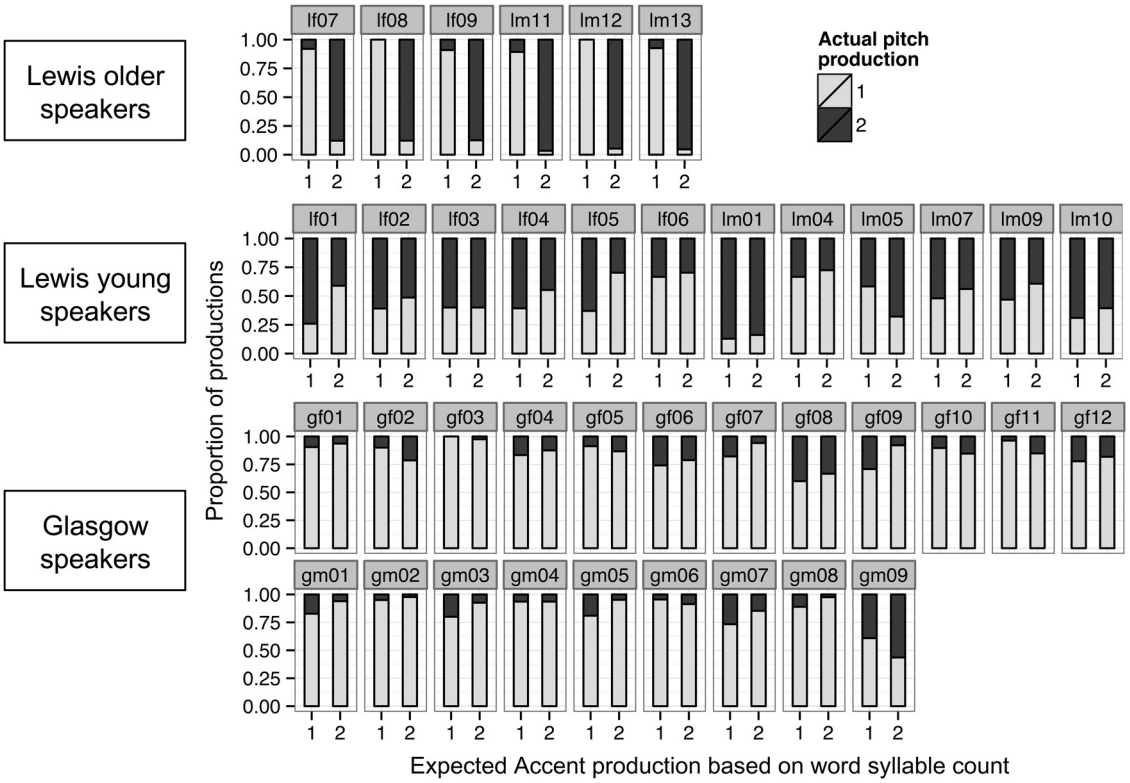

Fig. 4. Individual proportions of contour realisations for (traditionally) Accent 1 and Accent 2 words.

rather than them producing appropriate tones for all Accent 1 words. The phonetic outcome is the same, that they produce a traditional contour for half their words, but the fact that they use that same contour for Accent 2 words as well suggests that they are not using a lexical pitch accent system in the manner of the older Lewis speakers.

In order to exclude this possibility, I used Signal Detection Theory to further examine the data (e.g. Macmillan, 1993; Wickens, 2002). This method is commonly used in psychology to compare error rates between speakers. In this study, it is used to compare speakers' production of the tone system as corresponding to traditional descriptions, or not. There are four possible outcomes in the current scenario of tone production, listed below with their corresponding Signal Detection Theory labels in brackets:

1. Speaker produces an Accent 1 contour when word is Accent 1 ('hit').
2. Speaker produces an Accent 2 contour when word is Accent 1 ('miss').
3. Speaker produces and Accent 1 contour when word is Accent 2 ('false alarm').
4. Speaker produces an Accent 2 contour when word is Accent 2 ('correct reject').

The Signal Detection analysis first calculates the hit rate (number of hits divided by the total number of hits and misses), and the false alarms rate (number of false alarms divided by the total number of false alarms and correct rejections). The final calculation is as follows:

z (hit rate) – z (false alarm rate)

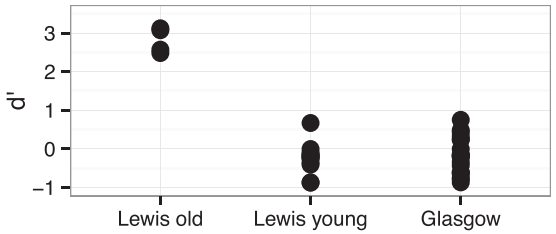

Fig. 5. D-prime results for each group of speakers. Each dot represents an individual speaker's value. Three speakers were excluded due to infinite results, $n = 36$.

The resulting value, known as *d-prime* or *d'*, in this study gives a scale where larger values indicate maintenance of the tone system, and values around zero indicate no use of the tone system. A negative value significantly different from zero would indicate backwards use of the tone system, i.e. traditional Accent 1 contours in Accent 2 words and vice versa. D-prime can also be calculated the other way round where speaker produces an Accent 2 contour when word is Accent 2 = 'hit' etc. and the values are exactly the same.

The results of the d-prime analysis are shown in Fig. 5. Each speaker is represented by one dot. Three speakers were excluded from this plot, as their d-prime values were infinite. This occurs when a speaker uses 100% appropriate tones for a particular lexical pitch accent (two Lewis older speakers did this), or 100% non-traditional tones (one young Glaswegian speaker did this).

The plot in Fig. 5 indicates very clear differences between the older Lewis speakers on the one hand, and the younger speakers in Lewis and in Glasgow on the other hand. In order to test whether the tone system was being used partially by young people, I conducted one sample *t*-tests on the Lewis young values and Glasgow values separately, to test their difference from zero, and indicate use or non-use of the tones. Neither test returned significant results, indicating that neither group of young speakers significantly distinguished Accent 1 and Accent 2 words. This result suggests that the young people in this study do not speak Gaelic using lexical pitch accents.

Three social factors were considered in the further exploration of the d-prime data: speaker gender, speaker location (differences between Glasgow and Lewis), and whether the Gaelic was spoken in the young person's household. Each speaker receives an individual d-prime value, which results in small token counts for the number of students with a

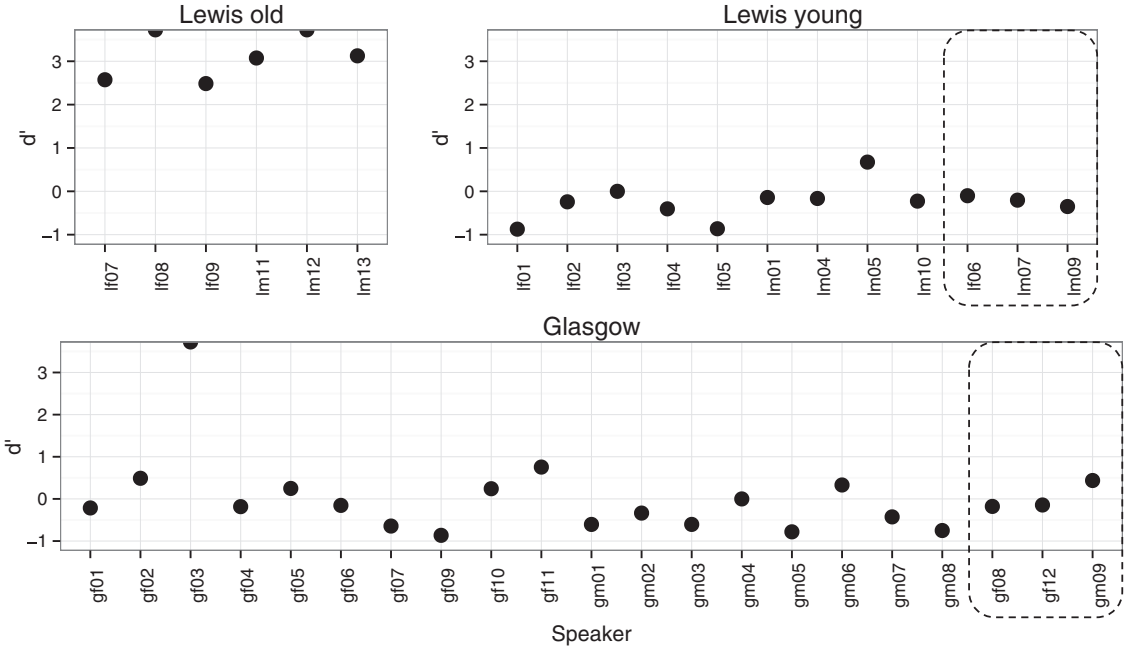

Fig. 6. Individual d-prime values for each group of speakers. Young people with one Gaelic-speaking parent are shown to the right of their respective panel, enclosed by a box with a dashed line.

Gaelic-speaking parent within each group of young people (3 in Glasgow, and 3 in Lewis). For this reason I did not conduct statistical testing in order to compare the young people with a Gaelic-speaking parent to those without. However, observation of the d-prime values for individuals allows some comparisons to be made, shown in Fig. 6. Individual values for the older speakers are also presented for completeness. As explained above, three speakers (gf03, lf08, lm12) had infinite d-prime values due to 100% non-use or use of the tone system. In each group of young speakers, those with one Gaelic-speaking parent are shown on the right of the figure, enclosed by a dashed line box. All of the young people with one Gaelic-speaking parent in both Lewis and Glasgow have a d-prime value around zero and are not substantially different from the young people who use English exclusively at home. This shows that, in the use/non-use of the Gaelic tone system, home language background does not affect production.

The remaining social factors of gender and location were tested via multiple linear regression. The dependent variable in the model was d-prime score, and the independent variables were speaker group (Lewis old; Lewis young; Glasgow young), gender (female; male), and an interaction between speaker group and gender. The baseline for speaker group was set as the young Lewis speakers, and the baseline for gender was female. The speakers with infinite d-prime values were excluded from this analysis. Non-significant predictors were removed from the model until an optimum model was reached (Baayen, 2008:205). In this final model (*Adj.* $R^2 = 0.83$, $F(1,34) = 173.9$, $p < .001$), Lewis old people were significantly different from Lewis young people ($\beta = 3.01$, $t = 13.19$, $p < .001$), indicating that the Lewis old people had significantly higher d-prime values. Glasgow young people were not significantly different from the Lewis young people, indicating that the two groups of young speakers were not behaving differently with respect to differentiating the lexical pitch accents. Gender, and the interaction of gender and speaker group, were not significant in this model. These results confirm what is clear from Figs. 5 and 6: there are extremely large differences between the older and younger speakers; younger speakers do not use the lexical pitch accent system, and there is no evidence that either group of young people use it more than the other.

2.4. Discussion: Gaelic as a lexical pitch accent language

The results presented above suggest a dramatic shift in the prosodic structure of Gaelic: older speakers speak the language with lexical pitch accents, whereas younger speakers in both heartland areas and new urban communities do not. It has been suggested that across Indo-European languages lexical pitch accent systems are typologically rare and subject to eventual loss (Salmons, 1992). However, there are clearly exceptions; for example, Kerswill (1993) reports that incomers to the city of Bergen from non-word accent dialect areas acquire the Bergen dialect's use of tones. There are several potential explanations for the specific loss of tones in Gaelic, which involve functional aspects and language contact. The contrast between Accent 1 and Accent 2 words is based on a difference between monosyllabic and polysyllabic words. As a result, there is little, if any, chance of confusion arising if this contrast is lacking in a speaker's system, given that words are already distinct in terms of the number of syllables (see also Iosad, 2014). Also, the words in Table 1 are, for the most part, different in some segmental aspects as well as the lexical pitch accents. In other words, it is possible that a contrast is still made, but using cues other than pitch patterns.

The alternative is that this contrast has been lost entirely among young speakers. As suggested above, several of the crucial words involved in these distinctions are not widely used such as *bogha* 'underwater rock' and *sithinn* 'venison', implying that this contrast is functionally marginal anyway. There were no instances of these words in my dataset (160,000 words) from either the older or younger speakers. In addition, due to the social situation of Gaelic, the language is used by many young people in a small set of contexts such as the school environment; this again reduces the possibility of confusion arising as a result of the lack of tones. There is, therefore, little motivation to retain a system with little communicative function. While it is difficult to provide full evidence for either interpretation from the current analysis, the extremely low functional load of this contrast would suggest that the contrast could be lost entirely among young people with little communicative inconvenience.

A second potential explanation for the lack of tones in young people's Gaelic is a result of contact with English, which does not have a lexical pitch accent prosodic system. It is also important to remember that the young people in this study have learned Gaelic (for the most part) through immersion schooling. As noted in Section 1.2, the majority of the teachers dispensing immersion education here were from Lewis and spoke the dialect of the island complete with lexical pitch accents. However, this is not a feature of every dialect and it is possible the children received a more dialectally mixed input during their nursery and primary education without lexical pitch accents. Pronunciation is rarely explicitly taught in immersion school programmes (Menke, 2010:37) and it is certainly the case that lexical pitch accents are not generally taught on Gaelic learner courses (e.g. Ó Maolalaigh, 2008). It is unlikely therefore that the young people in this study received specific instruction about using lexical pitch accents. This factor in combination with the low functional

load for this contrast and contact with English, can perhaps explain the lack of lexical pitch accents among the young people.

3. Analysis 2: Intonation in young speakers' Gaelic

The second analysis in this study looks in greater depth at the sentence-level intonation patterns among young speakers. Intonation is here defined as the 'the use of *suprasegmental* phonetic features to convey 'postlexical' or *sentence-level* pragmatic meanings in a *linguistically structured way*' (emphasis original; Ladd, 2008:6). The motivation for this analysis stems from the lack of lexical pitch accents in young people's Gaelic; this part of the study aims to gain a greater understanding of their prosodic behaviour in the absence of lexical pitch accents. As discussed above, there is very little work on sentence-level intonation patterns in Gaelic, or the interaction between lexical pitch accents and intonation. Borgstrøm (1940) and MacAulay (1979) suggest that a final falling pitch is common at the end of declarative phrases. The previous work on intonation in bilingual and contact setting discussed in Section 1 suggests that we might expect transfer from the young people's other language, English. For this reason, previous studies conducted on the varieties of English spoken by the young people in this study are discussed below.

3.1. Intonation in local varieties of English

Unlike Gaelic, English is described as an intonation language making no use of lexical tone (e.g. Wells, 2006). The intonation patterns of Glasgow English are well documented. Glasgow is one of the cities included in a group referred to as 'Urban Northern British' by Cruttenden (1997). The cities included in the Urban Northern British group are Liverpool, Belfast, Glasgow, Newcastle and Birmingham (Ladd, 2008:126). In Glasgow, as in the other Urban Northern British cities, the default realisation of a pitch accent is a rise (Mayo, 1996; Sullivan, 2010), which also includes nuclear accents in declaratives. This is unusual across the world's languages, where falls are typically associated with phrase-endings (Gussenhoven, 2004:89). It is also different from Scottish Standard English, where nuclear falls are more typical (Ladd et al., 2009). Specifically, Glasgow phrase-final contours are described as a 'rise plateau' shape, or 'rise plateau slump' by Cruttenden (1997:133). A 'rise plateau' refers to a rising contour, which stays level until the end of the phrase, whereas a 'rise plateau slump' falls slightly at the end. Examples of these two kinds of contour from the current dataset are in Fig. 7.

Little is known about the phonology of Highlands and Islands English in general, but it is reported to be significantly influenced by the phonology of Gaelic due to long-term contact with the language (Shuken, 1984). As such, the situation in Lewis is more complex: historically, Gaelic speakers have (presumably) borrowed aspects of the phonology of Gaelic into their English when they learned English. Many of the young people in this study have learnt English first and Gaelic on entering nursery education and are therefore potentially transferring aspects of their Gaelic-accented English back into their Gaelic. The outcome of this process is discussed in Section 3.4.

3.2. Method

The data used for this analysis are the same Intonation Phrases extracted for Analysis 1, described in Section 2.1. In order to ascertain the nature of the sentence intonation used by the younger speakers, I conducted prosodic labelling using an Autosegmental Metrical framework designed to consider variation in different dialects of British English, IViE (Intonational Variation in English, Grabe et al., 1998, 2001). The labelling was conducted on the Intonation Phrases and I analysed the penultimate pitch accents, and phrase-final pitch accents plus boundary tones from the data described in Section 2. In addition to labelling the realisation of each pitch accent and boundary tone, I also noted the number of syllables between the pitch accents, and the number of syllables following the nuclear accent. IViE recognises three boundary tones: a high tone H%, a low tone L%, and a level tone 0%. Cruttenden (1997:133) clearly describes a 'rise plateau slump' contour as different from a 'rise plateau' contour in Glaswegian English. As the original IViE did not have a label representing 'slump', I used the 0L% symbol to represent this possible boundary tone. Table 5 compares the IViE labels used here to descriptions of the pitch accent contours and accompanying boundary tones in the case of nuclear accents.

3.3. Results

Production of pitch accents among the young people was explored with reference to three social factors: gender, location (Glasgow or Lewis) and whether the young person has a Gaelic-speaking parent or not. The linguistic factors of discourse function, number of syllables between pitch accents, and number of syllables following the nuclear accent were also included in the analyses. The results for the Lewis and Glasgow young people are plotted in Fig. 8. There appear to

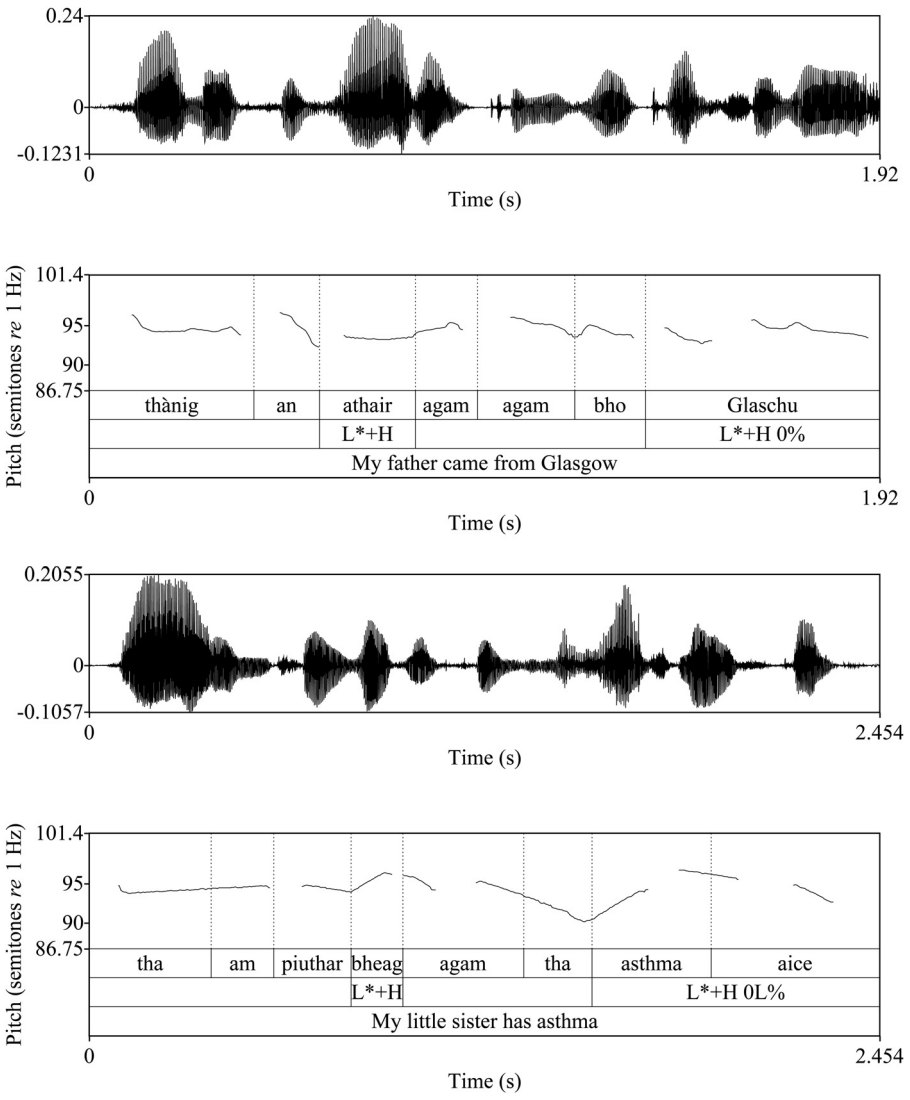

Fig. 7. Examples of 'rise plateau' contour (top panel) and 'rise plateau slump' (bottom panel) spoken by speaker gf01.

be large differences in pitch accent realisation between the young Lewis speakers and the young Glasgow speakers. Among the young Glasgow speakers, there appear to be a large number of L* + H pre-nuclear accents and a large number of L* + H 0% nuclear accents. The majority of nuclear accents in Glasgow are some kind of rise, mainly: L* + H 0% (rise plateau) or L* + H 0L% (rise plateau slump). In Lewis, on the other hand, the realisation of pre-nuclear and nuclear pitch accents is more mixed. Both groups of speakers produced instances of High Rising Terminal – HRT/Uptalk (L* + H H%). This was a somewhat unexpected finding for Gaelic and is presumably due to transfer from the presence of this contour in the young people's English. For reasons of space this finding is not discussed further here, but see Nance (2013) for details.

Separate statistical modelling was conducted on the pre-nuclear and nuclear accents. The models used were mixed effects multiple logistic regression and, in each case, individual speaker was included as a random effect. In the case of pre-nuclear accents, a dependent variable was constructed, comparing the two most common accent realisations: H* + L (fall) and L* + H (rise). This subset of the data contained 841 pre-nuclear pitch accents. The fixed effects in the model were location (Lewis or Glasgow), gender, discourse function (narrative or general account), whether the young person in question spoke Gaelic with one of their parents, and associated interactions. Again, non-significant factors were removed from the model until an optimum model was reached (Baayen, 2008:205).

In the case of nuclear accents, a dependent variable was created comparing H* + L 0% (fall) contours to all three kinds of rise: L* + H 0% (rise plateau), L* + H 0L% (rise plateau slump), L* + H H% (HRT). The independent variables in this

Table 5
Pitch accent contour descriptions and IViE labelling used here.

Pre-nuclear accents		Nuclear accents	
Contour description	IViE label	Contour description	IViE label
High	H*	High	H* 0%
Fall	H* + L	Fall	H* + L 0%
Fall-rise	H* + LH	Fall-rise	H* + L H%
		Fall-rise plateau	H* + LH 0%
Low	L*	Low	L* 0%
Rise	L* + H	Rise plateau	L* + H 0%
		Rise plateau slump	L* + H 0L%
		High Rising Terminal/Uptalk	L* + H H%
Rise-fall	L* + HL	Rise-fall	L* + H L%
		Rise-fall plateau	L* + HL 0%

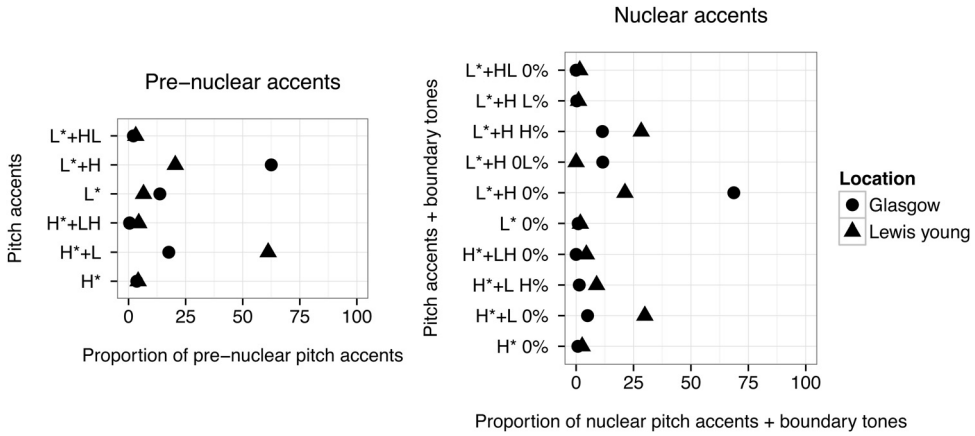

Fig. 8. Pitch accent realisation in Lewis younger speakers and Glasgow speakers in pre-nuclear accents (left panel), and nuclear accents (right panel).

model were location, gender, discourse function, whether the young person spoken Gaelic with a parent, interactions between these factors, the number of syllables between pre-nuclear and nuclear accents, and the number of syllables following the nuclear accent. Non-significant factors were removed except in the case of the number of syllables between pitch accents whose inclusion improved the model fit. A total of 947 nuclear accents were included in this model.

The final models are displayed in Table 6. The baseline for location is Lewis, so the models indicate how differently speakers in Glasgow behave. The baseline for Gaelic is not speaking Gaelic to a parent, so the models show the divergent behaviour of those who do. The baseline for discourse function is general accounts, so the models show the extent to which narratives are from this baseline. In each case, higher coefficients in the models indicate more rises.

In the model for pre-nuclear pitch accents, the Glasgow students produced significantly more L* + H (rising) pitch accents that the Lewis speakers. Similarly, in the nuclear pitch accent model, the Glasgow students produced more rising pitch accents overall. In both the pre-nuclear and nuclear models there were significant interactions between whether Gaelic was spoken by one of the student's parents, and the location the student was from.

Fig. 9 helps to disentangle the meaning of this interaction. The left panel shows pre-nuclear accent realisation in each location, split for whether the students had one Gaelic-speaking parent or not. The right panel shows the same for the nuclear accents. There are several cases where young Glasgow speakers with a Gaelic-speaking parent appear to have adopted more Lewis-like intonation patterns. For example, in pre-nuclear accents such speakers produced fewer L* + H contours than their English home language background counterparts, but more H* + L; and in nuclear accents the Glaswegians with a Gaelic-speaking background produced fewer L* + H 0% but more H* + L 0%. The reverse interpretation is also a possibility: that young Lewis speakers who speak Gaelic with one parent are adopting a more Glaswegian sounding intonation, but this seems less likely since Lewis is a Gaelic heartland area and these speakers are speaking Gaelic.

Additionally, in the model for nuclear rising accents compared to nuclear falling accents, the discourse function of the IP affects pitch accent realisation: narrative IPs had a greater number of rising contours than general accounts. Included in

Table 6
Results of the regression models conducted on pre-nuclear and nuclear pitch accents. Numbers are rounded to two decimal places.

Model	Independent variables	β	z	p
Pre-nuclear rise/fall	Intercept	−1.46	−4.78	<.001
	Location	3.11	8.42	<.001
	Speak Gaelic to a parent	0.73	1.44	0.15
	Location*speak Gaelic to a parent	−2.55	−3.49	<.001
Nuclear rise/fall	Intercept	0.09	0.21	.83
	Discourse function	0.65	2.93	.003
	Location	3.42	6.53	<.001
	Speak Gaelic to a parent	−0.47	−0.78	0.44
	Location*speak Gaelic to a parent	−2.46	−2.67	.007
	Number of syllables between accents	0.12	1.82	.07

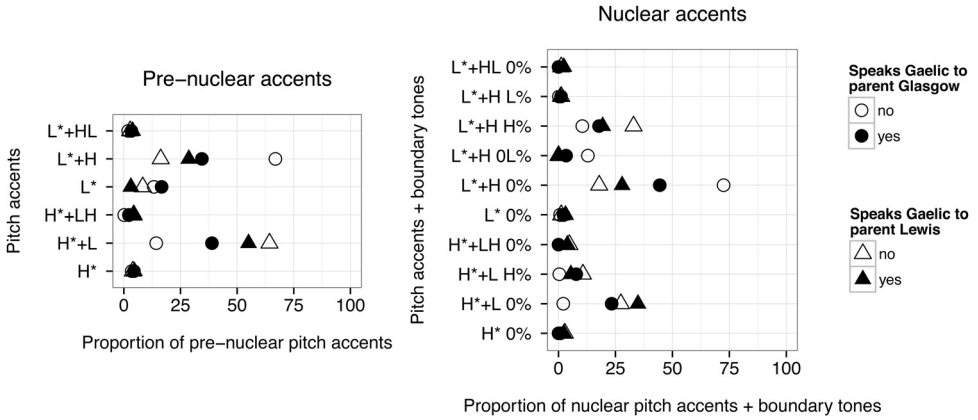

Fig. 9. Interactions between whether a student had a Gaelic-speaking parent and the location they were from. Left panel shows pre-nuclear accents, right panel shows nuclear accents.

the 'rising' group were the High Rising Terminal contours, which are described as more common in narrative styles than other types of discourse in English (e.g. Warren and Britain, 2000), which may explain this finding in young people's Gaelic. The greater the number of syllables between pre-nuclear and nuclear accents, the more likely the nuclear contour was rising.

3.4. Discussion: Intonational variation

The intonational analysis of the young people yielded several interesting results; namely, that there were large differences between the Lewis and Glasgow young people, with Glaswegians producing a majority of pre-nuclear and nuclear rises, and Lewis speakers producing more varied pitch accents. The results for the Lewis young people are potentially a relic of the tone system. Although the results in Section 2 suggest they are not using a tone system, they may experience greater exposure to traditional varieties of Gaelic in their surrounding community, which features a variety of accentual rises and falls. Among young people, this variety of rises and falls is not tied to syllabic structure as among older speakers, but is still apparent in their pitch accent realisation. The differences arise between Lewis and Glasgow because Glaswegian young people are less exposed to traditional Gaelic in the community. This explanation is further supported by the large differences between the young people who had one Gaelic-speaking parent and those who did not. Young people in Glasgow who had one Gaelic-speaking parent produced a variety of accentual rises and falls similar to young people in Lewis (Fig. 9). This may be a result of their greater exposure to traditional Gaelic. There were, however, large differences among the Glasgow and Lewis young people who did not have one Gaelic-speaking parent. It may be the case that the young people in Glasgow who were least connected to the wider Gaelic-speaking community show most transfer influence from their local English.

A second potential explanatory factor of the intonation patterns among young Lewis speakers is that they are transferring aspects of their Lewis English intonation. Lewis English, as discussed above, has been in contact with Gaelic

since English was first spoken on the island and is reportedly significantly influenced by borrowing from Gaelic (Wells, 1982; Shuken, 1984). Lewis English prosody is informally referred to as 'sing-song' or 'lilting' presumably due to the variety of pitch patterns used. This may be the result of borrowing from the lexical pitch accents of Gaelic. The intonation in young people's Lewis Gaelic may therefore be the result of two processes: fallout from the demise of the lexical pitch accent system, and transfer from a Gaelic-accented variety of English.

The majority of pre-nuclear and nuclear pitch accents plus boundary tones in Glasgow were rising variants. Specifically, there were a large number of pre-nuclear L* + H (rise), and nuclear L* + H 0% (rise plateau) and L* + H 0L% (rise plateau slump). These contours fit exactly with previous descriptions of Glasgow English intonation, where nuclear contours are described as 'rise plateau' or 'rise plateau slump' (Mayo, 1996; Cruttenden, 1997, 2007; Ladd, 2008). It therefore seems likely that the realisation of Glasgow Gaelic intonation contours is a result of language contact with Glasgow English. In support of this argument, phrase-final rising contours in declaratives are typologically rare (Gussenhoven, 2004:89), suggesting that Glasgow Gaelic intonation contours are unlikely to be realised as rising variants as a result of a language-internal development.

A final possible explanation is these distinctly Glaswegian intonation contours are part of how the young speakers construct their identity as Glasgow speakers of Gaelic, i.e. different from Highland and Island speakers. Previous work on Glasgow English suggests that Glaswegian speakers are proud of their distinct dialect (e.g. Stuart-Smith et al., 2007), and recent work on Gaelic suggests many lowland Gaelic speakers do not necessarily aim to sound like Islanders as they consider this inauthentic (McLeod et al., 2014). The reverse interpretation is also possible: the young Lewis speakers aim (overtly or implicitly) to sound different from Glaswegian. However, this does not appear to be the strongest explanation since the Lewis speakers are from a traditional Gaelic-heartland area and 'Glaswegian Gaelic' is such a new thing.

4. General discussion and conclusions

To summarise the results of the two analyses presented above: the data suggest that young Gaelic speakers do not use the lexical pitch accent system described in the previous literature on Gaelic prosody (especially Lewis Gaelic). Further examination of their intonation patterns suggests transfer from Glasgow English intonation in the case of the Glasgow young people, who mainly used the rising intonation patterns typical of Glasgow English. In Lewis, intonation patterns contained a greater mixture of pitch accents and boundary tones. It was suggested that this may stem from transfer from Lewis English, a variety which is in contact with Gaelic, and from the loss of the lexical pitch accent system but the retention of intonational variation. In these data, there were differences between young people who spoke Gaelic to a parent at home and those who did not. Specifically, young people who spoke Gaelic to a parent in Glasgow had more Lewis-like intonation than those who did not suggesting that more exposure to traditional varieties of the language has an effect on prosody.

In the remainder of this section I will discuss how the results above contribute to the study of intonation in contact and bilingual contexts, and then discuss the implications for language change in Gaelic, as well as Gaelic revitalisation more generally. Previous studies cited in Section 1 suggest that in contexts of societal language contact bilingual individuals may transfer aspects of one of their languages into the other (e.g. Colantoni and Gurlekian, 2004; O'Rourke, 2005, 2012; Simonet et al., 2008; Simonet, 2011). This process can have long-term implications on the community variety, which develops differently from varieties not in contact. The results here further support these findings: the intonation patterns of young people in Lewis and in Glasgow suggest transfer from local varieties of English is very common. As well as comparing communities in contact with different varieties of English, this study also compares different generations on the Isle of Lewis. One outcome of increased dominance in English among young people seems to be the loss of lexical pitch accents among young Lewis speakers. To the best of my knowledge, this apparently radical shift in the prosodic structure of the language has not previously been reported in work on intonation and language contact.

There is evidence of some individual variation in the dataset, which is suggestive of the influence of individual language acquisition pathways. Young people who spoke Gaelic to one parent produced significantly different intonation patterns compared to those who did not. Similar to Morris' (2013, 2014) study of Welsh young people, these findings suggest that the speech of immersion school students differs from those who have learned the language at home. However, the young people here with Gaelic at home still did not produce the lexical pitch accent system of older Gaelic speakers, and in other aspects of production there were no differences between students with a Gaelic-speaking background and those without (Nance, 2014). This may be due to the differing sociolinguistic situation in Wales and Scotland. In Wales, it is common in some western areas for young people to grow up with two Welsh-speaking parents (Morris, 2013, 2014). In the current sample of Gaelic young speakers, I recorded 16 out of 18 students attending the Gaelic-medium class in Lewis and 28 out of a possible 30 in Glasgow. Sub-samples of 12 and 21 students are analysed here, and none of the students not analysed had two Gaelic-speaking parents. The sample presented here can therefore be considered representative of Gaelic-medium classes today. It may be the case that more sustained community and home input of Gaelic would be necessary

for young people to acquire the lexical pitch accents, a context which does not exist in the contemporary Gaelic-speaking world (Munro et al., 2011).

Indeed the data reported in Munro et al. (2011) and Nance (2013) suggest that there is increased reliance on Gaelic-medium schooling as the main method of creating Gaelic speakers for the future. In this case, it would seem that in future generations the language will be spoken without lexical pitch accents. As discussed in Section 2.4, Gaelic can be spoken without lexical pitch accents with little or no communicate inconvenience due to the low functional load of this contrast. So although the shift away from lexical pitch accents may appear dramatic it does not mean that young people will be misunderstood by older generations. It is also important to consider that previous phonetic research on immersion school pupils (e.g. Harada, 2006; Menke, 2010) suggests that we would not expect young people coming through Gaelic-medium education to sound like Gaelic-speakers brought up in a monolingual environment, even if such an environment did exist.

Instead, it is perhaps better to interpret the findings presented here as positive step forward for Gaelic language revitalisation: young speakers in Glasgow would not be speaking Gaelic at all were it not for the advent of Gaelic-medium education through a revitalisation programme. The data presented here and elsewhere Nance (2013, 2014) point towards a distinctly Glaswegian variety of Gaelic spoken by school children, albeit in the limited context of their school education. It seems clear that the prosody of Gaelic will be different in the future, but that the language is developing and evolving to fit new geographical and social spheres, which were not occupied in the past.

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