

Teenagers' acquisition of variation: A comparison of locally-born and migrant teens' realisation of English (ing) in Edinburgh and London¹

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In recent years, the UK has experienced unparalleled numbers of migrants from Eastern Europe, particularly Poland. Many migrants came with their families. We examined variation in the English spoken by adolescent Polish migrants in Edinburgh and London. We asked: To what extent are teenage Polish migrants acquiring the patterns of variation typical of their local peer group? We compare the results for the well-known variable (ing) in the speech of both Polish migrants and their same age British peers. Our results indicate that the Polish teenagers seem to be sensitive to the overall rates of the non-standard variant in the city they have moved to. Moreover, Polish teenagers also replicate some of the linguistic and social constraints found in the speech of the locally-born teens. In some cases, they partially replicate the constraint patterns found in the locally-born teenagers, and in other cases they introduce novel constraints unattested in the speech of their locally-born peers. The results of our study raise several questions regarding local shared constraints and universal learning tools, potential supra-local constraints and the status of (ing) as a sociolinguistic variable for learners of English. We discuss these in the final section of this paper.

Keywords: immigration, London, Edinburgh, (ing), teenagers, acquisition of variation

1. Introduction

Immigration is an ideal social situation in which to explore language variation and change, since “immigration presents us with some of the most extreme cases of dialects and languages in contact” (Chambers 2003: 98). Yet immigrants are often excluded from sociolinguistic research on the grounds that they are not members of the core speech community. But as Bayley and Regan (2004) show, an investigation of immigrants in discussions of language variation and change illuminates not only how we understand the dynamics of variation but also second language acquisition. Our project is designed

principally as a variationist one, but the results are of broader interest as well. We examined variation in the English spoken by adolescent Polish immigrants living in the UK, asking to what extent teenage Polish migrants are acquiring the patterns of variation typical of their local peer group. We hypothesized (cf. Mougeon et al. 2004) that this could result in four possible outcomes:

1. Migrant adolescents could adopt the same distribution of variants as their locally-born peers;
2. Migrant adolescents could show variation that reflects the same underlying constraints operating on the variation of their locally-born peers, but the strength of these constraints may differ or the strength of individual factors within those constraints may differ;
3. Migrant adolescents could reinterpret the variation producing patterns of variation radically divergent from their locally-born peers; and
4. Migrant adolescents could eliminate the variation and show categorical use of one variant or another.

Our results provide evidence for a combination of 1-3.

We begin with some background on previous approaches to the study of variation in second language speakers, and we set the sociolinguistic scene in which the study was conducted. We then present an analysis of the (ing) variable (the alternation between velar and alveolar stops in unstressed <ing>, i.e. *walking* /ɪŋ/ and *walkin'* /ɪn/) in the speech of teenage Polish migrants living in London and Edinburgh, comparing the frequency and constraints on the different variants of (ing) with data collected from locally-born teenagers. We conclude by relating our findings to a discussion of local and supra-local constraints and

by commenting on how the status of the (ing) variable as a stable versus changing variable for the Polish-born teenagers impacts on our findings.

2. Background

2.1 Variation in learners' speech

Second language acquisition research has considered learners' variation for decades (e.g. Dickerson 1975), viewing the analysis of intra-speaker variation as a window on the L2 acquisition process. The notion of *interlanguage* (Corder 1971, Nemser 1971 and Selinker 1972) is crucially concerned with variable performance which may be attributed to L1 transfer or to universal constraints such as markedness hierarchies (Altenberg and Vago 1983, Eckman 1984). Bayley and Regan (2004) is a detailed review of the SLA literature on variability in interlanguage.

Many studies (e.g. Wolfram 1985, Young 1990, Bayley 1994, G. Sankoff et al. 1997, Mougeon et al. 2004, Blondeau and Nagy 2008) employ data collection techniques and methods of analysis typical of variationist sociolinguistics: the sociolinguistic interview (Labov 1969, 1972), and multivariate analysis (Varbrul and later variants, Cedergren and Sankoff 1974; Rousseau and D. Sankoff 1978). All of these early studies suggest that variation in interlanguage is not random but is highly systematic and constrained by a range of linguistic and social factors.

We have a considerable body of sociolinguistic research now that has established that much variation in L1 speech is highly structured and systematically constrained by linguistic and/or social factors. On some level, speakers **know** about variation – that is, it is part of their sociolinguistic competence – and the consistent patterns of variability found across individuals is seen as a crucial indicator of co-membership in a speech community (Labov 1972, 2001). This means that non-native speakers acquiring an L2 need to learn more than

the grammatical rules of the target language if they are targeting native-like competence; they must also acquire the patterns of sociolinguistic variation found in the target language community. This knowledge will allow them to (i) produce frequencies of key variants similar to native speakers, and (ii) replicate similar linguistic and non-linguistic constraints on the variants. Whether or not migrants want to sound like natives is an empirical question for every migrant, but it is notable that for economic migrants, language skills have been found to have an impact on whether they are able to make the most of their move (Ryan et al. 2007; Dustmann and Fabbri 2003).

Adamson and Regan (1991) examine the variable acquisition of native speaker-like patterns of the (ing) variable among Vietnamese and Cambodian learners of English living in Philadelphia and Washington DC. A multiple regression analysis of (ing) among native speakers was the basis for comparing the L2 learners' patterns and this showed the following significant constraints: speech style, speaker sex and grammatical category. These social and linguistic factors were replicated as significant constraints in the non-native speakers' use of (ing), but in a very different way. For instance, although grammatical category was overall a significant predictor of variation for both groups, which grammatical categories favoured and disfavoured the alveolar variant were not the same. Similarly, in both groups, (ing) was significantly constrained by speaker sex and speech style, but in more formal/monitored speech styles, the non-native males increased their frequency of the non-standard alveolar, while native speaker men decreased their use of the alveolar variant.

More recently, Major (2004) looking at four variable phonological forms used by Spanish and Japanese learners of English in Arizona, US, focussed specifically on the effects of style and speaker sex. Among native speakers, there were significant effects for both style and speaker sex across all four variables, and the effect of style was greater than the effect of speaker sex. Non-native speakers also produced patterns of variation that were significantly

constrained by style and sex, but in this case the effect of speaker sex was much greater than the effect of style. Major (2004) concludes that gender differences are acquired by non-native speakers before style differences in the L2 (cf. Nardy and Barbu 2006, Roberts 1997, Smith et al. 2007 on the acquisition of L1 social and linguistic constraints).

Quite a lot of research on the acquisition of native-speaker patterns of variation has considered the acquisition of variation in French (particularly in Canada) by learners in various immersion contexts (Howard et al. 2006, Uriteschu et al. 2004, Nagy et al. 2003, Blondeau 2008, Blondeau and Nagy 2008). Mougeon et al. (2004) synthesises the results of a large-scale project on the acquisition of 13 sociolinguistic variables among French immersion students. Results from these studies seem to point to the general, but rather weak, conclusion that L2 speakers often display partial mastery of the native-speaker norms of variation, but this generalisation in itself is highly variable. Mougeon et al. (2004) found that the non-native speakers had fully acquired native speaker constraints on five variables under analysis (cf. Hypothesis 1 above); two variables showed only one of the native speaker constraints (Hypothesis 2); two variables showed constraints that were particular to the L2 group (Hypothesis 3); and two variables showed none of the native speaker constraints (Hypothesis 4). Mougeon et al. conclude “it is not easy to generalize the findings of specific studies” (2004: 421). Our own work looking at Polish adolescents living in the UK tends to reinforce this.

2.2 Polish migration to the UK

Over the last decade, the UK has experienced significant changes in population demographics and the labour market. In the mid 1990s, the total number of foreign citizens in the UK was relatively stable at around 2 million. However in May 2004, ten new members were admitted to the European Union. Eight of these were from Central and Eastern Europe

and are known collectively as the (CEE) A8 group. The UK, Ireland and Sweden were the only countries to allow citizens of the CEE A8 virtually unrestricted access to their labour markets. This created the “largest single wave of in-migration that the British Isles have ever experienced” (Salt and Millar 2006: 335). In particular, there has been significant Polish immigration to the UK: 61.5% of all A8 citizens approved to work in the UK in 2005 were Polish. It is difficult to find accurate estimates of the total number of Polish migrants currently living in the UK because the UK government lacks a reliable system for accounting for overseas nationals but the number of foreign nationals currently working in the UK is in excess of 3 million² (Salt and Millar 2006: 228).

Traditionally, immigrants to the UK have settled predominantly in London and the south east of England. However, this picture is changing as new workers from A8 countries distribute themselves more widely. Drinkwater et al. (2006) find that only 14% of all recent A8 migrants settled in London and that Polish migrants in particular have settled throughout the country: more than 61% of the post-enlargement migrants settled outside London and the Southeast (Drinkwater et al. 2006: 7, 24). There have been attendant social stresses in communities where resources and public services are already stressed, or which had traditionally been more culturally homogeneous (De Lima et al. 2007, Clements 2009).

Although predominantly working adults, the Polish community also comprises a number of children and dependent family members. CRONEM (2006) found that more than

² The Workers Registration Scheme (WRS) was established with the ascension of the ten new member states to the EU. It allows any A8 citizen the opportunity to take paid work with an employer upon payment of a £50 registration fee. WRS data can be used as a measure of the number of A8 citizens coming to work in the UK but they provide no indication of the length of stay and, because they exclude the self employed, it is likely that these figures significantly underestimate the actual number of A8 migrant workers in the UK. One national survey found that more than a third (35.8%) of all Poles nationwide are not registered on the WRS (CRONEM 2006).

30% of Polish migrants had brought or planned to bring their family with them. If research on migrants' sociolinguistic competence is sparse, research on migrant children and adolescents is almost totally lacking: migrant children exist in a "research void" (Ackers and Stalford 2004:1), seen as lacking political and economic interest. Yet as sociolinguists have demonstrated, adolescents' linguistic and other social practices play a central role in delimiting and expanding the social meaning of variation in the speech community (e.g. Eckert 1989, 2000, Bucholtz 1999, Cutler 1999, Mendoza-Denton 2008, Wagner 2008). In addition, the Polish teenagers who have migrated to the UK have particularly intense contact with native-born peers and through immersion in the school system they have considerable opportunities to acquire local norms of variation. To the extent that "schools are microcosms of society, representing and often magnifying social relations that exist in the wider community" (Reynolds 2008: 9), and given the attested adaptability of teenagers' social practices, high school students are an ideal cohort in which to examine the potential for the acquisition of local norms of variation.

3. Methods

3.1 Data collection

Our study was conducted in two high schools, one in Edinburgh and one in London, where recent immigration has led to an increase in the number of non-locally born students. We interviewed both Polish migrants and teenagers from local British families so as to have a benchmark of the local norms that the teenage migrants were exposed to most frequently. Students volunteered for the study following a presentation from the research assistant about the general nature of the tasks; they were interviewed in friendship pairs in order to facilitate the most casual atmosphere possible given the school-based setting for the interviews (Milroy and Gordon 2003: 66).

The Edinburgh sample consisted of 16 Polish migrants (8 males, 8 females) and 21 Edinburgh-born teenagers. The London sample consisted of 21 Polish migrants (8 males, 13 females) and 24 London-born teenagers. The Polish teenagers were all aged between 12-18 with a mean age of 14 in both the London and Edinburgh samples. The length of time that each adolescent had spent in the UK varied from seven months to 5 years, with an average in both cities of 2.5 years in the UK.

A locally-born female research assistant carried out sociolinguistic interviews in both Edinburgh and London respectively. Recordings were made using the M-AUDIO Microtrack II 2-channel mobile digital recorder and SHURE headset microphones. The interviews were transcribed orthographically using ELAN (<http://www.lat-mpi.eu/tools/elan/>), resulting in a time-aligned corpus of around 200,000 words.

While the interview was structured around certain topics of conversation (e.g. living in London/Edinburgh, school life, hobbies, attitudes towards immigrants etc.), the conversation was not constrained by these topics and participants were encouraged to talk freely on other topics too. Speakers were also recorded performing a short reading task of 17 sentences that had been designed to elicit a wide range of different phonological variables. Combining reading and conversation data allows us some measure of comparison between differences in speech style, in the Labovian sense of attention paid to speech (Labov 1972).

Perception data was also collected from the speakers using the verbal guise technique (Ladegaard, 1998). The speakers in our sample were exposed to 8 different female voices reading a short neutral text. The voices included both standard and non-standard British accents plus a Polish speaker of English. The informants were asked to rate these voices along a number of personality traits relating to power and solidarity. This paper focuses principally on the speech production data (for more on the perception data, see Clark and Schleeef forthcoming).

3.2 The dependent variable: (ing)

Our study focuses on the variable realisation of (ing) among the native and non-native adolescents in Edinburgh and London. The sociolinguistic variable (ing) (the alternation between [ɪŋ] and [ɪŋ̥] in unstressed syllables) is a good variable to take as a starting point for five reasons: (i) it occurs fairly frequently in conversation, (ii) it is salient among native speakers of English (to the extent that the apical variant is typically considered non-standard or less ‘nice’ than the velar nasal), (iii) it is stable (and has remained so for at least 50 years),³ (iv) it can be analysed auditorally, and (v) it has been studied in a number of varieties of English since the 1950s (a “staple of sociolinguistics”, Hazen 2006: 581). Previous research on (ing) variation has found a relatively stable set of social and linguistic constraints operating cross-varietally, summarised in Labov (2001) and Hazen (2006); we only briefly review them below.

3.3 Coding of linguistic and social constraints

The most consistent linguistic constraint on (ing) is its grammatical conditioning. “[T]he closer the construction is to a verbal construction, the greater the use of the apical variant, and the closer to a nominal construction, the greater the percentage of the velar variant” (Labov 2001: 79). Specifically, the apical variant is favoured most in progressives (e.g. *he’s walking*) and participles (e.g. *He sat down putting his feet by the fire*), less in adjectives (e.g. *boring*, *amazing*) and gerunds (e.g. *we like going to hot places*) and least of all in nouns (e.g. *ceiling*, *scaffolding*).

³ There is no evidence of apparent time change in communities where studies have been conducted, reaching back as far as Fischer (1958) and Labov’s work in New York City (Labov 1972).

Many studies of (ing) exclude *-thing* compounds (i.e. *something, nothing, anything, everything*) on the grounds that they pattern differently from other nominals (e.g. Labov 2001: 79). Rather than assuming this a priori, *-thing* compounds were retained in our analysis but were coded separately from simple nouns. They were coded as pronouns in examples like “I don’t know *anything* about it” and as discourse markers in examples like “I don’t know about it, or *anything*”.

Previous studies of (ing) variation also tend to exclude place names and proper nouns on the grounds that they tend towards categorically [ɪŋ] forms (Labov 2001: 79). Again, rather than assuming this a priori for all corpora (cf. Clark and Trousdale 2009), proper nouns and place names were included in the analysis, but coded separately from simple nouns.

The tokens were also coded for various phonological constraints, priming and lexical frequency. Houston (1985) identified a set of phonological constraints in varieties of British English. She finds an effect of regressive homorganic assimilation and progressive homorganic dissimilation. Regressive assimilation describes the finding that when (ing) is followed by a velar (e.g. *getting caught*) the velar variant of (ing) is favoured; when (ing) is followed by an alveolar (e.g. *getting news*) the apical form is preferred. Progressive dissimilation is where the consonant immediately preceding the variable is a velar (e.g. *speaking up*), the velar variant is disfavoured; when the consonant immediately preceding (ing) is an alveolar (e.g. *sendling out*), an alveolar realisation is disfavoured. These phonological constraints do not appear to influence (ing) in the Northern Cities of the USA (Labov 2001: 420).

More recently, Abramowicz (2007) finds a recency or priming effect on the realisation of (ing). For instance, in *I like walking and sometimes running*, if a speaker produces a velar variant in *walking*, the chance that *running* will also be produced with a velar are (all other things being equal) greatly increased.

Abramowicz (2007) also tested Bybee's (2007, among others) claim that lexical frequency plays a role in phonological variation, but he finds little evidence that this is a constraint on (ing). However, Abramowicz's work forced the continuous measure of lexical frequency into discrete categories and this may have had an impact on his findings. More importantly, since Bybee's hypothesis relates to sound change and grammaticisation, it may not be relevant to a stable variable like (ing).

There are also replicable social constraints on (ing). The alveolar variant is favoured by speakers at the lower end of the socioeconomic scale and the velar variant is used more often by the middle and upper classes. There are stylistic effects: the alveolar variant is favoured in more casual talk and the velar variant is more frequent in careful speech and reading. Finally, there are gender effects: the alveolar form is typically favoured by males and the velar variant is used more frequently by women (Labov 2001).

Finally, we included some attitude measures as potential correlates with (ing). As discussed above, we collected attitude data from all participants in a verbal guise experiment. We assume that this gives a good indication of covert evaluations of different varieties and draw on it as an independent measure of an interaction between attitudes and production. We assume that if a participant rates a speaker with an Edinburgh accent highly, they are expressing a more positive (covert) attitude toward (speakers of) this variety of English. Since Edinburgh English normally uses [ɪŋ], we expect to find that participants who evaluate the Edinburgh accent positively would also produce the alveolar variant of (ing) more often.

The dependent and independent variables used in our analysis, and the factors coded for in each are as follows:

Dependent variable:

- (ing): realised as apical [ɪŋ] and velar [ɪŋ̞].

A third variant [ɪŋk] also exists among the Polish adolescents and some of the London adolescents, but these tokens were excluded from analysis (see below).

Independent variables:

- Preceding phonological context: velar/glottal, apical, other
- Following phonological context: velar/glottal, apical, other V or C, pause
- Grammatical category: proper noun (e.g. *Flemming*), pronoun (e.g. *I don't know anything about it*), simple noun (e.g. *ceiling*), adjective (e.g. *amazing*), gerund (e.g. *we like going to hot places*), verb (e.g. *He's running, He sat down putting his feet by the fire*), preposition (e.g. *during*), discourse marker (e.g. *or something*)
- Number of syllables in the word: 2, 3, 4 (e.g. *meaning, studying, developing* respectively)
- Realisation of previous (ING) variable: [ɪŋ] or [ɪŋ̞]
- Preceding alveolar/velar nasal in the word: alveolar nasal (e.g. *sounding*), velar nasal (e.g. *singing*), neither
- Log lexical frequency
- Speech style: reading, speaking
- Gender: male, female
- Attitude towards Edinburgh accent (in the Edinburgh corpus) and London accent (in the London corpus): continuous measure taken from the verbal guise data
- Attitude towards Scottish Standard English accent (in the Edinburgh corpus) and RP accent (in the London corpus): continuous measure taken from the verbal guise data

In addition, there were a small number of factors relevant only to the migrant teenagers. The first is friendship networks. We hypothesise that those Polish adolescents who maintain a

“migrant bubble” (Ackers and Stalford 2004), making friends predominantly with other Polish speakers, may be less likely to acquire the norms of their locally-born age peers.

The second factor is the teenagers’ attitude towards the UK, the third is the length of time they have spent in the UK (which may or may not be different to the length of time they have spent learning English), and fourth is their self-assessment of their English proficiency.

Based on previous research (e.g. Oyama 1976; Seliger, Krashen and Ladefoged 1975), the factor which we expect to have the greatest effect on variation in (ing) is age of arrival in the UK. We expected that the younger a learner is on arrival, the more likely that a native-like pronunciation will be attained.

Coding for the ‘Polish specific’ independent variables was as follows:

- Overt attitude towards living in Edinburgh (in the Edinburgh corpus) or London (in the London corpus): mostly positive, neutral, mostly negative
- Friendship network: mixed, mostly English-speaking, mostly Polish-speaking. The categories ‘mixed’ and ‘mostly English-speaking’ were later conflated due to the rare occurrence of the latter.
- Self assessment of proficiency in English: ‘I know a little English’, ‘My English is good’, ‘My English is very good’
- Time spent learning English: continuous measure in months
- Time spent living in the UK: continuous measure in months
- Age of arrival: continuous measure in months

3.4 Don’t count tokens

As noted, the Polish adolescents and some of the London-born adolescents have a third variant of (ing): [ɪŋk]. The status of [ɪŋk] among London-born adolescents is unclear but it is

of marginal frequency in our corpus. There were only 31 tokens produced by 6 speakers out of a total of 1188 tokens produced by 24 speakers, so we decided to exclude these tokens from the analysis.

In Polish, the velar nasal has a very restricted distribution, only ever appearing before velar plosives (Gussman 2007:12), so this variant could be the result of L1 transfer among the Polish teenagers (the velar nasal being essentially “reinforced” with the stop to create a well-formed Polish coda). A total of 420 tokens of [ɲk] (out of a total of 1690) were produced by Polish teenagers in Edinburgh and London. The native use of this variant in London seems to play only a minor, if any, role in the (ing) use of the Polish teenagers as the proportion of [ɲk] variants (27.84% in Edinburgh and 22.38% in London) is similar for Edinburgh- and London-based Polish kids. It seems likely that the occurrence of this variant is primarily a transfer effect. Due to its rarity among native speakers, the, albeit small, possibility that native London use may play a role in how it is used among Poles and the high likelihood that this variant is a transfer effect for the Polish speakers, we decided to exclude it from the current analysis.⁴

Unclear tokens of (ing) were also excluded, e.g. in cases of speaker overlap or in the phonetically reduced form of *going to* – *gonna*. Finally, the first token of (ing) from every speaker was excluded as well as all tokens preceded by a token with the variant [ɲk] because these could not be coded for preceding [ɪn] or [ɪŋ]. This left 1833 tokens of (ing) from the Edinburgh data and 1556 tokens of (ing) from the London data, a total of 3389 tokens of (ing).

⁴ It is possible that [ɲk] nevertheless serves a stylistic function for the Polish teenagers. One possibility is that both the velar and the stop-reinforced velar are used to mark careful speech and by excluding the reinforced variants we have missed this effect (cf. discussion of style below). We hope to undertake further research on the reinforced variants in the future. Thanks to Agata Daleszyska for pointing this out.

4. Results

4.1 Frequency of (ing) variants

The data presented in Figure 1 show the distribution of all variants of (ing) among the locally-born and migrant teens recorded in Edinburgh and London for both reading and conversation. To give the reader an idea of the overall use of all variants, Figure 1 includes the “don’t count tokens” discussed above (with the exception of unclear tokens). However, the “don’t count tokens” were excluded from further quantitative analysis.

INSERT FIGURE 1 ABOUT HERE

The apical variant is used more frequently by the native-speaker adolescents in Edinburgh than in London. As Labov (2001) notes, “Southern States English, northern English and Scots stand out [because] there the /ɪn/ form is used almost exclusively in speech, even of the most formal kind” (2001: 90) and this is confirmed by our data. Note that the Polish teenagers seem to be sensitive to the overall rates of the apical variant in the city they have moved to: Edinburgh-based migrants do not use apical variants as often as their locally-born age peers, but they use them more often than native-born Londoners.

Note also the frequency of [ɪŋk] among Polish adolescents in Edinburgh and London is very similar: as noted above, the relative consistency of this variant in both sub-corpora suggests that (i) there is a steady L1 transfer effect (the constraints on which would warrant independent analysis), and (ii) the occurrence of an [ɪŋk] variant in London speech does not seem to dramatically affect its use by the Polish migrants.

Having established the general distribution of the variants in both cities, we turn to the detailed analysis of constraints on the (ing) variable that emerged from a multivariate analysis

of all the independent variables. For the dependent variable, the standard, velar variant [ɪŋ] was treated as the application value in a mixed-effect multiple regression using Rbrul. We treated the individual speaker as a random effect, which, as Johnson (2009) discusses, is advisable in order to strengthen our confidence in the significance of any other factors.

4.2 Shared constraints

In this section, we show that the Polish teenagers to some extent replicate the constraints found in the speech of the locally-born teens, in some cases have partially replicated the constraint patterns found in the locally-born teens, and in some cases have introduced novel constraints unattested in the speech of their locally-born peers. Full details of the regression analysis for each group of teenagers are shown in the Appendix.

Of the eleven independent/predictor variables included in the regression for (ing) in the Edinburgh corpus (excluding, for the moment, the ‘Polish-specific’ predictor variables), the only variable that is significant for both the locally-born and the migrant teenagers is priming. If the speaker’s last realisation was [ɪŋ], there is a significant positive correlation with the realisation of the next token as [ɪŋ]. The same is true for [ɪn]. If a speaker’s last realisation was [ɪn], there is a significant positive correlation that the next token is also realized as [ɪn].

Priming is well attested in experimental conditions and has also been noted and discussed in sociolinguistic studies. Weiner and Labov’s (1983) early work on variation in the English passive construction was among the first to record a significant priming effect in spontaneous speech. Priming is thought to occur at all levels of linguistic structure, so it is no

surprise to find that in Edinburgh, for both groups of speakers: a velar variant of (ing) will encourage the next instance of (ing) to be realised as a velar variant.⁵

Although there is a priming effect on (ing) among the London-born adolescents, there is no evidence of a priming effect on (ing) among the Polish-adolescents living in London. Instead, in London, the constraint which operates most consistently across both speaker groups is an effect of progressive dissimilation. That is, where the phonological segment immediately preceding (ing) has an apical place of articulation (e.g. in *spending up*), (ing) is more likely to be realised as a velar [ɪŋ]; when the phonological segment immediately preceding the variable (ing) has a velar or glottal place of articulation (e.g. in *speaking out*), the (ing) variable is more likely to be realised as an apical [ɪn]. This is a significant constraint for both the London-born adolescents and for Polish adolescents living in London.

In both cities we find that only one constraint is significant and operates identically in the native-speaker teenagers and the immigrant L2 teenagers. Much more common is the re-interpretation of constraints among the L2 learners. That is, the Polish adolescents typically either produce a different version of the native-speakers' variable grammar by re-ordering the internal hierarchy of existing constraints or they adopt new constraints on (ing) which are not apparent in (or relevant to) the UK-born adolescents. We turn to a consideration of evidence for this now.

4.3 Different weighting of constraints: Edinburgh

⁵ Following Abramowicz (2007), we have employed a fairly simple measurement of phonological priming. In order to understand this phenomenon better, it would be interesting to determine in future work whether the effect holds over long periods of discourse and whether the use of (ing) by other participants in the discourse reinforces a speaker's own priming.

Table 1 shows that grammatical category and number of syllables in the word are selected as significant constraints on the variation for both the Edinburgh-born and the Polish-born teenagers in Edinburgh. However, the internal weighting of factors is different for the two groups of teenagers.

INSERT TABLE 1 ABOUT HERE

The grammatical category constraint is slightly complicated and we will deal with it shortly. We comment first on the number of syllables in the word. For both Edinburgh-born and Polish-born speakers, two syllable words and four syllable words group together, but for Edinburgh-born speakers, they disfavour [ɪŋ], while for Polish-born teens they favour [ɪŋ]. Houston (1985) attributes the effect of word length to stress patterns in longer words, pointing out that (ing) appears in a fully unstressed syllable in two and four syllable words. The majority of three syllable words in her study were *-thing* compounds – *anything* and *everything* – which carry secondary stress on (ing) and so, she argued, favour a velar realisation (in American English – there is little evidence of this pattern in varieties of British English).

This does not translate straightforwardly into the Edinburgh data. Compounds with *-thing* account for only about 20% of the three syllable words in the Edinburgh corpus. Moreover, *-thing* compounds do not *automatically* favour velar variants. As we will show, the behaviour of *-thing* compounds in Edinburgh is dependent on the function of the lexical item in the discourse.

As noted earlier, the most consistent linguistic constraint on (ing) in English is its sensitivity to what Labov (2001) calls the ‘nominal-verbal continuum’. Verb constituents favour an apical realisation of (ing), nouns favour velar realisations of (ing) and gerunds

(which have properties of both nouns and verbs) fall somewhere between these two extremes. For the Edinburgh-born adolescents, there is no evidence of a classic nominal-verbal continuum: common nouns behave no differently than verbs with respect to this variable. The effect of grammatical category emerges in a very clear pattern for the *-thing* compounds (*something, everything, anything, nothing*). Where a *-thing* compound functions as a pronoun (e.g. *I don't know anything about it*), it favours a velar variant and where a *-thing* compound functions as a discourse particle (e.g. *I don't know about it, or anything*), they favour the apical form. This constraint on (ing) variation has not been documented in previous research on (ing). This may be due to the fact that *-thing* compounds are often excluded from the analysis. Alternatively, this could be a local constraint operating on (ing) in Edinburgh. Further studies on other varieties of English that include *-thing* compounds in a more systematic fashion will have to be conducted to answer this question fully.

Polish adolescents living in Edinburgh seem to have acquired this constraint, with discourse markers strongly favouring an apical realisation and pronouns favouring the velar. However, the Polish teenagers in Edinburgh also treat common nouns like pronouns (favouring the velar), as described by Labov. Verbs, on the other hand, have very limited effect on the predicted variant, but are differentiated from nouns. This is particularly clear when we chart the log-odds of the regression analysis for each of the speaker groups as in Figure 2.

INSERT FIGURE 2 ABOUT HERE

In addition, there are two significant constraints for the Edinburgh-born teenagers that are not significant for the Polish teenagers (cf. Tables A1 and A2 in the appendix): style (reading aloud strongly favours use of the velar variant) and attitude towards the Edinburgh

accent (a positive attitude to the local accent favours the use of the apical variant). The latter finding strengthens ongoing work that hypothesises an active connection between perception and production (Niedzielski 1999, Campbell-Kibler 2006, Hay, Warren and Drager 2006).

On the other hand, for the Polish teenagers in Edinburgh, the following segment is a significant constraint, but it is not the pattern typically found in L1 English: instead a following apical consonant favours use of a velar.

Finally, a constraint applicable only to the Polish teenagers – the extent to which their friendship networks are mostly Polish or mostly Scottish/mixed – is significant (cf. Table A2 in the appendix). Perhaps unsurprisingly, migrants whose networks are mixed or consist of mainly Scottish kids strongly favour the apical realisation of (ing). It is unclear a priori whether this reflects the increased frequency with which Polish kids hear [ɪŋ] in Scottish networks, attitudinal factors, or some combination of both.

4.4 Different weighting of constraints: London

Similarly, in London, we find some constraints that only the locally-born teenagers have and some that only the Polish teenagers have (cf. Tables A3 and A4 in the appendix). The strongest constraint on the London teenagers is regressive assimilation, followed by style and priming: a following velar strongly favours production of a velar in the locally-born kids; conversation style strongly disfavours the velar; and there is a weaker but still clear effect where a preceding apical realisation of the last token of (ing) disfavours a velar realisation.

Despite their recurrence in other studies of (ing), neither grammatical category nor speaker sex were significant constraints on the London-born teenagers. However, the Polish teenagers in London have developed patterns of (ing) use that are significantly constrained by both these factors. Nouns favour a velar realisation of (ing) most for the Polish teenagers, and verbs favour an apical realisation most. This is what we would expect based on other work on

this variable. Indeed, the effect of grammatical category shows clear parallels with the effect of grammatical category reported for Philadelphians in Labov (2001) as shown in Figure 3. Although the details of how each study coded grammatical category differ,⁶ and the input probabilities are clearly very different in both cities, the underlying similarity is striking.

INSERT FIGURE 3 ABOUT HERE

Interestingly, Polish boys strongly favour the velar realisation of (ing) and Polish girls favour the apical realisation (cf. Table A4 in the appendix). This was not expected: native speaker stratification usually is the other way around (men using more apical and women more velar realisations).

Finally, the lexical frequency is not a significant predictor of the realisation of (ing) among the London-born adolescents, whereas it is a significant factor among the Polish-born London teenagers. Interestingly, none of the Polish specific variables of self-assessed

⁶ The details differ but the larger categories remain mostly the same. The main difference between our categories and Labov's is that Labov separated different types of verbal (ing) forms (e.g. future, progressive, participle). We initially followed this method but in the end decided to collapse all verbal tokens into the category 'verb', mainly because of the inherent difficulty of distinguishing between these forms in spoken data where fragments of talk rarely follow the shape of fully formed sentences. Labov also separates out 'gerunds' and 'gerundive nominals'; again, we collapsed these categories because of difficulties in establishing clear category membership in spoken data. The categories of nouns and adjectives are more or less the same in our and Labov's studies. In contrast to Labov, we also include the categories of pronouns, prepositions and discourse markers in our analysis, most of which have been excluded by Labov. While Labov's categories are more fine-grained in places, it is still obvious that we get the same pattern as Labov. The point we want to make here is that, regardless of how fine-grained the category of 'verbs' or 'gerunds' is, nouns and verbs behave very differently but gerunds, which share properties of nouns and verbs, fall somewhere in between.

proficiency in English, time spent learning English, length of stay or age of arrival showed any significant correlations with the use of (ing). Other social constraints, e.g. friendship network, seem to be more important than these.

5. Further implications of the research

5.1 Summary of results

Figures 4 and 5 summarise the findings, showing which constraints are replicated by the Polish immigrants and which are innovative in relation to their native-born peers.

INSERT FIGURES 4 AND 5 ABOUT HERE

We have shown above that the Polish teenagers seem to be sensitive to the overall rates of the apical variant in the city they have moved to. Polish teenagers to some extent also replicate the constraints found in the speech of the locally-born teens. In some cases they have partially replicated the constraint patterns found in the locally-born teens, and in some cases they have introduced novel constraints unattested in the speech of their locally-born peers. This process of re-interpretation or transformation of the constraints operating on variation for the native adolescents among the non-native peer group is particularly interesting as it is similar to findings reported elsewhere in work on long-term language and dialect contact (Meyerhoff and Niedzielski 2003, Meyerhoff 2003, 2009, Buchstaller and D'Arcy 2009). The results of our study raise several questions which we discuss in the final section of this paper.

5.2 Local shared constraints and universal learning tools

The first question concerns the shared constraints: what do our results show us here? Our findings under the heading of shared constraints indicate that none of the cognitive or processing constraints that we looked at are a basic tool that learners universally fall back on when acquiring new patterns of variation. Our results for priming, a constraint shared in Edinburgh but not London, show this very well.

Similarly the process of progressive dissimilation is shared in London but is not a significant constraint on either the locally-born or migrant Edinburgh teenagers. Similar constraints have previously been reported in American English (Shuy, Wolfram and Riley 1968, Cofer 1972) and other varieties of British English (Houston 1985). Assimilation and dissimilation are fundamental phonological processes attested cross-linguistically.

Dissimilation can be conceptualised in various ways: “a process by which one segment systematically avoids taking on a feature (or a set of features) of a neighbouring segment” (McCarthy and Smith 2003: 323), it is generalised as the Obligatory Contour Principle (Leben 1973, Goldsmith 1976). However, although we may invoke notions of phonological naturalness to account for this constraint in the London data, its absence in the Edinburgh corpus suggests that it is by no means fundamental to the ecology of (ing).

It is a striking result that in each of the London and Edinburgh corpora, only one constraint is significant and operates identically in the native-speaker teenagers and the immigrant L2 teenagers. This suggests that the wholesale adoption of native-speaker constraints on variation (Hypothesis 1 above) is possible, but not a dominant pattern. Much more common is the re-interpretation of constraints. Polish adolescents typically either produce a different version of the native-speakers’ variable grammar by re-ordering the internal hierarchy of existing constraints or they adopt new constraints on (ing) which are not apparent in (or relevant to) the UK-born adolescents (Hypothesis 2 and 3 outlined above).

Hypothesis 4 (migrant adolescents eliminate the variation and show categorical use of one variant or another) does not seem to play a role at all in our data set.

This leads to three further questions which we will discuss below. We must ask (1) why some of the constraints on the Polish kids' use of (ing) are not found in their locally-born peers, (2) why some constraints are reordered, and (3) why some of the constraints in the speech of the native speaker teenagers are not replicated by the Polish migrants.⁷ While we acknowledge that the answers to these questions may involve an interplay of factors and processes, we will focus on two processes, aiming to answer the questions above from a variationist perspective. We propose that a possible answer to question (1) is the influence of supra-local constraints on the speech of the Polish kids and that, from a variationist perspective, questions (2) and (3) are best answered with an explanation that involves imperfect learning and the instability of the “stable” variable (ing).

5.3 Supra-local constraints?

Some of the phonological constraints may be attributable to cross-linguistic phonological principles (regressive assimilation, progressive dissimilation), and the emergence of processing constraints such as priming are likewise unsurprising. Clearly, evidence from L2 learners indicates that variation is an extraordinarily complex and challenging thing to acquire and that a range of outcomes are possible. Mougeon et al. (2004) caution against the possibility of predicting outcomes when the input is variable, and our own work in London and Edinburgh seems to confirm this. However, there are several cases in our results that do not seem to be the result of re-ordering or non-replication of variable constraints; instead supralocal constraints seem to have been acquired.

⁷ These questions are explored in more detail in Meyerhoff and Schlee (under review). We review some of the main issues here.

In the Edinburgh data, we take the Polish teenagers' pattern with respect to *-thing* compounds to be evidence for their acquisition of a local grammatical constraint. However, they also show evidence of having acquired a contrast between common nouns and verbs (typical of most varieties of English), that is *not* found among their Edinburgh-born peers. The source of this constraint is unclear. Possibilities include previous exposure to a Standard English-based system of English in Poland, exposure to other varieties of English in the wider community or in the media following migration, or exposure to Scottish Standard English-speaking teachers in the UK. All of these sources may provide models for the noun-verb continuum, but we have no solid data about any of them. Whatever its provenance, we see this as evidence for the acquisition of supra-local norms or constraints on (ing). Polish adolescents in Edinburgh demonstrate both local and supra-local constraints on (ing).

The same is true for our London data. Since grammatical category is not a significant constraint on the London-born teenagers in this study, it is unclear how the Polish teenagers are deriving this pattern and how they are replicating the nominal-verbal continuum found in varieties of English world-wide. As in Edinburgh, this data suggests that supra-local constraints on this variable are influencing the migrant teenagers' speech. Polish kids seem to take as their reference and input more than just their same age peers. As we have noted, our sampling methods do not allow us to consider the potential input of teachers and speakers of other varieties of English that they may be exposed to. Data collection was based on the assumption that the English input is similar for both locally born and Polish teenagers. This is clearly an avenue for future research.

5.4 Imperfect learning and instability of a "stable" variable

Most other findings for the Polish kids can be explained by the particular situation they find themselves in as learners of English in an English-speaking context. This is very different to

their L1 peers. L1 learners replicate variable input with variable output, replicating stable variation or advancing changes in progress, based on a very rich diet of sociolinguistic information from birth. L2 learners (especially those in their teens or adulthood) in a situation of language contact do not have access to the same depth and breadth of information about the nature of a variable that an L1 learner does. Perhaps this is because the plasticity of adolescents' and adults' language faculty is reduced due to physiological changes, or perhaps it is simply because they get much less exposure to the language than little children do before they (must) start producing. This is surely an important question. One possibility is that replicating variable input is a sufficiently complex cognitive task that reordering or non-replication of constraints has to happen or is extremely likely to emerge as a result of engaging in the task (Meyerhoff 2009). It can be seen as collateral damage in the complicated and challenging business of identifying (a) variants, (b) the independent factors constraining those variants, and (c) the ordering of specific constraints in those factors. It requires highly detailed levels of linguistic analysis which may be more than L2 learners are exposed to, or that they can take the time to replicate. This means that the (ing) variable is likely to be a rather different type for L1 and L2 learners. While it is a stable variable for the native kids in Edinburgh and London, i.e. it is not involved in language change, it is not entirely clear that it can be considered a stable variable for the Polish kids.

This is particularly obvious in the London data and our findings in respect to gender. Polish boys strongly favour the velar realisation of (ing) and Polish girls favour the apical realization, the exact opposite of what we would expect based on previous research. Labov has proposed that “for stable sociolinguistic variables, women show a lower rate of stigmatized variants and a higher rate of prestige variants than men” (Labov 2001: 266). The (ing) variable is fundamentally stable in English, hence, typically women will produce velar tokens of (ing) more than men do. However, it is not certain that for second language learners

(ing) is a stable variable. These speakers are, after all, by definition, language learners. This suggests instability in their system as they fine-tune their acquisition of social and linguistic constraints on (ing). As a consequence, it is perhaps not surprising to find the typical gender pattern reanalysed.

However, this line of argumentation brings up some complex issues. While (ing) may currently not be a stable variable for these speakers, they may very well be in the process of acquiring stable variation for (ing). We are not arguing that the changes that take place in the speakers' interlanguage are the same types of phenomena as the changes that take place within a community, all we are arguing is that our Polish teenagers' use of (ing) is still evolving and that it would be wrong to assume their use of variable (ing) is stable. There are some other results that suggest that (ing) is not a stable variable for the Polish teenagers, e.g. the effect of lexical frequency.

Lexical frequency is a significant factor among just the Polish-born London teenagers. For the Polish-born teenagers, (ing) is a work in progress – it is a variable which is undergoing change as they learn to approximate the local norms. Philips (2006) and Bybee (2007) argue that lexical frequency is a driving factor in phonetic change; a lexical frequency effect for the Polish speakers would be compatible with this – the correlation is negative indicating that the apical, non-standard realisation of (ing) is more likely to appear in high-frequency words. On the other hand, for London-born teenagers, (ing) is a stable variable and as a consequence there is no predicted effect for lexical frequency.

The results for style also show that (ing) is a stable variable for the native teenagers but not for the Polish teenagers. While the expected style effect shows up for the native speakers, i.e. the velar variant is more frequent in the formal style, there is no such effect for the Polish teenagers. Major (2004) also found adult learners not acquiring native-like stylistic stratification of variables. However, note that it is possible that the tasks we used to

operationalise styles fail to capture all of the Polish teenagers' sociolinguistic competence, and recall our caution about the possible effect of having excluded all tokens of [ɪŋk]. While they may have limited experience with reading aloud (and therefore have failed to develop a specific style associated with this activity), it is possible that as they move between different social settings and social tasks, they can vary their use of (ing). Alternatively, it is possible that the stop reinforced variant can be co-opted to serve as a stylistic resource. These possibilities would reward further investigation.

Imperfect learning of constraints seems even more likely when we are dealing with perception and weak constraint effects among the native speakers. With respect to attitudes to the local accent: we note that in the matched guise test, the Polish teenagers showed limited awareness of British dialect variation and much less extreme reactions to those accents they could identify than locally-born teens do (i.e. they are even less native-like in perception than they are in production, Clark and Schleeff forthcoming). This, along with the fact that the correlation for locally-born teenagers is not a very strong effect, may account for the absence of an effect of 'attitude' in the Polish kids' production of (ing).

Imperfect learning, i.e. re-ordering or non-replication of variable constraints, does of course affect all learners. Even among native speakers, the boost in the frequency with which children and teenagers use a change in progress necessarily entails imperfect replication, so this process is not exclusive to non-native speakers, and our findings may be a step towards an improved understanding of the dynamics of linguistic innovation, clearly an important avenue for future research.

6. Conclusion

Our study of the production of (ing) by migrant Polish teenagers in London and Edinburgh has revealed that despite having been in the UK for sometimes very short periods of time, the

Polish teens have already acquired a number of indicators that they are successfully replicating the variation in native speakers' production of (ing). Overall frequencies of the apical variant were higher among the Polish kids in Edinburgh, where the apical variant is the native speakers' norm. Although few of the constraints on native speakers' production of (ing) are replicated in the Polish migrants' use of (ing), there is evidence of the migrant teenagers systematising the variable. This systematisation involves the emergence of some linguistically and cognitively predictable constraints, but also some interesting social constraints not found in the teenage native speakers.

Appendix

Table A1: Summary of best mixed effect model for (ing): [ɪŋ] among Edinburgh born adolescents.

Deviance				749.222
Df				14
Grand mean				0.314
Factors	Log Odds	Tokens (N)	Proportion of application value	Uncentered weight
STYLE				
Reading	2.141	585	0.634	0.921
Speaking	-2.141	790	0.077	0.139
GRAMMATICAL CATEGORY				
Pronoun (-thing compounds)	2.110	91	0.242	0.921
Adjective	0.457	49	0.122	0.69
Gerund	0.267	173	0.098	0.648
Proper noun	-0.229	86	0.651	0.528
Preposition	-0.356	23	0.609	0.497
Noun	-0.567	207	0.527	0.444
Verb	-0.774	684	0.301	0.394
Discourse marker (-thing compounds)	-0.908	62	0.032	0.362
PRIMING				
Previous (ing): [ɪŋ]	0.827	439	0.779	0.755
Previous (ing): [ɪn]	-0.827	936	0.096	0.371
NO. OF SYLLABLES				
3	0.493	250	0.380	0.657
4	-0.190	30	0.467	0.492
2	-0.304	1095	0.295	0.463
POSITIVE ATTITUDE TOWARDS EDINBURGH ACCENT				
Continuous	-0.091			
SPEAKER ID				
Random st.dev.: 1.285				

Not significant: preceding or following phonological context, preceding alveolar/nasal in the word, lexical frequency, gender, attitude towards SSE.

Table A2: Summary of best mixed effect model for (ing): [ɪŋ] among Polish-born adolescents living in Edinburgh.

Deviance				394.9
Df				13
Uncentered input probability				0.586
Factors	Log Odds	Tokens (N)	Proportion of application value	Uncentered weight
GRAMMATICAL CATEGORY				
Noun/pronoun	1.037	110	0.582	0.675
Adjective	0.773	11	0.545	0.545
Proper noun	0.602	32	0.531	0.531
Preposition	0.533	8	0.500	0.556
Verb	0.327	238	0.508	0.505
Gerund	-0.442	35	0.343	0.321
Discourse marker	-2.830	24	0.167	0.042
FRIENDSHIP NETWORK				
Mostly Polish	1.29	218	0.784	0.794
Mixed/mostly Scottish	-1.29	240	0.238	0.227
NO. OF SYLLABLES				
4	1.544	13	0.769	0.885
2	-0.464	380	0.492	0.508
3	-1.080	65	0.477	0.358
FOLLOWING SEGMENT				
Following apical	0.674	127	0.614	0.658
Following other	-0.123	247	0.482	0.464
Following velar/glottal	-0.551	84	0.369	0.361
PRIMING				
Previous (ing): [ɪŋ]	0.436	226	0.761	0.609
Previous (ing): [ɪn]	-0.436	232	0.241	0.394
SPEAKER ID				
Random st. dv	1.12			

Not significant: preceding phonological context, any preceding alveolar or velar nasal in the word, lexical frequency, speech style, gender, attitude towards SSE and Edinburgh English, attitude towards life in UK, self-assessment of proficiency in English, time spent in UK, time spent learning English, age of arrival.

Table A3: Summary of best mixed effect model for (ing): [ɪŋ] among London born adolescents.

Deviance				529.788
Df				9
Uncentered input probability				N/A
Factors	Log Odds	Tokens (N)	Proportion of application value	Uncentered weight
FOLLOWING SEGMENT				
Following velar/glottal	1.095	87	0.851	0.805
Following pause	0.351	174	0.816	0.663
Following other	-0.518	599	0.750	0.452
Following apical	-0.928	207	0.715	0.354
STYLE				
Reading	0.89	604	0.851	0.684
Speaking	-0.89	463	0.646	0.267
PRECEDING SEGMENT				
Preceding apical	0.483	336	0.842	0.572
Preceding other	0.175	629	0.765	0.496
Preceding velar/glottal	-0.659	102	0.480	0.299
PRIMING				
Previous (ing): [ɪŋ]	0.456	816	0.919	0.553
Previous (ing): [ɪn]	-0.456	251	251	0.332
SPEAKER ID				
Random st.dev.:	2.684			

Not significant: grammatical category, number of syllables in the word, preceding alveolar/nasal in the word, lexical frequency, gender, attitude towards London English or RP.

Table A4: Summary of best mixed effect model for (ing): [ɪŋ] among Polish-born adolescents living in London.

Deviance				328.474
Df				11
Uncentered input probability				N/A
Factors	Log Odds	Tokens (N)	Proportion of application value	Uncentered weight
PRECEDING SEGMENT				
Preceding apical	0.643	174	0.885	0.547
Preceding other	0.613	271	0.827	0.539
Preceding velar/glottal	-1.256	44	0.523	0.153
GRAMMATICAL CATEGORY				
Noun (incl. proper noun)	0.693	139	0.950	0.724
Discourse marker	0.350	10	0.900	0.651
Gerund	0.131	51	0.804	0.600
Pronoun	0.051	19	0.842	0.580
Preposition	-0.312	10	0.900	0.490
Verb	-0.914	260	0.746	0.345
GENDER				
Male	0.778	192	0.927	0.720
Female	-0.778	297	0.751	0.352
LEXICAL FREQUENCY (LOG)				
SPEAKER ID				
Random standard deviation	1.009			

Not significant: following phonological context, preceding alveolar or velar nasal in the word, number of syllables in the word, previous realisation of (ing), attitude towards RP and London English, attitude towards life in UK, self-assessment of proficiency in English, friendship networks, time spent in UK, time spent learning English, age of arrival.

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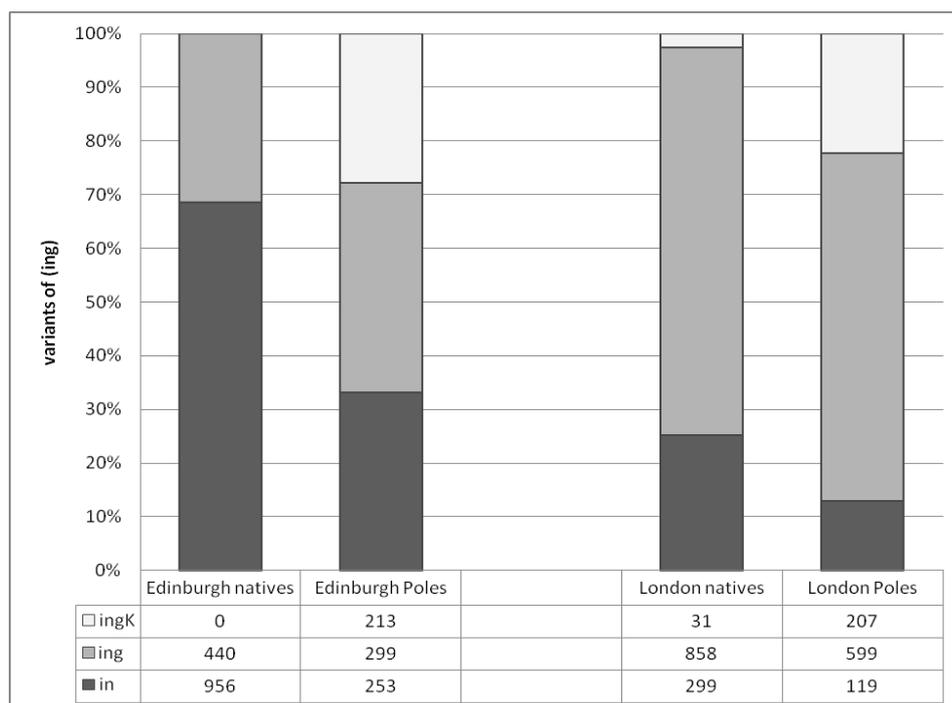
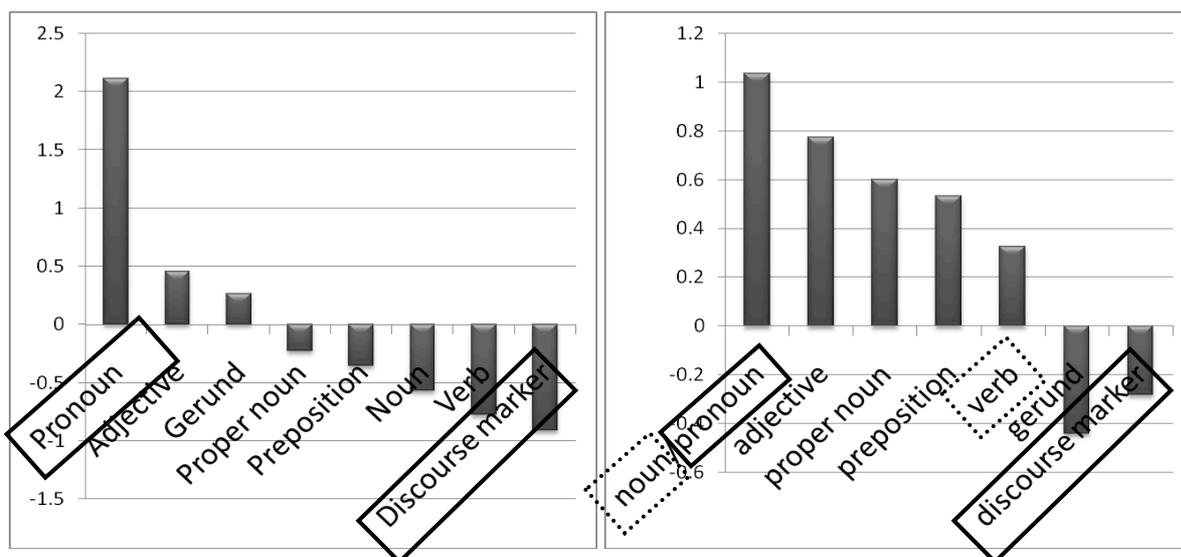


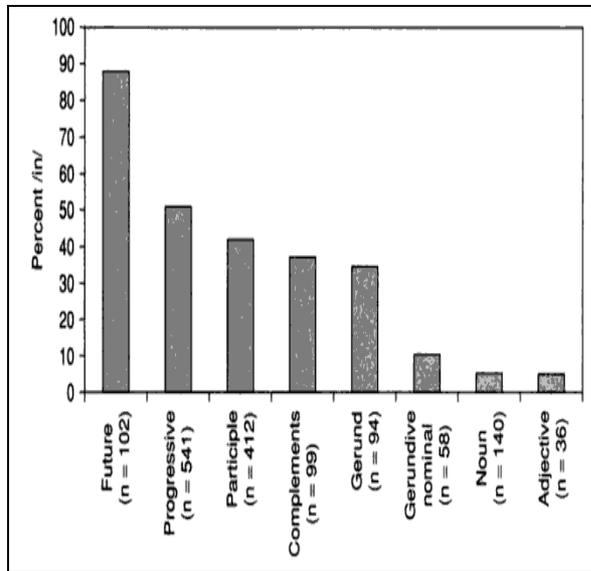
Figure 1: Variants of (ing) by speaker group. Percent of apical (in) variants, velar (ing) variants, and stop reinforced variants (ingK) for teenagers in Edinburgh and London. Locally-born teenagers compared to teenage Polish migrants.



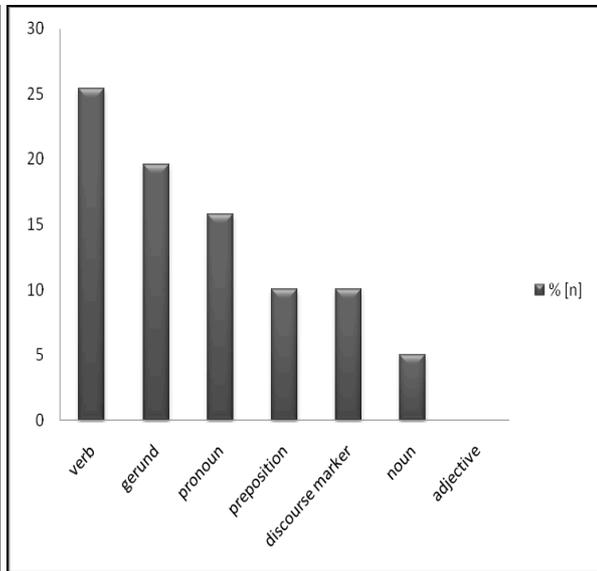
Grammatical conditioning of (ing) among Edinburgh-born adolescents. Regression log-odds plotted against grammatical category.

Grammatical conditioning of (ing) among Polish-born adolescents living in Edinburgh. Regression log-odds plotted against grammatical category.

Figure 2: Comparison of grammatical category among locally-born and Polish-born teenagers in Edinburgh. Positive log-odds favour the velar variant; negative log-odds disfavour the velar. Length of the bar proportional to the strength of the effect.



Grammatical conditioning of (ing) among adults in Philadelphia (Labov 2001: 88).



Grammatical conditioning of (ing) among Polish adolescents in London.

Figure 3: Comparison of the nominal verbal continuum among native English speakers in Philadelphia and Polish adolescents living in London.

Edinburgh-born teens	Polish-born teens
<p>Style</p> <p>Grammatical category+</p> <p>Priming++</p> <p>Number of syllables+</p> <p>Positive attitude towards Edinburgh accent</p>	<p>Grammatical category+</p> <p>Friendship network [Polish-specific]</p> <p>Number of syllables+</p> <p>Following segment</p> <p>Priming++</p>

Figure 4: Significant constraints for Edinburgh-born teens and Polish-born teens in Edinburgh (in order of effect size; ++ shared constraints; + reordered constraints).

London-born teens	Polish-born teens
<p>Following segment</p> <p>Style</p> <p>Previous segment++</p> <p>Priming</p>	<p>Previous segment++</p> <p>Grammatical category</p> <p>Gender</p> <p>Lexical frequency</p>

Figure 5: Significant constraints for London-born teens and Polish-born teens in London (in order of effect size; ++ shared constraints; + reordered constraints).

Table 1: Significant constraints on (ing) among Edinburgh-born and Polish-born adolescents living in Edinburgh. Application value is [ɪŋ]. Factors favouring the application of [ɪŋ] shown in bold. Note differences in ranking of factors.

	Edinburgh-born adolescents					Polish-born adolescents in Edinburgh			
	Log odds	N	%	factor weight		Log odds	N	%	factor weight
GRAMMATICAL CATEGORY					GRAMMATICAL CATEGORY				
Pronoun	2.11	91	0.224	0.921	Noun/pronoun	1.037	110	0.582	0.675
Adjective	0.457	49	0.122	0.69	Adjective	0.773	11	0.545	0.545
Gerund	0.267	173	0.098	0.648					
Proper noun	-0.229	86	0.651	0.528	Proper noun	0.602	32	0.531	0.531
Preposition	-0.356	23	0.609	0.497	Preposition	0.533	8	0.5	0.556
Noun	-0.567	207	0.527	0.444	Verb	0.327	238	0.508	0.505
Verb	-0.774	684	0.301	0.394	Gerund	-0.442	35	0.343	0.321
Discourse marker	-0.908	62	0.032	0.362	Discourse marker	-2.83	24	0.167	0.042
<i>Range</i>	56				<i>Range</i>	63			
total N	1375				total N	458			
NUMBER OF SYLLABLES IN WORD					NUMBER OF SYLLABLES IN WORD				
3 syllables	0.493	250	0.38	0.657	4 syllables	1.544	13	0.769	0.885
4 syllables	-0.19	30	0.467	0.492	2 syllables	-0.464	380	0.492	0.508
2 syllables	-0.304	1095	0.295	0.463	3 syllables	-1.08	65	0.477	0.358
<i>Range</i>	19				<i>Range</i>	52			
total N	1375				total N	458			