Manchester Metropolitan University

Ryan, Sadie Durkacz (2021) "I just sound Sco[]ish now": The acquisition of word-medial glottal replacement by Polish adolescents in Glasgow. English World-Wide. ISSN 0172-8865

"I just sound Sco[ʔ]ish now": The acquisition of word-medial glottal replacement by Polish adolescents in Glasgow

Abstract

This article investigates the speech of adolescents who have moved directly from Poland to Glasgow, using data from a range of social contexts and comparing their speech to that of their locally-born peer-group. Focusing on the acquisition of word-medial glottal replacement, I find that the Polish participants have replicated one of the constraints shown by their locally-born peers (number of syllables), have come close to replicating another (following segment), and have three which are not significant for the Glaswegians: lexical frequency, preceding segment and speech context.

The emergence of the speech context constraint for the Polish group (and not for the Glaswegians) is a novel finding, and sheds light on how learners come to understand and negotiate style in the L2. I suggest that as they are going through the acquisition process, the Polish group use speech context as an interpretive framework around which they structure their stylistic variation.

1. Introduction

Traditionally, research on second language acquisition has "tended to assume that standardised varieties are the target of language learning" (Nestor, Ní Chasaide and Regan 2012: 328). However, for many language learners, standardised varieties are not the only target (Goldstein 1987). They may be explicitly taught standardised language norms in the classroom, but outside of the classroom they will encounter nonstandardised varieties.

During the fieldwork for the current study, I met 12-year-old Cameron[1], born and brought up in the Glasgow. Cameron told me about the complexities of stylistic variation in school, taking as an example the word *what*: in his community, *what* can be realised as either /wɔt/ (the standardised variant) or /wɪt/ (the nonstandardised variant).

Cameron: Sometimes I just say "/wɪt/", but when I'm in school I say "/wɔt/", not "/wɪt/". 'Cause I'm a nice boy.

Me: Do the teachers mind if you say "/wɪt/"?

Cameron: No. Beca- well, it depends who you get. Yeah, some teachers don't really care, but if you say, like - if they ask you a question and you say "/wɪt/" to them they go crazy. Whoa! Because - uh, they take it as an insult. Because you were cheeky to

---

[1] Pseudonyms are employed throughout this article.

them.

Cameron understands a great deal about how sociolinguistic variation works in his community. But he was born in this community, and has been acquiring this understanding from birth. What about his classmates who have moved to this community from elsewhere? On entering a new community, migrant learners are faced with a complex landscape of variation, and – as formal language instruction tends not to focus on sociolinguistic variation - often no map to help them navigate it.

There is a relatively small, but growing, body of research exploring how L2 (additional language) speakers[2] come to understand and reproduce the sociolinguistic variation in their input. A central task of this research is understanding how speakers learn to negotiate stylistic variation in an L2. However, quantitative[3] examinations of style in L2 speech have so far been methodologically limited, most either comparing conversational style to reading style (Adamson and Regan 1991; Schleef, Meyerhoff and Clark 2011; Schleef 2013b; Meyerhoff and Schleef 2014; Schleef 2017a), comparing different reading styles (Major 2004), or organising interview data into monitored and unmonitored speech styles (Adamson and Regan 1991; Regan 2009).[4] Schilling-Estes points out the limits of such approaches to style, noting that "reading styles may not lie on the same plane as spoken styles" (382), and "level of formality cannot be neatly correlated with attention to speech even in spoken styles" (382). Schleef, Meyerhoff and Clark (2011: 228), who examine style by comparing conversational speech to reading, note the possibility that this method captures only a partial picture:

it is possible that the tasks we used to operationalise styles fail to capture all of the Polish teenagers' sociolinguistic competence […] 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). […] These possibilities would reward further investigation.

Taking this cue, this article extends previous research with a quantitative examination of style across a range of speech contexts. The contexts recorded roughly reflect those normally encountered in the course of a school day, and represent a fuller picture of the participants' sociolinguistic repertoires than we generally see in this field.

The recordings are made at St John's, a high school in the East End of Glasgow. I examine the speech of 14 adolescents who were born in Poland, comparing their speech to that of seven of their classmates who were born in Glasgow.

The main research question discussed in this article is:

---

[2] The terms "L1" for first language and "L2" for second or additional language have been criticised on the grounds that they often over-simplify complex situations (Rampton 2013: 361-362; Howley 2015: 43). As they remain the dominant terminology, and as they are relevant to the speakers in this research (who all began their lives speaking Polish, learned English on moving to Glasgow, and have no significant knowledge of any other language), they are used here as a necessary shorthand, with caution.

[3] Qualitative examinations (Rampton 2013; Schleef 2017a) offer a richer and more nuanced insight into the workings of style in L2 speech, but are less able to generalise beyond the behaviour of particular speakers in particular contexts.

[4] A notable exception is Rampton (2013: 365).

Does the use of word-medial glottal replacement by the Polish speakers match that of their Glaswegian classmates?

I ask whether the Polish speakers are matching their Glaswegian peers for a range of social and linguistic constraints, including style. Following on from this, I ask what the theoretical implications of my findings are.

2. Previous research

2.1. Acquiring stylistic constraints in a new language

Previous research shows that when migrants acquire an L2 within a community where it is the dominant language, they generally acquire nonstandardised variants alongside standardised variants (Adamson and Regan 1991; Major 2004; Regan 2009; Drummond 2010; Meyerhoff and Schleef 2014; Howley 2015), but their patterns of variation are not always the same as their locally-born peers.

In their work with Polish adolescents in Edinburgh and London, Schleef, Meyerhoff and Clark suggest that while migrant learners generally move towards replicating the sociolinguistic constraints of their new community (Schleef 2017a: 313) this movement is not always linear and predictable (Schleef, Meyerhoff and Clark 2011; Schleef 2013b; Meyerhoff and Schleef 2014; Schleef 2017a). In their data, a variety of constraint acquisition patterns emerge. The speakers replicate some constraints, and reject (i.e. do not acquire) others, but they also "re-interpret" some (Schleef 2017a: 322). For example, when examining word-medial glottal replacement in London, Schleef (2017a: 321) finds a grammatical category constraint for his London-born speakers. Some of the Polish speakers also have a grammatical category constraint, but for them the constraint is different: it is stronger, and it is differently ordered (for the London-born speakers glottal replacement is most likely in function words and least likely in nouns, for the Polish speakers it is most likely in verbs and least likely in adjectives) (2017a: 325). Schleef, Meyerhoff and Clark suggest that the structured reinterpretation of constraints may be an inherent step in the acquisition of variation in an L2. This claim is supported by Regan's (2009: 258) work with learners acquiring an L2 in a study abroad context, where she describes instances in which L2 learners over-acquire constraints, so that the constraints are stronger for the learners than they are for L1 speakers.

Before turning specifically to the acquisition of style constraints, it's important to note that when we look at the use of variants linked to the L1, or "non-native" variants, in migrants' speech, it is well-attested that this type of variation can be used for stylistic purposes (Sharma 2005, 2011). However, this study does not focus on migrants' use of these "non-native" variants, but on the acquisition of the local nonstandardised variants "native" to their new community. Do migrants use this type of variation for stylistic purposes, as their locally-born peers do?

The picture from previous quantitative research is mixed.[5] Major (2004: 177) finds "negligible" style-shifting among L1 Japanese speakers living in the US, and only slightly more among L1

---

[5] This mixed picture is perhaps not surprising given that each of these studies focuses on a different group of speakers in a different environment.

Spanish speakers. Adamson and Regan (1991: 12) find that while the female Vietnamese and Cambodian migrants in their study style-shift in the expected direction, the male migrants style-shift in the opposite direction to that expected. Rampton (2013: 373) finds some quantitative evidence of style-shifting in the expected direction, in a case study of a single speaker, Mandeep, an Indian migrant living in London. Schleef, Meyerhoff and Clark also find some evidence of style-shifting matching that of the locally-born peer group, but only for some of the variables analysed, and only for some of their participants (Schleef, Meyerhoff and Clark 2011; Schleef 2013b; Meyerhoff and Schleef 2014; Schleef 2017a).

Rampton's (2013) and Schleef's (2017a) qualitative analyses suggest that L2 speakers may be employing local nonstandardised variants in ways which differ from their locally-born peers, but which are nonetheless stylistic in nature. Rampton (2013: 361) provides a qualitative analysis of Mandeep's use of glottal replacement in acts of "stylization", suggesting that glottal replacement is available to Mandeep as a stylistic resource, but that he doesn't have full control of the feature. Schleef finds quantitative evidence of style-shifting in the expected direction amongst speakers who have been living in London for more than three years, but not those who have been in London for a shorter period of time, leading him to report that "style in the sense of attention paid to speech only starts to emerge three years after arrival in England" (2017a: 330). However, he goes on to provide a qualitative analysis of the ways in which glottal replacement may be available as a stylistic resource before this point, even when the expected quantitative patterns don't emerge in a comparison of conversational speech and reading. According to Rampton (2013) and Schleef (2017a), local nonstandardised variants may be available for stylistic use even where quantitative studies don't uncover style-shifting patterns which match those of the new community.

2.2. Glottal replacement

The replacement of [t] by [ʔ], as in (a) and (b) - hereafter referred to as glottal replacement – is common in L1 varieties of Scots and English across the UK, and is frequent in L1 Glaswegian speech (Stuart-Smith 1999; Stuart-Smith, Timmins and Tweedie 2007).

Glottal replacement can occur in word-medial /t/ (a) and word-final /t/ (b).

a. My mum was ge[ʔ]ing scared.
b. I think they might be able to follow i[ʔ].[6]

Stuart-Smith (1999: 183) writes that:

Glasgow has a special place in any discussion of T-glottalling in English. It is reputed to be the original source of the glottal stop in urban British English (e.g. Macafee, 1997: 528). Whether or not this derivation is correct, it is certainly the case that T-glottalling has been particularly noted as a highly-stigmatised feature of Glasgow vernacular speech since the nineteenth century.

---

[6] Examples come from the data under analysis.

Macaulay and Trevelyan studied glottal replacement in Glasgow in the 1970s. At this time, they wrote that it was "the most openly stigmatised feature of Glasgow speech" (1977: 47), and, as expected for a heavily stigmatised feature, they found evidence of style-shifting: the participants used it less in reading style compared to conversational style (1977: 53).

In recent decades, studies from across the UK suggest a general trend of destigmatisation (Fabricius 2002), and with this, style constraints may be becoming weaker, or even non-existent, for some L1 speakers. Although some recent studies have found evidence of stylistic constraints on glottal replacement[7] in the L1 speech of adolescents in Edinburgh and London (Schleef 2013a: 211, 2013b: 208; Meyerhoff and Schleef 2014: 113; Schleef 2017a: 321), others have found it to be unconstrained, or only slightly constrained (Stuart-Smith 1999: 200; Stuart-Smith, Timmins and Tweedie 2007: 242; Smith and Holmes-Elliott 2018: 338).

Kirkham and Moore (2016: 108) suggest that glottal replacement continues to be deployed stylistically by at least some UK speakers, and suggest that [ʔ] can "invoke meanings from a rich indexical field", including "solidarity or familiarity", while [t] may be used to index "credibility and responsiveness". Schleef's perceptual research conducted with students from Manchester found that "the variable (t) is a highly salient and socially relevant variable in Greater Manchester" (2017b: 41), with [ʔ] being linked to informality and gregariousness, and [t] being linked to poshness, articulateness, reliability, intelligence, educatedness, and hard-workingness (2017b: 44) . It may be that these social meanings are region, community or age-specific, and therefore are not present for the speakers in Stuart-Smith (1999), Stuart-Smith, Timmins and Tweedie (2007) and Smith and Holmes-Elliott (2018), or it may be that they are present and simply do not translate into quantitative style-shifting effects for these speakers.

Glottal replacement[8] has also been described in the L2 speech of migrants living in the UK (Drummond 2010; Rampton 2013; Schleef 2013b; Meyerhoff and Schleef 2014; Schleef 2017a). For some of the L2 speakers who use glottal replacement, evidence of style-shifting emerges (Rampton 2013: 365; Schleef 2013b: 208[9]; Meyerhoff and Schleef 2014: 117; Schleef 2017a: 327[10]), but others do not show evidence of style-shifting, even when style-shifting is present in the speech of their locally-born peers (Schleef 2013b: 208[11], 2017a: 327[12]).

Word-medial and word-final glottal replacement often show differing variation patterns (Stuart-Smith 1999: 194). This finding has led most researchers to separate the two contexts in their analyses. Some examine only word-final /t/ (Fabricius 2002; Straw and Patrick 2007; Schleef 2013b; Meyerhoff and Schleef 2014), and some include both word-medial and word-final /t/ but categorise them separately and examine how the two contexts differ (Macaulay and Trevelyan 1977; Stuart-Smith 1999; Schleef 2013a, 2017a). In this paper I focus solely on word-medial glottal replacement. Because word-medial glottal replacement is less frequent than word-final glottal replacement, less research has been conducted on it, and of the previous studies of glottal replacement in L2 speech, only Schleef (2017a) includes an in-depth quantitative analysis of word-medial glottal replacement.

---

[7] Both word-medial and word-final.
[8] Both word-medial and word-final.
[9] Polish adolescents in Edinburgh, but not in London.
[10] Polish adolescents in the later stage of acquisition only.
[11] Polish adolescents in London, but not in Edinburgh.
[12] Polish adolescents in the earlier stage of acquisition only.

3. Methodology

3.1. The participants

St John's is a working-class high school in the East End of Glasgow and is attended by pupils from settled families (the majority) and migrant families (a sizable minority). As part of a larger project, I spent two years in the school conducting ethnographic fieldwork while simultaneously collecting speech data for quantitative analysis. Most of the research took place at an after-school club, set up for the purposes of the project. As well as providing opportunities to record speech data and engage in participant observation, running the after-school club ensured that the participants and the school received an immediate and tangible benefit to participation (Ryan 2018: 49). The decision to work with high school pupils stems from the relative lack of studies examining the sociolinguistics of adolescence in an L2 (Schleef, Meyerhoff and Clark 2011: 211).

Of the pupils at St John's who speak English as an additional language, 24% are originally from Poland, and this was the group from which the participants were recruited. The recruitment criteria for the Polish participants were as follows:

i. Born in Poland
ii. L1 Polish, L2 English
iii. No significant knowledge of languages other than Polish and English
iv. Moved directly from Poland to Glasgow
v. Very little or no contact with L1 English speakers before arrival in Glasgow
vi. Comfortable holding a half hour conversation in English

Table 1: Details of the Polish participants[13]

Speaker	Age	Length of residency in Glasgow	Age at arrival in Glasgow
Izabela	12y8m	1.5y	11y
Adam	13y0m	1.5y	11y
Angelika	15y1m	2y	13y
Piotr	12y10m	3y	9y
Kinga	14y2m	4y	10y
Szymon	14y11m	5y	9y
Kamila	11y11m	7y	4y
Dominik	11y11m	7y	4y
Maja	12y1m	7y	4y
Marek	13y3m	8y	5y
Jan	13y7m	8y	5y
Zofia	16y0m	8y	8y
Nikola	13y0m	10y	3y
Anna	13y8m	10y	3y

As shown, the Polish participants have a relatively wide range of lengths of residency and ages at arrival, a point which will be returned to in Section 4.6.

---

[13] The recorded ages and lengths of residency in Glasgow relate to September 1, 2014, at the start of the fieldwork period.

The Polish participants were invited to bring friends to the after-school club, and of those who attended regularly, an eligible subset of Glasgow-born pupils was selected for inclusion in the study. These friendships helped to facilitate social interaction within the after-school club sessions, and added some assurance that the speech of this group is representative of the input the Polish participants are receiving. The recruitment criteria for this group were as follows:

i. Born in Glasgow
ii. L1 English
iii. No significant knowledge of languages other than English
iv. Have not spent a significant length of time living anywhere other than Glasgow
v. Close friendship with one or more of the Polish participants

Table 2: Details of the Glaswegian participants

Speaker	Age
Callum	11y10m
Laura-Kim	12y1m
Jake	12y1m
Candice	12y5m
Skye	13y6m
Matt	14y5m
Jamie	14y7m

Before beginning the research, I secured ethical approval from the University of Glasgow's research ethics committee. After running a series of information evenings at the school, conducted in both Polish and English, I invited the pupils' parents or carers to sign a consent form in the language of their choice. Pupils also had opportunities to ask questions about the research, and signed assent forms to signal their willingness to participate. See Ryan (2018: 47-57) for further details.

3.2. The speech data

I recorded the participants' speech across a range of contexts. Firstly, they were recorded while interacting with their friends in the after-school club. This context, hereafter referred to as "the peer-group context", was designed to mimic the social context of the playground as closely as possible.[14] The participants were given radio microphones to wear, allowing them to be recorded while moving around and engaging in various activities and interactions. Much of the interaction took place out of earshot of me and other adults. Interaction with the workshop leaders and with me was not transcribed, so that only interaction within the peer-group is included.

Next, the participants were recorded interacting with me, one-to-one, in a series of unstructured conversations, hereafter referred to as "the conversation context". Although I was no longer a stranger to them by the time the recordings took place, they were still interacting with someone who was not a member of their peer-group, or of the local

---

[14] This stand-in for actual playground recordings was necessary because the staff at the school felt uncomfortable about the idea of the pupils being given responsibility for recording equipment.

community. This context was designed to act as a midpoint between the playground-like peer-group context and the classroom-like interview context.

Finally, the participants were interviewed by Professor Evelyn Arizpe, a complete stranger to them at this time. This is hereafter referred to as "the interview context". Before each interview, the participant was asked to look at a book in a waiting room next door. When they were invited into the room, Evelyn asked them a series of questions about the book. This context was designed to mimic the social context of the classroom.[15]

All of the speech data was recorded between September 2014 and November 2015. It was then transcribed and anonymised, creating a 200,000 word corpus.

4. Analysis and results

4.1. Circumscribing the variable context

Not all /t/ tokens can be realized with glottal replacement: in some contexts, it is blocked. However, exactly where it is blocked is complex, and the rule differs across different varieties (Smith and Holmes-Elliott 2018: 330). Previous research has identified where it can and cannot occur in Glaswegian speech (Macaulay & Trevelyan 1977; Stuart-Smith 1999); however, glottal replacement is known to be a rapidly expanding variable, and with its rise and spread, the linguistic environments in which it can occur in particular varieties may be changing. For this reason, I follow Smith and Holmes-Elliott (2018: 330) and take a bottom-up approach: I remove all lexical items which never occur with glottal replacement in these data, as we can't be sure that glottal replacement is possible in these contexts.

Following Stuart-Smith (1999), I also exclude tokens which come directly before or after a non-sonorant consonant. Therefore I include only tokens which come after a vowel or /r, n, l/, and before a vowel. The previous studies of glottal replacement outlined in section 2.2. do not all take the same methodological approach, e.g. Schleef (2017a) includes tokens which come before a non-sonorant consonant. Comparisons between the current data and previous studies can never be direct comparisons, both because of methodological differences and also because of regional and demographic differences between the speakers. For this reason, the main point of comparison in this analysis is between the speech of the Polish group and the speech of their Glaswegian classmates: I ask whether the Polish speakers are matching the linguistic behaviour of the Glaswegians, and what the theoretical implications of this are.

4.2. Coding the variants

Using LaBB-CAT (Fromont and Hay 2012), I extracted all relevant /t/ tokens, excluding the first 5 minutes of the interview and conversation data, and the first 10 minutes of the peer-group data. Then, using Praat 6.0.19. (Boersma and Weenink 2016), I coded the data auditorily,[16] excluding those tokens where it was impossible to determine the variant (e.g.

---

because of background noise), and very occasional tokens where the /t/ is elided completely. Following Drummond (2010: 92) and Smith and Holmes-Elliott (2018: 330), I excluded minority variants to focus on the distinction between [ʔ] and [t]. I annotated approximately 75 tokens per speaker.[17] These tokens were split evenly across the speech contexts, to ensure that the full range of contexts was represented for each speaker. The tokens annotated were the first 25 tokens to occur after the exclusion period in each context. The total number annotated was 1,559.

Table 3: Overall distribution of [ʔ] vs. [t] for word-medial /t/, N = 1,559

Variant	Glaswegian speakers		Polish speakers	
	n	Rate	n	Rate
[ʔ]	379	80.81%	740	67.89%
[t]	90	19.19%	350	32.11%

4.3. Statistical modelling

The purpose of the analysis is to answer the question: are the Polish speakers matching the Glaswegian speakers in their use of word-medial glottal replacement? To address this question, I created a mixed-effects logistic regression model using the lme4 package in R version 3.3.2. (R Core Team 2016). This model contained all of the data from both speaker groups - Polish and Glaswegian.[18] I included individual speaker and lexical item as random intercepts: this corrects for the unusual behaviours of particular speakers or lexical items, meaning that the constraints which emerge as significant will not be the result of idiolectal differences or word-specific effects. I fitted the model by beginning with these random intercepts, and then adding potential constraints.

4.4. Potential constraints

The potential constraints tested for are listed in Table 4.

---

studies on glottal replacement in conducting auditory analysis (Stuart-Smith 1999; Fabricius 2002; Drummond 2010; Smith and Holmes-Elliott 2018).

[17] Dominik only produced 59 tokens.

[18] Within quantitative variationist sociolinguistics, many multivariate analyses compare speaker groups by modelling each group separately, presenting the significant constraints for each group, and making a qualitative comparison between the groups. In the present study, the main focus is on whether the Polish speakers are matching the constraints shown by their Glaswegian peers. In order to answer this question, I modelled both of the speaker groups together and made a statistical comparison between the two groups within this model.

Table 4: Potential constraints tested for in the statistical model

Potential constraint	Method of analysis
following phonological segment	Comparison of two categories: i. /t/ comes before a segment containing a plosive (/d k t b/)[19] ii. /t/ comes before a segment which doesn't contain a plosive (vowel or /n m ŋ r l s ʃ ʤ f v/)
preceding phonological segment	Comparison of two categories: i. /t/ comes after a vowel ii. /t/ comes after /r, n, l/
grammatical category	Comparison of two categories: i. /t/ occurs in a verb ii. /t/ occurs in a word which is not a verb
lexical frequency[20]	Continuous numerical predictor, log transformed and centred around its mean
number of syllables	Continuous numerical predictor, centred around its mean
speech context	Comparison of three speech contexts: i. peer-group context ii. conversation context iii. interview context
gender	Comparison of two categories:[21] i. female ii. male
age	Continuous numerical predictor, centred around its mean
length of residency (Polish group only)	Continuous numerical predictor, centred around its mean
age at arrival (Polish group only)	Continuous numerical predictor, centred around its mean
social network (Polish group only)[22]	Comparison of three categories i. speaker's social interaction is mostly in Polish ii. speaker's social interaction is mostly in English iii. speaker's social interaction is quite evenly mixed between Polish and English

---

[19] There were no tokens in which /t/ was followed by [ʔ].

[20] I extracted frequency counts from my own corpus, following Clark & Trousdale (2009).

[21] Although gender identities exist beyond this binary, all of the speakers in this study self-identify as either male or female.

[22] This measure was established using sociograms (Ryan 2018: 84). The speakers were asked to draw a diagram of the most important people in their lives, and then to indicate which languages they use with these people.

The operationalisation of following segment and grammatical category require some further explanation. Only tokens immediately followed by a vowel are included in the analysis, and it would be possible to treat these as a single following segment category. However, Stuart-Smith (1999: 195) makes a qualitative observation suggesting that the phoneme following the vowel may also be of interest, when she notes that "Instances of [t] are mostly found in past participles in *-ed* to stems ending in /t/, e.g. *shouted*" (1999: 195). This could indicate (i) an effect of following segment in which the phoneme following the vowel plays a role, or (ii) an effect of grammatical category.

I initially coded for a range of following segments (e.g. *started* was coded as following vowel + /d/, *button* was coded as following vowel + /n/), but this needed to be simplified for inclusion in the multivariate model. Initial observation suggested that following vowel + /d/ words appeared to disfavour glottal replacement, supporting Stuart-Smith's (1999: 195) observation about *-ed* words, but so did words in which the /t/ is followed by a vowel + any other plosive. In order to examine this further, I collapsed the full range of following segments into these two categories:

i. /t/ comes before a segment containing a vowel and a plosive
ii. /t/ comes before a segment which doesn't contain a plosive

It is also possible that Stuart-Smith's observation is due to a grammatical category effect. Testing for a full range of grammatical categories was not possible due to low token counts in several categories, and because it would overcomplicate the model. However, I was able to compare verbs to other grammatical categories. If verbs behave differently to other grammatical categories, this may suggest that the apparent disfavouring of glottal replacement in *-ed* words is related to their grammatical category rather than their phonology.

Each time I added a potential constraint, I tested whether it improved the fit of the model using a log-likelihood ratio test, and if it did not it was removed again. The final model, therefore, contains only significant constraints.

Table 5 shows which of the above constraints emerged as significant and were included in the final model.

Table 5: Potential constraints tested for in the statistical model

Significant	Not significant
number of syllables	grammatical category
following segment	gender
preceding segment	age
lexical frequency	length of residency (Polish group only)
speech context	age at arrival (Polish group only)
	social network (Polish group only)

Note that grammatical category does not emerge as significant in this data. This negative finding suggests that verbs do not behave differently to non-verbs in this data. Therefore, the disfavouring of glottal replacement in *-ed* words seems to result from (i) following segment, which does emerge as significant, rather than (ii) grammatical category.

4.5. Comparison of the groups

Next, I added speaker group to the model as an interaction term, which significantly improved the fit of the model ($\chi^2(4) = 38.43, p < 0.001$). This shows that the two groups have statistically different linguistic behaviour with respect to word-medial glottal replacement. The appendix gives a detailed summary of the model with speaker group added as an interaction term.

Figures 1 – 5 are partial-effects plots detailing how the two groups differ from one another. These plots illustrate how the factor under consideration affects the outcome, after controlling for idiolectal variation, word-specific effects and the effects of any other factors. In each figure, the panel on the left shows how the constraint patterns for the Glaswegian group, and the panel on the right shows how the constraint patterns for the Polish group. Recall that the central research question in this analysis is: are the Polish speakers matching the Glaswegian speakers in their use of word-medial glottal replacement? In relation to these figures, this translates as: how similar is the panel on the right to the panel on the left?
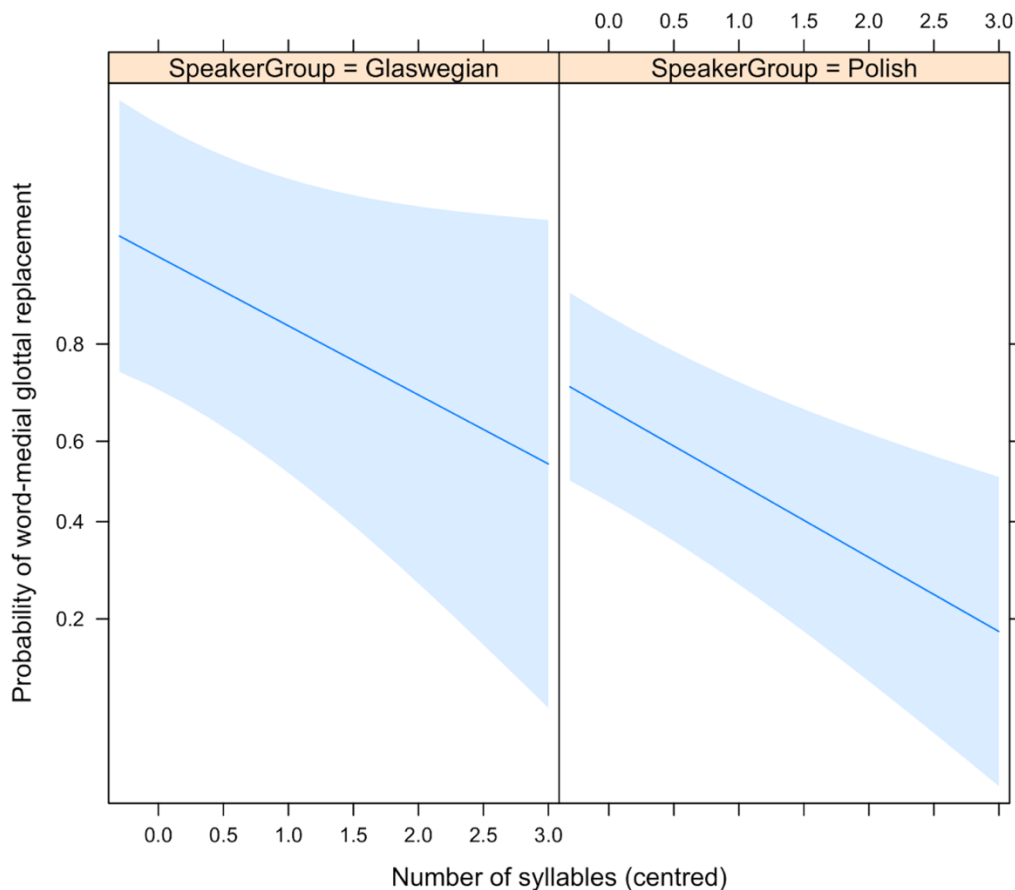

Figure 1: Partial-effects plot showing the effect of number of syllables on the probability of word-medial glottal replacement for each speaker group, N = 1,559

Figure 1 shows how the number of syllables affects the probability of word-medial glottal replacement occurring for each speaker group. The x-axis shows number of syllables, which is treated as a continuous numerical predictor and centred around its mean so that the baseline value is a word with an average number of syllables, rather than a word with 0 syllables. The

y-axis shows the probability of word-medial glottal replacement occurring. For this constraint, differences between the Polish and Glaswegian groups are not significant: in other words, the Polish speakers have replicated this constraint.

Figure 2 shows the effect of **following segment** across the Glaswegian and Polish speaker groups.
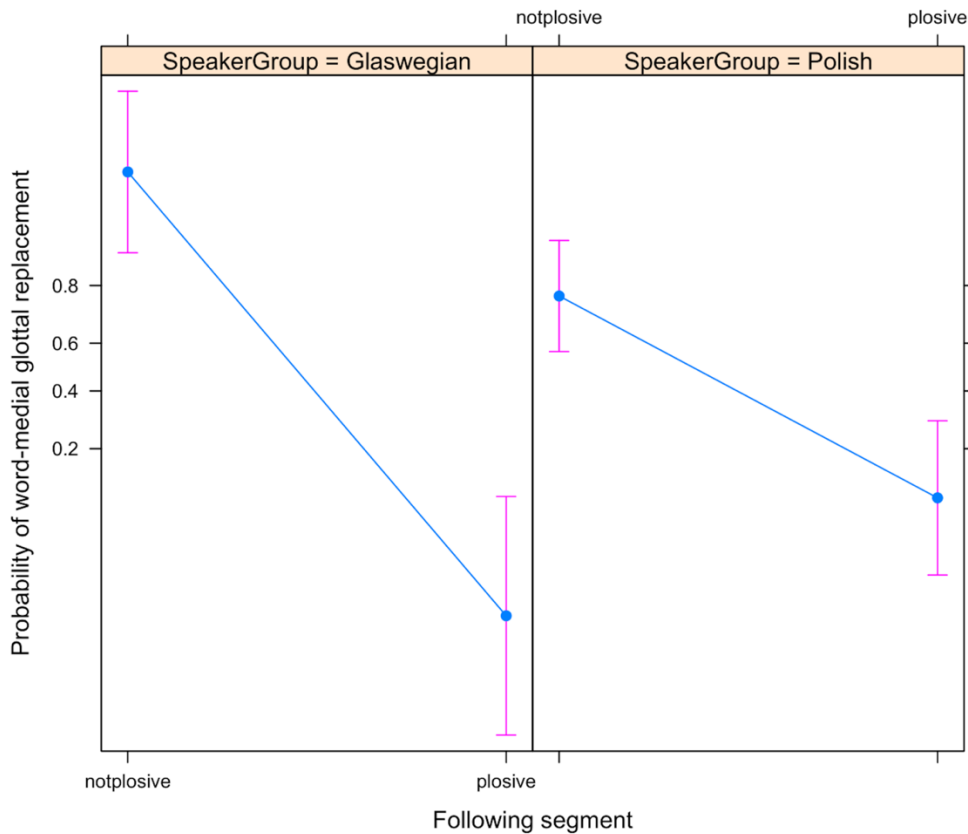

Figure 2: Partial-effects plot showing the probability of word-medial glottal replacement across following segment categories for each speaker group, N = 1,559

Table 6: Number of observations for each level of the following segment variable

	Glaswegian speakers	Polish speakers
Following segment	n	n
Does not contain a plosive	403	940
Contains a plosive	66	150

For both groups, the probability of word-medial glottal replacement occurring is lower when /t/ comes before a segment containing a plosive (/d k t b/), supporting Stuart-Smith's observation about the disfavouring of glottal replacement in *-ed* words (1999: 195). This pattern is significant for the Glaswegian group, but it is significantly weaker for the Polish group, who shift their rates of use less dramatically than their Glaswegian peers.

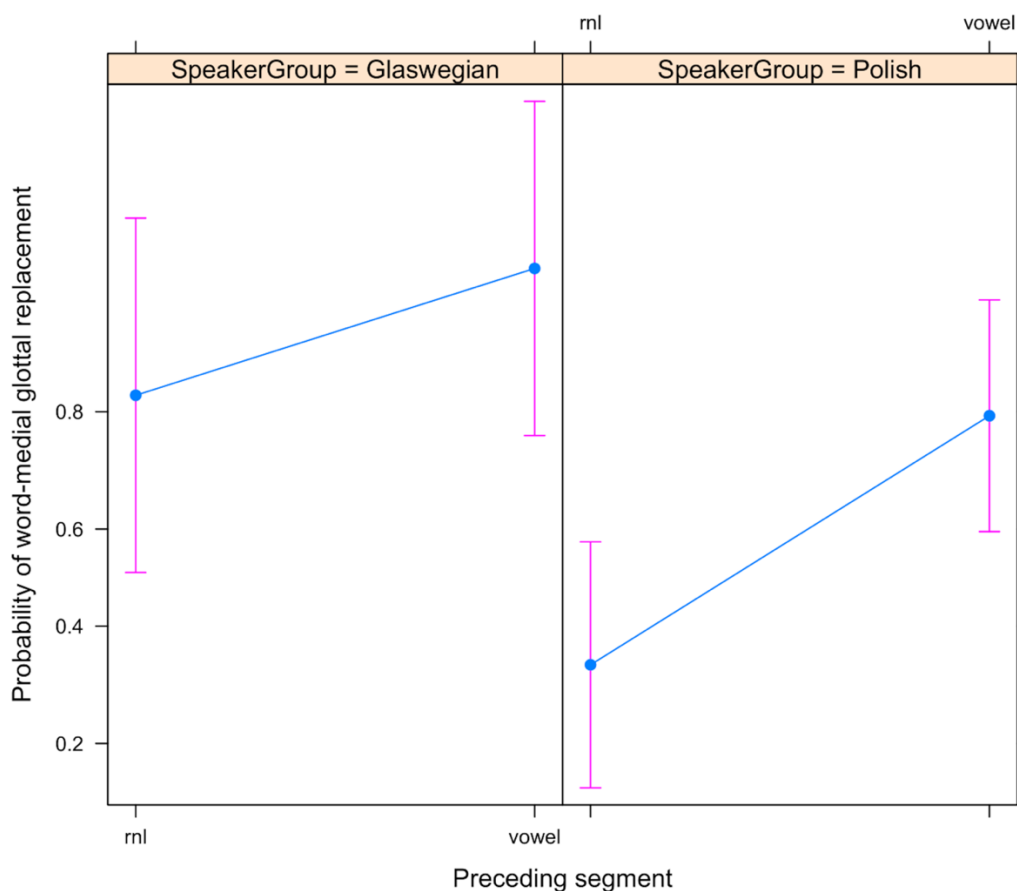Figure 3 shows the effect of **preceding segment** across the speaker groups.

Figure 3: Partial-effects plot showing the probability of word-medial glottal replacement across preceding segment categories for each speaker group, N= 1,559

Table 7: Number of observations for each level of the preceding segment variable

	Glaswegian speakers	Polish speakers
Preceding segment	n	n
Vowel	338	752
/r, n, l/	131	336

For the Polish group, word-medial glottal replacement is less likely when /t/ comes after /r, n, l/, and more likely when /t/ comes after a vowel. Here, the Polish group show a constraint which is not present in the speech of their locally-born peers.

Figure 4 shows the effect of lexical frequency across the speaker groups. The x-axis shows lexical frequency, which is treated as a continuous numerical predictor, log-transformed[23] and centred around its mean so that the baseline value is a word of average frequency, rather than a word with a frequency of 0. The y-axis shows the probability of word-medial glottal replacement occurring.
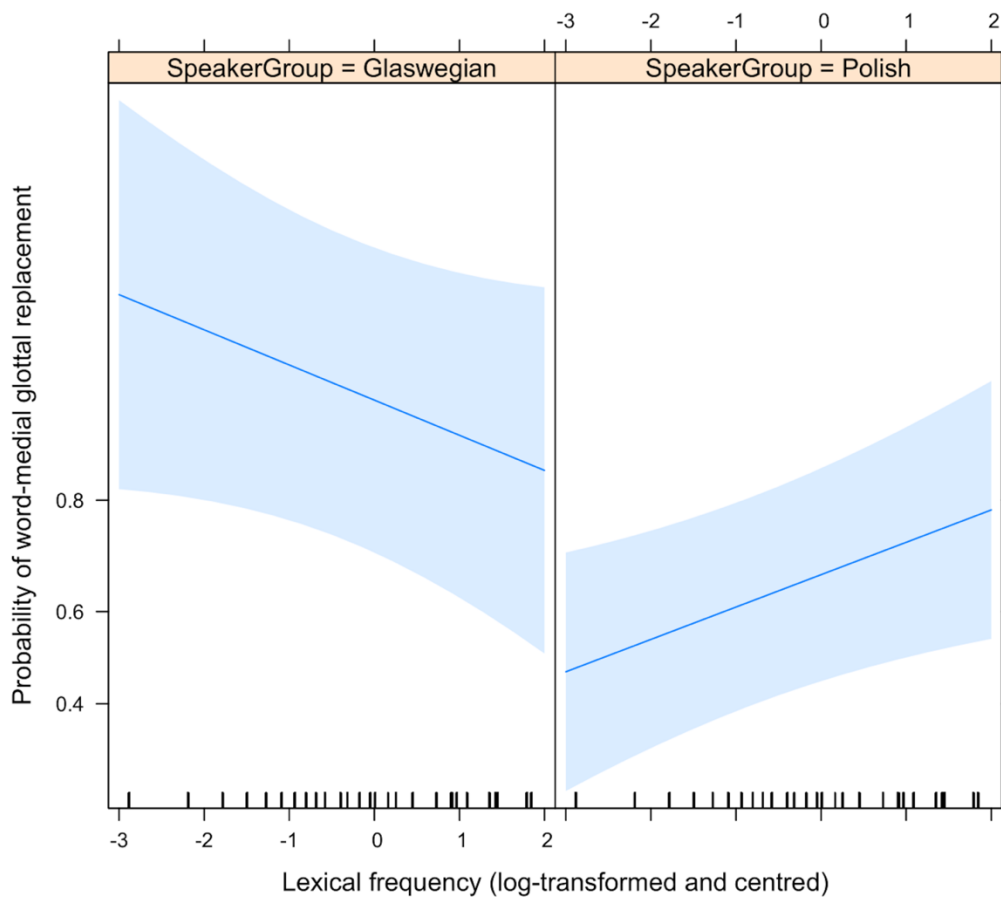

Figure 4: Partial-effects plot showing the effect of lexical frequency on the probability of word-medial glottal replacement for each speaker group, N = 1,559

For the Polish group, word-medial glottal replacement is more likely to occur in higher frequency words. This constraint is not significant for the Glaswegian group, and the trend in fact appears to be in the opposite direction for these speakers. Again, the Polish group show a constraint which is not present in the speech of their locally-born peers.

Figure 5 shows the speech context constraint across the speaker groups.

---

[23] It is log transformed to account for the fact that frequency differences at the lower end of the scale are more important than frequency differences higher up the scale: the difference between a frequency of 1 and 100 is more important than the difference between a frequency of 1001 and 1100.
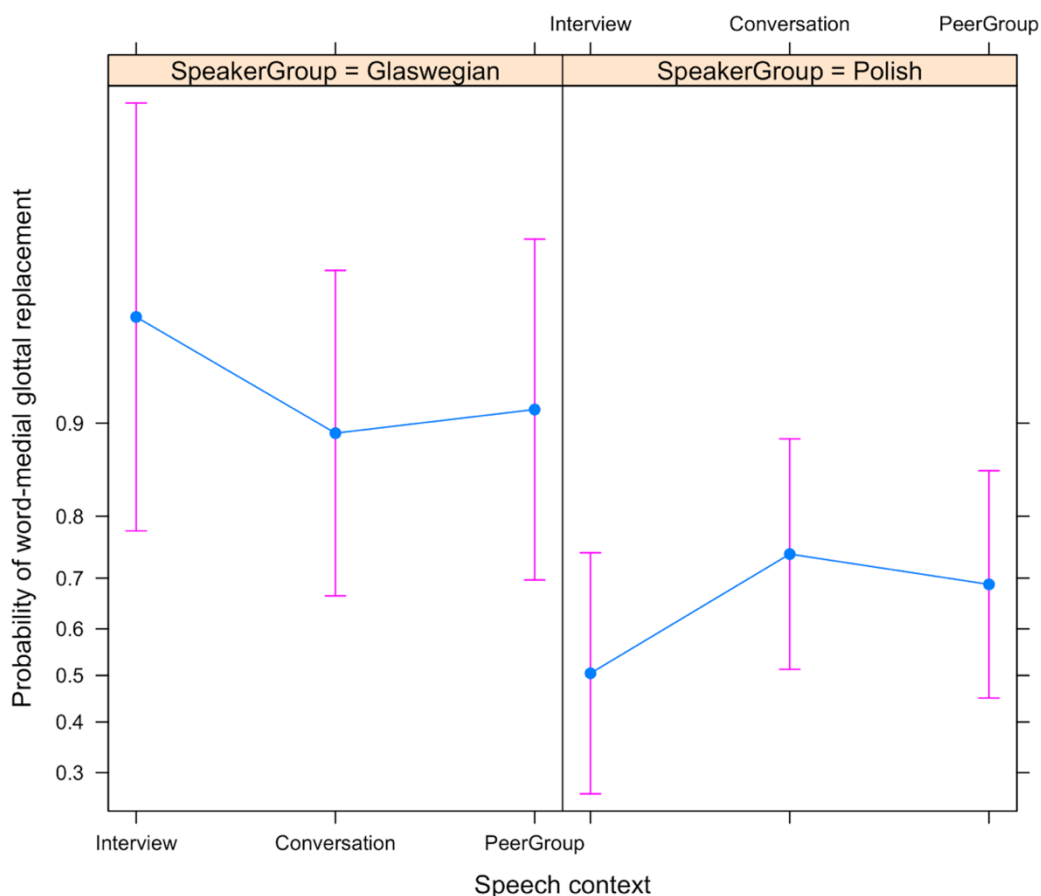
Figure 5: Partial-effects plot showing the probability of word-medial glottal replacement across speech context for each speaker group, N = 1,559

Table 8: Number of observations for each level of the speech context variable

	Glaswegian speakers	Polish speakers
Speech context	n	n
Peer-group context	168	474
Conversation context	232	367
Interview context	69	190

For the Glaswegian group, the effect of speech context is not statistically significant. It's worth noting that in analyses of other sociolinguistic variables, reported in Ryan (2018), these speakers do show clear style-shifting across this range of speech contexts. So it isn't the case that these speech contexts have simply failed to elicit style-shifting from these speakers: rather, the absence of style-shifting for word-medial glottal replacement is a notable absence. As described in Section 2.2., there is a general trend of destigmatisation for glottal replacement, and some studies in recent decades have suggested that style-shifting effects may be weakening or disappearing for some L1 speakers (Stuart-Smith 1999: 200; Stuart-Smith, Timmins and Tweedie 2007: 242; Smith and Holmes-Elliott 2018: 338). However, while style does not emerge as a significant constraint for the Glaswegian group, it does for the Polish group: specifically, there is no significant difference between the conversation context and the peer-group context, but they do use significantly lower rates in the classroom-like interview context.

The Polish group have another constraint which is not reflective of the speech of their locally-born peers.

Table 9: Summary of constraint acquisition patterns for word-medial glottal replacement

Constraint	Constraint acquisition pattern
Number of syllables	Polish group have replicated the constraint
Following segment	Polish group have under-acquired the constraint: it is significant for them, but significantly weaker than it is for the Glaswegians
Preceding segment	The constraint is significant for the Polish group, and not for the Glaswegians
Lexical frequency	The constraint is significant for the Polish group, and not for the Glaswegians
Speech context	The constraint is significant for the Polish group,, and not for the Glaswegians

4.6. Stages of acquisition

One point that remains to be addressed is that, as shown in Table 1, the Polish participants have a range of lengths of residency (LoRs) in Glasgow, as well as a range of ages at the time of arrival in Glasgow (AaAs). This has the potential to be problematic, if those who have been in Glasgow for longer, or arrived at a younger age, show very different linguistic behaviour to those with shorter LoRs and older AaAs. However, multivariate modelling shows that this is not the case: LoR and AaA do not emerge as statistically significant for word-medial glottal replacement, or for a range of other sociolinguistic variables examined (Ryan 2018: 261-263).

One possible explanation for this is that all of these speakers, even the newest arrivals, Adam and Izabela, would probably be considered "high proficiency" speakers. All were confident enough in their L2 to volunteer for participation in a project which involved spending a large amount of time interacting socially in the L2, and a possible unintended consequence of the data collection methods is that the participants may be higher proficiency speakers than those with comparable LoRs in other similar studies. Schleef (2017a: 310) suggests that language proficiency is a "very important factor influencing the acquisition of variation", and proficiency emerges as a significant predictor of the acquisition of variation across three of the four variables examined by Drummond (2010: 218). Although the newest arrivals, Adam and Izabela, had only been in Glasgow for 1.5 years at the beginning of the fieldwork period (just over 2.5 years at the end), both were very confident in their use of the L2, and both used a range of nonstandardised variants (see Ryan 2018), including word-medial glottal replacement, at overall rates similar to their Glaswegian classmates: this is very different from Schleef's (2017a: 323) findings, where those speakers who have been in the UK for less than two years do not use word-medial glottal replacement at all.[24]

---

[24] The school provided me with English proficiency ratings for the participants, but these were largely based on literacy, and for some pupils they were very out of date. Because they bore little relation to how comfortable the participants were with conversing in English, I chose not to include them in my analysis.

The speakers with longer LoRs do not use more glottal replacement than those with shorter LoRs: however, it's still possible that the longer LoR speakers will have different constraints on their variation, as found by Schleef (2017a). I tested this by repeating the statistical modelling described above, but separating out the participants with LoRs of three years or less (comparable to Schleef's phase 1 and 2 speakers) and the participants with LoRs of more than three years (comparable to Schleef's phase 3 speakers, and reaching beyond to later developmental stages), and modelling these groups separately. This showed that the two groups had almost the same set of significant constraints. This is surprising, but might be, again, explained by the unusually high proficiency levels of the newest arrivals in the group. The one clear difference between the two groups was that for those with shorter LoRs, speech context did not emerge as significant. This is broadly in line with Schleef's (2017a: 235) finding that his participants who had been in the UK for three years or less did not have a style constraint. The difference is that in the current study, neither do their locally-born classmates. The emergence of a style constraint for those of the Polish speakers who have been in Glasgow for a longer period of time will be addressed in Section 5.

5. Discussion

The main research question discussed in this article is:

Does the use of word-medial glottal replacement by the Polish speakers match that of their Glaswegian classmates?

I ask whether the Polish speakers are matching their Glaswegian peers for a range of social and linguistic constraints. The analysis shows that the Polish speakers have replicated one constraint (number of syllables) and under-acquired another (following segment). It also shows that they have three constraints on their use of word-medial glottal replacement which are not significant for their locally-born classmates: lexical frequency, speech context and preceding segment. I now examine some possible explanations for the emergence of each of these constraints.

In Schleef's (2013a, 2017a) analysis of L1 word-medial glottal replacement by adolescents born in Edinburgh and London, lexical frequency emerges as a significant constraint in both regions.[25] It is therefore worth asking whether this constraint could have entered the speech of the Polish group from a source other than their Glaswegian classmates: is their speech influenced by other groups of L1 speakers outside of the school community? During my time with the participants, I elicited information about their social networks using sociograms (Ryan 2018: 84). These sociograms indicated that around half of the Polish group do have friends outside of the school community who they use English with, but these friends were almost always neighbours living in the same community and attending nearby schools.[26] None of the Polish speakers attend extracurricular activities or social groups outside of their community,

---

[25] Stuart-Smith (1999: 195) also hints at a possible lexical frequency effect in L1 Glaswegian speech when noting that "instances of [t] are mostly found in […] 'learned' words, e.g. *hospital, university*". However if this effect is present in Stuart-Smith's data, its absence in the current data might be explained by the 15+ year gap between the two studies, as glottal replacement is known to be spreading and growing rapidly (Smith and Holmes-Elliott 2018: 233).

[26] In Glasgow, each neighbourhood tends to be served by several different publicly-funded schools, with families being able to choose which one their children attend.

and none mentioned connections outside of Glasgow's East End, other than connections in Poland. Therefore, it seems unlikely that they have acquired a lexical frequency constraint from outside of their school community.

A possible explanation for the emergence of the lexical frequency constraint in the speech of the Polish group is that it represents a lexical diffusion effect related to their acquisition of English as an additional language. Previous research has noted that in the process of acquiring sociolinguistic variation, learners often acquire features in a small number of specific words first, before they spread to the rest of their lexicon (Chambers 1992: 694; Wolfram, Carter and Moriello 2004: 345). Word-medial [ʔ] may be initiated in the high-frequency lexical items the learners are exposed to most in their input, before spreading to the lower-frequency lexical items which they hear less.

For the Glaswegian speakers in the current study, word-medial glottal replacement is not constrained by speech context. Stuart-Smith (1999: 199) finds middle-class Glaswegian speakers style-shift more than working-class speakers for glottal replacement, which might lead us to question whether the Polish speakers are simply modelling their speech on middle-class norms, rather than those of their classmates. However, as noted above, the speakers have very little contact with L1 speakers outside of their local community, a community in which working-class speech norms are very much dominant (Ryan 2018: 44-46). They may have some exposure to middle-class Glaswegian speech norms via some of their teachers and other non peer-group interactions, but this pales in comparison to their immersion in working-class Glaswegian speech (see Ryan 2018, chapter 4).

If the Polish group are not modelling their speech on middle-class norms, then where does their style constraint come from? I suggest that, in fact, they are picking up on social meanings which exist in the speech of their Glaswegian classmates, and tying these to speech context as a structuring principle. To elucidate, I first turn to the speech of the Glaswegian group.

When discussing the speech of working-class Glaswegian adolescents, Stuart-Smith writes that 'It is possible to explain every exception to T-glottalling (i.e. instance of [t]) […] [t] occurs as the result of emphasis, prosody, and style-shifting' (1999: 195-196). In relevant contexts, [ʔ] is expected and [t] is the exception.[27] This observation bears out in the current data, where all of the individual Glaswegian speakers use word-medial [t] only rarely. The [t] tokens that do occur can all be grouped into one of the following categories:

i. the phonological environment strongly disfavours glottal replacement
ii. [t] is used for specific stylistic effect

Although the Glaswegians don't have a quantitative style constraint, they do appear to be deploying [t] stylistically, as in the following excerpt from the conversation context.

---

[27] As further evidence of this, anecdotal evidence suggests that the use of the form <lit> is emerging among Glaswegians on social media as an informal written representation of discourse marker *like*. This representation only works if the orthographic <t> is understood to represent the sound [ʔ], so that <lit> represents [lɪʔ], a possible realisation of discourse marker *like* in connected speech. The use of <lit> for *like* suggests that, for some Glaswegians at least, the assumed realisation of <t> is [ʔ].

Candice: And then I nearly went for[28] one of them the other day. […] I told them to back off. Didn't do i[ʔ]. And then they just pushed me. And then I went for her.

Me: Yeah? Did you ge[ʔ] in trouble?

Candice: No 'cause nobody seen i[ʔ] and nobody believed her. 'Cause I am Li[t]le Miss Perfect. […] I ge[t] le[t] away with anything.

In this excerpt, Candice displays two quite different personae. First, she displays toughness and anti-authoritarianism, as she talks about attacking another pupil. Here she uses a cluster of nonstandardised variants: as well as [ʔ], she uses the nonstandardised realisation of 'pushed' with an open-mid back unrounded vowel, and the nonstandardised syntactic structure 'nobody seen it'. When she says 'I am Little Miss Perfect', there is a very clear shift in her speech style. As she begins to tell me about her ability to put on a 'good pupil' persona when interacting with teachers, she slows her speech rate and separates out the words 'I am', instead of contracting them as she usually would. She also uses word-medial [t].

[t] appears to be something which Candice can use when she wants to, in playful constructions of personae, and in combination with other features. It appears to have indexical links to the world of teachers, classrooms, authority, and middle-class speech, likely related to the indexical meanings uncovered by Kirkham & Moore (2016: 108) and Schleef (2017b: 44). There are many examples like the one above in the data: it seems clear that [t] is socially meaningful for Candice and the other speakers, and that, despite the results of the quantitative analysis, the Glaswegians are using it stylistically. The lack of a quantitative style-shifting effect might be explained by that fact that, for working-class Glaswegian adolescents, the social meaning of [t] goes beyond a straightforward link to social context. Candice's 'good pupil' persona is available for use in classroom contexts, but it can also be enacted in other kinds of situations. There are instances of [t] being used for stylistic effect across all of the speech contexts in which the pupils were recorded.

The above offers a possible explanation as to why word-medial glottal replacement is not constrained by speech context for the Glaswegians. But why, then, does it emerge as a constraint for the Polish group? Recall that when the newer arrivals in the Polish group were modelled separately, speech context did not emerge as significant for those who had been in Glasgow for three years or less, which aligns with Schleef's findings (2017a: 330). Like Schleef's Polish speakers, for my participants, a quantitative style constraint only emerges after three years of exposure to the variation. Where my data differs is that after three years of exposure, a quantitative style constraint emerges where none exists for the locally-born peer group.

Schleef suggests that his Polish participants in London initially use grammatical category and lexical frequency "as interpretive frameworks that (to an extent) guide the acquisition of variation" (2017a: 336). On entering a new sociolinguistic environment and acquiring sociolinguistic variation in the L2, they initially structure their variation around categories that help them to make sense of the complex situation they are faced with. In a similar way, I suggest that the Polish participants in the current study (and perhaps other learners like them) are using speech context as an interpretive framework which they use to structure their stylistic variation before (potentially) gaining full stylistic control.

---

[28] Attacked

Schleef's Polish participants don't create their "interpretive frameworks" from nothing: the grammatical category and lexical frequency constraints are present in the speech of their London-born peers (2017a: 321), but they become more central structuring principles for the Polish speakers while they are in the early stages of the acquisition process (2017a: 325), before becoming less important again in the later stages (2017a: 327). I suggest that the Polish group in the current study may be doing something similar with style: they are picking up on social meanings which exist in the community, and tying these to speech context as a structuring principle, where their Glaswegian classmates have looser ties, or none at all. They may be picking up on a weak, non-significant speech context constraint in the speech of the Glaswegians and over-acquiring it, rather than innovating a brand new constraint. A similar pattern also emerges in Ryan (2018: 144) in the quantitative analysis of another sociolinguistic variable, *aye* v *yes*, where a speech context constraint does exist for the Glaswegians, but is heightened in the speech of the Polish group so that it becomes stronger for them.

There may also be heightened social pressures on the Polish group which lead them to latch onto speech context as a structuring principle. The ethnographic analysis I undertook at St John's (see Ryan 2018: Chapter 4) suggests that the speech of the Polish group is subject to a heightened level of scrutiny compared to their Glaswegian classmates. Firstly, they are undergoing (or have undergone) formal second language instruction, which may have reinforced the use of standardised variants in classroom contexts: they are more likely to have had their pronunciation corrected than the Glaswegians. Secondly, they also occupy a more insecure social position than their locally-born classmates outside of the classroom. Sounding non-local is a common source of bullying in the school, and "blending in" linguistically is something several of the participants spoke to me about. This may in turn have reinforced the use of nonstandardised variants in non-classroom contexts, as they try to establish themselves as part of the adolescent peer-group. In the context St John's High. School, perhaps the acquisition of a heightened style constraint is not so surprising: heightened pressure to align with different linguistic expectations in different social situations may have led to this heightened pattern in their speech.

The emergence of the preceding segment constraint for the Polish group may result from the emergence of the speech context constraint. For the Polish group, word-medial glottal replacement is more likely to occur after a vowel than after /r, n, l/: for example, we are more likely to hear these speakers use glottal replacement in the word *patted* than in the word *parted*. The Glaswegian group show the same tendency, but the constraint is not significant in their speech.

Further observation of the Polish data shows that there is more evidence of style-shifting in words like *parted*. This may be because there is a difference in speaker awareness across these two categories, but additional research would be required to determine whether or not this is the case. Whatever the cause of this difference, the Polish group dramatically reduce their rate of word-medial glottal replacement in words like *parted* when they occur in the classroom-like interview context. The fact that the Polish group alter their use of glottal replacement across the speech contexts more than the Glaswegians do may, therefore, cause the preceding segment constraint to emerge as significant for this group only.

6. Conclusions

This study builds on previous research on how L2 speakers come to understand and reproduce the sociolinguistic variation in their input. Methodologically, it extends previous research with a quantitative comparison of speech produced in a range of social contexts, including peer-group interaction, a context which is less frequently captured. Examining word-medial glottal replacement using this methodology, we see the emergence of three quantitative constraints in the speech of the Polish participants which are not significant for their locally-born peers: lexical frequency, preceding segment and speech context.

I suggest that the emergence of the lexical frequency constraint might be explained as a lexical diffusion effect (Wolfram, Carter and Moriello 2004: 345), and that the preceding segment constraint may be explained as a side-effect of the speech context constraint. The emergence of the speech context constraint is perhaps the most intriguing. To my knowledge, similar patterns have not been observed in previous research: but, as noted, this field remains relatively small, and previous quantitative studies have tended to examine style across a fairly limited range of contexts, often comparing conversational style to reading style (Adamson and Regan 1991; Schleef, Meyerhoff and Clark 2011; Schleef 2013b; Meyerhoff and Schleef 2014; Schleef 2017a). As well as this, the participants in other studies have tended to be newer arrivals than those in the current study. The fact that this study looks at participants a little further along in the acquisition process may help to explain the emergence of this novel finding, which does not apply to those who have been in Glasgow for only a short time. The data captured in this study differs from that captured in previous studies in that it includes both a wider range of speech contexts and a wider range of developmental stages, and it may be either or both of these differences that allow for the emergence of this novel finding.

The emergence of speech context as a significant constraint for the Polish group (and not for the Glaswegians) provides insight into how speakers may come to understand and negotiate style in an L2. I suggest that as the Polish group are going through the acquisition process, they use speech context as an interpretive framework around which they structure their stylistic variation before (potentially) gaining full stylistic control. I suggest that for these speakers, and perhaps for others like them, speech context acts as a floatation device that they can hold onto as they learn to swim in a new pool of sociolinguistic variation.

Appendix

Reference levels:
Speaker group = Glaswegian
Following segment = not plosive
Preceding segment = /r, n, l/
Speech context = interview

Output of the logistic regression analysis showing significant constraints for word-medial glottal replacement with speaker group added as an interaction term, N = 1,559

Predictor	Estimate (β)	SE (β)	*z*-value	*p*
Intercept	3.505	1.037	3.381	< .001
Speaker group = Polish	-4.482	1.151	-3.894	< .001
Following segment = plosive	-7.675	0.955	-8.038	< .001
Preceding segment = vowel	0.977	0.534	1.830	0.067
Lexical frequency	-0.356	0.209	-1.702	0.089
Number of syllables	-0.804	0.380	-2.113	< .05
Speech context = conversation	-1.012	0.739	-1.371	0.170
Speech context = peer-group	-0.806	0.784	-1.028	0.304
Speaker group = Polish: Following segment = plosive	4.182	0.963	4.343	< .001
Speaker group = Polish: Preceding segment = vowel	1.134	0.534	2.124	< .05
Speaker group = Polish: Lexical frequency	0.660	0.206	3.209	< .01
Speaker group = Polish: Number of syllables	0.055	0.418	0.132	0.895
Speaker group = Polish: Speech context = conversation	2.051	0.801	2.561	< .05
Speaker group = Polish: Speech context = peer group	1.581	0.842	1.878	0.060

References

Adamson, Douglas, and Vera Regan. 1991. "The Acquisition of Community Speech Norms by Asian Immigrants Learning English as a Second Language". *Studies in Second Language Acquisition* 13: 1-22.

Boersma, Paul, and David Weenink. 2016. *Praat: Doing Phonetics by Computer, Version 6.0.19*. Amsterdam: University of Amsterdam. <www.praat.org> (accessed June 1, 2016).

Chambers, Jack. 1992. "Dialect acquisition". *Language* 68: 673-705.

Clark, L. & G. Trousdale. 2009. "Exploring the Role of Token Frequency in Phonological Change: Evidence from TH-Fronting in East-Central Scotland". *English Language and Linguistics* 13: 33-55.

Docherty, Gerry, and Paul Foulkes,. 1999. "Derby and Newcastle: Instrumental Phonetics and Variationist Studies". In Paul Foulkes, and Gerry Docherty, eds. *Urban Voice: Accent Studies in the British Isles*. London: Arnold, 47-71.

Drummond, Rob. 2010. "Sociolinguistic Variation in a Second Language: The Influence of Local Accent on the Pronunciation of Non-Native English Speakers Living in Manchester". Ph.D. Dissertation, University of Manchester.

Fabricius, Anne. 2002. "Ongoing Change in Modern RP: Evidence for the Disappearing Stigma of T-glottalling". *English World-Wide* 23: 115-136.

Fromont, Robert, and Jennifer Hay. 2012. *LaBB-CAT: An Annotation Store (Online Storage Facility)*. Canterbury: University of Canterbury. <www.labbcat.sourceforge.net> (accessed June 1, 2016).

Goldstein, Lynne. 1987. "Standard English: The Only Target for Nonnative Speakers of English?" *TESOL Quarterly* 21: 417-436.

Howley, Gerry. 2015. "The Acquisition of Manchester Dialect Variants by Adolescent Roma Migrants". Ph.D. Dissertation, University of Salford.

Kirkham, Sam, and Emma Moore. 2016. "Constructing Social Meaning in Political Discourse: Phonetic Variation and Verb Processes in Ed Miliband's Speeches". *Language in Society* 45: 87–111

Macaulay, Ronald and George Trevelyan. 1977. *Language, Social Class and Education: A Glasgow Study*. Edinburgh: Edinburgh University Press.

Major, Roy. 2004. "Gender and Stylistic Variation in Second Language Phonology". *Language Variation and Change* 16: 169-188.

Meyerhoff, Miriam, and Erik Schleef. 2014. "Hitting an Edinburgh Target: Immigrant Adolescents' Acquisition of Variation in Edinburgh English". In Robert Lawson, ed., *Sociolinguistics in Scotland*. London: Palgrave Macmillan, 103-128.

Nestor, Niamh, Caitríona Ní Chasaide, and Vera Regan. 2012. "Discourse 'Like' and Social Identity: A Case Study of Poles in Ireland". In Bettina Migge, and Máire Ní Chiosáin, eds. *New Perspectives on Irish English*. Amsterdam: John Benjamins, 327-353.

R Core Team. 2016. *R: A Language and Environment for Statistical Computing*, *Version 3.3.2*. *"Sincere Pumpkin Patch"*. Vienna: R Foundation for Statistical Computing. <www.R-project.org> (accessed October 1, 2016).

Rampton, Ben. 2013. "Styling in a Language Learned Later in Life". *The Modern Language Journal* 97: 360-382.

Regan, Vera. 2009. "The Acquisition of *ne* Deletion by Irish-English Speakers of French L2 During the Year Abroad". In Vera Regan, Martin Howard, Isabelle Lemée, eds. *The Acquisition of Sociolinguistic Competence in a Study Abroad Context*. Bristol: Multilingual Matters, 62-78.

Ryan, Sadie. 2018. "Language, migration and identity at school: A sociolinguistic study with Polish adolescents in Glasgow". Ph.D. Dissertation, University of Glasgow.

Schilling-Estes, Natalie. 2002. "Investigating Stylistic Variation". In Jack Chambers, Peter Trudgill, and Natalie Schilling-Estes, eds. *The Handbook of Language Variation and Change*. Malden: Blackwell Publishing, 375 – 401.

Schleef, Erik, Miriam Meyerhoff, and Lynn Clark. 2011. "Teenagers' Acquisition of Variation: A Comparison of Locally-Born and Migrant Teens' Realisations of English (ing) in Edinburgh and London". *English World-Wide* 32: 206-236.

Schleef, Erik. 2013a. "Glottal Replacement of /t/ in Two British Capitals: Effects of Word Frequency and Morphological Compositionality". *Language Variation and Change* 25: 201-223.

Schleef, Erik. 2013b. "Migrant Teenagers' Acquisition of Sociolinguistic Variation: The Variables (ing) and (t)". In Peter Auer, Javier Caro Reina, and Göz Kaufmann, eds. *Language Variation: European Perspectives 4*. Amsterdam: John Benjamins, 201-213.

Schleef, Erik. 2017a. "Developmental Sociolinguistics and the Acquisition of T-glottaling by Immigrant Teenagers in London". In Gunther de Vogelaer, and Matthias Katerbow, eds. *Acquiring Sociolinguistic Variation*. Amsterdam: John Benjamins, 305-341.

Schleef, Erik. 2017b. "Social Meanings Across Listener Group: When Do Social Factors Matter?" *Journal of English Linguistics* 45: 28-59.

Sharma, Devyani. 2005. "Dialect Stabilization and Speaker Awareness in Non-Native Varieties of English". *Journal of Sociolinguistics* 9: 194–224.

Sharma, Devyani. 2011. "Style Repertoire and Social Change in British Asian English". *Journal of Sociolinguistics* 15: 1–29.

Smith, Jennifer, and Sophie Holmes-Elliott. 2018. "The Unstoppable Glottal: Tracking Rapid

Change in an Iconic British Variable". *English Language and Linguistics* 22: 323-355

Stuart-Smith, Jane. 1999. "Glottals Past and Present: A Study of T-glottalling in Glaswegian". *Leeds Studies in English* 30: 181-204.

Stuart-Smith, Jane., Timmins, Claire & Tweedie, Fiona. 2007. " 'Talkin' Jockney'? Variation and Change in Glaswegian Accent". *Journal of Sociolinguistics* 11: 221-260.

Straw, Michelle, and Peter Patrick. 2007. "Dialect Acquisition of Glottal Variation in /t/: Barbadians in Ipswich". *Language Sciences* 29: 385-407.

Wolfram, Walt, Phillip Carter, and Beckie Moriello. 2004. "Emerging Hispanic English: New Dialect Formation in the American South". *Journal of Sociolinguistics* 8: 339-358.