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Three's a crowd: Ternary (ing) variation in the North of England

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Abstract

Despite the attention (ing) has received in variationist literature, it is comparatively understudied in the North West of England where it holds something of a unique sociolinguistic profile. Variation in this region is between three competing forms: [ɪŋg] appears alongside the usual [ɪn]/[ɪŋ] variants. Based on sociolinguistic interviews with 32 speakers from this region, this study investigates whether [ɪŋg] replaces [ɪŋ] as the local standard or exists alongside it to fulfill a different sociolinguistic role. Results suggest that [ɪŋ] is maintained as the standard variant, and that [ɪŋg] occupies its own functional space as a feature of emphatic and hyper-articulate speech, appearing almost exclusively before pause. (ing) also shows no sensitivity to part of speech, despite the strength of this effect in other varieties of English. These results are discussed in the context of broader questions regarding the underlying representation of this variation, specifically its allophonic or allomorphic nature.

Keywords: (ing); variation; sound change; allomorphy; dialects of English

Introduction

The (ing) sociolinguistic variable has been studied extensively and has been shown to be remarkably consistent with respect to both its patterning along social and linguistic dimensions and its sociocultural meanings throughout the world's varieties of English (Labov, 1989). The variation between *-in* [ɪn] and *-ing* [ɪŋ] as a realization of the *-ing* suffix, and of unstressed clusters in monomorphemic words such as *pudding* or *ceiling*, has been shown to be sensitive to a range of factors defined by sociological *and* linguistic properties, such as age, sex, social class, part of speech, and phonological environment (see Hazen, 2006 for an overview).

In this paper, many of these predictors are tested in the North West of England using a corpus of 32 sociolinguistic interviews. This dialect region serves as a particularly interesting site, as (ing) holds something of a unique sociolinguistic profile here. First, (ing) is said to be much less variable in the North of England,

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with claims that the alveolar *-in* form is used "almost exclusively" here (Labov, 2001:90). Second, the North West in particular features a third possible variant *-ingg* [ɪŋg]—termed "velar nasal plus" by Wells (1982:365)—that is severely understudied relative to the more geographically widespread [ɪn] and [ɪŋ] forms. The status of (ing) as a ternary, rather than binary, variable in these speech communities in the North West of England raises questions as to how the three variants compete with each other, the roles they each fulfill, and the underlying representation of this variable alternation.

The results of this study suggest that previous descriptions of [ɪŋg] as a "local prestige" form (Beal, 2004:127; Mathisen, 1999:111) do not quite capture this variant's unique functional role, which appears to be as a marker of emphatic or hyper-articulate speech. Furthermore, this study shows that *-in* is indeed prominent in the North, so much so for these speakers that the variable shows no sensitivity to grammatical category and exhibits only minimal differentiation along age and sex dimensions. This lack of morphological conditioning of (ing), and its sensitivity to contextual phonological information, is discussed in light of open questions regarding its allomorphic or allophonic representation in speakers' grammars.

Background

(ing) is a sociolinguistic variable so thoroughly studied that it barely needs any introduction, and providing an exhaustive and detailed exploration of variationist investigation of it is far beyond the scope of this paper. Instead, in the following sections I provide a brief overview of the social and internal factors that have been shown to influence this variation and that are most pertinent to the current study, with a specific focus on the origin of this dialectal [ɪŋg] form and of the variable alternation more generally.

Origin of (ing) variation

The diachronic account of how (ing) variation began in the history of English is now widely established, though not exactly straightforward. In the words of Lass (1992:145), the history of the present participle and the gerund, and therefore of synchronic (ing) variation itself, is "complex and somewhat murky."

Synchronic variation in (ing) is said to stem from the conflation of two distinct grammatical morphemes from Old English: the present participle *-inde* and verbal noun suffix *-ynge* or *-ung* (Irwin, 1967; Visser, 1966). During the Middle English period, a series of phonological reductive processes then took place, reducing the final /e/ to [ə], followed by its subsequent deletion, and finally simplification of the consonant cluster resulting in the [ɪn] and [ɪŋ] forms that still exist today. In the North West and West Midlands of England, however, simplification of /ŋg/ never ran to completion and still exists today as a probabilistic rule in speakers' grammars: this results in three-way variation between [ɪn], [ɪŋ], and [ɪŋg] in words such as *walking, during*, and *morning*, and two-way variation between [ŋ] and [ŋg] in words that invariably have [ŋ] in all other varieties, such as *hang, wrong*, and *singer* (Bailey, 2021; Bermúdez-Otero, 2011; Wells, 1982).

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The historical account of how (ing) variation developed also suggests that the convergence of these two Old English suffixes was not uniform across all of England. An isogloss from Moore, Meech, and Whitehall (1935) in their study of Middle English dialects indicates that by the middle of the 15th century *-ind* had been replaced with *-ing* first in the South of England and had been diffusing northward. The fact that competition between the apical and velar forms began first in the South before diffusing geographically is said to result in patterns of regional variation that still exist today: rates of *-in* in contemporary British English dialects are supposedly highest in the North of England and in Scotland because this form existed unopposed as the verbal ending for much longer (Labov, 2001:90). This claim finds support from a range of empirical reports of (ing) variation throughout the British Isles, where high rates of the apical form have been attested in the likes of Edinburgh (Schleef, Meyerhoff, & Clark, 2011), Manchester (Schleef, Flynn, & Ramsammy, 2015), and Tyneside (Mechler, Grama, Bauernfeind, Eiswirth, & Buchstaller, 2022).

Internal factors and the representation of (ing) variation

This historical account of (ing) variation is also reflected synchronically in its sensitivity to part of speech, a grammatical conditioning that is one of the most consistent and robust predictors of (ing) variation in almost all dialects in which it has been studied. This effect patterns along a "nominal-verbal continuum" such that rates of *-in* are relatively higher in more verb-like tokens and relatively lower in more noun-like tokens. As Houston (1985, 1991) explained, this synchronic behavior is a natural consequence of *-in* developing from a verbal suffix and *-ing* from a nominal suffix. This effect has been attested in numerous varieties of American English (Abramowicz, 2007; Forrest, 2017; Huspek, 1986; Labov, 2001), British English (Houston, 1985, 1991; Tagliamonte, 2004; Watts, 2005), Australian English (Shnukal, 1982), and New Zealand English (Bell & Holmes, 1992), though to varying degrees.

Tagliamonte (2004:399) reported a very strong effect in the northern English city of York: among these speakers, grammatical category was in fact the strongest predictor of (ing), and individual analyses of the nominal and verbal tokens revealed "entirely separate and unique linguistic and social profiles." In a discussion of those results, Tagliamonte (2004) predicted that (ing) might behave similarly in other northern British English varieties. However, a review of subsequent research suggests otherwise: Watts (2005:160) reported only a small effect size for grammatical category in the northern community of Wilmslow, and no effect whatsoever for her working-class Colshaw speakers. Furthermore, the grammatical conditioning reported by Schleef et al. (2011:221) for Edinburgh adolescents did not pattern along the nominal-verbal continuum at all; they also reported no significant effect among their London participants. In Tyneside English, Mechler et al. (2022:107) reported an effect of grammatical conditioning, with *-thing* tokens favoring *-ing* and verbal participles favoring *-in*, but this effect was absent among the younger speakers for whom *-in* predominates. In sum, the results of these studies suggest that this grammatical effect may not be as robust as first thought in varieties of British English.

(ing) variation has also been found to pattern with respect to the immediate phonological environment, though reports are somewhat less consistent for this internal

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factor. Labov (2001:87) claimed that there is no such effect in Philadelphia, but a number of other studies report strong and, crucially, consistent patterns between the rate of *-ing* and the segments that both precede and follow the [ɪ] + nasal sequence.

Houston (1985:19) reported two types of phonological conditioning: regressive homorganic assimilation, in which a following velar consonant favors use of *-ing* and a following alveolar consonant favors *-in*, and progressive homorganic dissimilation, in which a preceding velar consonant favors *-in* and a preceding alveolar consonant favors *-ing*. This has been corroborated in a number of other empirical studies of this variable (e.g., Cofer, 1972; Mechler et al., 2022), although evidence from Forrest's (2017) large-scale corpus analysis suggested that this "following segment" effect may only arise at a community-wide level, with significant variation at the level of individual speakers.

These reports of grammatical and phonological conditioning have also given rise to debates over the underlying representation of (ing), specifically whether it should be considered a morphological variable involving a choice between allomorphs or a phonological variable involving discrete allophones instead.

A morphological analysis might seem appealing given the historical origin of (ing) as a conflation of two distinct morphemes, and the regular grammatical conditioning attested in most varieties that sees nominal *-ing* suffixes behave quite differently from verbal ones. However, this of course fails to account for the variation found in non-suffixal (ing)—that is, in monomorphemic words such as *ceiling* and *morning*, and in *-thing* compounds such as *something, anything, nothing*, none of which contain an *-ing* suffix that can act as the source of allomorphic variation.

While Labov, Ash, Ravindranath, Weldon, Baranowski, and Nagy (2011:434) took the view that (ing) is a morphological variable due to its "regular grammatical conditioning," they did acknowledge that variation in *something, nothing* must stem from a separate phonological variable instead. Indeed, some scholars have reconciled these competing accounts by suggesting that both are in fact true and that surface-level (ing) variation is actually the product of two different variable processes, one at the level of morphology and one at the level of phonology (Hazen, 2008:121; Tamminga, 2016). This claim is partially backed up by patterns of observed variation: Tamminga (2016) reported a significant effect of morphologically conditioned *persistence* in the use of (ing) in Philadelphia English. Producing *-ing* in one instance increases the likelihood of producing it again for a subsequent (ing) token, but this kind of self-priming effect only holds when the prime and target—the two subsequent (ing) tokens—are matched in morphological composition. This lack of priming between polymorphemic and monomorphemic items suggests that the variation in each belong to two different underlying sources.

This theoretical issue, relating to the locus of (ing) variation, will be returned to later in the "Discussion" section, in light of the results presented here.

Social factors

(ing) is a staple of sociolinguistic inquiry because its variation is not just influenced by these internal constraints, but also by a range of sociodemographic factors.

(ing) is often strongly stratified along socioeconomic lines, and the direction of this effect is consistent across all communities: *-in* is favored by speakers of lower

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socioeconomic status, and this has been attested in varieties of British English spoken in Cardiff (Coupland, 1988:81), West Yorkshire (Petyt, 1985:175), the West Midlands (Mathisen, 1999:111), and Cheshire (Watts, 2005:151-153), and also across the Atlantic in Philadelphia (Labov, 2001:108-109). It has also been reported to a lesser extent in York, but overall Tagliamonte (2004:400) observed that internal factors play a much larger role than social factors in this community, and based on this claims that there is "very little socio-symbolic value attached to (ing)." The variable also shows parallel stylistic variation, with the nonstandard *-in* variant occurring more frequently in informal, conversational styles. This stylistic variation is also incredibly robust, having been attested by Fischer (1958) in the earliest quantitative study of (ing), more recently by Schleef et al. (2011) in London and Edinburgh, and in many of the aforementioned studies.

Sociolinguistic alternations involving an overtly prestigious form typically also vary as a function of gender and/or sex, with male speakers favoring the nonstandard form over female speakers; (ing) is no exception, with this pattern attested throughout the sociolinguistic literature (e.g., Labov, 1966; Mathisen, 1999; Shnukal, 1982; Trudgill, 1972; Watts, 2005). As a diachronically stable variable in most varieties of English, (ing) is also often reported to show age-graded patterning as a curvilinear function of age, with a drop in the use of *-in* during adulthood before a later increase as normative pressures ease (Mechler et al., 2022; Van Hofwegen & Wolfram, 2010; Wagner, 2012).

Previous work on [ŋg]

Up to this point, the preceding review of literature on (ing) has focused exclusively on the widespread variation between *-in* and *-ing*. The factors that condition the variable presence of [ɪŋg] in the North West and West Midlands regions of England are comparatively understudied.

The most thorough sociolinguistic study of ternary (ing) variation was conducted by Watts (2005), who considered a range of social and internal factors among the speech of middle-class Wilmslow informants and the working-class community of Colshaw, both in Cheshire in the North West of England. Results indicate that *-ingg* [ɪŋg] is marginally more frequent among middle-class speakers (3.2%, cf. 0.2% for working class), but the effect is small and *-ingg* is generally rare in conversational speech for all social groups regardless of class, age, or sex. Where it does occur, *-ingg* tends to be found before vowels or before pause, and Watts (2005) also cited a number of examples in which it is used for emphatic effect.

This scarcity of *-ingg* in informal conversational styles is also reported by Schleef et al. (2015); this study is largely perceptual in nature, but patterns of variation in production are discussed briefly, based on nine sociolinguistic interviews conducted with 18- to 20-year-olds in Greater Manchester. They reported that *-ingg* was only present in conversational speech to a marginal extent, with no speaker using this form more than 10% of the time. It appeared more frequently in the more formal reading task, but even then it only occurred about 20% of the time across all speakers (comparable to the rate of *-ing* in this style). Mathisen (1999) reported parallel stylistic stratification in Sandwell, West Midlands, where the local variant *-ingg* was virtually absent in

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conversational speech but showed a marked increase in reading styles. In both cases, the authors concluded that *-ingg* may hold local prestige in these communities.

The sociolinguistic evaluation of *-ingg* is certainly an interesting area of study, as this is technically a localized dialect form but one that might be seen as "correct" due to the influence of orthography (Beal, 2004:127) and the fact it is less lenited than the bare velar nasal [ɪŋ] variant.

However, these claims that *-ingg* has local prestige tend to be based on reports of stylistic stratification, rather than direct perceptual work or patterning along socioeconomic dimensions. After all, Watts (2005) only reported a small effect of class, and no consistent patterning emerged in Mathisen's (1999) study either: *-ingg* was favored by working-class speakers in their 30s, but the results were more mixed for the other age cohorts and she concluded that gender was more relevant than class (with women using *-ingg* consistently more than men). There are, of course, issues with interpreting this style-shifting pattern as being solely the result of attention paid to speech for overtly prestigious sociolinguistic variants; this point will be returned to later in the "Discussion" section in light of the style-shifting patterns reported in this study.

In terms of actual perceptual work, the aforementioned study by Schleef et al. (2015) uncovered interesting patterns of indexicality: while the authors found an association with [ɪŋg] and prestige, they argued that it was not as socially attractive as the more widespread [ɪŋ] form and that it was instead associated with an "unenergetic, uptight attitude towards life" (2015:207). Taken together, the results surveyed here cast reasonable doubt over the claim that *-ingg* replaces *-ing* as a locally prestigious form in these dialects.

The historical account of (ing) presented earlier highlights the shared origin of [ŋg] as both a realization of unstressed (ing) and a dialectal variant in the stressed (ng) environment (e.g., in words such as *sing* [sɪŋg] and *wrong* [ɹɒŋg]). As such, it can be illuminating to review previous work on this overlapping (ng) environment and to consider whether similar factors may influence the variable presence of post-nasal [g] in both contexts.

In a previous analysis of contemporary (ng) variation, I showed that [g]-presence was most strongly predicted by internal factors, with the local, non-coalesced [ŋg] form favored before vowels (e.g., in *singer* or *sing it*) and, increasingly among younger speakers, before pause (Bailey, 2021). Setting that pre-pausal change aside, there is otherwise no significant effect of age, or of sex, on the use of [ŋg]. This phonological conditioning echoes the results of Watts (2005:166), who reported similarly high rates of [ŋg] in prevocalic and pre-pausal position. In terms of social factors, Watts (2005) found that [ŋg] was the predominant form among working-class Colshaw speakers, though no significant gender differentiation was found and even the middle-class Wilmslow speakers still use this local dialect form approximately 50% of the time. It also appears to be more frequent among younger speakers, which Watts attributed to increased contact between younger working-class and middle-class speakers through school.

In separate perceptual work, it is also shown that the (ng) variable has a fairly low social profile among speakers in the North West of England, with no shared consensus on the evaluation of [ŋg] and a general lack of awareness that this is even a feature of northern Englishes (Bailey, 2019a). A more explicit attitudinal test was carried out by Newbrook (1999) in West Wirral, a region of Merseyside in the North West of England,

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including an overt "norm identification" task and a self-report task. The results paint a similar picture of community-level disagreement over which form is deemed to be the "norm" for word-final (ng), although there was more consensus that word-medial [ŋg] (e.g., in *singer*) is locally prestigious.

Methodology

This study uses a corpus of 32 sociolinguistic interviews to conduct a quantitative analysis into how (ing) patterns in the North West of England. In the following subsections, information is provided on the interviews themselves, the participants, and how the dependent and independent variables were coded.

Data collection

Almost all of the sociolinguistic interviews were carried out between 2015 and 2017. The interviews were conducted one-on-one with the participants, and on average lasted for around an hour. They consisted of spontaneous, unscripted conversation covering topics such as childhood, family life, career, and holidays. Efforts were also made to elicit narratives of personal experience to minimize any effects of the observer's paradox (Labov, 2010).

The informal conversation was followed up by two elicitation tasks: a word list containing tokens of (ing) amidst a number of distractor items, and a short reading passage also containing tokens of interest in various phonological and prosodic environments.

The interviews were recorded using a Sony PCM-M10 recorder and a lavalier microphone attached to the participant, saved as an uncompressed WAV file at a 44.1 kHz sampling rate.

Participants

These interviews were carried out with 17 female and 15 male speakers covering a range of ages from 17 to 83, and with dates of birth spanning almost the entirety of the 20th century. Participants were all born and raised in the North West of England. Although this is a relatively large and dialectally diverse region, it is unified by the presence of [ŋg] as a characteristic dialect feature, and the speakers come from a fairly small and controlled area within the North West. As illustrated in Figure 1, the two furthest speakers are separated by just 40 km. Specifically, 12 speakers were born and raised in parts of East Lancashire and a further 20 are from Greater Manchester, mostly in the northern part of this metropolitan county in towns and villages that were historically part of Lancashire. None of the speakers were geographically mobile: most speakers still lived in the town or city they grew up in, and even those who have moved since childhood only did so within the North West.

In order to have a balanced sample without introducing a confound of social class, socioeconomic status was controlled for by only interviewing upper working–class speakers, with this classification based primarily on occupation (see Baranowski, 2017:303, for a similar operationalization of social class in the Manchester speech community).

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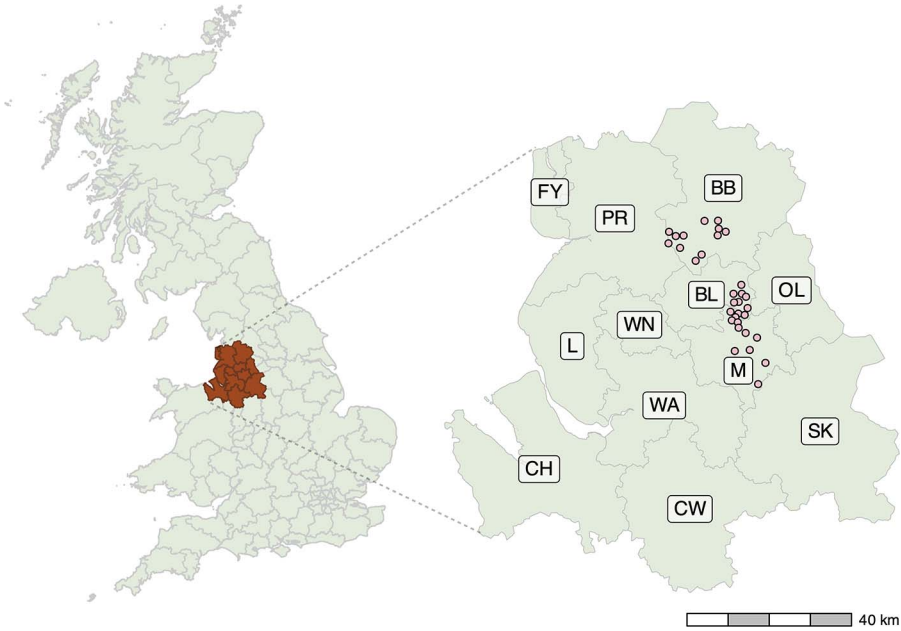

Figure 1. Map of North West England, showing where each speaker in the sample was born and raised (boundaries and labels refer to postcode areas).

Data annotation and statistical methods

The interviews were orthographically transcribed using *ELAN* and force-aligned using the *FAVE* suite (Rosenfelder, Fruehwald, Evanini, Seyfarth, Gorman, Prichard, & Yuan, 2014) to produce a word- and phone-level TextGrid for each speaker.

The dependent variable was coded manually, based on a combination of auditory and acoustic analysis using *Praat* (Boersma & Weenink, 2017). Each token was coded for whether the surface realisation was [ɪn], [ɪŋ], or [ɪŋg]. The following independent variables were also coded:

- **Age** of the speaker: measured in years, but also operationalised as a categorical variable with *younger* (17–25), *middle-aged* (27–60), and *older* (61–83) groups.
- **Sex** of the speaker: coded as *male* or *female* (all speakers identify with the sex assigned at birth).
- **Style**: distinguishing *narratives of personal experience* and *formal conversation* within the spontaneous parts of the interview, and *reading passage* and *word list* tasks within the elicited speech.
- **Grammatical category**: distinguishing *nouns, adjectives, gerunds*, and *progressive verbs*.
- **Morphological composition**: distinguishing *monomorphemic, polymorphemic*, and *-thing* compound words.
- **Preceding segment**: the segment immediately before the vowel of each (ing) variant (e.g., /t/ in *waiting*).

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- **Following segment**: the segment immediately after the (ing) variant (i.e., the initial segment of the following word).
- **Speech rate**: measured in segments per second based on the duration of each breath group and the number of segments in a canonical phonemic transcription.
- **Lexical frequency**: measured as a log-transformed Zipf score and based on the SUBTLEX-UK corpus of UK television subtitles (see van Heuven, Mandera, Keuleers, & Brysbaert, 2014)

In total, the interviews contain 5,222 tokens of (ing), 4,622 of which occur naturally in the informal conversation. The *lme4* (version 1.1-31, Bates, Maechler, Bolker, & Walker, 2015) package in *R* (version 4.2.2, R Core Team, 2024) was used for fitting mixed-effects logistic regression models to the (ing) dependent variable. Best-fitting models were reached by initially fitting a full model including all relevant predictors followed by a combination of automatic step-wise regression—in which single predictors are dropped at a time—and manual ANOVA comparison between nested models to diagnose significant differences in model fit as measured by their Akaike Information Criterion.

Results

Given that in the North West of England (ing) variation surfaces as a three-way alternation between [ɪn], [ɪŋ] and [ɪŋg], the results are split into two parts: I first address the factors that influence the rate of alveolar [ɪn] relative to the two velar forms, and then in the subsequent section I exclude these alveolar tokens to focus directly on the factors that influence variable [g]-presence within the velar forms. This implicitly mirrors the proposed grammatical representation of this ternary variation, as will be discussed later in the section on "The locus of (ing) variation".

Before these two aspects of (ing) variation are investigated in closer detail, the overall distribution of variants for all speakers in this sample is given in Figure 2: this broad overview of the frequencies at which each form appears indicates that *-ingg* is particularly marginal in conversational styles and that *-in* is extremely frequent and the majority variant for all speakers.

Variation between -in and -ing(g)

Despite the overall predominance of *-in*, there is clearly inter-speaker variation with respect to the relative frequencies of alveolar–velar forms: are these differences explained by social factors, and does the variation within individual speakers reflect the expected internal constraints on this variable? The best-fitting regression model for the use of *-in* includes significant main effects of speaker age and sex, preceding and following phonological environment, speech rate, and style; it also includes random intercepts of speaker and word, and by-speaker random slopes of style and following segment based on evidence of inter-speaker variation with respect to the magnitude of style-shifting and how different phonological environments pattern. The model coefficients are given in full in Table 1.

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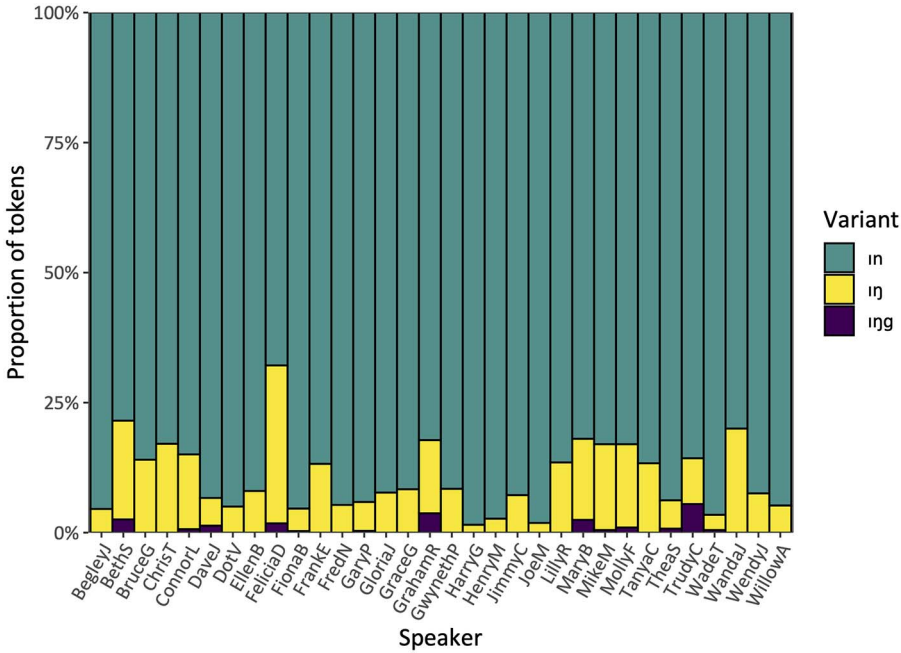

Figure 2. Frequency of (ing) variants in conversation on a speaker-by-speaker basis.

Table 1. Mixed-effects logistic regression model for (ing), with *-in* as the application value ($n = 5171$); statistical significance symbols: *** $p < .001$, ** $p < .01$, * $p < .05$

	Estimate	Std. error	*z*-value	*p*-value	%	*N*
Intercept	2.33	0.21	11.19	<0.001***		
Age-group						
Middle		Reference level			78.1	2620
Old	0.60	0.23	2.55	0.011*	85.5	1219
Young	0.48	0.24	2.01	0.045*	83.8	1332
Sex						
Female		Reference level			80.1	2602
Male	0.41	0.18	2.31	0.021*	82.4	2569
Preceding segment						
Other consonant		Reference level			82.9	2201
Alveolar consonant	−0.48	0.16	−3.02	0.003**	76.0	1596
Velar consonant	−0.09	0.21	−0.46	0.644	84.8	1374
Following segment						
Other consonant		Reference level			83.2	4533
Velar consonant	−3.22	0.30	−10.88	<0.001***	31.0	142
/l, w, j/	−0.99	0.17	−5.92	<0.001***	78.4	496

(*Continued*)

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Table 1. (*Continued.*)

	Estimate	Std. error	*z*-value	*p*-value	%	*N*
Speech rate (scaled)						
Segments per s.	0.40	0.06	6.26	<0.001***		
Style						
Conversation		Reference level			89.7	4571
Reading passage	−3.81	0.27	−14.36	<0.001***	22.3	394
Word list	−6.56	1.10	−5.98	<0.001***	8.3	206

First, it can be seen that social factors do influence (ing) variation in the North West, but that they play a very minor role. The probability of *-in* over *-ing(g)* is slightly higher for older ($\beta = 0.597$, $p = 0.011$) and younger ($\beta = 0.479$, $p = 0.045$) speakers relative to the middle-aged cohort (between 27 and 60 years old), and male speakers are also slightly more likely to use *-in* than female speakers ($\beta = 0.410$, $p = 0.021$). However, as shown in Figure 3, this sex differentiation is absent for the youngest cohort of speakers and the estimates from Table 1 suggest that the effect sizes of these two external predictors are relatively small.

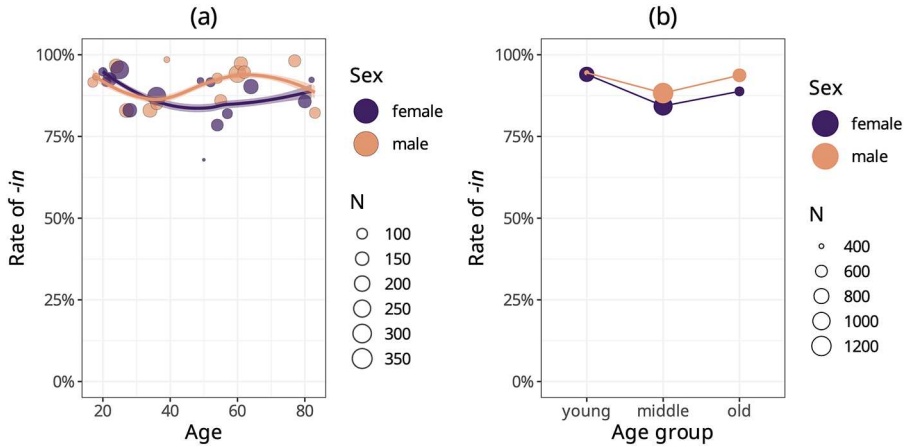

Figure 3. The rate of *-in* by speaker age and sex. In (a), points reflect speakers' own proportions with curves fitted to individual tokens using locally weighted (LOESS) smoothing. In (b), points reflect proportions aggregated over age-groups.

There is also evidence of sensitivity to the immediate phonological environment. The effect of the preceding segment is similarly small in magnitude, with a preceding alveolar consonant (e.g., in *batting, passing*, etc.) decreasing the likelihood of *-in* ($\beta = -0.483$, $p = 0.003$), but there is no evidence that a preceding velar consonant has the opposing effect. That is, there is only partial evidence of the word-internal dissimilatory effects discussed in the previous literature on this variable.

Variation in (ing) shows much greater sensitivity to the *following* segment, which is in fact the strongest predictor for conversational tokens. This effect is best modeled

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by making a distinction between two groups of segments. A following velar consonant (i.e., [g] or [k]) greatly decreases the probability of *-in* ($\beta = -3.223$, $p < 0.001$), and there exist other segments that exert a similar influence on (ing) to a smaller but still significant degree: *-in* is also less likely to appear before [j], [w], and [l], which appear to constitute a "weaker" assimilation-triggering category ($\beta = -0.988$, $p < 0.001$). This latter effect is only evident for some speakers, however, thus motivating the random slope of assimilation strength by speaker. Figure 4 illustrates this bimodality between these two groups of segmental contexts, with average rates of *-in* between 90% and 72% before [l], [w], and [j], and around 40% when followed by either of the velar stops. Importantly, while the aggregate community-wide behavior before [l] may point to the absence of an effect, there are a number of speakers for whom [l] exerts a particularly strong influence on the use of *-ing(g)*.

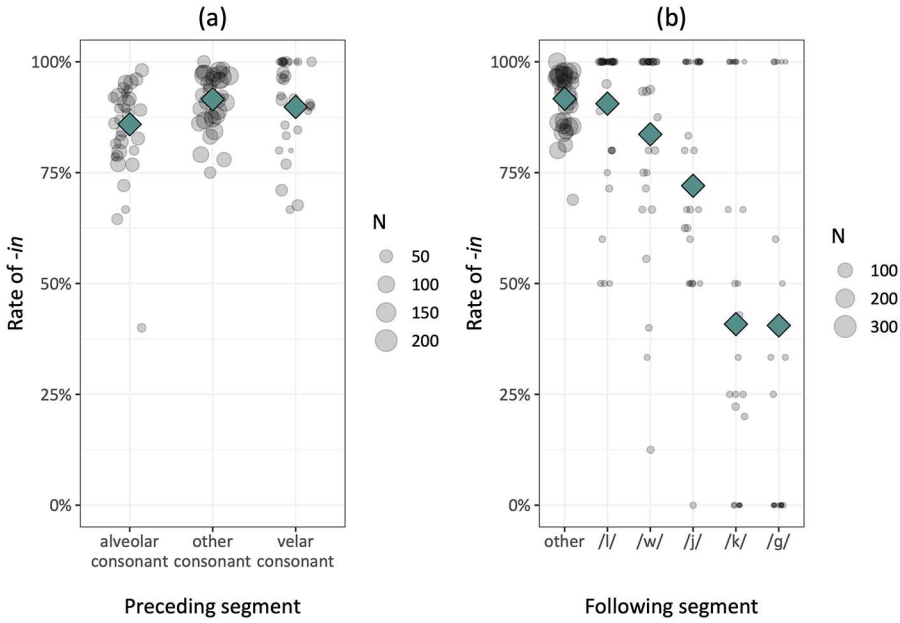

Figure 4. Rate of *-in* by (a) preceding and (b) following segment. Shaded circles reflect individual speaker proportions; diamonds reflect overall proportion.

Speech rate is the only other factor to which conversational (ing) is sensitive: *-in* is more likely to be used in faster speech rates ($\beta = 0.398$, $p < 0.001$). However, as illustrated by Figure 5, the magnitude of this effect is again fairly small: the use of *-in* does not drop below approximately 75% even in the slowest speaking rates.

The only other significant factor influencing the use of *-in* is style, with the alveolar variant significantly decreasing in frequency in both the reading passage ($\beta = -3.811$, $p < 0.001$) and word list ($\beta = -6.556$, $p < 0.001$) elicitation tasks; this will be discussed in the "Style-shifting" subsection where the stylistic distribution of all three variants is investigated in more detail.

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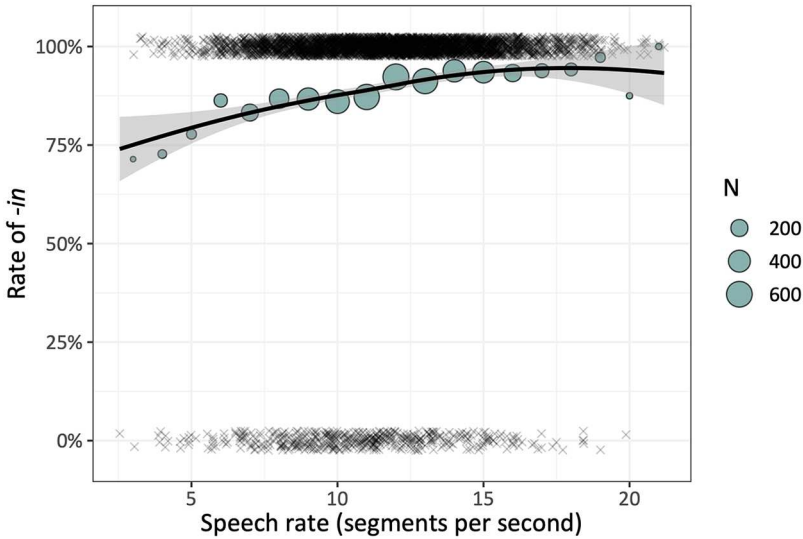

Figure 5. Rate of *-in* by speech rate; curve fit to individual tokens using locally weighted (LOESS) smoothing.

Among the non-significant factors, it is important to draw attention to grammatical category. Despite the wealth of evidence that this plays an important role—quite often *the* most important role—in (ing) variation elsewhere throughout the English-speaking world, no such effect is present here with grammatical category absent from the best-fitting regression model. There are only minor differences between the categories, ranging from 83% *-in* in adjectives ($n = 279$) to 93% in *-thing* compounds ($n = 702$). One might expect monomorphemic nouns and progressive verbs to lie at the two end-points of this supposed nominal-verbal continuum, but here they differ only minimally (86% *-in* versus 91%, respectively) and the regular patterning of nouns, adjectives, gerunds, and progressives does not arise in this data.

Variation between -ing and -ingg

As has already been shown, the velar forms [ɪŋ] and [ɪŋg] are relatively infrequent in naturally occurring conversation, and the latter variant—the understudied form exclusive to the North West and West Midlands of England—is particularly rare, occurring in just 32 of 4,622 tokens. In order to establish the factors that specifically determine the variable presence of the non-coalesced variant, the analysis in this section excludes all tokens of *-in* and focuses solely on the alternation between [ɪŋ] and [ɪŋg].

The best-fitting model for use of [ɪŋg] includes predictors of preceding and following segment, speech rate, and style; the random effect structure includes random intercepts for speaker and word, and a random by-speaker slope for style to reflect inter-speaker variation with respect to the degree of style-shifting. The model coefficients are given in full in Table 2, where [g]-presence is the application

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value; that is, positive log-odds represent a factor level favoring the use of [ɪŋg] over [ɪŋ].

Table 2. Mixed-effects logistic regression model for velar (ing) tokens with [g]-presence as the application value ($n = 968$); statistical significance symbols: *** $p < .001$, ** $p < .01$, * $p < .05$

	Estimate	Std. error	*z*-value	*p*-value	%	*N*
Intercept	−4.26	0.57	−7.43	<0.001***		
Preceding segment						
Other consonant		Reference level			28.7	376
Alveolar consonant	−0.16	0.37	−0.43	0.665	23.0	383
Velar consonant	−1.14	0.49	−2.33	0.020*	25.4	209
Following segment						
Other consonant		Reference level			8.7	550
Velar consonant	2.68	0.50	5.41	<0.001***	61.9	268
/l, w, j/	1.90	0.39	4.83	<0.001***	23.3	150
Speech rate (scaled)						
Segments per s.	−0.84	0.23	−3.67	<0.001***		
Style						
Conversation		Reference level			6.8	473
Reading passage	2.62	0.62	4.25	<0.001***	23.5	306
Word list	2.71	0.72	3.77	<0.001***	76.7	189

This model is much simpler than that which predicted the occurrence of *-in*: the conversational variation is only sensitive to three factors, contrasting with the five that were relevant in the earlier discussion. It is also striking that no social factors are significant. The roles of age and sex in influencing use of *-in* were small, but here they are completely absent.

The phonological conditioning is best modeled by a distinction between a following pause, vowel, and consonant. This mirrors the classification of environments in other work on /ŋg/ variation (see Bailey, 2021) and on similar leniting processes such as /t,d/-deletion (Guy, 1980; Tagliamonte & Temple, 2005). As Table 2 indicates, when (ing) surfaces with a velar nasal it is more likely to exhibit [g]-presence when it occurs before a vowel-initial word ($\beta = 1.902$, $p < 0.001$), and even more likely when it occurs before a pause ($\beta = 2.683$, $p < 0.001$). The pre-pausal environment has by far the largest influence on [g]-presence in conversational styles. There is also a weaker effect imposed by the preceding segment, such that the post-nasal [g] is less likely to surface (in fact it is categorically absent in spoken conversation) if the segment preceding [ɪ] is also a velar stop such as in *thinking* or *singing* ($\beta = -1.143$, $p = 0.020$). Both of these effects are illustrated in Figure 6.

Variation between *-ing* and *-ingg* is also sensitive to prosody: [g]-presence becomes increasingly unlikely as the speech rate increases ($\beta = -0.844$, $p < 0.001$). This is illustrated in Figure 7.

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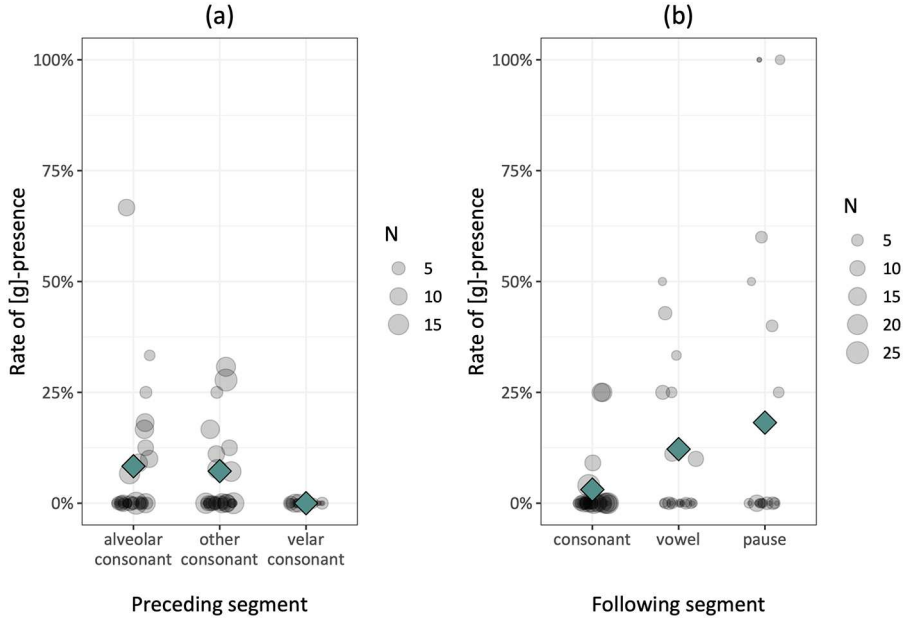

Figure 6. Rate of [g]-presence by (a) preceding segment and (b) following segment. Shaded circles reflect individual speaker means; diamonds reflect overall mean.

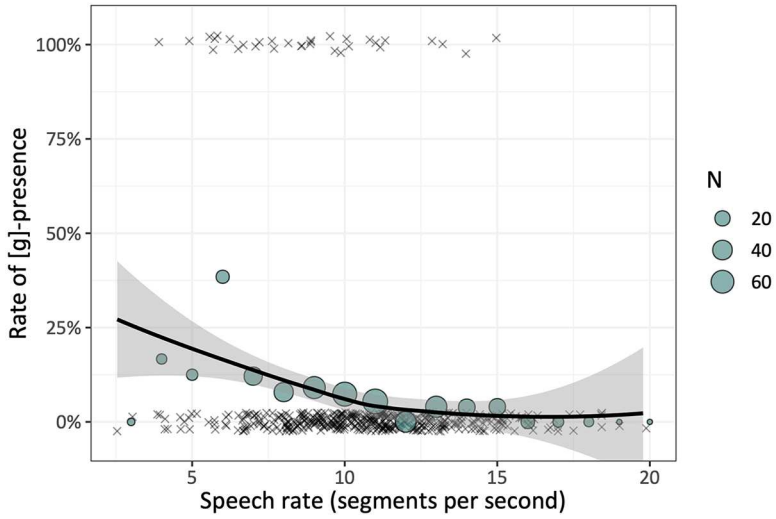

Figure 7. Rate of [g]-presence by speech rate; curve fit to individual tokens using locally weighted (LOESS) smoothing.

As with the variable occurrence of *-in*, there is no significant effect of grammatical category—in this case there would be no reason to expect one of course—and also no effect of word frequency. A further parallel can be drawn in that the strongest overall

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predictor is once again style, which will now be explored in more detail for all three forms.

Style-shifting

The estimates of the two logistic regression models indicate that (ing) exhibits a large degree of style-shifting. Figure 8 illustrates the way that these three variants pattern along four different speech styles, distinguishing narrative speech from informal conversation within the spontaneous part of the interviews, and then reading passage and word list styles within the formal elicitation tasks.

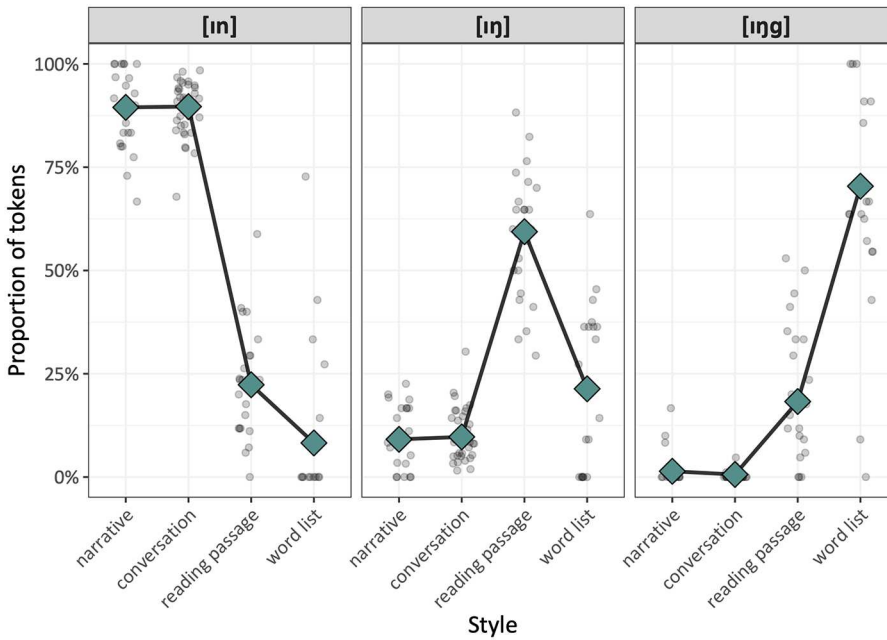

Figure 8. The rate of *-in*, *-ing*, and *-ingg* by style. Shaded circles reflect individual speaker means; diamonds reflect overall means.

It can be seen that *-in* decreases monotonically along these four styles, which are themselves ordered by increasing level of formality. The only exception to this pattern is the lack of any difference between narrative and non-narrative conversational styles, which pattern together with respect to all three variants. The rate of *-ing* increases from conversation to reading passage, as one might expect of an overtly standard form, but then we see a decrease from the reading passage to the word list; this is because *-ingg*, which is almost entirely absent from the conversation, shows a marked increase in word list style. Of course, it is also more frequent in the reading passage relative to spontaneous conversation, but it is most strongly associated with the word list register of speech. In sum, we see a situation in which (ing) is realized almost exclusively as [ɪn] in conversational speech, then predominantly as [ɪŋ] in reading passage and [ɪŋg] in word list styles.

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Discussion

In this section, I will address the two major components of this study's results: first, what the conditioning factors of (ing), and specifically the local [ɪŋg] variant, suggest about the nature of this variation and its sociolinguistic role in the North West of England, and second, what these results mean for the representation of this variation in speakers' grammars.

Social and internal factors on (ing)

Much like Tagliamonte (2004) found in York, this study reveals that social/external predictors play only a small role in (ing) variation in the North West of England, at least among this controlled sample of working-class speakers. It is of course entirely possible that the use of *-in* shows a marked decrease among speakers of a higher socioeconomic status, particularly as Watts (2005) reported major differences between the working-class and middle-class neighborhoods of Wilmslow in nearby Cheshire. There *are* still significant effects of age and sex here, which do pattern in the expected direction. However, the marginal nature of these effects is reflected by the fact that even for the middle-aged women of this population sample—those for whom the prestigious velar forms should be most frequent—nonstandard *-in* is still the majority variant used 84% of the time.

The rates of *-in* are so high across the board for these speakers that even grammatical category plays no role in its probabilistic occurrence, despite the frequency with which this effect is reported elsewhere in the literature (e.g., Houston, 1985; Huspek, 1986; Labov, 2001:88). It seems that for this working-class northern vernacular, the synchronic patterning of (ing) variation is *not* a reflection of historical morphology at all. Just as Watts (2005:161) reported for the working-class speakers of Colshaw, "use of [n] is so ingrained in their linguistic repertoire that the recognised pattern of grammatical conditioning is simply not apparent." This might suggest the lack of sensitivity to part of speech is primarily a feature of the working-class vernacular, where rates of *-in* are simply high across the board. However, it should be noted that the effect Watts (2005:160) reported for middle-class speech in Cheshire, where *-ing* is the dominant form, is still very small: *-in* is still only used 15.7% of the time in verbal forms, and higher rates are actually reported in the *-thing* items, as also reported in this paper.

Indeed, (ing) appears to be much more constrained by phonological factors rather than those of a morphosyntactic nature: the immediate phonological environment exerts by far the strongest influence on conversational (ing) in the North West of England. This sensitivity to the segments preceding and following the vowel + nasal cluster patterns in ways predicted by previous reports (e.g., Cofer, 1972; Houston, 1985; Tagliamonte, 2004) with evidence of both assimilatory and dissimilatory effects, although the behavior of the former differs somewhat from expectations. If (ing) is followed by a velar stop, it is much more likely to surface with the velar nasal, reflecting a clear articulatory anticipation of the tongue dorsum gesture as expected. However, a similar (though weaker) effect is present before /w/ and /j/, which has not been reported previously. These segments can be considered as belonging to the same natural class, all sharing a [+DORSAL] feature (Hayes, 2009:95-97), so the same mechanisms appear to be motivating the use of [ɪŋ] before all of these segments.

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Additionally, for some speakers /l/ exhibits a comparable effect. While this may on the surface appear to lack the same mechanistic motivation, it should be noted that for many varieties spoken in the northwestern county of Lancashire /l/ surfaces as a dark velarized allophone [ɬ] in *all* environments, rather than being positionally restricted to the coda like in most other varieties of English (Beal, 2004:130; Carter, 2002; Cruttenden, 2014:221; Turton 2017). This provides a likely explanation, although direct articulatory evidence would be needed to confirm this hypothesis. In line with the results of Forrest (2017), there is a great deal of inter-speaker variation with respect to how these different contexts pattern, suggesting that while the aggregate effect is well-established across varieties of English, the ranking of these environments is somewhat less clear at the level of the individual.

In terms of stylistic stratification, the patterning of (ing) here is more consistent with that of other dialects: the predominance of *-in* applies only to conversational styles, with a marked decrease in its use both in the reading passage and word list elicitation tasks. Although there was only minimal differentiation along age and sex dimensions, *-ing* still appears to be the form considered more appropriate for the kind of formal speech adopted in these styles. The only caveat to this pattern is the marked behavior in word list styles, where *-ing* decreases in favor of the local *-ingg* form instead. This will be discussed more in the following subsection in a closer inspection of this particular variant.

In sum, (ing) appears to have somewhat less sociocultural significance in the North West of England relative to other (particularly non-northern) communities. As described by Levon and Fox (2014:201), in British English (ing) is associated more strongly with region than social status. The use of *-in* so ingrained in the Northern vernacular, particularly among these working-class speakers where it is only really influenced by mechanical factors such as speaking rate and phonological assimilation with adjacent segments.

The status and role of [ɪŋg]

Having established the sociolinguistic profile of the alveolar *-in* variant, attention now turns to the variable presence of post-nasal [g]: what function or sociocultural role does [ɪŋg] play in this region?

The role of age and sex in determining the variable use of *-in* was fairly peripheral, but it is entirely non-existent in the case of [ɪŋg]. There are further similarities in that its appearance is also most strongly predicted by factors relating to the phonological environment, although the mechanisms underpinning these effects are different. The nature of the following segment effect with respect to use of *-in* reflects assimilation to place of articulation, while in the case of [g]-presence the favoring effect of a following vowel likely reflects phrase-level resyllabification and the fact that [g] is more likely to be licensed in onset, rather than coda, position. A similar interpretation has been applied to the same effect present in /t,d/-deletion (Guy, 1980; Tamminga, 2018).

Style is also a strong predictor, but here it is unlikely that this reflects overt prestige and metalinguistic commentary: independent evidence (from an overlapping sample of speakers with this production study) suggests that the dialectal feature of post-nasal [g]-presence is relatively below the radar compared to other variable phenomena

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(Bailey, 2019a). It is more probable that the increase in [g]-presence in word list elicitations reflects prosodic sensitivity and the way that word list items are produced with clear pauses and intonational breaks between them.[1] This finds support from the fact that [g]-presence is also favored before pause in conversational styles as shown in this study, as reported by Watts (2005) in her study of (ing) in the nearby town of Wilmslow, *and* as has been shown for the stressed (ng) context (Bailey, 2021). Furthermore, the rate of [g]-presence does not show the same drastic increase in the similarly formal reading passage, most likely due to its similarity with the conversational style with respect to prosodic factors such as speech rate and intonational phrasing. In other words, the reading passage style allows us to tease apart these prosodic and stylistic differences that are conflated in the word list. Velar variants are favored in the more formal, elicited speech styles, with *-ing* more suited for the reading passage where (ing) is used in a range of prosodic and segmental contexts, and *-ingg* more suited for the extreme carefulness and prosodic chunking involved in producing elicited items in a word list.

Taken together, these results suggest that *-ingg* is not necessarily a local prestige form in these northwestern varieties, contrary to earlier claims (e.g., Beal, 2004:127; Mathisen, 1999:111). It is more accurately described as a kind of hyper-articulated "clear speech" variant that is largely restricted to word lists or emphatic speech, possibly influenced by the fact that it more closely resembles the orthography. Indeed, this supports the perceptual results of Schleef et al. (2015), who argued that *-ingg* occupies its own indexical field in Manchester English rather than taking on the indexical role of *-ing*, and aligns with how Watts (2005:149) described *-ingg* being used when words are repeated with "emphatic stress" in conversational styles.

The fact that *-ingg* is most favored in slower, more careful speech rates, before vowels, and particularly before pause, is noteworthy: these are the exact same environments that most favor post-nasal [g]-presence in the stressed (ng) environment (Bailey, 2021). This is not coincidental. Rather, it suggests quite strongly that the presence of [g] in both these environments is determined by the same underlying process. In other words, the ternary variation displayed by these speakers is derived in a two-step manner from two overlapping, but distinctly separate, binary processes[2]. This view also mirrors the historical facts of post-nasal /g/-deletion being an independent synchronic process in the morphophonological history of British English, with its own sociolinguistic profile and history, that just so happens to intersect with the more widespread sociolinguistic variation of unstressed (ing).

The locus of (ing) variation

In the preceding discussion, I outlined how the surface alternation between the *three* variants in these dialects is likely derived from two separate, intersecting binary variables: (1) a choice between alveolar *-in* and velar *-ing(g)*, and (2) a process of post-nasal [g]-deletion. The question still remains, however, as to the very nature of the former: is it also phonological in nature, or is instead rooted in allomorphy?

In the "Background" section, I presented an overview of the various lines of evidence often drawn upon in these discussions, namely: the origin of (ing) variation as a conflation of two discrete grammatical suffixes and the strong grammatical conditioning

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that is still present in most varieties, the phonological conditioning that is similarly reported on a widespread and consistent basis, and of course the need to account for variation in monomorphemic items such as *ceiling* and other words that do not contain an *-ing* suffix for variable allomorphy, such as *anything*.

As discussed earlier, this has led some scholars to propose that the sociolinguistic (ing) variable actually constitutes both an allophonic rule and a separate allomorphic rule (Hazen, 2008; Tamminga, 2016). However, if (ing) variation has both morphological *and* phonological sources, a further empirical prediction would arise logically that to my knowledge has yet to be explicated in previous studies of this variable. Under this account, there would be two possible routes by which a polymorphemic token involving a discrete *-ing* suffix could be realized as *-in*: the alveolar variant could be selected through variable allomorphy, but if not then this variant still has another chance to surface during the phonological derivation through variable allophony. This should be reflected on the surface by higher rates of *-in* for polymorphemic (ing) relative to monomorphemic (ing).

This type of prediction is borne out for other sociolinguistic variables that lie at the intersection of phonology and morphology. /t,d/-deletion is a similar case of surface phonological variation that corresponds to the realization of a discrete morphological unit in some cases (e.g., the past tense suffix in *missed*, cf. the *-ing* suffix in *sealing*) but not in other cases (e.g., *mist*, cf. *ceiling*). Where these variables differ, though, is that /t,d/-deletion *has* been shown to be sensitive to morphological composition, with deletion most likely in the monomorphemic items, followed by semi-weak past tense items and then least likely in instances where the /t,d/ corresponds to a regular past tense morpheme (Baranowski & Turton, 2020; Guy, 1991; Wolfram, 1969). Scholars reporting this finding have attributed it to various sources, such as cyclic application of phonological rules (Guy, 1991), but Fruehwald (2012) proposed an analysis in which deletion actually stems from two interleaving sources: competing grammars (i.e., variation at the level of morphology) and also a phonological rule (variation at the level of phonology) that work in tandem to produce increased rates of deletion.

Returning to (ing), while the contrasting behavior of nominal and verbal tokens is widely attested, contrasts between polymorphemic and monomorphemic items are less so. Houston (1991) found that monomorphemic tokens were less likely to surface with *-in* compared to polymorphemic nominals, and that *-thing* compounds in particular strongly disfavored *-in*. Mechler et al. (2022) did not investigate differences between monomorphmic and polymorphemic (ing) in Tyneside English, but did partially replicate Houston's results in reporting how *-thing* tokens surfaced near-categorically as *-ing*. This potential factor has received much less attention in the literature on (ing), however, so it is not known how widespread and generalizable this finding is. In this study, no effect of morphological composition was found: polymorphemic nominal tokens were produced with *-in* 86.2% of the time ($n = 472$), and their monomorphemic nominal counterparts behaved almost identically with 85.5% rates of the alveolar variant ($n = 83$). More surprisingly, *-thing* compounds are actually the most likely to surface with *-in* both in this study (92.9%, $n = 702$), and the study reported by Watts (2005:160), despite only involving one of the two potential processes of (ing) variation.

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Taken together with the lack of significant differences between nominal and verbal (ing) suffixes, there is no evidence at all to support any kind of morphological (ing) analysis for the speakers analyzed here. It is more likely, given that (ing) is most strongly influenced by phonological contextual factors, that the variation is purely derived from *phonological* processes for these working-class speakers in the North West of England. It is of course possible that the mental representation of (ing) differs for other speakers, in other communities, where (ing) patterns in very different ways. An analysis similar to Tamminga's (2016) study of persistence, and a detailed treatment of the factors discussed here—the effects of part of speech, of morphological composition, and of phonological environment—should be replicated in other communities to lend further insight into these questions.

Conclusion

(ing) variation is remarkably well-studied throughout the English-speaking world, and patterns in largely the same way in most varieties in which it has been attested. However, the behavior of this variable in the North West of England departs from most other dialects in a number of important ways.

In some respects, the story of (ing) presented here, for working-class speech in the North West of England, is one of great simplicity. Speakers are so generally predisposed toward *-in* that there is very little variation at all in naturalistic conversation: significant social stratification emerges along age and sex dimensions, but the effects are smaller than those reported in most other studies of (ing). There is also no systematic patterning along the continuum of nominal–verbal categories that conditions (ing) so significantly in most other dialects. However, this belies a level of complexity that is absent in most other dialects in which (ing) has been studied: most notably, variation here involves competition between *three* forms, and the intersection between two different variable processes with overlapping environments of application. The results presented here suggest that this third variant [ɪŋg] exists not as a replacement of [ɪŋ] to index prestige or formality, but rather occupies its own functional space as a feature of emphatic, hyper-correct and careful speech.

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Competing interests. The author declares none.

Notes

1. An anonymous reviewer points out that this pre-pausal environment encompasses a range of phenomena, such as turn ends, the boundaries of prosodic phrases, mid-turn pauses and repairs, etc. Although a discourse-analytic treatment of conversational data would be needed to fully tease apart these factors, a study of controlled lab speech does suggest that [ŋg] is favored before pause regardless of intonational phrasing (Bailey, 2019b).

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2. MacKenzie (2020) provided a detailed discussion of the treatment of ternary variables in sociolinguistic study, alongside an investigation of auxiliary *have*- and *is*-contraction in English where the results lend credence to a genuine ternary analysis in which three forms vary independently of each other.

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