Correlations in Frequency of Coda Voiceless Stop Variants with Phonological and Stylistic Factors in Vietnamese-Accented English

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Abstract

This study investigates how Vietnamese-accented English speakers articulate coda voiceless plosives (/p, t, k/), influenced by L1 phonology and sociolinguistic factors. Since Vietnamese only allows unreleased /p, t, k/ in coda positions and forbids consonant clusters, the learners often adapt English coda plosives using modifications such as glottalisation, deletion, and vowel insertion. Using Labov's sociolinguistic interview framework, speech data were gathered from 22 Vietnamese speakers across different ages, regions, and English proficiency levels in four speech styles. Ten allophonic variants were identified, with unreleased and/or glottalised forms being the most common (49.3%). The study found that speech style, place of articulation, and cluster position significantly influenced pronunciation, with increased glottalisation and deletion in informal contexts, especially for /t/ and /k/, whereas /p/ remained more stable. The findings suggest that some VE variants mirror native English usage, offering insights for improving English pronunciation instruction in Vietnam through context-sensitive, evidence-based approaches.

Keywords

L2 phonology, Vietnamese-accented English, coda voiceless plosives, sociolinguistic factors, phonological transfer

1. Introduction

Coda voiceless plosives /p, t, k/ in English can vary a lot depending on both adjacent sounds and the speaker's use of language in context. In native varieties of English, these sounds may be glottalised, aspirated, or even left out entirely, depending on factors such as speaking style

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and the surrounding phonetic environment. In Vietnamese-accented English (VE), this variation becomes more complicated due to influence from L1. Vietnamese allows only unreleased /p, t, k/ in syllable-final positions, and does not permit coda consonant clusters. As a result, VE learners often produce coda voiceless plosives with variants such as unreleased, glottalised, substituted, or modified articulations, and simplify final clusters by dropping sounds, inserting vowels, or producing voiceless plosives without audible release.

Fortunately, unreleased and/or glottalised realisations of coda voiceless plosives in VE are native-like. However, prior research on VE has predominantly focused on learners' errors while overlooking the presence of native-like pronunciations of coda voiceless plosives, as well as the interaction between linguistic and sociolinguistic variation. With these factors in mind, to fill in the research gap, this study investigates the allophonic variation of VE coda /p, t, k/ and their potential correlations with sociolinguistic factors. The following questions are raised to guide the inquiry:

1. What are the allophonic variants of VE coda voiceless plosives?
2. What factors affect these VE allophonic variants?
3. What are the correlations between the allophonic variants of VE coda voiceless plosives and the affecting factors?

The study employed the sociolinguistic interview method developed by Labov (1972) to collect the pronunciations of VE coda voiceless plosives in various speech styles, from formal to informal. It further explores the allophonic variations and correlations between linguistic and non-linguistic contributions. The findings aim to enhance the efficiency of phonetic and phonological training for Vietnamese adult learners, particularly in mastering English coda /p, t, k/, and to improve pedagogical approaches for English coda consonants more broadly within Vietnamese contexts. By providing empirical insights into VE phonetics and phonology, this research contributes to the literature on VE and supports the development of targeted pedagogical strategies for English language education in Vietnam.

The paper is organised into nine sections. Sections 1, 8, and 9 cover the introduction, limitations, and conclusion respectively. Section 2 looks at how L2 phonological variation, specifically the pronunciation of coda voiceless plosives, is shaped by sociolinguistic and contextual factors in second language learning, focusing on VE. Section 3 compares how coda voiceless plosives are pronounced in Vietnamese and English, pointing out key similarities and differences that may

influence VE pronunciation. Section 4 explores how VE speakers tend to simplify coda consonant clusters, especially those with voiceless plosives, due to the rules of Vietnamese phonology. Section 5 highlights the way in which VE speakers often voice English /p/ and /k/ (influenced by L1), while /t/ tends to be easier for them, likely because Vietnamese allows some aspiration in alveolar stops but not in bilabial or glottal ones. Section 6 explains the methods used to analyse how often different allophonic variants of English coda voiceless plosives appear in VE, and how this relates to speech style and phonological factors. Section 7 presents the findings, showing how factors such as place of articulation, style of speech, and the position of the plosive in coda consonant clusters affect how these sounds are realised in VE.

2. Style and Variation in Vietnamese-Accented English

In SLA and foreign language learning, L2 phonological variation is connected to sociolinguistic interference, affected by contextual factors like linguistic dimensions, environment, formality, style, and audience (Hansen 2006). This is because variationists and SLA researchers both study structured speech forms, with variationist research focusing on changes over time in L2 speech. SLA and variation studies on non-standard dialects explore speakers' internal systems to determine if their forms are structured or haphazard, finding systematic variability in L2 data (Regan 2013). Also, collaboration between SLA and variationist researchers acknowledges that variability in L2 data is influenced by multiple elements, leading researchers to use multivariate analysis to examine how linguistic and social factors impact L2 speech (Pienemann 2007).

Speech style therefore plays a significant role in how coda voiceless stops are pronounced. In more formal settings, L2 speakers may try to pronounce stops more clearly, sometimes adding aspiration (like [tʰ] or [kʰ]), while in casual speech they might drop them or replace them with glottal stops (Foulkes and Docherty 2006). In VE, this stylistic variation is closely tied to L1 habits. Speakers usually pay much more attention to pronouncing standard English sounds in tasks like reading aloud, but shift back to more familiar, L1-based pronunciations during spontaneous conversation. Tang (2007), for instance, found that Vietnamese speakers used more aspirated stops when reading, but often left them unreleased or dropped in interviews.

As one English variety, VE shows non-native pronunciation patterns shaped by all L1 influence, part of Universals (Jenkins 2000, Kirkpatrick 2007), and English constraints (Major 2001). Younger Vietnamese speakers in particular often adjust their speech based on who they are talking to and what the situation calls for (Tang

2007). This kind of flexibility helps explain why their pronunciation can shift depending on formality and context. In sum, the way VE speakers pronounce coda voiceless stops depends on a mix of phonological and stylistic factors. Informal speech tends to bring out more glottalised, unreleased, or deleted forms, while formal settings push toward more standard or aspirated variants.

3. Coda Voiceless Plosives in Vietnamese and English Phonology

Vietnamese and English share unreleased and/or glottalised coda /p, t, k/. Debate persists on glottalisation with Vietnamese coda /p, t, k/. Some scholars argue against it (Michaud 2004), while others assert that all Vietnamese coda /p, t, k/ feature glottal reinforcement (Singer 2012), as in *khóc* 'cry' [kʰoʔkˀ]. The trend is that Vietnamese coda /p, t, k/ appear unreleased and/or glottalised (Tran et al. 2019). Likewise, English coda /p, t, k/ may lack audible release bursts, often reinforced or replaced by a glottal stop (Cruttenden 2014).

Despite these similarities, English and Vietnamese coda /p, t, k/ exhibit nuances. Remarkably, Vietnamese final /p, t, k/ are consistently unreleased, unlike English, where occasional releases occur (Lisker 1999) due to phonotactic and phonological factors. Vietnamese coda /p, t, k/ remain invariably unreleased and/or glottalised regardless of their adjacent consonants or vowels from contiguous syllables, as coda [ʔkˀ] in *khóc lóc* 'tearful' [kʰoʔkˀɭ loʔkˀɭ], *khóc nhè* 'cry' [kʰoʔkˀɭ ŋɛ˥ɭ], and *khóc đi* 'Cry!' [kʰoʔkˀɭ di], where [ʔkˀ] pronunciation persists in all examples. The reason is that Vietnamese consonants are mainly ingressive, causing implosive coda /p, t, k/, with aspirated ones limited to onsets.

English consonants, by contrast, are primarily egressive, forming voiceless plosives /p, t, k/. These plosives are typically aspirated [pʰ, tʰ, kʰ], but can be unaspirated /p, t, k/ after /s/ in clusters [sp, st, sk] (Balogné Bérces & Szentgyörgyi 2006). Acoustically, English plosives undergo closing, holding, and release phases (Laver 1994). In codas, their release varies with nearby sounds, often without audible ([pˀ, tˀ, kˀ]). They may be inaudibly released before another plosive (as in *locked* [lɒkˀt], *blackboard* [blækˀbɔːd], and *thick dust* [θɪkˀ dʌst]), nasally released before a nasal (as in *acknowledge* [əkⁿnɒlɪdʒ], *dark night* [dɑːkⁿ naɪt], and *black magic* [blækⁿ ˈmædʒɪk]), or laterally released before a lateral (as in *buckle* [ˈbʌkˡɬ] and *blackleg* [ˈblækˡleg]) (Cruttenden 2014). Frequency shifts in the pre-consonantal vowel formants help in perceiving these unreleased codas, possibly less intelligible after diphthongs, particularly [kˀ] (Ogden 2017). These cross-linguistic similarities and differences in the coda realisations may explain how L1 Vietnamese phonology influences the production of VE coda voiceless plosives.

4. Clusters and Pronunciation Choices in Vietnamese-Accented English

Where a stop appears in a consonant cluster, this also affects how it is pronounced. Hansen (2011) showed that the more complex the cluster, the more likely it is that parts of it will be dropped. In VE, stops that appear in coda consonant clusters, e.g., the /k/ in *act* or the /p/ in *helped*, are more likely to be simplified or broken up by extra vowels, especially if they are in the middle or end of the cluster (Nguyen and Ingram 2007). Tran and Nguyen (2022) further observed that Vietnamese speakers tend to simplify three-consonant clusters by omitting the first, the second, or occasionally both consonants, especially in clusters containing voiceless plosives. These deleted, simplified, or vowel-inserted realisations of coda consonant clusters are in line with Vietnamese phonology, which favours only one consonant after a vowel (i.e., CV, VC, and CVC) (Tang 2007). Furthermore, Vietnamese phonology is primarily monosyllabic, meaning consonant clusters only occur at syllable edges between single-syllable words in fluent speech (Tran et al. 2019). This supports the idea that VE speakers rely on simplification strategies that match the rules of their first language.

5. Variation across Place of Articulation in Vietnamese-Accented English

Although VE learners often alter the voicing of voiceless consonants, particularly plosives such as /p/ and /k/, by producing them as their voiced counterparts due to differences in voicing features between English and Vietnamese (Hwa-Froelich et al. 2002), they generally do not encounter significant difficulty in pronouncing English /t/ (Tran and Nguyen 2022). This may be attributed to the fact that Vietnamese allows slight aspiration in alveolar stops like /tʰ/, but not in other places of articulation, such as bilabial or glottal positions (Tran and Nguyen 2022).

Taken together, the present study on VE coda voiceless plosives explores allophonic variation in foreign language learning, as well as examining the contributions of linguistic factors (i.e., place of articulation, plosive position in coda consonant clusters) and sociolinguistic factors (i.e., speech style), along with the interaction between these factors as a key role in shaping these patterns.

6. Study on the Correlations of Frequency of Coda Voiceless Stop Variants with Phonological and Stylistic Factors in Vietnamese-Accented English

6.1. Data Collection

6.1.1. Quantitative Methods

With the aim of achieving the research goals and optimising the validity and profound insights of the study, quantitative methods were employed. The speech data from VE informants was used for both acoustic and statistical analyses.

6.1.2. The Participants

A total of 22 well-educated Vietnamese speakers of English, all of whom were university students or lecturers at the time of the interviews, from Saigon University in Ho Chi Minh City, Vietnam, were selected as participants. They represented varying levels of English proficiency: 8 were at the pre-intermediate level, 9 at the intermediate level, and 5 at the upper-intermediate level. The age distribution included 15 individuals in their 20s, 6 in their 30s, and 1 over 40. Gender representation was diverse, with 14 female and 8 male participants. Additionally, the informants came from different regions of Vietnam: 3 speakers from the North, 3 from the Central region, and 16 from the South. This selection ensured a broad range of linguistic backgrounds, providing a comprehensive view of the variation in English pronunciation among Vietnamese speakers across different levels of language proficiency and sociolinguistic factors.

6.1.3. The Interview

Interview data were collected through individual audio-recordings conducted in quiet rooms on university campuses. To examine variation in the linguistic forms used by informants, the interview elicited speech data across four speech styles: (i) fully controlled speech (FC), (ii) partially controlled speech (PC), (iii) second partially controlled speech (PC2), in which participants re-read a passage, and (iv) spontaneous conversational speech (S). The interview format followed the sociolinguistic interview protocol developed by Labov (1972). As Labov (1981) noted, spontaneous speech, where speakers pay minimal attention to their speech, provides the most systematic data for linguistic analysis.

This study required both spontaneous and controlled speech data to examine how learners' real-time language production compares with their perceptions of the similarities and differences between English and Vietnamese coda voiceless plosives (/p, t, k/). Furthermore, since more casual speech styles tend to reflect earlier-acquired phonological rules, whereas formal styles are often shaped later through education and conscious correction, sociolinguistic interviews were structured to proceed from formal to informal contexts.

Accordingly, the interview comprised three main tasks, presented in order from most to least formal: (1) reading 40 minimal pairs, (2) reading and completing a 200-word passage twice, and (3) engaging in a question-and-answer interactive conversation with the interviewer. The full list of interview questions is provided in the Appendix.

6.1.4. The Interview Procedures

The data collection took place over a four-month period at Saigon University in Vietnam. Each interview lasted approximately 60 minutes. The researcher interviewed and recorded the informants' speech concurrently. To minimise attention to target forms, informants were not informed about the specific speech sounds under investigation until the end of the interview. All interviews were recorded using the same smartphone device to ensure consistency in audio quality.

6.2. Data Processing

The 60-minute recordings, collected across fully controlled, partially controlled, repeated partially controlled, and spontaneous speech styles from 22 informants, were automatically transcribed using Cockatoo Transcription (AI-powered), with manual cross-checking conducted by the researcher. Transcripts were segmented and partially annotated using Praat software. Cockatoo generated text transcriptions for permanent storage and further analysis, with each informant's data organised into separate sheets. The transcriptions included pauses or hesitations, represented by ellipses (…), as well as any speech errors made by informants. Praat was used to segment, annotate, and acoustically analyse the speech data, providing visualisations and detailed measurements of relevant phonetic features.

6.3. Data Analysis

This study employed quantitative methods. Descriptive statistics were used to report the frequency (in percentages) of informants' production of allophonic variants, based on the total number of potential occurrences of English coda voiceless plosives across different places of articulation (/p/, /t/, /k/), speech styles (fully controlled [FC], partially controlled [PC], repeated partially controlled [PC2], and spontaneous [S]), and the position of the plosive within coda consonant clusters (singleton coda, or as the first, second, or third member in a cluster). Descriptive analyses were conducted using R and Microsoft Excel and served as the basis for subsequent inferential statistical tests.

Inferential statistics were conducted using R to determine significant correlations between (a) speech style, place of articulation, and the frequency of coda /p, t, k/ allophonic variants; and (b) speech style and the position of the plosive within coda clusters. A multiple regression test was used for these analyses. Statistical significance was determined at the $p = .05$ level. Additionally, any unexpected or emergent findings were also taken into account during the final analysis.

7. Results

7.1. Allophonic Variation in VE Coda Voiceless Plosives

The analysis of VE coda voiceless plosives revealed notable variation across allophonic variants, places of articulation, speech styles, and plosive positions within consonant clusters. In general, a total of ten allophonic variants were identified across the dataset (see Table 1). Table 1 provides a summary of the frequency of different voiceless coda plosive variants in VE, offering insight into how often each variant appears across the dataset. These ten allophonic variants are unreleased and/or glottalised, aspirated, dropped, plain voiceless plosive, [s]-inserted and/or substituted, [f]-inserted and/or substituted, [i]- or [ə]-inserted and/or substituted, laterally released, nasally released, and velarised.

The most dominant variant by far was the unreleased and/or glottalised form, accounting for 49.3% of all tokens. This suggests that articulatory reduction is a prevailing strategy in VE, particularly in coda position where plosive release may be minimised or replaced by glottal closure. The high frequency of this variant reflects common patterns in casual or spontaneous speech, where full articulation is often reduced for efficiency.

In contrast, aspirated plosives made up 20.7% of the data, making them the second most frequent variant. This relatively high rate of aspiration indicates that clear, fully articulated plosives still occur regularly, particularly in more careful speech contexts. Dropped plosives occurred in 10.5% of cases, showing that coda position is vulnerable to segment loss, especially in rapid or informal speech. Similarly, plain voiceless plosives, which were neither aspirated, unreleased, nor modified, were present in 9.5% of tokens, indicating that the plain form is relatively preserved, though much less frequent than the modified forms.

Among less frequent variants, [s]- insertion and/or substitution accounted for 3.6% of the data, suggesting some degree of phonological reanalysis or assimilation, possibly when speakers adjust coda structure to fit L2 phonotactic constraints. [f]- insertion and/or substitution appeared in 2.7% of tokens, typically linked to variation in the bilabial /p/, often surfacing in more casual speech. Other types of variants (i.e., lateral release, nasalisation, non-systematic modifications, velarisation, and vowel colouring ([i]/[ə])) each occurred in fewer than 1% of cases. These are likely context-sensitive or speaker-specific and do not represent regular patterns in the dataset. In sum, the data show that reduction strategies, especially unreleased and/or glottalised forms, are central to how VE speakers handle voiceless coda plosives.

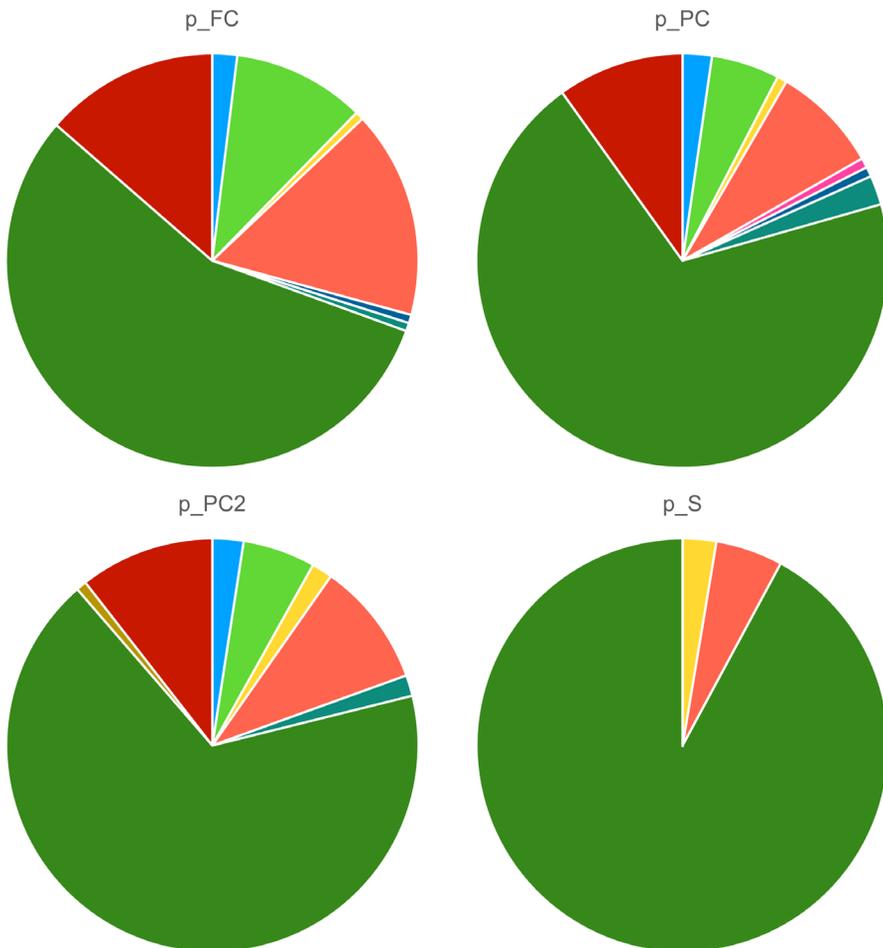| Allophonic Variant	Percentage (%)
Unreleased and/or glottalised	49.3
Aspirated	20.7
Dropped	10.5
Plain voiceless plosive	9.5
[s]-inserted and/or substituted	*n/a for /p/, included for /t/, /k/ (3.6 total)**
[f]-inserted and/or substituted	2.7
[i]- or [ə]-inserted and/or substituted	0.9
Velarised	*n/a for /k/, included for /p/, /t/ (0.9 total)**
Laterally released	0.7
Nasally released	0.7
Non-systematic variants	0.7

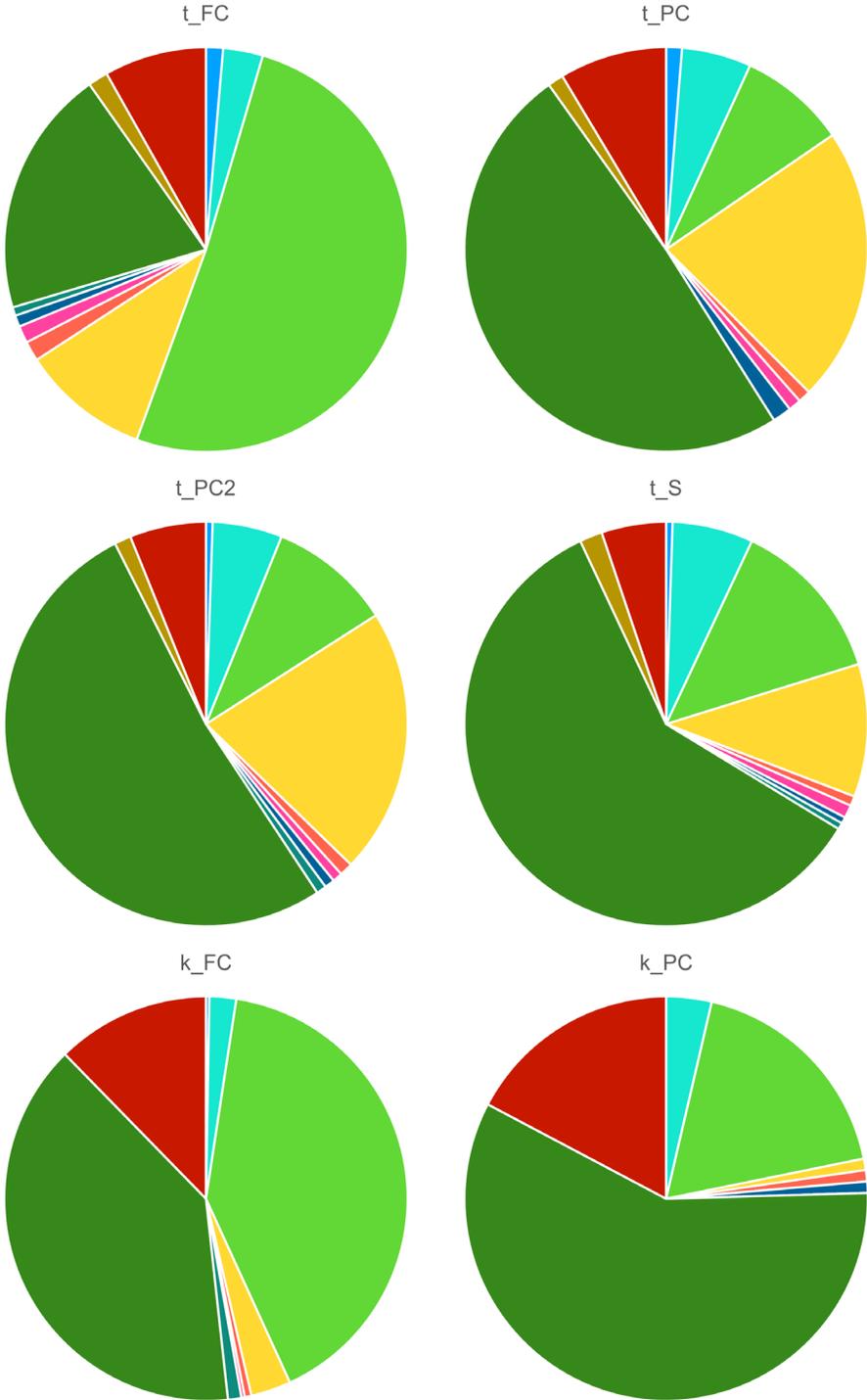Table 1. Frequencies of Allophonic Variants of Coda Voiceless Plosives in Vietnamese-Accented English

Note. /t/ exhibited all ten allophones and additional non-systematic forms. /p/ lacked [s]-insertion/ substitution, and /k/ lacked velarisation.

The results also suggest that the frequency of coda voiceless plosive variants in VE was significantly influenced by the interaction of three key linguistic factors: place of articulation, speech style, and the position of the plosive within a consonant cluster. The correlations among these factors and their illustrations are presented in the subsequent sections.

7.2. Correlations of Allophonic Variants of Coda Voiceless Plosives in Vietnamese-Accented English with Their Places of Articulation and Speech Styles

As a result of a multiple regression analysis conducted in R, which yielded a statistically significant p-value ($p = 1.459 \times 10^{-14}$), a meaningful relationship was identified between the frequency of coda voiceless plosive variants, their places of articulation, and speech style. In other words, the data demonstrated that speech style had a significant effect on the realisation of these sounds, with different places of articulation (i.e., coda /p/, /t/, and /k/) being variably influenced (see Chart 1).
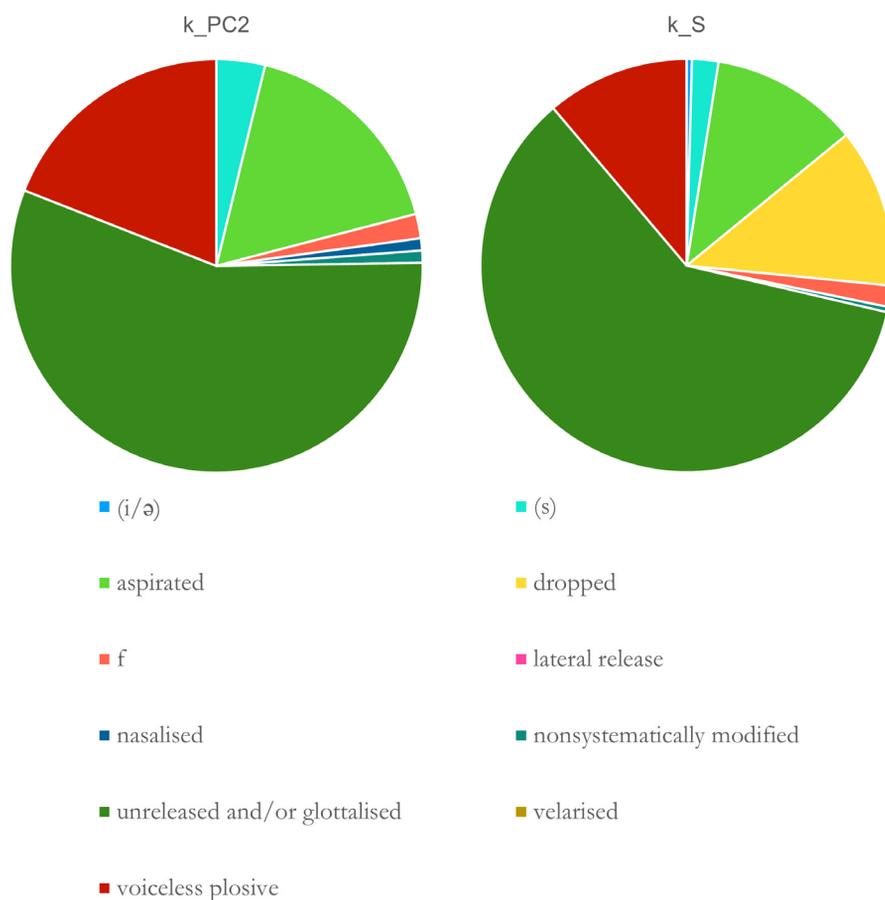
Chart 1. Frequencies of allophonic variants of coda voiceless plosives in Vietnamese-accented English across places of articulation and speech styles

Note.   FC: fully controlled speech
           PC: partially controlled speech
           PC2: repeated partially controlled speech
           S: spontaneous speech

Specifically, for /k/, in fully controlled speech, voiceless plosives were produced with more aspiration (40.8%) and fewer reductions, with only 3.2% of tokens dropped and 39.4% being unreleased and/or glottalised. However, in spontaneous speech, the /k/ sound was simplified more often, with a higher rate of glottalisation (60.2%) and a slight increase in deletion (12.5%). This suggests that when speech becomes less controlled, speakers tend to simplify the pronunciation of coda /k/, making it more likely to be dropped or glottalised.

For /p/, fully controlled speech showed minimal changes, with just 16.2% of /p/ tokens being realised as [f], which could point to some fricativisation. In

spontaneous speech, /p/ stayed mostly stable, with very little deletion (2.6%). However, in partially controlled and repeated partially controlled speech, there were more reductions, with unreleased and/or glottalised forms occurring at higher rates (up to 69.5% and 67.5%, respectively). This suggests that while /p/ tends to stay more stable than other plosives, it is nevertheless simplified in more casual or repeated speech contexts.

The /t/ sound showed the most variation across speech styles. In fully controlled speech, it was aspirated 51% of the time and had a relatively low deletion rate (10.3%). In spontaneous speech, however, /t/ was much more likely to be unreleased and/or glottalised (59.3%) and dropped (10.6%). Similarly, in partially controlled and repeated partially controlled speech, /t/ was unreleased and/or glottalised (up to 49.1% and 51.9%, respectively) and dropped (22% and 21.3%, respectively) more often. This suggests that as speech becomes less structured or more casual, speakers tend to reduce or alter the /t/ sound more frequently. In brief, the analysis of the data showed that /t/ and /k/ were more affected by speech style, with /t/ undergoing the biggest shift towards glottalisation and deletion in more casual speech. /p/ remained relatively stable, though it did show some reduction in less controlled speech contexts.
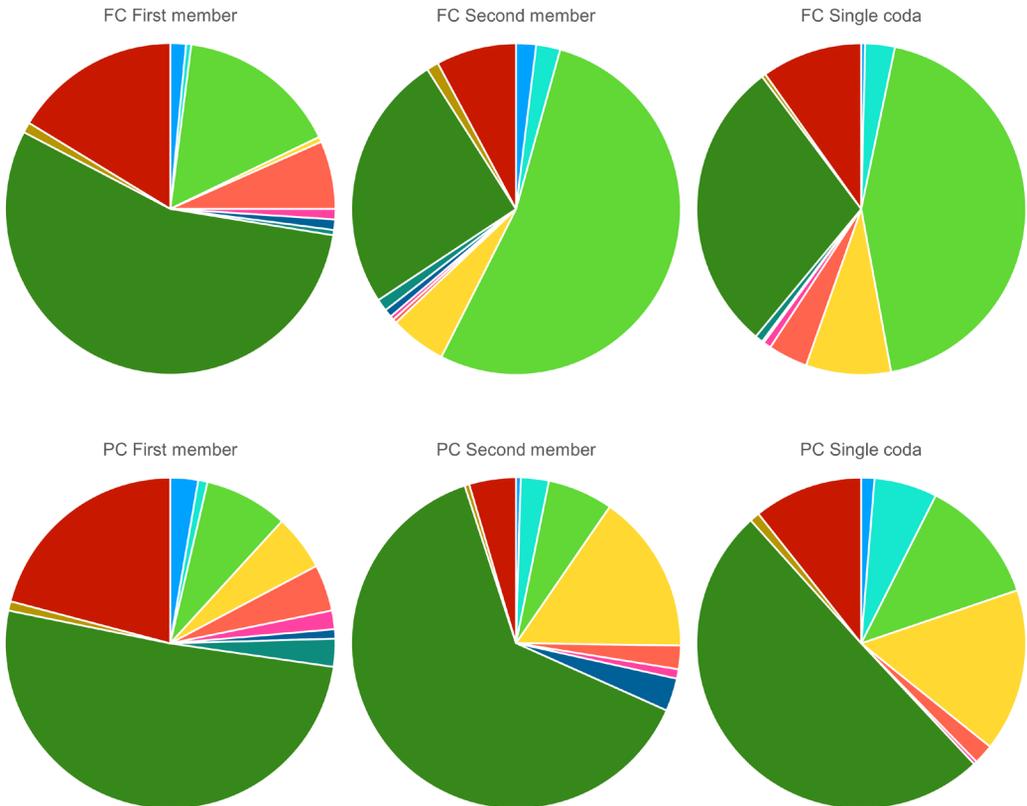
7.3. Correlations of Allophonic Variation of Coda Voiceless Plosives in Vietnamese-Accented English with Their Position within Consonant Clusters and Speech Styles

A multiple regression analysis conducted in R, which yielded a highly significant p-value ($p < 2.2 \times 10^{-16}$), revealed a strong association between the frequency of coda voiceless plosive variants, their position within consonant clusters, and speech style. The results indicate that both speech style and the position of the plosive within the cluster, whether occurring as a single coda or as the first, second, or third member, significantly influenced the phonetic realisation of these sounds in VE (see Chart 2).

In first member positions, fully controlled speech had relatively stable forms, with aspiration (3.2%) and voiceless plosive realisations (3.3%) being the most frequent. As the speech style became less controlled, moving into partially and repeated partially controlled speech, aspiration decreased, and deletion increased slightly (by 0.9%). In spontaneous speech, these patterns became even more simplified, with only 1.1% aspirated realisations and a drop in overall plosive clarity, pointing to more relaxed articulation.

Second member positions show stronger shifts. Fully controlled speech had high aspiration rates (14.0%) and low glottalisation (6.6%). But as attention to speech decreased, aspiration dropped, deletion increased, and glottalisation became far more frequent, peaking at 23.8% in spontaneous speech. This suggests that second member positions are especially susceptible to phonetic reduction in casual contexts.

The clearest pattern appears in single coda positions. In careful speech, aspiration was very high (23.4%), and deletion was already notable (4.5%). As speech styles became less formal, deletion rose, reaching 9.9% in spontaneous speech, and glottalisation increased even more sharply, from 15.3% in fully controlled speech to 27.2% in spontaneous contexts. These findings point to a strong effect of informality on coda plosive weakening.
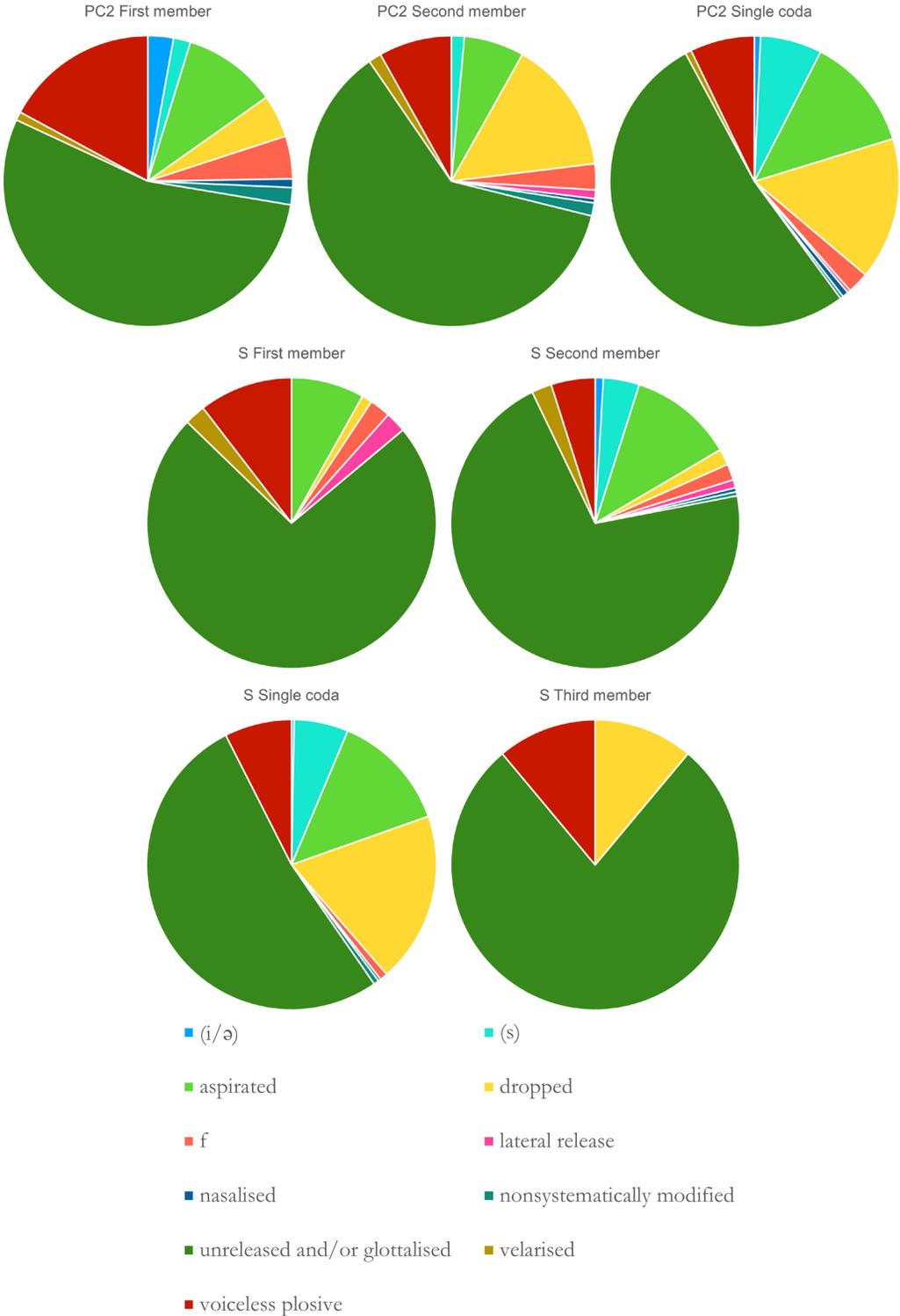
Chart 2. Frequencies of allophonic variants of coda voiceless plosives in Vietnamese-accented English across speech styles and plosive position within coda consonant clusters

Note.   FC: fully controlled speech
          PC: partially controlled speech
          PC2: repeated partially controlled speech
          S: spontaneous speech

Third member positions were rare in the data, appearing only in spontaneous speech, and showed very low variation across all categories. Due to its low frequency of occurrence in speech, voiceless plosives in the third member positions were not fully observed in the study. Hence, further study exclusively on voiceless plosives as the third member in coda consonant clusters is needed to provide sufficient insight into coda voiceless plosives in Vietnamese-accented English speech. In brief, the analysis confirms a consistent trend: as speech becomes less formal, aspiration declines while glottalisation and deletion rise, especially in second member and single coda positions.

8. Limitations

The study contains several limitations. First, coda /p/ and the plosive in the third position in coda consonant clusters occurred infrequently in the speech data, limiting their observability. Second, the sample size was small and complicated by numerous independent variables, such as variation in proficiency level, L1 accent, age, occupation, and regional background. This limitation may reduce the generalisability of the findings, highlighting the need for larger, more controlled studies. While the large quantity of speech data collected may partially mitigate this limitation, broader informant diversity remains essential to strengthen generalisability. As a result, future research should focus on these understudied areas and ensure a larger sample size to deepen understanding of VE coda voiceless plosives.

9. Conclusion

The results highlight the complex variation in the articulation of coda voiceless plosives in VE, influenced by both linguistic and sociolinguistic factors. This variation has meaningful implications for phonetic analysis, language teaching, and the broader understanding of language transfer.

Firstly, the study identifies ten allophonic variants of coda voiceless plosives in VE, including unreleased, glottalised, aspirated, and dropped forms. The most prevalent variant is the unreleased and/or glottalised form, accounting for 49.3% of occurrences. This suggests that VE speakers often employ articulatory reductions,

particularly in casual speech contexts, aligning with Vietnamese phonological patterns that favour simpler coda structures.

Secondly, the impact of Vietnamese phonology on VE is evident, as Vietnamese permits only unreleased voiceless plosives in syllable-final positions and does not allow coda consonant clusters. Consequently, VE speakers may simplify English coda clusters by omitting consonants or inserting vowels, leading to variants such as [s]-inserted or [f]-inserted forms. This phonetic adaptation underscores the role of L1 phonological structures in shaping L2 pronunciation.

Thirdly, the use of sociolinguistic interviews enabled the collection of speech data across a range of styles, from formal to informal. The analysis reveals that speech style significantly influences the realisation of coda voiceless plosives, with more casual speech associated with increased glottalisation and deletion. This finding aligns with Bybee's (2003) assertion that spontaneous speech provides systematic and valuable data for studying phonetic and sociolinguistic variation.

Fourthly, understanding the allophonic variation in VE can inform phonetic and phonological training for Vietnamese learners of English. Recognising that certain allophonic variants, such as unreleased and glottalised forms, are native-like, especially with regard to British English, can help educators prioritise more areas where learners face challenges, such as aspiration and coda consonant clusters.

In conclusion, the variation in coda voiceless plosives in VE reflects a significant interplay of linguistic structures and sociolinguistic contexts. This understanding can enhance phonetic analysis, inform language teaching practices, and contribute to a more nuanced perception of Vietnamese-accented English.

References

Balogné Bérces, Katalin, and Szilárd Szentgyörgyi. 2006. *The Pronunciation of English.* Budapest: Bölcsész Konzorcium.

Bybee, Joan. 2003. *Phonology and Language Use.* Cambridge: Cambridge University Press.

Cruttenden, Alan. 2014. *Grimson's Pronunciation of English.* 8th ed. London and New York: Routledge.

Foulkes, Paul, and Gerard Docherty. 2006. "The Social Life of Phonetics and Phonology." *Journal of Phonetics* 34 (4): 409–438. https://doi.org/10.1016/j.wocn.2005.08.002.

Hansen, Jette G. E. 2006. *Acquiring a Non-Native Phonology: Linguistic Constraints and Social Barriers.* London: Continuum.

—. 2011. "Deletion of /t, d/ and the Acquisition of Linguistic Variation by Second Language Learners of English." *Language Learning* 61 (4): 1256–1301. https://doi.org/10.1111/j.1467-9922.2011.00672.x

Hwa-Froelich, Deborah, Barbara W. Hodson, and Harold T. Edwards. 2002. "Characteristics of Vietnamese Phonology." *American Journal of Speech-Language Pathology* 11 (3): 264–273. https://doi.org/10.1044/1058-0360(2002/031).

Jenkins, Jennifer. 2000. *The Phonology of English as an International Language.* Oxford: Oxford University Press.

Kirkpatrick, Andy. 2007. *World Englishes: Implications for International Communication and English Language Teaching.* Cambridge: Cambridge University Press.

Labov, William. 1972. *Sociolinguistic Patterns.* Philadelphia: University of Pennsylvania Press.

—. 1981. "Field Methods of the Project on Linguistic Change and Variation." *Sociolinguistic Working Paper* Number 81. Austin: Southwest Educational Development Lab.

Laver, John. 1994. *Principles of Phonetics.* Cambridge: Cambridge University Press.

Lisker, Loraine. 1999. "Perceiving Final Voiceless Stops without Release: Effects of Preceding Monophthongs versus Non-Monophthongs." *Phonetica* 56: 44–55. https://doi.org/10.1159/000028440

Major, Raymond C. 2001. *Foreign Accent: The Ontogeny and Phylogeny of Second Language Phonology.* New York and London: Psychology Press.

Michaud, Alexandre. 2004. "Final Consonants and Glottalization: New Perspectives from Hanoi Vietnamese." *Phonetica* 61 (2–3): 119–146. https://doi.org/10.1159/000082560.

Nguyen, Tuan, and John Ingram. 2007. "Prosody of Tone Sandhi in Vietnamese Reduplications." In *Proceedings of the 2006 Annual Meeting of the Australian Linguistic Society*, 1–17. Brisbane: School of English, Media Studies & Art History, University of Queensland.

Ogden, Richard. 2017. *An Introduction to English Phonetics.* 2nd ed. Edinburgh: Edinburgh University Press.

Pienemann, Manfred. 2007. "Variation and Dynamic Systems in SLA." *Bilingualism: Language and Cognition* 10 (1): 43–45. https://doi.org/10.1017/S1366728906002793.

Regan, Vera. 2013. "Variation." In *The Cambridge Handbook of Second Language Acquisition*, edited by Jacqueline Herschensohn and Martha Young-Scholten, 272–291. Cambridge: Cambridge University Press.

Singer, Erik. 2012. "Vietnamese English." VASTA 2012: Asian Accents Panel. https://www.yorku.ca/earmstro/asia/Vietnamese_accent_Erik_Singer.pdf. Accessed June 12, 2023.

Tang, Giang. 2007. "Cross-Linguistic Analysis of Vietnamese and English with Implications for Vietnamese Language Acquisition and Maintenance in the United States." *Journal of Southeast Asian American Education and Advancement* 2 (1): Article 3. https://doi.org/10.7771/2153-8999.1085.

Tran, Thi Khanh Lam, and Anh Thi Nguyen. 2022. "Common Mistakes in Pronouncing English Consonant Clusters: A Case Study of Vietnamese Learners." *CTU Journal of Innovation and Sustainable Development* 14 (3): 32–39. https://doi.org/10.22144/ctu.jen.2022.040.

Tran, Thi Thuy Hien, Nicolas Vallée, and Ludovic Granjon. 2019. "Effects of Word Position on the Acoustic Realization of Vietnamese Final Consonants." *Phonetica* 76 (1): 1–30. https://doi.org/10.1159/000485103.