

Phonetic and Sociolinguistic Dynamics of Vowel Variation in Hiberno-English: An Acoustic Analysis

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المخلص

تهدف هذه الدراسة إلى تحديد الجوانب الصوتية والاجتماعية اللغوية للإنجليزية الأيرلندية، مع التركيز على تباين الأصوات المتحركة. وباستخدام منهجية ثلاثية المحاور تشمل مراجعة الأدبيات، وجمع البيانات باستخدام أدوات صوتية عالية الجودة، والتحليل الوصفي عبر أدوات برمجية مثل برات وأوداسيتي، تحدد الدراسة الاختلافات في الأصوات المتحركة مثل /ɪ/ و /ɑ:/ و /æ/ التي تميز بوضوح الإنجليزية الأيرلندية. وتتشكل هذه التباينات في الأصوات بفعل العوامل الاجتماعية والجغرافية والثقافية، حيث يُظهر ذلك تأثير الصوتيات على اللغويات الاجتماعية وتشكيل اللهجات. وتوفر هذه المنهجية الجديدة، التي تمزج بين نطق الأصوات المتحركة والإلقاء الرسمي والحوارات العفوية، فهماً شاملاً للأصوات المتحركة في الإنجليزية الأيرلندية. وتُظهر النتائج أن الصوتيات في الإنجليزية الأيرلندية تشهد عملية تطور تتأثر بالعولمة ووسائل الإعلام والهجرة، مما يشير إلى لهجة ديناميكية تم إدخال عناصر جديدة عليها دون أن تفقد طابعها المميز. ويكشف التحليل الموضوعي للبيئة الاجتماعية اللغوية في أيرلندا، مع دراسة حالات اللهجات الإقليمية، والتنقل الاجتماعي، والعولمة، والتحول اللغوي. من خلال مقارنة البيانات التي تم جمعها بالمعايير التي قدمها لادافوغيد (2006)، وتساهم هذه الدراسة في علم الصوتيات المقارن، وفي اللغويات بشكل عام.



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Abstract

This study aims to establish phonetic and sociolinguistic aspects of Hiberno-English with a focus on vowel variation. Utilizing a three-pronged methodology encompassing a literature review, data collection through high-quality audio equipment, and descriptive analysis via software tools like Praat and Audacity, the research identifies significant phonetic shifts in vowels such as /ɪ/, /ɑ:/, and /æ/ that clearly distinguish Hiberno-English. These variations in sounds are shaped by social, geographical, and cultural factors. This shows the impact of the phonetics on sociolinguistics and the formation of dialects. The novel method, mixing isolated vowel articulation, formal elocution, and unrehearsed dialogues, offers an overall understanding of Hiberno-English vowel sounds. The results show that Hiberno-English phonetics are undergoing a process of evolution, taking their cue from globalization, media, and migration, which points to a dynamic dialect in which new elements have been introduced without losing their character. The thematic analysis explores the sociolinguistic setting of Ireland, looking at the case of regional dialects, social mobility, globalization, and code-switching. By comparing the acquired data against standards, such as those supplied by Ladefoged (2006), this research contributes to comparative phonetics and, in general, the linguistic discipline.

Keywords: *acoustic analysis, code-switching, formant frequencies, Hiberno-English, phonetic diversity*

Introduction

The linguistic dynamics of Ireland, a nation deeply entrenched in rich historical narratives, paint a vivid picture of its cultural and historical lineage through the evolving tapestry of languages and dialects. This is significantly evident in the Hiberno-English dialect, the harmonic blend of Irish and English nuances that forms a unique subset of linguistic characteristics influenced by both its Gaelic and Anglo-Saxon heritage (Hickey, 2007).

This study centers on the intricacies of vowel sounds in Hiberno-English, significant markers of regional dialect variations, representing a fertile ground for an exhaustive investigation (Wells, 1982b). Despite a substantial body of existing literature, there still seems to be a gap in the complex network of vowel sounds specific to this dialect, with a potential overlook on the in-depth acoustic analysis spotlighting the formant frequencies and vowel durations in Hiberno-English.

To bridge that gap, the present study is planned as a detailed study of the present-day Hiberno-English vowels. And by means of a methodologically sound dissemination, it attempts to find a way through the difficult trails of vowel sounds of Hiberno-English thus providing a true representation of the country's linguistic legacy and a modern perspective for celebrating the diversity of speech forms.

The journeys through this linguistic and phonetic discourse are now at the turning point where they attempt not only to significantly contribute to linguistic research but also to preserve the linguistic wealth of the area to create a well-drawn portrait of the linguistic and cultural identity of Ireland as manifested through language. Besides that, it attempts to convey a better understanding and appreciation of the Hiberno-English dialect, a highly significant dialect both linguistically and culturally. This project is intended to enhance the linguistic and phonetic discourse which could lead to broader cultural education through the use of information gained from linguistics.

The study attempts to answer the following questions:

- 1- What phonetic features distinguish Hiberno-English vowels from other dialects, emphasizing their acoustic uniqueness?
- 2- How do factors like regional diversity, social influences, and migration shape the unique vowel sounds of Hiberno-English, according to formant frequency analysis?

The research sets the following hypotheses:

- 1- Hiberno-English possesses a distinct set of vowel sounds, influenced by the Irish language and significantly varied by regional and social factors.
- 2- Distinctive acoustic features of Hiberno-English vowels, identified through formant frequencies and qualitative analysis, differentiate them from vowels in other dialects.

Literature Review

Irish English or Hiberno-English emerged in Ireland as a result of the blending of the Gaelic and Anglo-Saxon linguistic cultures. This literature review outlines the main studies that have been done on the linguistic features of Irish English and sheds light on the outstanding elements in this variety.

Starting with the historical context and present-day forms, Hickey (2007) provides a comprehensive analysis of the historical context and contemporary manifestations of Irish English in his work. His study shows the particular phonetic and lexical features of Hiberno-English and demonstrates the impact that the Irish language has on its pronunciation and vocabulary. The technique Hickey's uses to inspect such a plethora of Hiberno-English dialectal traits is undoubtedly among the most meticulous, thus contributing to the recognition of a distinct English dialect for Ireland.

Moving on to morphology and syntax, Filppula et al. (2008) discussed the grammatical facets of Hiberno-English in the study "Irish English: Morphology and Syntax". The research described the morphological and syntactic distinctions that make Hiberno-English different from the other English varieties. The research to some extent clarified the differences in word choice and sentence construction and explained that the Irish language legacy is a potential component influencing the distinctiveness. They also investigated manifolds of different kinds of pursuits which are the semantic variation and the phonetic distinctions that result as the mother tongue Hiberno-English.

As to the accents of English, Wells (1982a) provided in his eminent work "Accents of English" a detailed account of the various accents that adorn the language. His work provided a profound analysis of the many vowel and consonant sounds of different English accents including Hiberno-English. The phonetic research by Wells provided a comprehensive account of the articulatory nuances at play in English accents; this created a framework for other explorations in linguistic disciplines and academic endeavors that were geared towards developing a refined knowledge of English accents, their vocabulary, and pronunciation.

Another significant aspect was also concerned with regional variation; this was the main topic of the examination by Corrigan (2010) whose work, "Irish English: Northern Ireland" came into view. Herein, the author sheds light on a significant part of Hiberno-English speech, explaining the morphosyntactic aspects as well as vocabulary and pronunciation typical of the north-eastern variety. Corrigan's findings displayed a complex combination of influences and language properties, paving the way for it to be clearly distinguished within the Hiberno-English grouping, and that in turn contributes to the identification of its character.

Tieken-Boon van Ostade (2000) provided a new perspective on studying language evolution by applying social network analysis (SNA). Examining society-related aspects like social binding and social action unveiled the mechanisms of how societal factors influence language development - including vocabulary and pronunciation. The research suggested that this approach should be applied to language variants like Irish English to reveal how the features of dialects appear through the interconnectedness of the communities, as a result of their social contacts and relationships. In sum, social circles serve as a driving force that makes languages successful or the reason for their demise.

In his study *Irish English: Phonology*, Hickey (2008) elaborated on the various phonological features that make Irish English distinct from other regional dialects. This study involves in-depth acoustic analysis, as well as the evaluation of existing literature, and it investigates the variability of vowels, consonant usage, and pronunciation patterns to highlight the different features resulting from the blending of Irish and English characteristics. Hickey's work is integral to understanding the dialectal variations of English spoken in Ireland, as it identified and analyzed their distinctive phonological features.

Filppula et al. (2008) scrutinized the Anglo-Celtic linguistic interfaces, which still occur in the phonetics, morphology, and syntax of Irish English. Not only their fine-grained analysis but also their presentation of dialectal variation provided valuable insight into the dialectal usage that is unique to Irish English, which is greatly influenced by the interactions of English and Irish languages through processes of contact and language transfer. The study emphasized the fact that one must know about contact languages.

Finally, in her study titled *Hiberno-English language and culture in Cork*, Hickey (2021) presents key findings about the influence of regional dialects on vocabulary and pronunciation in the Cork area. Her research relies on acoustic analysis, which is based on the comparison of vowel sounds from speakers with various accents. The research demonstrates that accent variation is a regional characteristic deeply connected to the linguistic, cultural, and identity dynamics. The research reveals specifically how Cork City's Hiberno-English is unique and specific to the region. The intricate link between language and local identity is evident in the distinct characteristics of Cork City's Hiberno-English.

The existing literature on Irish English discusses its vocabulary, phonetics, history, morphology, and syntax, presenting unique features and regional varieties in detail. However, there is a lack of thorough theoretical explanation and comparison of its vowels with those of more prominently used English dialects worldwide. This research seeks, first, to provide further information about similarities or differences in Irish English vowel production and perception; and second, to explore how these findings contribute to an understanding of Irish English phonology and its connection to other English varieties.

Methodology

Preliminary Literature Review

As a first step, we carried out a literature review to determine the boundaries of already existing works on Hiberno-English. While a thorough study of the corpus helped us mark some notable gaps in the current discourse, the issue of phonetics and phonology emerged as by far the most prominent. Using the residual biases of preceding research as a dominant force, the researcher emphasized the significant role of descriptive analysis. This methodology was recommended not merely as a supplementary tool but as a vital technique increasingly recognized in dialectology and sociolinguistics, paving the way for more advanced monolingual research.

Data Collection

I used the Honor X's built-in recorder app to capture high-quality sound. To maintain research reliability, several measures were implemented during the data collection process to create a large dataset of Hiberno-English vowels. This methodology was applied across various communicative settings. To this end, I developed an instrument through which participants, all of whom were originally from Ireland, read a list of words, enabling the recording of isolated vowel articulations in formal elocution settings to evaluate controlled language production. This age group was chosen because they were considered less likely to be influenced by American media and more likely to retain their authentic Irish accent compared to younger generations.

Subsequently, dialogues guided by a set of predetermined probe questions were conducted to allow for spontaneous speech from participants. This three-pronged methodological approach was designed to optimize the results of future research on Hiberno-English vowel properties and their historical background. The recorded dialogues were then subjected to thematic analysis to determine their suitability for the study.

Descriptive Analysis

The researcher used advanced software tools, such as Praat and Audacity, to examine the audio elements in the recordings. Using the capabilities of those dedicated apps the researcher could accurately extract the data about the frequencies of the formants and vowel durations. This was carried out as the most significant part of the organized cataloging of the specific phonetic signs that are unique to Hiberno-English vowel sound patterns. The results are projected to change the factual understanding of the intrinsic phonetic and phonological features of this dialect. The researcher also designed an interview template with the main goal of obtaining more details from native Hiberno-English speakers. This tool was developed to gain an understanding of the personal experiences and views of the participants regarding the type of vowels being produced in this accent. By offering qualitative information, such as speaker views and subjective perceptions, the researcher could complement the results of acoustic studies.

This three-pronged approach was proposed in order to foster a more intricate and multi-dimensional knowledge of the peculiarities of the language as used in Hiberno-English. Together, the qualitative data offered an in-depth view of consonant and vowel intricacies with richness and depth when connected with other sources of information.

Data Presentation

Using a well-thought-out approach to express and demonstrate the specific information in a clear and visually comprehensible manner, the researcher applied the available data to create the visual tools. A range of visual aids were employed to make the quantitative parameters comprehensible and logically persuasive. I then illustrated this evaluation by including a thorough comparative analysis that compared the Hiberno-English data with the results obtained by Ladefoged (2006) as a benchmark. Ladefoged's work is a foundational reference in the field of phonetics, known for its comprehensive and rigorous methodology. This approach to studying languages has proven the comparative method to be an exceptionally effective tool for investigating phonetic changes and variations in the dialect's phonemic foundation.

Figure 1 shows two charts displaying the frequencies of the first three formants (F1, F2, F3) for eight American vowels, as reported by Ladefoged (2006, p. 185-187). The vowels included are [i], [ɪ], [e], [æ], [a], [ɔ], [o], and [u]. The formant frequencies are measured in Hertz

(Hz) and plotted on the vertical axis, with the vowel symbols along the horizontal axis. The charts show the higher frequency ranging from approximately 1000 Hz to 3000 Hz, which encompasses the second and third formants (F2 and F3), and the lower frequency ranging from about 250 Hz to 1100 Hz, showing the first formant (F1) values.

Figure 1

The Frequency of the First Three Formants in Eight American Vowels (Ladefoged, 2006, p. 185-187)

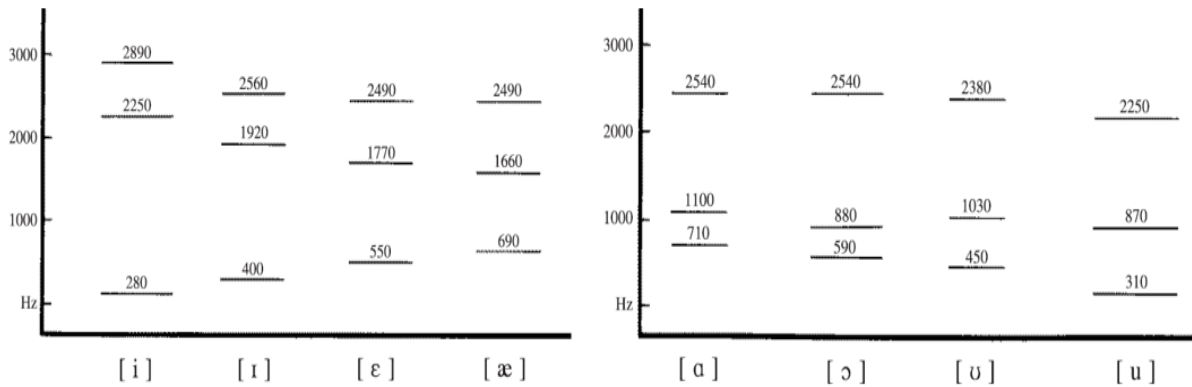
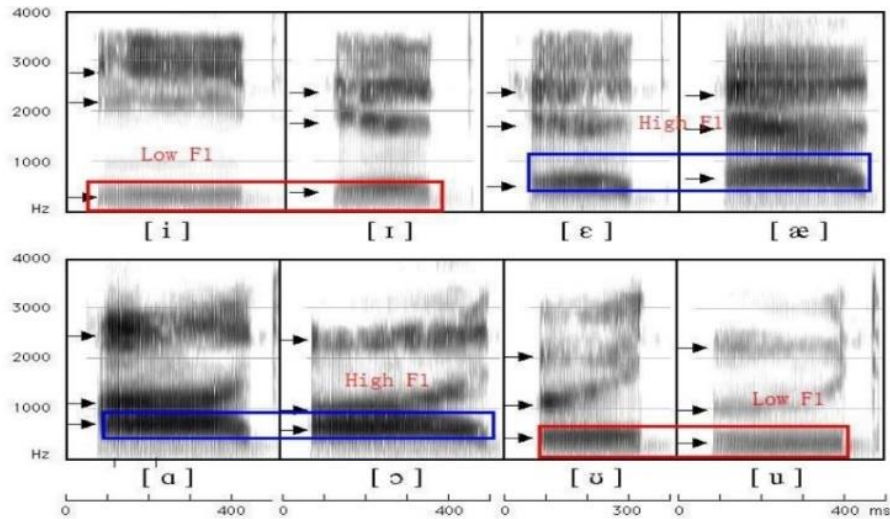


Figure 2 below is a spectrogram representation of the first formants (F1) in eight American vowel sounds, as cited from Ladefoged (2006, p. 185-187). The correlation between the first formant (F1) and vowel height operates in an inverse manner. First, vowels articulated with a fronted tongue, such as /a/, become characterized by reduced F1 frequencies. However, the vowels that are produced by the tongue in the higher position in the oral cavity, like /i/ and /u/, are the ones that have the lower F1 frequency. This phenomenon can be attributed to the spatial dynamics within the oral cavity during vowel production: lowering the tongue will expand the oral cavity area, so the resonant frequency will decrease and this means that the higher F1 will be produced. Conversely, a raised tongue position will have a less vocal cavity space and therefore will result in a higher resonant frequency (F1). Red color is used to indicate front vowels with higher F2, and blue signifies back vowels with lower F2 frequencies.

Figure 2:

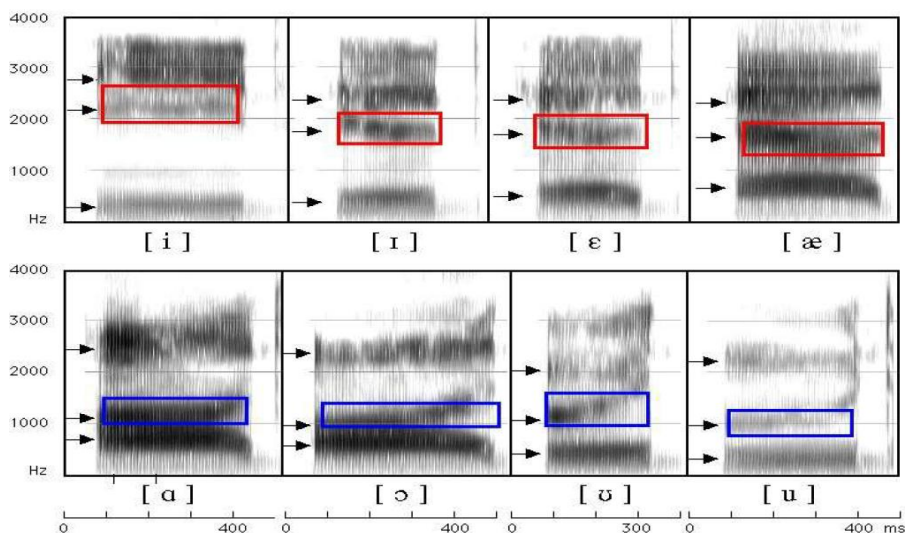
The First Formants (F1) in Eight American Vowels. (Ladefoged, 2006, p. 185-187)



The second formant (F2) (Figure 3) relates to the vowel's degree of backness—how far back in the mouth the tongue is when articulating the vowel. Front vowels (like /i/) have higher F2 frequencies because the tongue is positioned forward, creating a longer vocal tract that resonates at higher frequencies. Back vowels (such as /u/), where the tongue retracts towards the back of the mouth, have lower F2 frequencies, indicating a shorter vocal tract. Lip rounding can affect F2; rounded lips can lower the F2 frequency, often seen in back vowels. In the figure, red is used to indicate front vowels with higher F2, and blue signifies back vowels with lower F2 frequencies.

Figure 3

The Second Formants (F2) in Eight American Vowels. (Ladefoged, 2006, p. 185-187)



The third formant (F3) is linked to the rounding of the lips. A lower F3 frequency often indicates more rounded lips, as observed in vowels like /u:/. However, compared to F1 and F2, F3 plays a smaller role in differentiating vowel quality. This implies, i.e., that although F3 is indicative of some factors of vowel articulation e.g., lip rounding, it plays a smaller role in differentiating vowels from each other compared to F1 and F2. Therefore, I did not consider this in my comparison.

Limitations

First, the small sample size and limited diversity could limit the generalizability of the findings. Second, the reliance on controlled speech settings instead of natural, ordinary speech may not fully capture vowel variations, which could affect real-world applicability. Finally, the selection of Ladefoged as a benchmark, although known for its comprehensive and rigorous methodology, might not fully align with Hiberno-English vowels, potentially leading to oversimplification in comparisons.

Ethical Considerations

Consent was obtained from the participants and they understood the research and their right to opt out at any time. Their identities were concealed with pseudonyms and the data collected was secured from any identity disclosure. Cultural preferences or concerns related to Hiberno-English were respected in the research process, and the data collected in the research was kept secure to ensure it did not fall into the wrong hands. The findings of the study are genuine since the research was conducted objectively and without any form of prejudice.

Results

Vowels Analysis

The pronunciation of English vowels by Irish speakers can vary significantly depending on numerous factors including geographical location, social context, and the influence of the Irish language. However, in the context of this study, I am considering Irish English as one variety regardless of the subtle differences between the different accents within Ireland. The recorded list included all 20 vowels in English, but the focus later shifted to the marked vowels—those with different frequencies and formants than those appearing on Ladefoged's spectrogram. Several vowel sounds are often pronounced differently in Hiberno-English, compared to other forms of English.

In some Hiberno-English accents, this sound can be pronounced closer to a schwa (/ə/) or even a short /i:/ in certain contexts. In phonetics, the analysis of formant frequencies provides insight into the ways in which different dialects realize vowel pronunciation, as with the vowel /i/ in American and Hiberno-English accents. Table 1 illustrates a significant increase in the first formant (F1) frequency, indicating that, compared to American English, the vowel is positioned lower, to such an extent that it verges on a schwa (/ə/). The decrease in the second formant frequency (F2), on the other hand, conveys information about some slight retraction or centralization of the vowel in Hiberno-English that does not occur in the American counterpart. The decrease in the third formant frequency (F3) is also part of the story, but its influence on the vowel lessens as we move higher in formant frequency. However, this thorough acoustic analysis of vowels emphasizes the subtlety with which vowel sounds differ across dialects thus, comprehensively demonstrating the intricate nature in which language and accent variation arise in speech.

Table 1

/i/ as in the Word "bit"

Formants Frequency	American English	Hiberno-English	Difference
F1_Hz	280	366.789434	+86.7894
F2_Hz	2250	2085.806662	-164.1933
F3_Hz	2890	2752.948699	-137.0513

In Hiberno-English, this vowel /ɑ:/ might be pronounced more fronted, somewhat resembling /æ:/. The examination of /ɑ:/ as in “start” (Table 2) shows interesting phonetic differences in American English and some Hiberno-English dialects. The /ɑ:/ in Hiberno-English shows a more advanced tongue root and a more fronted articulation than the American /ɑ:/. This can also be seen in the formant frequency data; F1 is significantly lower in Hiberno-English than in American English (615 Hz) showing a higher vowel height. F2 is slightly higher in Hiberno-English. It suggests the second formant is slightly higher and the vowel more fronted. Most importantly, there is a substantial decrease in F3 in Hiberno-English, which is critical in making the /ɑ:/ sound closer to /æ:/. Therefore, phonetic and acoustic features bring out the difference in Irish accents spoken by people in terms of vowel pronunciation and provide a clue to the vowel variety in different dialects.

Table 2
/ɑ:/ as in the Word "start"

Formants Frequency	American English	Hiberno-English	Difference
F1_Hz	710	615.489906	-94.5101
F2_Hz	1100	1157.045955	57.04596
F3_Hz	2540	1736.302784	-803.697

The next vowel is /æ/ as in the word “bat”. Table 3 shows that this sound is more centralized and less open in Hiberno-English than in American English. This vowel is pronounced in a much more central and much less open position. The first formant (F1 = 677 Hz) in Hiberno-English is lower than in American English. Therefore, a small shift towards higher vowel articulation in Hiberno-English is evident compared to American English for this vowel, which is characterized by a pronounced fall of the second formant (F2) and is associated with more peripheral vowels. Similar to American /æ/, Hiberno-English /æ/ is centralized, albeit less so than American /æ/. The third formant (F3) experiences only a slight increase. However, we still find that its effect on vowel quality is not as noticeable as either F1 or F2. Variations in the formant frequencies reveal subtle yet significant differences in the production of the vowel sound /æ/ in Hiberno-English. These variations highlight a range of distinct vowel sounds that contribute to the rich tapestry of English dialects worldwide.

Table 3

/æ/ as in the Word “bat”

Formants Frequency	American English	Hiberno-English	Difference
F1_Hz	690	677.065892	-12.9341
F2_Hz	1660	1313.028520	-346.971
F3_Hz	2490	2572.008884	82.00888

This sound /ɒ/ can sometimes be realized as /ɔ/ or even /ɑ/ in some varieties of Irish English. An examination of the vowel /ɒ/ in “cot” reveals a significant change in its realization in many varieties of Irish English where it is often realized as a /ɔ/ or even an /ɑ/. This is apparent in the comparison of the formant frequency data between American and Hiberno-English. The first formant (F1) in Hiberno-English is much smaller (554 Hz) indicating a vocalic height significantly greater than that of its American English counterpart. This large degree of lowering in F1 is a primary factor in the shifting of this vowel from something more like /ɒ/ to more like /ɔ/ or /ɑ/. The second formant (F2) also shows a large reduction, suggesting a more back vowel quality—similar to that found in /ɔ/ or /ɑ/. In addition, F3 undergoes a significant decrease, further distinguishing the dialects. The changes in formant frequencies, which represent the multifaceted nature of dialectal variations in vowel pronunciation, draw attention to the acoustic characteristics that differentiate the forms of spoken English and, furthermore, give in-depth insight into the phonetic subtleties typically conveyed by Irish English.

Table 4

/ɒ/ as in the Word “cot”

Formants Frequency	American English	Hiberno-English	Difference
F1_Hz	1475	554.642343	-920.358
F2_Hz	2811	719.315566	-2091.68
F3_Hz	5437	2378.500691	-3058.5

This vowel /e/ can be pronounced as a more open, almost closer in openness to /æ/ in certain regions. This is interesting because when we look at a plot of F1 values for /e/ (as in “bet”) in American English and regional varieties of Hiberno-English, we can see that Hibernocentric varieties tend toward a realization of /e/ that is more open, approaching /æ/. These data allow us to better understand the phonetic basis for this regional variation. A significant decrease in F1 from American English to Hiberno-English by approximately 920 Hz suggests a substantial shift towards a higher vowel articulation in Hiberno-English. This dramatic reduction implies that the vowel in question is articulated with the tongue positioned closer to the roof of the mouth in Hiberno-English compared to its American counterpart. The second formant (F2) is considerably lower, an indicator of retraction or, in fact, a backward movement of the tongue, moving closer to /æ/. This very marked difference in the F1 frequencies between the two dialects corresponds to a huge difference in the means of realization

of the same vowel sounds and therefore to a drastic change in the quality of vowels. This placement could contribute to the perceptual differences recognized by listeners familiar with both dialects.

Table 5

/e/ as in the Word "bet"

Formants Frequency	American English	Hiberno-English	Difference
F1_Hz	550	532.034938	-17.9651
F2_Hz	1770	1643.078392	-126.922
F3_Hz	2490	2584.813317	94.81332

The vowel sound /ɒ/ might be pronounced more like /ʌ/ in some dialects, exhibiting a more centralized tongue position. It shows significant phonetic variation; in many dialects of English, the vowel is raised to something more like /ʌ/ with a mid-centralized tongue position. The formant frequency data provide a taste of such variation; in these dialects, the first formant (F1) is significantly higher at 515.202250 Hz, compared to 450 Hz for American English, suggesting a marginally higher tongue position “Table 6”. Moreover, the second formant (F2) increases sharply from 1030 Hz to 1129.470473 Hz, thus drawing the vowel even closer to the standard for schwa. Surprisingly, the third formant (F3) is notably less; it stands at 2181.010184 Hz down from 2380 Hz, with important implications for vowel range. Thus, formant data show some phonetic minutiae that distinguish the pronunciations of vowels among dialects, and hints at some of the causes for rich variety in English dialects.

Table 6

/ʊ/ as in the Word "put"

Formants Frequency	American English	Hiberno-English	Difference
F1_Hz	450	515.202250	65.20225
F2_Hz	1030	1129.470473	99.47047
F3_Hz	2380	2181.010184	-198.99

In Hiberno-English, the diphthong /əʊ/ might be realized acoustically as a monophthong pronounced something akin to /o:/ or /ɔ:/. The /əʊ/ as in *go* is an important token of the phonetic inventory of Hiberno-English, as compared to American English. In Hiberno-English, this diphthong tends toward a more monophthongal initial position, such as the realization as /o:/ or /ɔ:/. This difference is clearly marked in the formant frequency data in Table 7. For /əʊ/ in Hiberno-English, the first formant (F1) is significantly lower (356 Hz) than in American English, indicative of a more closed vowel quality, consistent with the sounds of /o:/ or /ɔ:/. The decrease in F2 from American English to Hiberno-English by approximately 104 Hz suggests that, for this particular vowel sound, Hiberno-English speakers tend to produce it with slightly

more backness compared to American English speakers. The third formant (F3) undergoes a modest rise, but it is less important to the overall variability of the vowels considered. These acoustic properties reflect the movement of /əʊ/ from a diphthong to a more monophthongal realization in Hiberno-English and serve to add not only to our understanding of the unique phonetic inventory of this variety, but also to our understanding of the variance of vowels in English dialects.

Table 7

/əʊ/ as in the Word "go"

Formants Frequency	American English	Hiberno-English	Difference
F1_Hz	539	356.605812	-182.394
F2_Hz	886	782.154106	-103.846
F3_Hz	2485	2514.145162	29.14516

As can be derived from the data in Table 8, the diphthong /aɪ/ can sometimes be realized as /ɔɪ/ in a rounded fashion in specific contexts. The first formant (F1) of Hiberno-English (1781.424406 Hz) is considerably lower than that of American English, suggesting that the Hiberno-English vowel system employs a more open vowel position, which corresponds to the /ɔ/ element of the /ɔɪ/ diphthong. Additionally, the significant increase in the second formant (F2) in Hiberno-English demonstrates that the vowel /ɔɪ/ is produced with the tongue positioned much nearer to the front of the oral cavity, sliding from the mid-back to high-front. The Hiberno-English vowel is characterized by an F3 peak that is particularly sharp compared to the American version of the pronunciation. The comparison of formant frequencies reveals that the /ɔɪ/ diphthong in Hiberno-English is pronounced with a more open and fronted vowel articulation compared to American English, as indicated by the variations in F1 and F2. This difference, along with a distinctive F3 peak, highlights the unique vowel production and the phonetic diversity between the two dialects.

Table 8

/aɪ/ as in the Word "my"

Formants Frequency	American English	Hiberno-English	Difference
F1_Hz	771	1781.424406	1010.424
F2_Hz	1320	2995.841737	1675.842
F3_Hz	2787	5437.143417	2650.143

In some Irish dialects, the sound /i:/ might exhibit a more centralized quality, which can be quantified using formant frequency data to analyze this phonetic variation. When compared to American English, Hiberno-English's first formant (F1) exhibits a slight increase (301 Hz), suggesting a slightly higher vowel height—more akin to /ɪ:/. The second formant (F2) is also higher in Hiberno-English, where there is a shift towards a more centralized and fronted tongue position, indicative of the quality of the sound. Meanwhile, the third formant (F3) is lower, indicating a slight retraction and a relatively more back position of the tongue, although the

effect on vowel quality is not overly detrimental. The change in these formant frequencies reveals that in the Irish variety under discussion, the vowel /i:/ has shifted to a more centralized /ɪ:/, which, although slight, represents a significant articulatory modification

Table 9

/i:/ as in the Word "seat"

Formants Frequency	American English	Hiberno-English	Difference
F1_Hz	280	301.598350	21.59835
F2_Hz	2250	2439.968462	189.9685
F3_Hz	2890	2707.026918	-182.973

The diphthong /eə/, as in “hair”, shows a clear phonetic difference in some Irish English accents where it is often realized more as a monophthong and sounds extremely close to /ɛ:/. The formant frequency data provide clear evidence for this difference. The first formant (F1) is significantly lower (396.802053 Hz) in Hiberno-English, indicating a closer vowel quality to /ɛ:/. The second formant (F2) also decreases, albeit to a lesser extent, reflecting a movement of the vowel into a more centralized position and this is a characteristic quality of /ɛ:/. The third formant (F3) also shows a decrease, further indicating that this pronunciation is different from the vowel in American English. These acoustic differences demonstrate clear acoustic evidence of a shift from the diphthong /eə/ to a more monophthongal /ɛ:/ pronunciation in Irish English, reflecting the diversity of linguistic and phonetic characteristics that arise from differing regional dialects and accents in the English language.

Table 10

/eə/ as in the Word "hair"

Formants Frequency	American English	Hiberno-English	Difference
F1_Hz	655	396.802053	-258.198
F2_Hz	1710	1607.884732	-102.115
F3_Hz	2021	1874.728897	-146.271

The vowel /u:/ as in "boot" shows a phonetic shift in some dialects, notably in Hiberno-English, where it is pronounced with a more fronted tongue position, close to /ʉ:/. This shift is clearly shown in the formant frequency data in Table 11. In Hiberno-English, the first formant (F1) is slightly lower (289.537601 Hz) than in American English, reflecting a marginally more closed vowel. This change is even more significant in the second formant (F2). Fronting of the tongue can be inferred from the substantial increase in F2 values observed in this data. Such fronting is an important feature of /ʉ:/. In addition, the third formant (F3) also rises considerably. It is perhaps this prominent expansion in the vowel that typifies Hiberno-English. These formant changes demonstrate the nuanced shift from the traditional /u:/ in certain Irish accents to

approximate a /ʌ:/-like sound, thereby reflecting the interesting variations that can also take place in the vowel pronunciation between different dialects of English.

Table 11
/u:/ as in the Word "boot"

Formants Frequency	American English	Hiberno-English	Difference
F1_Hz	310	289.537601	-20.4624
F2_Hz	870	1092.259472	222.2595
F3_Hz	2250	2693.880659	443.8807

Vowel analysis and formant frequencies in American and Hiberno-English indicate distinct phonetic variations associated with each variety, which highlights the diversity and uniqueness of English pronunciation globally. F1, F2, and F3 play a key role in illustrating the differences in vowel height, backness, and roundness in accents, calling attention to the dominance of regional characteristics in speech. The assimilation of vowels from close to open or centralized vowels or the conversion of diphthongs to monophthongs illustrates the complexity of the dialect. Through this research apart from depicting the beauty of English accents it associates acoustic phonetics with language variation and change.

Thematic Analysis

From the interview analysis, a number of themes emerged related to Hiberno-English as a whole, with the vowels being central to the investigation even if it is not mentioned directly. In other words, when accent, dialect, or a variety is mentioned, we know for sure that none of these can be without vowels, which vary too.

Regional Variation and Identity

The interview starts with observing the regional differences in pronunciation of the word "ride" focusing on the variations stemming from different vowel articulation. So, for example, "the /aɪ/ sound in 'ride'" is contrasted with the rounded vowels in words like "oil." One respondent said: "Oh, ride. Yeah. I've never thought about it. I say ride. Right. Yeah, ride a bike. As in right, as in fight. You can hear it in some places with little rounding as the vowel oil, foil, and the like." This indicates how the dialogue about accents plays an important role, stressing the significance of regional spoken language variations to the entirety of linguistic diversity.

In addition, the responses show how social classes, education levels, and pronunciation are inseparably tied to the regional variations, which results in language use differences. As expressed by one respondent: "It doesn't only depend on parts of the country, but it can also depend on, if we can say so, levels of education, social class as well." This indicates the intrinsic relationship between language and social identity — "Young people farther away (from the east coast) often speak with certain words that we call mid-Atlantic accent – This shows the evolving nature of the language being influenced by social factors like where a person was raised or what education the person has had."

Another point the interview revealed was the influence of American and British media on linguistic practices, highlighting how regional cultural spaces within a country can shape linguistic identity, particularly among the younger generation. One of the interviewees explained: “The cultural influence and identity formation engage in a complex struggle when language becomes the battleground.” Another influence, as revealed, comes from immigration, which plays a role in contributing to the linguistic diversity and the development of regional accents. Another respondent added, “There is real potential for change, but this is not just caused by American influence. There is also large migration to Ireland.”

This tells us that regional linguistic identity is considered one of the pillars when it comes to personal and communal identity maintenance both during shifts and globalization processes. The responses accentuate the view on the diversification of dialects, which express the theme of identity, with local perspective in a way exploring how language defines regional, cultural and human nature. Therefore, it demonstrates that local dialects are not only connected to aspects such as geographical, economic and social differences but also play a core function in the creation of the individual and collective identities.

Social Mobility and Linguistic Flexibility

The discussion about young people who assimilate to what is commonly known as a mid-Atlantic accent during their college years illustrates linguistic flexibility as a response to social mobility. This is clarified by one of the interviewees: “The cases of young people who adopt a mid-Atlantic accent when they go to college, and we call this assimilation. This accent adaptation signals a bid to comply with a more cosmopolitan or conspicuously trendy identity, usually linked to university and a wider social spectrum.”

Moreover, the transcript suggests that social class and level of education can impact pronunciation, thus showing that there are some markers of social mobility within linguistic practices. As one participant puts it: “Indeed, social class and education level can affect how people pronounce; there are sometimes indicators of social mobility in linguistic practices.” People's speech discloses two kinds of information through words: the content expressed by the language and the speaker's social position and their ambitions.

The influence of the American and British media on the pronunciation of younger generations speaks of the globalization of cultural influences that may cause speakers to sound as if they were from a place other than where they live. One participant stated: “Okay now, you know that the TV shows and movies from the Americans will change the accent.” This occurrence provides evidence of the possibility that young people and perhaps other groups might adopt linguistic elements from global cultures while trying to find a sense of belonging within a bigger and more socially and culturally interconnected circle of people.

The impact of migration on Irish accents and how diverse accents have been accepted into the local speech serves as an illustration of the linguistic adaptability of the community in the face of demographic changes: “... not entirely due to American influence, rather the large migration to Ireland contributes to this shift.” The fact that linguistic adaptation underpins the processes of social advancement supported by a fluid environment of constant movement speaks volumes about the progress of languages, human beings and their race-informed sense of identity.

We can conclude that social mobility and linguistic flexibility underscore the capacity of individuals to adapt their language use in response to changing social contexts, aspirations, and influences. This linguistic adaptability is considered a key facet of social communication, allowing individuals to adapt themselves to desired social groups, navigate social hierarchies, and respond to the pressures and opportunities of a globalizing world.

Media Influence and Globalization

In an ongoing conversation about the choice of youth to speak accents and phrases similar to Americans, the topic of the immediate influence of global media uses is raised: "Okay now, you know how the American and British TV shows and movies will affect the accent they sort of have because those shows have more American than...they tend to adopt more American impression." This trend demonstrates the ever-increasing power of the American market through its mass media exports, showing us that mass media today have networking abilities as well as the potential of a cultural exchange medium.

The observation of youth adopting an American accent and using American words shows young people's identities are based on that of this globalized generation. Although communicating through the world's media popularizes American English, young people struggle with a decision between the global influence and settling in their local linguistic identity: "Younger generations watch cartoons and... So. Disney. Yeah. They almost look like natives by their American accent." The idea that this type of interaction indicates how globalization goes hand-in-hand with the preservation of local culture is illustrated by the use of language as an explicit element.

The transcript conveys that the national media surge makes the youth flexible in their language since they are the most uninhibited persons who become keen to incorporate foreign cultures in their identity: "I suppose the youth will if they have been constantly immersed in more American than British TV and movies rather than properly educated on the British language." This trait seems to be inherent to the process of globalization with the concept of identity becoming increasingly variable and the language practices embracing both the global and the local nuances.

In doing so, the fact that migration trends go hand-in-hand with the media's impact on discourse practices highlights the complex picture of globalization which implies not only the flow of media and ideas, but also the movement of people: "It's also the huge migration to Ireland." Migration impacts language and culture by offering new influences and diversity that eventually result in complexity and variety in global and local communications or interactions. The transcript deals with media influence and globalization and highlights that the phenomena are part of a wider horizontal perspective where the global media serves as a channel and motor for cultural and linguistic change, thus challenging and confronting the society.

Code-Switching and Context-Dependent Speech

The interview illustrates that when young people living in bilingual or multiple-language contexts speak a different code depending on where they are. This habit shows that depending on the social class, people may adjust their pronunciation to suit the given atmosphere, as we noticed in the example of the taxi driver below. Social contexts, such as formal events or less

formal conversations with certain social groups, might lead people to change their accent or pronunciation.

This signifies a social awareness of the stylistics of language use and a purposeful communication style in which the speakers will choose the language that they perceive as most befitting or beneficial at a particular time. Here is a taxi driver anecdote:

A taxi driver once told me that a group of young ladies from going to university got into his car going out at night and they were speaking in their college accent. And by the time that he picked them up to bring them home, they were after having a pleasant evening and imbibing some alcohol. And they were now talking in their rural, Tipperary, Clare accents. So, what I'm saying is that people will revert. They are conscious about what they are saying, they will start to use the standard.

The anecdote above about individuals reverting to their regional accents after a night out serves as a poignant example of how context-dependent speech can be influenced by emotional states or a sense of belonging. This reversion to a more authentic or comfortable linguistic identity in familiar or informal settings underscores the deep connection between language and personal identity. This approach is a way of changing one's language depending on different social surroundings or norms in order to facilitate communication, demonstrate identity or gain social status. In addition, delving into code-mixing and context-dependent speech demonstrates how intricate the link between language, personality, and social context is. It is a manifestation of how people use linguistic fluidity to conform to various social worlds, negotiate personal identities within relational borders, and adapt to the globalizing tendencies of the media and culture.

From the analysis above, I am therefore in a position to justify, correlate, and explain the observed variations in vowel frequencies and formant patterns in relation to important linguistic parameters such as regionalism, mobility, and media. It must be recognized that regional identity is likely an influential factor contributing to the development of distinct vowel peculiarities within specific communities, particularly due to the tradition of passing down dialect norms from one generation to the next. Social mobility may lead to shifts in aspects such as the use of new vowel sounds, as individuals change their speech patterns due to a change in social status or occupation, especially when entering higher education institutions or moving to urban areas. Moreover, media pressure, particularly from American and British sources, can influence young speakers to adopt a more neutral phonemic variation, which is considered more prestigious. Thus, by combining these factors with the acoustic analysis, we gain a richer perspective on how social factors influence phonetic variation in Hiberno-English.

The Future of Irish English

There is an emphasis on the role of the immigrant population in solidifying the status of both Irish and English as the co-official languages of Ireland. People coming into Ireland with different mother tongues, automatically leads to the adoption of diverse accents and dialects in the country that accounts for a multifaceted and intriguing Irish English: "It might be influenced by Americans, and it also is because of the large influx of immigration into Ireland." This transformation, which is part of the ongoing change, helps the language used in Ireland evolve alongside global migration trends.

Despite globalization and multiculturalism, the tradition of Irish English, principally its accent, inherent warmth, and regional vernaculars, is likely to be retained. The interview highlights that although the external pressures are quite perceptible, there is no likelihood of them completely taking over the beautiful mosaic of regional accents in Ireland: "I feel that the Irish accent will probably always stay the way it is... But the combination of the two together I do not think they can do; most Irish people wouldn't use them." Through this persistence, we can also see the pride and the preservation of identity and rootedness among Irish language speakers.

Discussion

Vowels

The findings show the subtle ways in which the different vowel sounds vary across the American English and Hiberno-English dialects and how these dialects are phonetically diverse. Our study highlights the complexity of vowel pronunciation, which comes about due to different designs of formant frequencies that create the rich dialectal diversity of English. Within this context, the analysis reveals that vowels such as /ɪ/, /ɑ:/, and /æ/ in Hiberno-English go through considerable phonetic adjustments that are distinct from what may be found in American English when it comes to the way vowels are pronounced.

Specifically, these shifts often pertain to adjustments in formant frequencies that entail modifications of vowel height, frontness, and rounding, resulting in these vowels typically being pulled towards either a schwa (/ə/) or showing retreating or central tendency. This pattern of vowel sound adaptation illustrates the unique and original phonetic identity that Hiberno-English comprises. These findings do, in fact, add to prior research on accents of English, as those documented by Wells (1982) and Hickey (2008). Therefore, we can conclude that the first hypothesis—assuming that Hiberno-English possesses a distinct set of vowel sounds influenced by the Irish language and significantly varied by regional and social factors—has been verified.

Also, those variations are the basic factor of dialect formation in sociolinguistics, and they prove that a dialect is the reflection of social, geographical, and cultural differences supported by formant frequency data. This highlights the critical role of phonetics in sociolinguistic studies, exemplified by the advanced tongue root in Hiberno-English /ɑ:/ contrasting with its counterpart the American /ɑ:/, which is generally understood as a characteristic of the dialects in which it is found but not only as a mere phonetic differentiator. It enhances our understanding of the delicate connection between language, society, and culture more vivid. The notion of the social factor elucidated in our research is reinforced by the study undertaken by Tieken-Boon van Ostade (2000), which illuminates the processes by which vocabulary and pronunciation are shaped and influenced by social networks and interactions. The phonetic differentiator mentioned earlier can support the second hypothesis: the distinctive acoustic features of Hiberno-English vowels, identified through formant frequencies and qualitative analysis, differentiate them from vowels in other dialects.

As the discussion progresses, the participants come to the conclusion that dialect evolution is characterized by dynamicity strongly associated with globalization. The media and migration significantly affect language use which suggests that even the phonetic features of language varieties like Hiberno-English are on the path to further evolving. The interaction

between American mass media and Hiberno-English multilingualism implies such a process, demonstrating the constant negotiation between local linguistic identities and global cultural influences. These results are in line with the work of Stuart-Smith (2007) and Stuart-Smith et al. (2013). The scenario expresses dialect fluidity, the adaptation and reshaping of these dialects that happens as a result of the influences from outside the society.

Dialectal diversity can enrich the language, adding complexity since vowels in different regions tend to sound different. Here the complexity of the association between language and society becomes evident emphasizing how the way in which one speaks aligns with one's social identity as emphasized by Hickey (2008). Vowels, as we have asserted, are integral to those linguistic features that stand out in any given variety.

Thematic Analysis

The thematic analyses carried out show how Irish English functions as a complex communication medium involving language, society, and identity. Each theme uncovers the sociolinguistic environment of Ireland and challenges many language debates such as differences caused by regional dialects, social advancement, how the globalizing world influences grammars and the complexity of code-switching.

The consideration of regional differences and personalities shows how strongly language is rooted in place. It is an identity carrier at the regional level, and changes in pronunciation and dialect highlight the sense of belonging to a particular region. Such an investigation exposes the intricate details of how social group and educational status come together to form an identity with many facets to it, making the landscape of speech diverse. Additionally, media and migration trends suggest that regional identities are dynamic and adaptable. These identities can absorb new influences while preserving essential elements that connect people to their cultural heritage. These findings align with the work of Stuart-Smith (2007) and Stuart-Smith et al. (2013).

Language is an instrument that provides ways to navigate the complexities of society. Teens who are among the earliest to incorporate a 'Mid-Atlantic accent' in their speech are also seen as a testament to a growing phenomenon: adaptation to social environments by using a mix of different language varieties. This highlights language as the key element that serves the purpose of achieving social mobility as a tool for navigating social classes. People are using strategies like assimilation and mixing languages in order to fit into the groups and project their identities. It implies a competition in which the ability to speak and achieve social goals are restrained by privileges, opportunities and the ambition of fitting in. This concept of adaptation is consistent with the accommodation strategy explored by Rahmasari et al. (2022).

Media and globalization, as two influential forces in the language process, have put a spotlight on the prominent role of global media agencies in creating linguistic trends. American slang and accents appropriated by Irish youth through TV shows, movies, and online media channels reveal the extent of American culture, mediated through TV, films and online platforms, is absorbed by others. These dynamics of cultural interaction often occur at the expense of local non-dominant language groups. It implies the global media can act as a barrier for the exchange of culture, but at the same time, challenging well-established language norms which are replaced with a mix of lingual phrases that also reflect globalization itself. The

influence of American media on English dialects around the world has been emphasized by some prior research. For example, Bolton (2010) researched American English and the media, and Mammadzada (2023) discussed American English and its influence on British English.

The idea of code-switching and discourse-appropriate speech highlights language's ability to adapt to the environment and the strategic use of speech in different socio-cultural situations. It conveys the success of the individual in navigating among different linguistic codes and uses of speech in different speech contexts, depending on their audience and objectives. This idea emphasizes the capacity of vocabulary to impart certain social cues, as well as the unique space it creates for personal identity, group alignment, and communication. In the context of our study, the exploration of code-switching within language is supported by prior works in the following chronological order: Auer (2005), De Fina (2007), Abdul-Zahra (2010), Auer (2013, Ed.), and Anchimbe (2015).

The topic of Irish English's future addresses the way this dialect is changing as a result of globalization, the spreading influence of media worldwide, and the prevalent processes of immigration. It envisions a path where Irish English continues to retain its traditional components while simultaneously integrating new linguistic properties. This scenario proposes a balance between maintaining tradition and welcoming innovation, ensuring that the distinctiveness of local accents and the flexibility of its speakers contribute to the ongoing vitality and depth of Irish English. This perspective is supported by insights from Filppula et al. (1993) in *Changing paradigms in the study of Hiberno-English* published in the Irish University Review, and by Pietsch (2010) through *What has changed in Hiberno-English: Constructions and their role in the contact-induced change*, demonstrating the ever-changing behavior of English influenced by global and methodological factors.

The study of formant frequencies in both American and Hiberno-English accents illustrates a varying foundation of vowel sounds across the dialects. In this way, we develop a more profound understanding of the importance of phonetics not only in terms of studying language variation but also, in sociolinguistics and dialect adoption to our increasingly interconnected world. At the same time, the emerging themes present a holistic reflection on the sociolinguistic dynamics of Irish English. They reveal how language serves as a mirror for social identity, navigates globalization's complexities, and adapts to the rapidly changing world.

Conclusion

The phonetic patterning of Hiberno-English such as the vowel sounds having distinct differences acoustically from other English dialects was confirmed by this research. Molded by the interests of geography, cultural context, and external influences, Irish English vowels are a distinct system. The localized speech varieties and the use of unique vocabulary, the influence of the media and the toggling between different codes as well as merging the old with the new are the elements of a dialect that upholds tradition but allows for innovation too. Drawn from a comparison of localities, the investigation has the ultimate goal of demonstrating how Hiberno-English exhibits the abundance of complex phonetic features that it acquires from a more connected world. Language dialect as a whole reflects the relationship between language and group affiliation by its intricate and ever-changing identity. On the other hand, that keeps the

door open to new lines of research to be put forward. The vowels are the eloquent expression that allows people to conserve the essence of tradition despite an ever-changing environment.

Implications

The study aims to display the phonetics and sociolinguistics of Hiberno-English, focusing on vowel variation and its sociocultural implications. It reveals significant phonetic shifts in vowels like /ɪ/, and /ɑ:/. Furthermore, the /e/ and /æ/ compared to their English counterparts, illustrate the Hiberno-English's distinct phonetic sound. Thus, we have variations that arise from the social, geographical and cultural forces, which indeed points to the contribution of phonetics to sociolinguistic analyses and accent formation. The linguistic reality as influenced by globalization, the media, and migration is constantly changing and has become a highly diverse world where different dialects are continuously developing. Beyond this, thematic analyses of the sociolinguistic environment of Ireland consider regional dialects and the phenomenon of code-switching, alongside the influence of social standing on language, emphasizing the inseparable nature of language and identity. This diverse and continuous phonetic patterns examination provides us with comprehensive information linked to our initial questions and assumptions, which depicts the rich phonetic diversity of Hiberno-English in the global context.

Bio

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