UDC 811.111

THE STUDY OF THE PRONUNCIATION OF INTERDENTAL SOUNDS IN ENGLISH

Tazhenova Dana
tazenovadana2436@gmail.com
1st-year undergraduate student in the major of "Translation and Translation Studies"
Khalel Dosmukhamedov Atyrau University, Atyrau, Republic of Kazakhstan
Scientific Supervisor: Candidate of Philological Sciences, Associate Professor Bainiyeva K.T.

Introduction: While interdental sounds are actually quite rare if you look at languages globally, they are a fundamental part of how English works. We treat them as phonemes, which basically means they are the "deciding factor" when we need to tell the difference between two words that sound nearly identical. [1]

Even though there are only two of them, they are a huge point of interest for linguists because of the unique way we have to move our mouths to produce them and the way they shift so dramatically across different accents. [2]

This discussion looks at the physical mechanics of these sounds, how they show up in the IPA, and why they are such a notorious challenge for anyone trying to learn English as a second language [2].

Interdental sounds**.** Producing these sounds is all about precision: you have to place the tip of your tongue right between your upper and lower teeth. This is a subtle but important step that separates them from standard "dental" sounds, where the tongue stays tucked behind the teeth [3].

In English, we almost always see this represented by the "th" spelling, as in *that* and *whether.*

When you force air through that tiny gap, it creates a turbulent, "fuzzy" noise known as a fricative [1]. These interdental fricatives are represented by the following symbols:

IPA Symbol	Articulatory Description	Examples
θ	voiceless interdental fricative	*math* [mæθ], *thatch* [θætʃ]
ð	voiced interdental fricative	*bathe*[/beɪð], that [ðæt]

Other interdental sounds may be represented in the IPA as alveolar consonants marked with the advanced diacritic, indicating the place of articulation is shifted forward toward the teeth:

IPA Symbol	Articulatory Description
t̪	voiceless interdental plosive
d̪	voiced interdental plosive
n̪	interdental nasal

Interdental fricatives. If you were to look at this on a spectrogram—a tool that lets us see sound requencies—you'd notice these sounds appear as messy, diffuse patterns[4].

Unlike the [s] sound, which has a very sharp and intense high-frequency energy appearing as a darker area, interdentals like [θ] are much more spread out, looking quite similar to an [f] sound [5].

Definition:

A **spectrogram** is a graph of a sound wave's component frequencies over time. Component frequencies are the range of frequencies present in the sound.

A spectrogram provides important clues about the nature of different speech sounds by visually representing a sound wave's component frequencies over time. This visual difference reflects the acoustic properties of fricatives and helps researchers distinguish between different places of articulation.

How /θ/ and /ð/ are realized in various English dialects:

Variety	**/θ/ realization**	**/ð/ realization**
General American	interdental [θ̪] (tongue between teeth)	voiced [ð̪] (also interdental)
British RP (England)	dental [θ] (tongue against upper teeth)	[ð] dental
Cockney/Estuary	[f] (th-fronting)	[v] (for /ð/)
Irish English	[t] (th-stopping)	[d] (for /ð/)

Interdental consonants**.** Interdental consonants can appear in languages as phonemes or as allophones.

Definition:

A **phoneme** is a single unit of sound that is meaningful and capable of distinguishing words from one another in a language.

Allophones are different articulatory realizations of the same phoneme. For example, the [t] sounds can be produced with or without an exhalation of air.

In English, the voiced and voiceless interdental fricatives /θ/ and /ð/ function as phonemes. These are the only interdental phonemes in the language. However, their pronunciation may vary depending on the speaker and context.

English speakers may realize these phonemes through different allophonic variations, such as:

- Alveolar stops [t, d]
- Labiodental fricatives [f, v]
- Dental fricatives [θ̪, ð̪]

Some examples of interdental sounds in English are:

1. /θ/ - as in "think"
2. /ð/ - as in "this"
3. /s/ - as in "sip"
4. /z/ - as in "zip"
5. /n̪/ - as in "n̪apkin" (this sound is sometimes considered an allophone of /n/ in English)

It is worth considering why English maintains these difficult sounds at all, given their rarity in other languages. Linguists often point to their "functional load"—the job these sounds do in distinguishing words.

While there aren't many "minimal pairs" for /θ/ (like *thigh* vs. *tie*), the voiced /ð/ is workhorse of the English language. It appears in some of the most frequently used functional words: *the, this, that, they, then,* and *there*.

If a speaker replaces /ð/ with [d], it doesn't just change a sound; it shifts the entire "rhythm" of their speech, which is why these interdentals are so closely tied to our perception of a "standard" accent. This also explains why the assimilation in words like *width* [wɪt̪θ] happens so naturally—the tongue is essentially taking a shortcut to prepare for a high-frequency sound, showing that even "proper" speech is always looking for physical efficiency.

Some speakers of Malayalam, a language spoken in Southern India, produce the interdental nasal [n̪], whereas other speakers produce the dental nasal [n̪]. This was seen in words like /pun̪n̪i/ (which means *pig*) in research done by Peter Ladefoged and Ian Maddieson. [7]

The English word *width* is usually transcribed as [wɪtθ]. For some speakers, the voiceless alveolar stop [t] assimilates to the position of its neighbor, the voiceless interdental fricative [θ]. The result is the voiceless interdental stop [t̪].

The speech pattern called **a** lisp involves replacing the alveolar fricatives [s] and [z] with the interdental fricatives [θ] and [ð]. Just like with [t̪], [d̪], and [n̪], this pattern advances the place of articulation of an alveolar consonant.

Perception vs. Production**.** An important distinction in learning these sounds is the difference between perception and production. Many learners can hear the difference between /θ/ and /s/, or /ð/ and /d/, but still struggle to produce them correctly.

This is because recognizing a sound and physically producing it involve different processes. Accurate pronunciation requires motor training—training the tongue and speech organs—not just listening.

As a result, exercises that focus on slow, controlled articulation are often more effective than passive listening.

This perceptual gap is further compounded by the fact that interdental perception is multimodal. To be more specific, one key aspect in which the /θ-ð/ continuum differs from other fricatives is that their perception depends heavily on visual information. Interdentals are high-visibility sounds; the tongue's position between the teeth is visible to the interlocutor when producing these sounds. Among phonemes, /θ/ and /ð/ are perhaps unique in that they are relatively easily lip-read; so, for many language learners, there may be an extra visual part involved in decoding a relatively weak acoustic signal. When the visual signal is eliminated (e. G., in phone conversations or when both parties are wearing masks) accuracy in differentiating interdentals from labio-dentals /f-v/ drops significantly.

So, from the point of view of acquisition, mastering English interdentals is not so much of an auditory problem as a multimodal challenge where language learners need to see as well as hear. As a result, motor training should also incorporate both the acoustic and the visual aspects of English interdentals to narrow down the gap between perception and motor control.

Difficulties for language learners**.** Understanding these sounds isn't just an academic exercise; it gives us a much better handle on the mechanics of English and helps us understand the genuine hurdles that language learners face. English possesses nine fricatives: /f, v/, /θ, ð/, /s, z/, /ʃ, ʒ/, and /h/. Eight of these work in voiceless–voiced pairs and differ from each other in place of articulation, while /h/ remains voiceless without a voiced equivalent.

Since interdental sounds are globally quite rare, they often become a major stumbling block for students, especially if their native phonology doesn't require placing the tongue between the teeth.

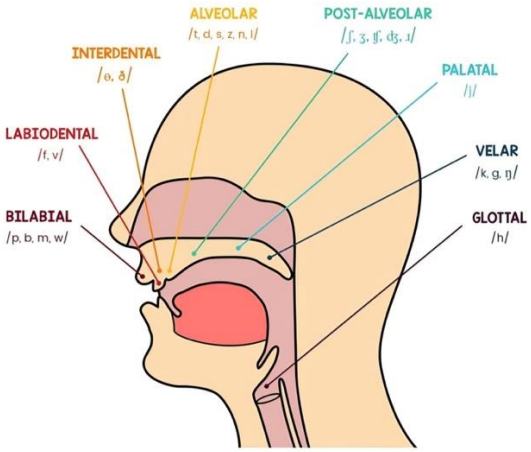
It is perfectly natural for a learner to reach for the closest familiar sound in their own "mental map"—which is why, according to Celce-Murcia et al. [6], we so frequently hear /θ/ turn into [s] or [t], while /ð/ often shifts toward [z] or [d]. These substitutions are often the result of "slight shifts" in either the place or manner of articulation. For example, in Japanese-L1 learners, the labio-dental fricative /f/ is often replaced by the voiceless bilabial fricative /ɸ/ (as in "Fuji"). Because English listeners align this with the only voiceless bilabial phoneme they have (/p/), a word like *coffee* can sound like *copy* or *fur* like *purr*. This demonstrates how a minor articulatory shift can have a serious impact on intelligibility.

Simply hearing the distinction is rarely enough to fix these habits. Real progress usually requires a clear, physical breakdown of where the tongue actually goes. Using Praat offers a way to verify pronunciation through acoustic analysis.[5]

Teaching strategies. From a practical standpoint, teaching interdental sounds works best when multiple approaches are combined:

- Visual demonstration of tongue placement
- Physical awareness of airflow
- Practice with minimal pairs (*thin–sin, then–den*)

It is also important to note that perfect pronunciation is not always necessary for communication. Many substitutions are widely understood in global English contexts.



Bilabial	Labiodental	Interdental	Alveolar	Palatal	Velar	Glottal
[p]ie [b]uy			[t]ie [d]ie		[k]ite [g]uy	
	[f]ie [v]ie	[θ]igh [ð]y	[s]igh [z]ion	me[š]er mea[ž]ure		[h]igh
				[č]ime [ǰ]iant		
[m]y			[n]igh		si[ŋ]	
			[l]ie [r]ye			
[w]hy				[j]ou		

Sociolinguistics and "standard" speech In addition to being tricky to pronounce, interdental fricatives have rich sociolinguistic connotations in the English speaking world. /θ/ and /ð/ are the defining phonemes of "Standard" English (e. G. RP, General American), so the replacement of these sounds often indexes a particular geographic region or social setting. So-called "th-stopping, " or replacing /ð/ with [d], is a classic marker of African American Vernacular English (AAVE) and New York City English, not a sign of linguistic deficiency. It is not surprising then that language learners often struggle with the correct articulation of these sounds.

Their pronunciation can lead to subconscious associations with a speaker's education level and learners must navigate a web of sound changes and social dynamics that go beyond simply putting one's tongue between one's teeth. The evolutionary fragility of interdental fricatives /θ/ and /ð/ are the most important phonemes in modern English but also two of the least common sounds in the world's languages. Interdentals happen in only 5% of the world's phonologies [8], since they are both acoustically weak and articulated in a difficult (non-economic) manner.

As a result, in most languages interdentals are the first sounds to weaken or replace over generational time: I. E., they undergo "phonetic attrition". We can actually see this process playing out in real-time for speakers of Multicultural London English (MLE) as /θ/ and /ð/ are slowly being replaced by labiodentals [f, v]. So, English interdentals may never be a feature of the spoken form of the language.

Conclusion. In conclusion, interdental consonants in English, specifically the fricatives /θ/ and /ð/, represent a small but essential part of the phonological system. Their articulatory complexity and variability across dialects make them particularly noteworthy in the study of speech sounds.

Although these sounds function as phonemes in English, their realization may vary significantly, often resulting in allophonic substitutions such as alveolar or labiodental consonants. This variation highlights the dynamic nature of speech production and the influence of regional and individual factors.

Overall, the study of interdental sounds contributes to a deeper understanding of English phonetics and provides valuable insights for both linguistic research and language learning.

References

1. Ladefoged, P., & Johnson, K. (2015). A Course in Phonetics. (7th ed) Cengage Learning. 160-162 pp.
2. Roach, P. (2009). English Phonetics and Phonology. (4th ed) Cambridge University Press. 40-42 pp.
3. Ashby, M. (2011). Understanding Phonetics. (1st ed) Hodder Education. 116-117 pp.
4. Johnson, K. (2012). Acoustic and Auditory Phonetics. (3rd ed) Wiley-Blackwell. 146-149 pp.
5. Boersma, Paul & Weenink, David (2022). Praat: Doing phonetics by computer [Computer program]. Version 6.3.02, retrieved 29 November 2022 from http://www.praat.org/.
6. Celce-Murcia, M., Brinton, D., & Goodwin, J. (2010). Teaching Pronunciation. (2nd ed) Cambridge University Press. 281-284 pp.
7. Peter Ladefoged and Ian Maddieson (1996). The Sounds of the World's Languages. (1st ed) 102-104 pp.
8. Maddieson, I. (1984). *Patterns of Sounds*. Cambridge University Press. 44-45 pp.